



**2026-2027**

# **ROTATING METALCUTTING TOOLS**

# Contents

|                               |                                                                                    |                                                                                  |                   |          |                               |
|-------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------|----------|-------------------------------|
| <b>Thread Making</b>          |   | Contents<br>Thread Milling<br>Tapping                                            | C2<br>C11<br>C75  | <b>C</b> | <b>Thread Making</b>          |
| <b>Holemaking</b>             |   | Contents<br>Drilling Tools<br>Reaming Tools                                      | D2<br>D17<br>D129 | <b>D</b> | <b>Holemaking</b>             |
| <b>Milling</b>                |   | Contents<br>Cutters<br>Inserts                                                   | E2<br>E43<br>E251 | <b>E</b> | <b>Milling</b>                |
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| <b>MPT</b>                    |  | Contents<br>Shanks and Heads<br>Spare Parts                                      | H2<br>H6<br>H60   | <b>H</b> | <b>MPT</b>                    |
| <b>Materials &amp; Grades</b> |                                                                                    | Grade Comparison Table<br>Hardness Conversion Table<br>Material Conversion Table | I2<br>I6<br>I8    | <b>I</b> | <b>Materials &amp; Grades</b> |
| <b>Index</b>                  |                                                                                    |                                                                                  |                   |          | <b>Index</b>                  |



# How to use the catalogue page

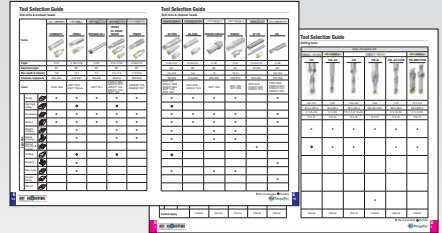
## 1 Main Contents

Select an application line from the main Table of Contents. Each line is color coded in alphabetical order.



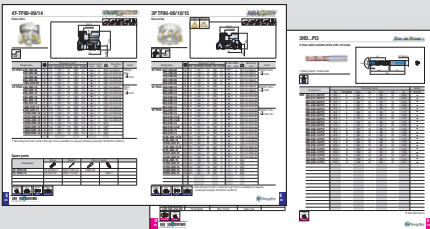
## 2 Tool Selection Guide

Choose the required machining solutions and tools from tool selection guide.



## 3 Products Page

Obtain detailed information of products such as dimensions, grades and related parts etc. Holder and insert pages are organized separately.

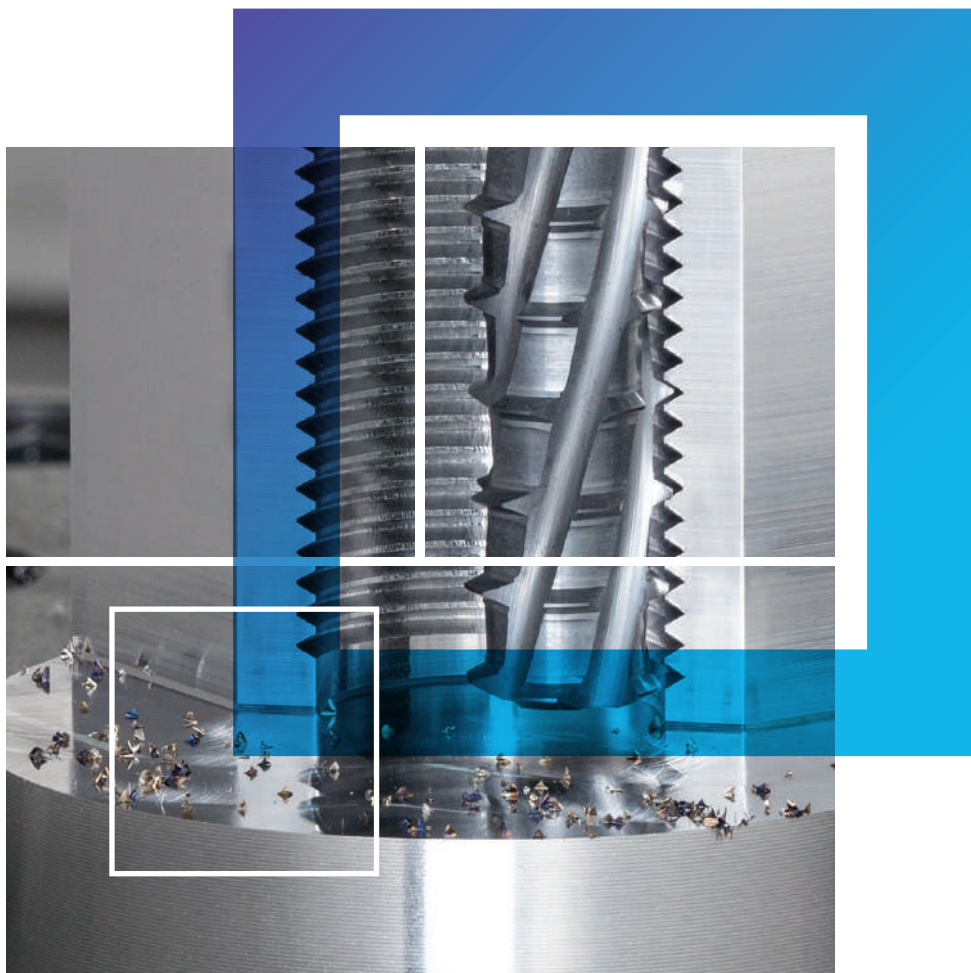


## 4 Alphabetical Index

All tools are listed in the alphabetical index at the end of the catalogue.

ABC

# THREAD MAKING



[illegible]



## Guide to Icons



➤ TS-THREAD  
Holder Page



➤ Insert Page



➤ Cutting Condition Page

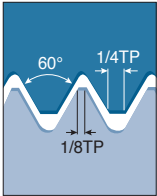
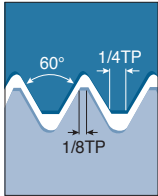
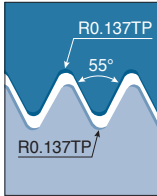
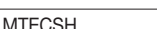


### T-TAP (Tapping)

[illegible]

# Tool Selection Guide

## Solid carbide threading end mills

| Thread                                                                                                                                       | TS-THREAD                                                                         |                                                                                   |                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                                                                                                                                              | Metric ISO                                                                        | American UN                                                                       | Whitworth                                                                          |
|                                                                                                                                              |  |  |  |
| Application                                                                                                                                  | General usage for all industries                                                  | General usage for all industries                                                  | General industries. Pipe fittings and couplings                                    |
|  <div>General</div>                                          | <div>●</div> <div>C13, C14</div>                                                  | <div>●</div> <div>C28, C29</div>                                                  | <div>●</div> <div>C41</div>                                                        |
|  <div>Internal coolant</div>                                 | <div>●</div> <div>C15</div>                                                       | <div>●</div> <div>C30</div>                                                       | <div>●</div> <div>C41</div>                                                        |
|  <div>Internal coolant<br/>more flutes</div>                 | <div>●</div> <div>C16</div>                                                       | <div>●</div> <div>C31</div>                                                       | <div>●</div> <div>C42</div>                                                        |
|  <div>Reduced neck<br/>diameter<br/>for deep threading</div> | <div>●</div> <div>C17</div>                                                       | <div>●</div> <div>C32</div>                                                       |                                                                                    |
|  <div>Internal coolant<br/>in the flutes</div>               | <div>●</div> <div>C18</div>                                                       | <div>●</div> <div>C33</div>                                                       | <div>●</div> <div>C41</div>                                                        |
|  <div>Chamfering ability<br/>hard material</div>             | <div>●</div> <div>C19</div>                                                       | <div>●</div> <div>C34</div>                                                       |                                                                                    |
|  <div>Triple lead for<br/>low cutting load</div>            | <div>●</div> <div>C20</div>                                                       | <div>●</div> <div>C35</div>                                                       |                                                                                    |
|  <div>Double lead for<br/>low cutting load</div>           | <div>●</div> <div>C21</div>                                                       | <div>●</div> <div>C38</div>                                                       |                                                                                    |
|  <div>Short flute</div>                                    | <div>●</div> <div>C22</div>                                                       | <div>●</div> <div>C36</div>                                                       | <div>●</div> <div>C42</div>                                                        |
|  <div>Short flute for<br/>hard material</div>              | <div>●</div> <div>C24</div>                                                       | <div>●</div> <div>C39</div>                                                       |                                                                                    |
|  <div>Short flute<br/>drilling ability</div>               | <div>●</div> <div>C25</div>                                                       | <div>●</div> <div>C40</div>                                                       |                                                                                    |
|  <div>Single point edge</div>                              | <div>●</div> <div>C26, C27</div>                                                  |                                                                                   |                                                                                    |

► For correct tool choice and CNC programming, use the 'TS-thread guide' software (Available at [www.taegutec.com](http://www.taegutec.com))

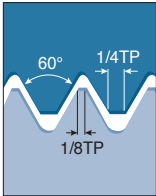
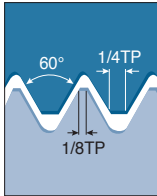
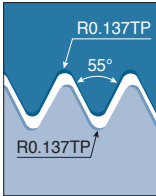
# Tool Selection Guide

## Solid carbide threading end mills

| TS-THREAD                  |                                      |                                         |                                 |                                 |
|----------------------------|--------------------------------------|-----------------------------------------|---------------------------------|---------------------------------|
| NPT                        | NPTF                                 | BSPT                                    | UNJ                             | MJ                              |
|                            |                                      |                                         |                                 |                                 |
| Steam, gas and water pipes | Steam, gas and water pipes. Dry seal | 55° form for steam, gas and water pipes | Aviation and aerospace industry | Aviation and aerospace industry |
| ●<br>C43                   | ●<br>C44                             | ●<br>C45                                |                                 |                                 |
| ●<br>C43                   |                                      | ●<br>C45                                |                                 |                                 |
|                            |                                      |                                         |                                 |                                 |
|                            |                                      |                                         |                                 |                                 |
| ●<br>C43                   | ●<br>C44                             | ●<br>C45                                |                                 |                                 |
|                            |                                      |                                         |                                 |                                 |
|                            |                                      |                                         |                                 |                                 |
|                            |                                      |                                         |                                 |                                 |
|                            |                                      |                                         | ●<br>C46                        | ●<br>C46                        |
|                            |                                      |                                         |                                 |                                 |
|                            |                                      |                                         |                                 |                                 |
|                            |                                      |                                         |                                 |                                 |

# Tool Selection Guide

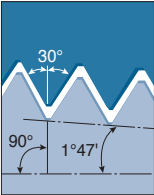
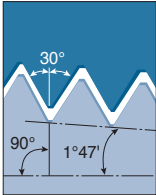
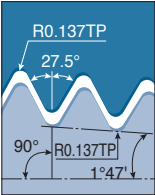
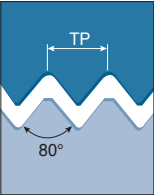
## Indexable insert type

| Thread                                               | TS-THREAD                                                                         |                                                                                   |                                                                                    |
|------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                                                      | Metric ISO                                                                        | American UN                                                                       | Whitworth                                                                          |
|                                                      |  |  |  |
| Insert page                                          | C56, C64                                                                          | C57-C58, C65                                                                      | C59, C66                                                                           |
| Application                                          | General usage for all industries                                                  | General usage for all industries                                                  | General industries. Pipe fittings and couplings                                    |
| MTE D-1<br>C48<br><br>Single insert                  | •                                                                                 | •                                                                                 | •                                                                                  |
| MTE D-1-C<br>C49<br><br>Solid carbide shank          | •                                                                                 | •                                                                                 | •                                                                                  |
| MTE D-2<br>C50<br><br>Twin insert                    | •                                                                                 | •                                                                                 | •                                                                                  |
| TMTSRH<br>C51<br><br>Helical end mill                | •                                                                                 | •                                                                                 | •                                                                                  |
| MTF D<br>C52<br><br>Large diameter thread            | •                                                                                 | •                                                                                 | •                                                                                  |
| MTFLE D<br>C53<br><br>Multi tooth-external threading | •                                                                                 | •                                                                                 | •                                                                                  |
| TMTSRH<br>C54<br><br>Helical shell mill              | •                                                                                 | •                                                                                 | •                                                                                  |

► For correct tool choice and CNC programming, use the 'TS-thread guide' software (Available at [www.taegutec.com](http://www.taegutec.com))

# Tool Selection Guide

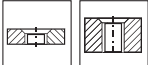
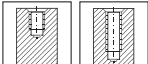
Indexable insert type

| TS-THREAD                                                                         |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| NPT                                                                               | NPTF                                                                              | BSPT                                                                              | PG                                                                                |
|  |  |  |  |
| C60, C66                                                                          | C61                                                                               | C62, C67                                                                          | C63                                                                               |
| Steam, gas and water pipes                                                        | Steam, gas and water pipes (Dry seal)                                             | 55° form for steam, gas and water pipes                                           | Electrical connector                                                              |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |



# Tool Selection Guide

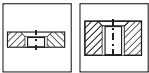
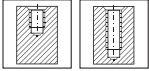
Straight flute with spiral point tap

| Series                |                                                                                                                        | <div>T-TAP</div> <div>Straight flute with spiral point tap</div>                  |                                                                                   |                                                                                   |
|-----------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                       |                                                                                                                        | TPH...52B                                                                         | TPH...52B05                                                                       | TPH...52B10                                                                       |
|                       |                                                                                                                        |  |  |  |
| Pages                 |                                                                                                                        | C77                                                                               | C78                                                                               | C79                                                                               |
| Coating type          |                                                                                                                        | Uncoated                                                                          | Steam tempered                                                                    | TiN coated                                                                        |
| Chamfer form          |                                                                                                                        | Form B<br>4-5 threads chamfer                                                     | Form B<br>4-5 threads chamfer                                                     | Form B<br>4-5 threads chamfer                                                     |
| Range<br>(ISO metric) | Coarse threads                                                                                                         | M2 - M20                                                                          | M2 - M20                                                                          | M2 - M20                                                                          |
|                       | Fine threads                                                                                                           | M8 - M16                                                                          | M8 - M16                                                                          | M8 - M16                                                                          |
| Tolerance             |                                                                                                                        | ISO 2-6H                                                                          | ISO 2-6H                                                                          | ISO 2-6H                                                                          |
| Material              | P                                                                                                                      | ○                                                                                 | ●                                                                                 | ●                                                                                 |
|                       | M                                                                                                                      |                                                                                   | ●                                                                                 | ●                                                                                 |
|                       | K                                                                                                                      | ○                                                                                 | ○                                                                                 | ○                                                                                 |
|                       | N                                                                                                                      | ●                                                                                 | ○                                                                                 | ○                                                                                 |
|                       | S                                                                                                                      |                                                                                   |                                                                                   | ○                                                                                 |
| Application           | Through hole<br><br>(2xTDZ) (3xTDZ) | ●                                                                                 | ●                                                                                 | ●                                                                                 |
|                       | Blind hole<br><br>(2xTDZ) (3xTDZ)   |                                                                                   |                                                                                   |                                                                                   |

● Recommended, ○ Suitable

# Tool Selection Guide

## 40° Right-hand spiral flute tap

| Series                |                                                                                                                        | <div>T-TAP</div> <div>40° Right-hand spiral flute tap</div>                       |                                                                                   |                                                                                   |
|-----------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                       |                                                                                                                        | TPH...54C                                                                         | TPH...54C05                                                                       | TPH...54C10                                                                       |
|                       |                                                                                                                        |  |  |  |
| Pages                 |                                                                                                                        | C80                                                                               | C81                                                                               | C82                                                                               |
| Coating type          |                                                                                                                        | Uncoated                                                                          | Steam tempered                                                                    | TiN coated                                                                        |
| Chamfer form          |                                                                                                                        | Form C<br>2-3 threads chamfer                                                     | Form C<br>2-3 threads chamfer                                                     | Form C<br>2-3 threads chamfer                                                     |
| Range<br>(ISO metric) | Coarse threads                                                                                                         | M2 - M20                                                                          | M2 - M20                                                                          | M2 - M20                                                                          |
|                       | Fine threads                                                                                                           | M8 - M16                                                                          | M8 - M16                                                                          | M8 - M16                                                                          |
| Tolerance             |                                                                                                                        | ISO 2-6H                                                                          | ISO 2-6H                                                                          | ISO 2-6H                                                                          |
| Material              | P                                                                                                                      | ○                                                                                 | ●                                                                                 | ●                                                                                 |
|                       | M                                                                                                                      |                                                                                   | ●                                                                                 | ●                                                                                 |
|                       | K                                                                                                                      | ○                                                                                 | ○                                                                                 | ○                                                                                 |
|                       | N                                                                                                                      | ●                                                                                 | ○                                                                                 | ○                                                                                 |
|                       | S                                                                                                                      |                                                                                   |                                                                                   | ○                                                                                 |
| Application           | Through hole<br><br>(2xTDZ) (3xTDZ) |                                                                                   |                                                                                   |                                                                                   |
|                       | Blind hole<br><br>(2xTDZ) (3xTDZ)   | ●                                                                                 | ●                                                                                 | ●                                                                                 |

● Recommended, ○ Suitable

# Grades

## Thread making grades

| Grades                      | ISO                                                                                                             | Characteristics & applications                                                                                                                                                                                           |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TT9030</b><br>PVD coated | <div><div>P20 — P40</div><div>M20 — M40</div><div>S20 — S40</div></div>                                         | <ul style="list-style-type: none"><li>• General machining of steel</li><li>• General machining of stainless steel</li><li>• General machining of heat-resistant alloy</li></ul>                                          |
| <b>TT5515</b>               | <div><div>P10 — P30</div><div>M10 — M30</div><div>K10 — K30</div><div>S10 — S30</div><div>H10 — H30</div></div> | <ul style="list-style-type: none"><li>• High speed machining of steel and hardened steel</li><li>• General machining of stainless steel, cast iron and heat-resistant alloy</li></ul>                                    |
| <b>TT1040</b>               | <div><div>P10 — P30</div><div>M10 — M30</div><div>K10 — K30</div><div>S10 — S30</div><div>H10 — H30</div></div> | <ul style="list-style-type: none"><li>• High speed machining of steel and hardened steel Excellent wear and heat resistance</li><li>• General machining of stainless steel, cast iron and heat-resistant alloy</li></ul> |
|                             |                                                                                                                 |                                                                                                                                                                                                                          |
|                             |                                                                                                                 |                                                                                                                                                                                                                          |
|                             |                                                                                                                 |                                                                                                                                                                                                                          |
|                             |                                                                                                                 |                                                                                                                                                                                                                          |
|                             |                                                                                                                 |                                                                                                                                                                                                                          |
|                             |                                                                                                                 |                                                                                                                                                                                                                          |
|                             |                                                                                                                 |                                                                                                                                                                                                                          |

***TS-THREAD***

# Thread Milling



|             |                                                                                   |           |           |          |           |            |            |               |
|-------------|-----------------------------------------------------------------------------------|-----------|-----------|----------|-----------|------------|------------|---------------|
| <b>MTEC</b> |  | <b>06</b> | <b>04</b> | <b>C</b> | <b>14</b> | <b>1.0</b> | <b>ISO</b> | <b>TT9030</b> |
| <b>1</b>    | <b>2</b>                                                                          | <b>3</b>  | <b>4</b>  | <b>5</b> | <b>6</b>  | <b>7</b>   | <b>8</b>   | <b>9</b>      |

## 1 TaeguTec mill thread

**MT** - Mill thread  
**E** - End mill  
**C** - Carbide

## 2 End mill type

☐ - General  
**B** - Internal coolant hole  
**BF** - More flutes number  
**Q** - Reduced neck diameter  
**Z** - Coolant hole in the flutes  
**H** - Chamfering ability  
**M** - Triple lead  
**K** - Double lead  
**S** - Short flute  
**SH** - Short flute for hard material  
**D** - Drilling ability  
**I** - Single point edge

## 3 Shank diameter

**06** 6.0 mm  
**10** 10.0 mm

## 4 Cutting diameter

**031** 3.1 mm  
**04** 4.0 mm

## 5 No. of flutes

**C** - 3 flutes  
**D** - 4 flutes  
**E** - 5 flutes  
**F** - 6 flutes  
**G** - 7 flutes  
**H** - 8 flutes

## 6 Length of thread (APMX)

**10** 10.0 mm

## 7 Thread pitch

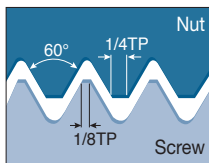
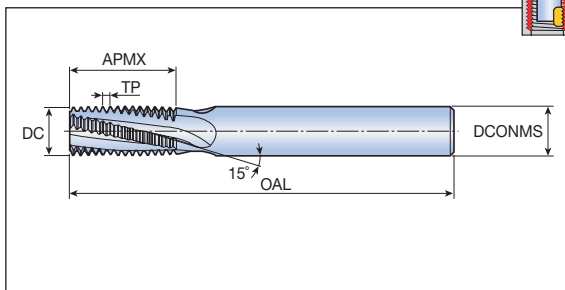
**0.25-4.0 mm** (Thread pitch)  
**72-7 TPI** (Threads per inch)

## 8 Thread standard

**ISO**  
**UN**  
**W**  
**NPT**  
**NPTF**  
**BSPT**  
**UNJ**  
**MJ**  
**UNJ**

## 9 Grades

**Coated**  
**TT5515**  
**TT9030**  
**TT1040**



Cutting Condition

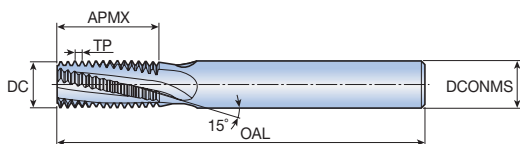
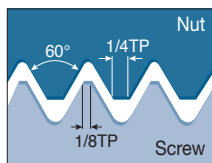
 C70

●: Standard items

# MTEC E-ISO

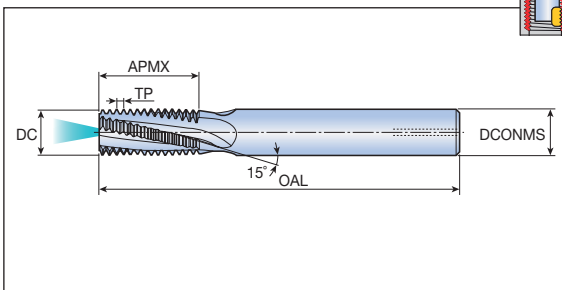
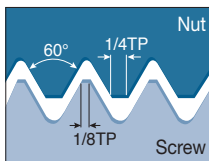
**TS-THREAD**

### Solid carbide external threading end mills

[illegible]

► NOF: Number of flutes

●: Standard items

[illegible]

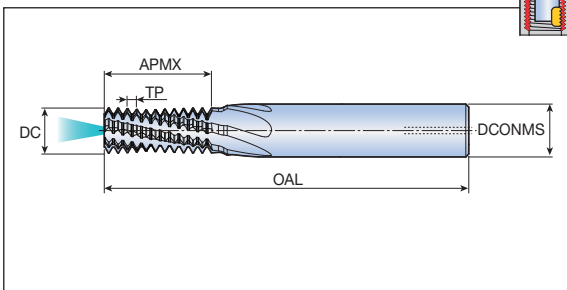
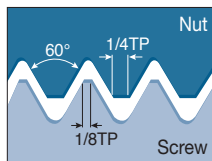
●: Standard items



# MTECBF-ISO

**TS-THREAD**

### Solid carbide threading end mills with large number of flutes

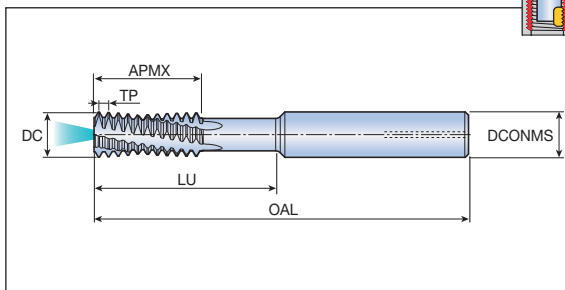
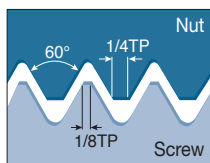
[illegible]

► NOF: Number of flutes

●: Standard items

**TS-THREAD**

A diagram showing a cross-section of a piston and crank mechanism. A blue piston is connected to a yellow crankshaft by a yellow piston pin. The piston is shown in a compressed state, with red wavy lines representing the combustion pressure pushing it down. The crankshaft is shown in a horizontal position, with the piston pin attached to its end. The entire mechanism is housed within a grey block representing the engine block.

[illegible]

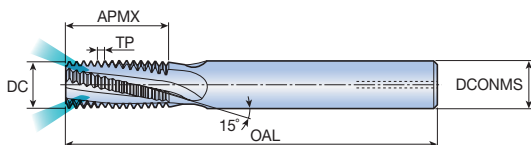
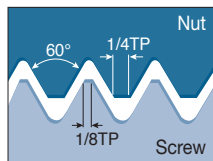
- ▶ TDZ: Thread diameter size
- ▶ NOF: Number of flutes

●: Standard items

# MTECZ-ISO

**TS-THREAD**

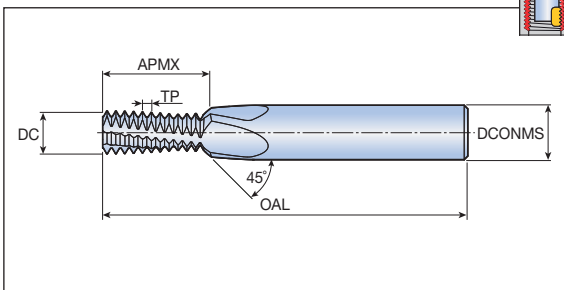
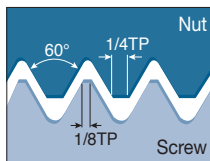
### Solid carbide threading end mills with internal coolant holes directed to the cutting edges

[illegible]

- ▶ NOF: Number of flutes

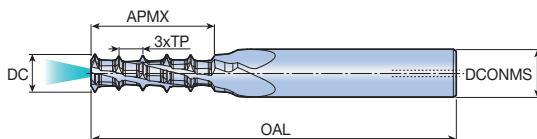
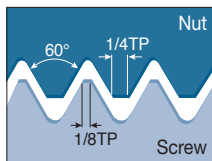
●: Standard items

A schematic diagram of a piston and crank mechanism. A blue piston is shown in a cylinder, connected to a yellow crankshaft. The piston is at the top of its stroke, and the crankshaft is in a horizontal position. The cylinder walls are shown in grey, and the crankshaft is shown in yellow.

[illegible]

●: Standard items

A schematic diagram of a piston and crank mechanism. A blue piston is shown at the top of its stroke, connected to a yellow crankshaft. The piston is surrounded by red wavy lines representing the combustion chamber. The crankshaft is shown in a horizontal position, indicating the piston is at the top of its stroke.

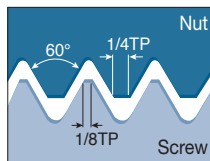
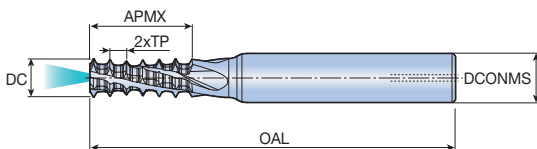


- [illegible]



●: Standard items

A schematic diagram of a piston and crank mechanism. A blue piston is shown in a cylinder, connected to a yellow crankshaft. Red wavy lines represent the combustion pressure pushing the piston down.



- Lead: 2 x pitch

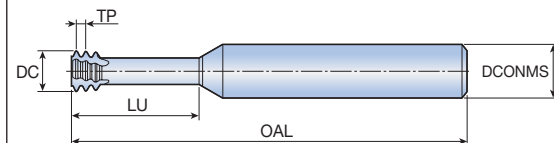
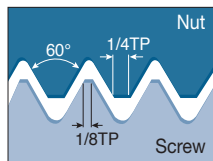
[illegible]

► NOF: Number of flutes

●: Standard items



Solid carbide threading end mills with short cutting flutes for low cutting loads



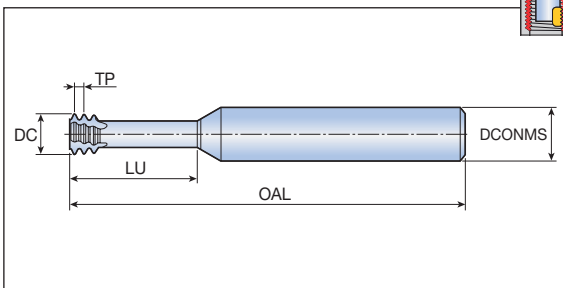
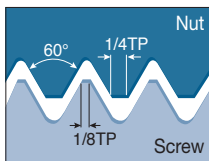
| Designation                   | TP<br>(mm) | TDZ  | Dimension (mm) |      |      |     | NOF | Grade<br>TT9030 |
|-------------------------------|------------|------|----------------|------|------|-----|-----|-----------------|
|                               |            |      | DCONMS         | DC   | LU   | OAL |     |                 |
| <b>MTECS 03007C2 0.25 ISO</b> | 0.25       | M1   | 3              | 0.72 | 2.5  | 39  | 3   | ●               |
| <b>03009C3 0.25 ISO</b>       | 0.25       | M1.2 | 3              | 0.9  | 3.0  | 39  | 3   | ●               |
| <b>03011C4 0.3 ISO</b>        | 0.3        | M1.4 | 3              | 1.05 | 4.0  | 39  | 3   | ●               |
| <b>03012C5 0.35 ISO</b>       | 0.35       | M1.6 | 3              | 1.20 | 5.0  | 39  | 3   | ●               |
| <b>06016C4 0.4 ISO</b>        | 0.4        | M2   | 6              | 1.53 | 4.5  | 58  | 3   | ●               |
| <b>03016C6 0.4 ISO</b>        | 0.4        | M2   | 3              | 1.53 | 6.0  | 39  | 3   | ●               |
| <b>03017C7 0.45 ISO</b>       | 0.45       | M2.2 | 3              | 1.65 | 7.0  | 39  | 3   | ●               |
| <b>06017C5 0.45 ISO</b>       | 0.45       | M2.2 | 6              | 1.65 | 5.0  | 58  | 3   | ●               |
| <b>0602C5 0.45 ISO</b>        | 0.45       | M2.5 | 6              | 1.95 | 5.5  | 58  | 3   | ●               |
| <b>0602C5 0.45 ISO-L</b>      | 0.45       | M2.5 | 6              | 1.95 | 5.5  | 100 | 3   | ●               |
| <b>0602C7 0.45 ISO</b>        | 0.45       | M2.5 | 6              | 1.95 | 7.5  | 58  | 3   | ●               |
| <b>06024C6 0.5 ISO</b>        | 0.5        | M3   | 6              | 2.37 | 6.5  | 58  | 3   | ●               |
| <b>06024C9 0.5 ISO</b>        | 0.5        | M3   | 6              | 2.37 | 9.5  | 58  | 3   | ●               |
| <b>06024C9 0.5 ISO-L</b>      | 0.5        | M3   | 6              | 2.37 | 9.5  | 100 | 3   | ●               |
| <b>03024C12 0.5 ISO</b>       | 0.5        | M3   | 3              | 2.4  | 12.5 | 39  | 3   | ●               |
| <b>03024C15 0.5 ISO</b>       | 0.5        | M3   | 3              | 2.4  | 15.5 | 39  | 3   | ●               |
| <b>06054D20 0.5 ISO</b>       | 0.5        | M6   | 6              | 5.35 | 20.0 | 58  | 4   | ●               |
| <b>06028C7 0.6 ISO</b>        | 0.6        | M3.5 | 6              | 2.75 | 7.5  | 58  | 3   | ●               |
| <b>06028C10 0.6 ISO</b>       | 0.6        | M3.5 | 6              | 2.75 | 10.5 | 58  | 3   | ●               |
| <b>06031C9 0.7 ISO</b>        | 0.7        | M4   | 6              | 3.1  | 9.0  | 58  | 3   | ●               |
| <b>06031C12 0.7 ISO</b>       | 0.7        | M4   | 6              | 3.1  | 12.5 | 58  | 3   | ●               |
| <b>06031C12 0.7 ISO-L</b>     | 0.7        | M4   | 6              | 3.1  | 12.5 | 100 | 3   | ●               |
| <b>06031C16 0.7 ISO</b>       | 0.7        | M4   | 6              | 3.1  | 16.7 | 58  | 3   | ●               |
| <b>0808D25 0.75 ISO</b>       | 0.75       | M10  | 8              | 8.0  | 25.0 | 64  | 4   | ●               |
| <b>06038C12 0.8 ISO</b>       | 0.8        | M5   | 6              | 3.8  | 12.5 | 58  | 3   | ●               |
| <b>06038C16 0.8 ISO</b>       | 0.8        | M5   | 6              | 3.8  | 16.0 | 58  | 3   | ●               |
| <b>06038C16 0.8 ISO-L</b>     | 0.8        | M5   | 6              | 3.8  | 16.0 | 100 | 3   | ●               |
| <b>0604C20 0.8 ISO</b>        | 0.8        | M5   | 6              | 4.0  | 20.8 | 58  | 3   | ●               |
| <b>06047C14 1.0 ISO</b>       | 1.0        | M6   | 6              | 4.65 | 14.0 | 58  | 3   | ●               |
| <b>06047C20 1.0 ISO</b>       | 1.0        | M6   | 6              | 4.65 | 20.0 | 58  | 3   | ●               |
| <b>06047C20 1.0 ISO-L</b>     | 1.0        | M6   | 6              | 4.65 | 20.0 | 100 | 3   | ●               |
| <b>06048C25 1.0 ISO</b>       | 1.0        | M6   | 6              | 4.8  | 25.0 | 58  | 3   | ●               |
| <b>0606C18 1.25 ISO</b>       | 1.25       | M8   | 6              | 6.0  | 18.0 | 58  | 3   | ●               |
| <b>0606C24 1.25 ISO</b>       | 1.25       | M8   | 6              | 6.0  | 24.0 | 58  | 3   | ●               |
| <b>0606C24 1.25 ISO-L</b>     | 1.25       | M8   | 6              | 6.0  | 24.6 | 100 | 3   | ●               |



► TDZ: Thread diameter size  
► NOF: Number of flutes

●: Standard items

A diagram showing a cross-section of a piston and crank mechanism. A blue piston is connected to a yellow crankshaft by a yellow piston pin. The piston is shown in a compressed state, with red wavy lines indicating the combustion pressure pushing it down. The crankshaft is shown in a horizontal position, with the piston pin attached to its end.

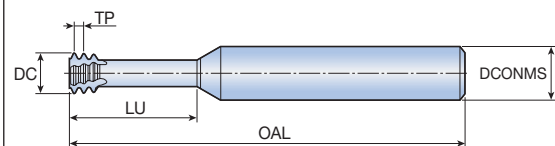
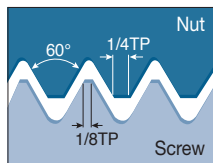


**Cutting Condition**

- : Standard items



A schematic diagram of a piston and crank mechanism. A blue piston is shown in a cylinder, connected to a yellow crankshaft. Red wavy lines represent the combustion pressure pushing the piston down.

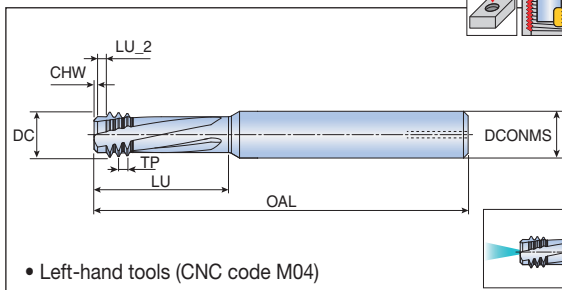
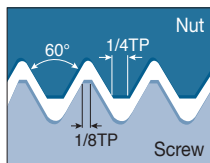


- [illegible]

Cutting Condition

C74

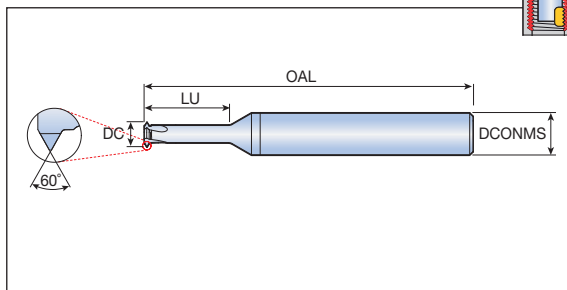
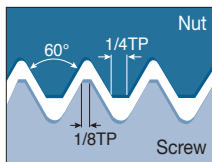
- ADVANCECUTTING**  
TaeguTec

[illegible]

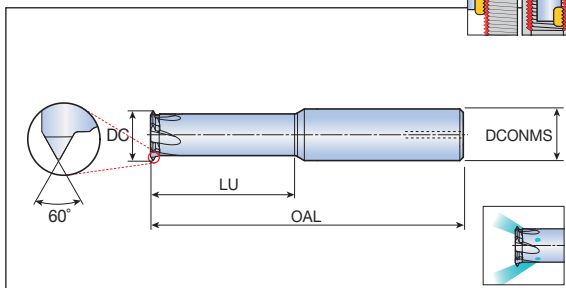
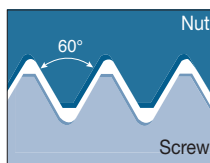
- ▶ Thread hole, thread and chamfer by circular interpolation
- ▶ TDZ: Thread diameter size
- ▶ NOF: Number of flutes

●: Standard items

A schematic diagram of a piston and crank mechanism. A blue piston is shown at the top of its stroke, connected to a yellow crankshaft. The piston is surrounded by red wavy lines representing combustion pressure. The crankshaft is shown in a horizontal position, indicating the piston is at the top of its stroke.



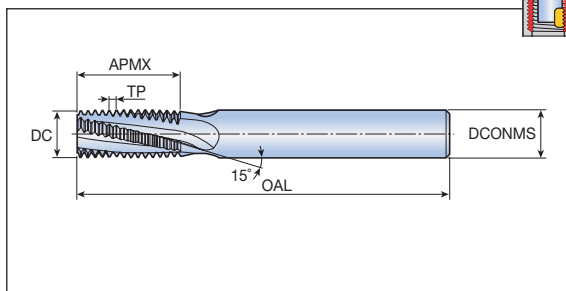
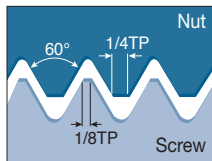
●: Standard items

[illegible]

- ▶ TDZ: Thread diameter size
- ▶ NOF: Number of flutes

●: Standard items

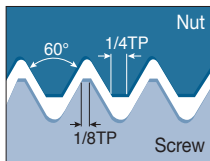
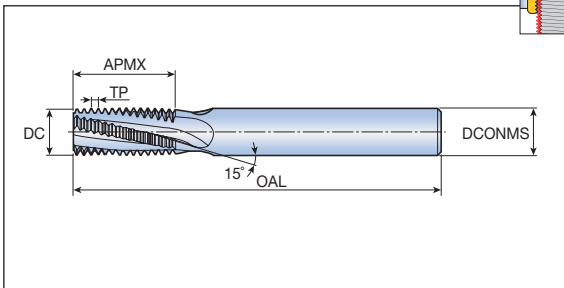
A schematic diagram of a piston and crank mechanism. A blue piston is shown at the top of its stroke, connected to a yellow crankshaft. The piston is surrounded by red wavy lines representing the combustion chamber. The crankshaft is shown in a horizontal position, indicating the piston is at the top of its stroke.

[illegible]

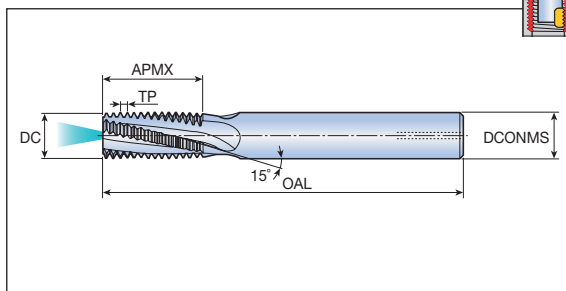
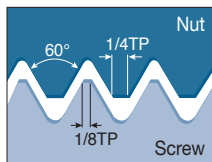
●: Standard items

**TS-THREAD**

A diagram showing a cross-section of a piston and crank mechanism. The piston is on the left, connected to a crankshaft on the right. The piston has a yellow crown and a red skirt. The crankshaft is shown in grey.

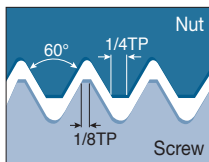
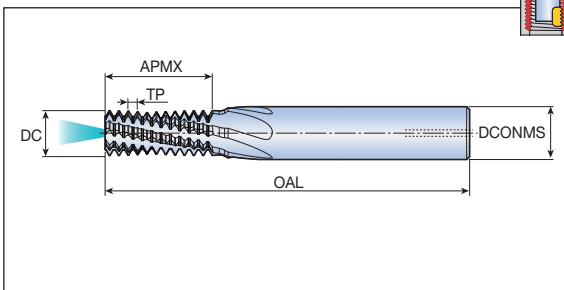
[illegible]

●: Standard items

[illegible]

●: Standard items

A diagram showing a cross-section of a piston and crank mechanism. A yellow piston pin is shown connecting the piston to the crankshaft. The piston is blue and the crankshaft is grey. The mechanism is shown in a simplified, schematic style.

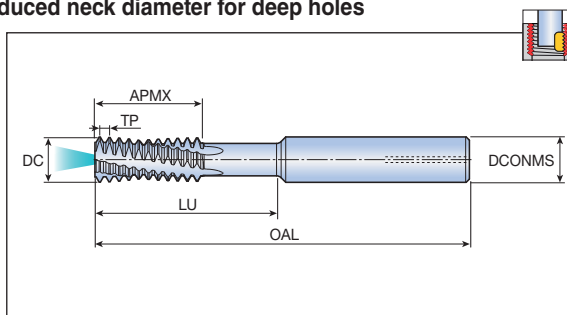
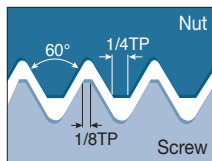
[illegible]

●: Standard items





## Solid carbide threading end mills with reduced neck diameter for deep holes

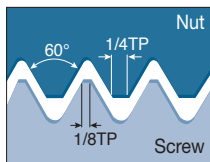
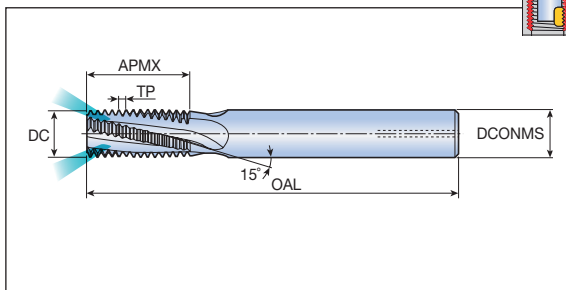
[illegible]

- ▶ TDZ: Thread diameter size
- ▶ NOF: Number of flutes

●: Standard items

**TS-THREAD**

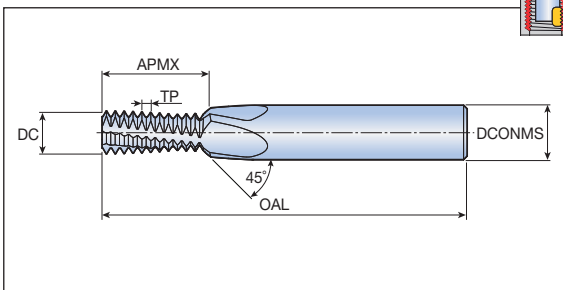
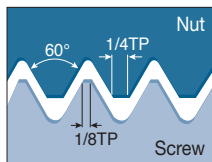
A schematic diagram of a piston and crank mechanism. A blue piston is shown at the top of its stroke, connected to a yellow crankshaft. The crankshaft is shown in a horizontal position, indicating the piston is at the top of its travel. The piston is connected to the crankshaft by a connecting rod. The entire mechanism is housed within a grey frame.



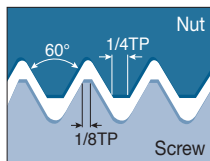
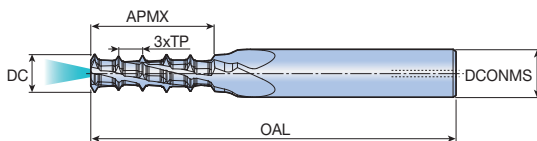
**Cutting Condition**

●: Standard items

A schematic diagram of a piston and crank mechanism. A blue piston is shown in a cylinder, connected to a yellow crankshaft. Red wavy lines represent the combustion pressure pushing the piston down.



●: Standard items



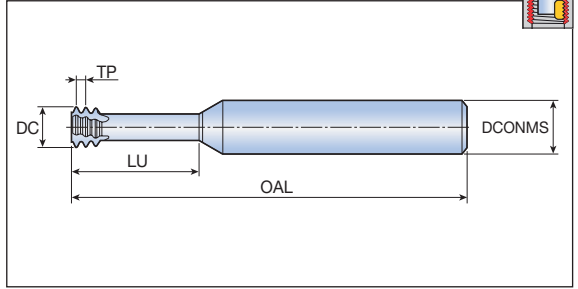
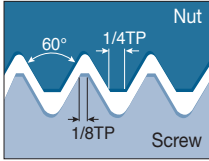
- Lead: 3 x pitch

[illegible]

► NOF: Number of flutes

●: Standard items

Solid carbide threading end mills with short cutting flutes for low cutting loads



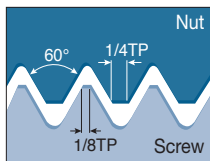
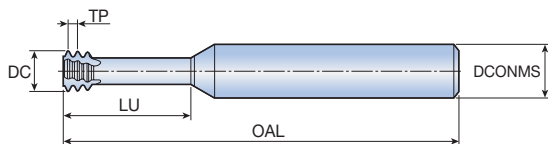
| Designation                | TPI | UNC     | UNF  | Dimension (mm) |      |      |     | NOF | Grade<br>TT9030 |
|----------------------------|-----|---------|------|----------------|------|------|-----|-----|-----------------|
|                            |     |         |      | DCONMS         | DC   | LU   | OAL |     |                 |
| <b>MTECS 03012C8 80 UN</b> | 80  | -       | #0   | 3              | 1.15 | 8.0  | 39  | 3   | ●               |
| <b>03015C6 72 UN</b>       | 72  | -       | #1   | 3              | 1.45 | 6.0  | 39  | 3   | ●               |
| <b>03016C6 56 UN</b>       | 56  | #2      | #3   | 3              | 1.65 | 6.6  | 39  | 3   | ●               |
| <b>03016C9 56 UN</b>       | 56  | #2      | #3   | 3              | 1.65 | 9.2  | 39  | 3   | ●               |
| <b>03016C11 56 UN</b>      | 56  | #2      | #3   | 3              | 1.65 | 11.4 | 39  | 3   | ●               |
| <b>06016C4 56 UN</b>       | 56  | #2      | #3   | 6              | 1.65 | 4.4  | 58  | 3   | ●               |
| <b>06016C6 56 UN</b>       | 56  | #2      | #3   | 6              | 1.65 | 6.6  | 58  | 3   | ●               |
| <b>06016C6 56 UN-L</b>     | 56  | #2      | #3   | 6              | 1.65 | 6.6  | 100 | 3   | ●               |
| <b>06019C5 48 UN</b>       | 48  | #3      | #4   | 6              | 1.9  | 5.2  | 58  | 3   | ●               |
| <b>03021C8 40 UN</b>       | 40  | #4      | -    | 3              | 2.1  | 8.0  | 39  | 3   | ●               |
| <b>03021C12 40 UN</b>      | 40  | #4      | -    | 3              | 2.1  | 12.0 | 39  | 3   | ●               |
| <b>06021C6 40 UN</b>       | 40  | #4      | -    | 6              | 2.1  | 6.3  | 58  | 3   | ●               |
| <b>06021C6 40 UN-L</b>     | 40  | #4      | -    | 6              | 2.1  | 6.3  | 100 | 3   | ●               |
| <b>06021C8 40 UN</b>       | 40  | #4      | -    | 6              | 2.1  | 8.0  | 58  | 3   | ●               |
| <b>06021C8 40 UN-L</b>     | 40  | #4      | -    | 6              | 2.1  | 8.0  | 100 | 3   | ●               |
| <b>06024C9 40 UN</b>       | 40  | #5      | #6   | 6              | 2.45 | 9.6  | 58  | 3   | ●               |
| <b>06033C9 36 UN</b>       | 36  | -       | #8   | 6              | 3.3  | 9.0  | 58  | 3   | ●               |
| <b>03025C14 32 UN</b>      | 32  | #6      | -    | 3              | 2.55 | 14.8 | 39  | 3   | ●               |
| <b>06025C7 32 UN</b>       | 32  | #6      | -    | 6              | 2.55 | 7.1  | 58  | 3   | ●               |
| <b>06025C10 32 UN</b>      | 32  | #6      | -    | 6              | 2.55 | 10.5 | 58  | 3   | ●               |
| <b>06025C10 32UN-L</b>     | 32  | #6      | -    | 6              | 2.55 | 10.5 | 100 | 3   | ●               |
| <b>06032C9 32 UN</b>       | 32  | #8      | #10  | 6              | 3.2  | 9.5  | 58  | 3   | ●               |
| <b>06032C12 32 UN</b>      | 32  | #8      | #10  | 6              | 3.2  | 12.5 | 58  | 3   | ●               |
| <b>06037C10 32 UN</b>      | 32  | -       | #10  | 6              | 3.7  | 10.5 | 58  | 3   | ●               |
| <b>06037C15 32 UN</b>      | 32  | -       | #10  | 6              | 3.7  | 15.0 | 58  | 3   | ●               |
| <b>06037C15 32 UN-L</b>    | 32  | -       | #10  | 6              | 3.7  | 15.0 | 101 | 3   | ●               |
| <b>06042C11 28 UN</b>      | 28  | -       | #12  | 6              | 4.2  | 11.0 | 58  | 3   | ●               |
| <b>0605C14 28 UN</b>       | 28  | -       | 1/4  | 6              | 5.0  | 14.5 | 58  | 3   | ●               |
| <b>0605C19 28 UN</b>       | 28  | -       | 1/4  | 6              | 5.0  | 19.0 | 58  | 3   | ●               |
| <b>06035C10 24 UN</b>      | 24  | #10,#12 | -    | 6              | 3.5  | 10.6 | 58  | 3   | ●               |
| <b>06035C15 24 UN</b>      | 24  | #10,#12 | -    | 6              | 3.5  | 15.5 | 58  | 3   | ●               |
| <b>08066C17 24 UN</b>      | 24  | -       | 5/16 | 8              | 6.6  | 17.0 | 64  | 3   | ●               |
| <b>08066C24 24 UN</b>      | 24  | -       | 5/16 | 8              | 6.6  | 24.0 | 64  | 3   | ●               |
|                            |     |         |      |                |      |      |     |     |                 |
|                            |     |         |      |                |      |      |     |     |                 |



► NOF: Number of flutes

●: Standard items

A schematic diagram of a piston and crank mechanism. A blue piston is shown at the top, connected to a yellow crankshaft. The piston is surrounded by red wavy lines representing combustion pressure. The crankshaft is shown in a cross-section view, with the piston rod passing through it.

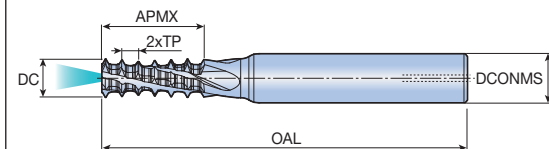
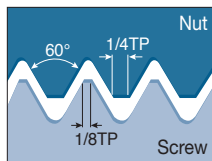


Cutting Condition

C74

●: Standard items

A schematic diagram of a piston and crank mechanism. A blue piston is shown in a cylinder, connected to a yellow crankshaft. The piston is at the top of its stroke, and the crankshaft is in a horizontal position. The cylinder walls are shown in grey.

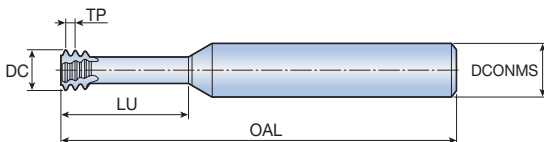
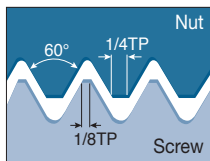


- [illegible]



●: Standard items

### Left-handed solid carbide threading end mills with short cutting flutes for hardened steel



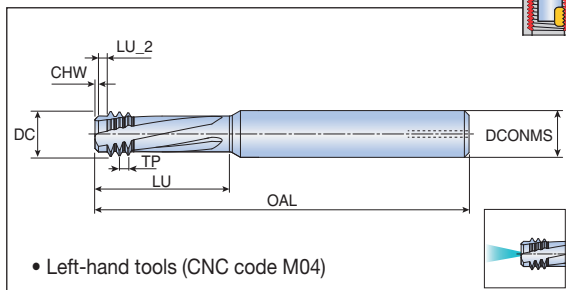
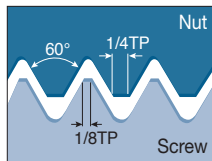
- Left-hand tools (CNC code M04)

[illegible]

► NOF: Number of flutes

●: Standard items

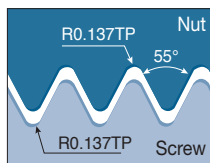
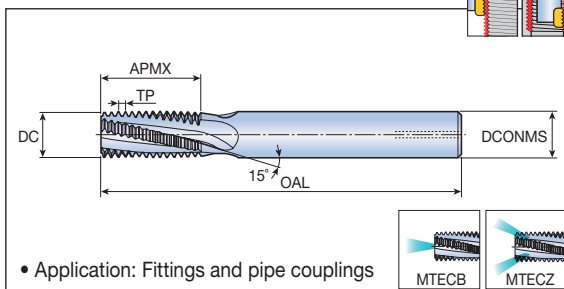


[illegible]

- ▶ Thread hole, thread and chamfer by circular interpolation
- ▶ NOF: Number of flutes

●: Standard items

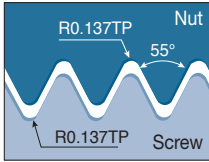
**TS-THREAD**

BSF  
BSP  
BSW

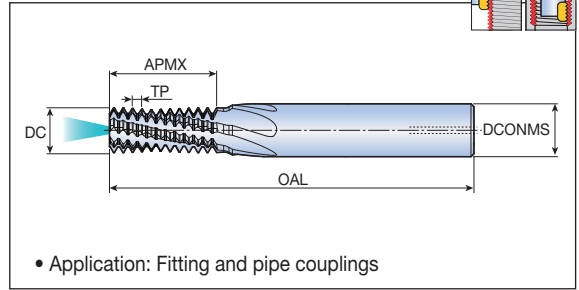
- ▶ TDZ: Thread diameter size
- ▶ NOF: Number of flutes

●: Standard items

## Solid carbide threading end mills with large number of flutes



BSF  
BSP  
BSW



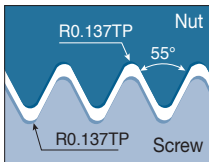
| Designation                 | TPI | TDZ      | Dimension (mm) |      |      |     | NOF | Grade<br>TT9030 |
|-----------------------------|-----|----------|----------------|------|------|-----|-----|-----------------|
|                             |     |          | DCONMS         | DC   | LU   | OAL |     |                 |
| <b>MTECBF 08078H14 28 W</b> | 28  | G1/8     | 8              | 7.8  | 14.0 | 64  | 8   | ●               |
| <b>1010G16 19 W</b>         | 19  | G1/4-3/8 | 10             | 10.0 | 16.0 | 73  | 7   | ●               |
| <b>1614H26 14 W</b>         | 14  | G1/2-7/8 | 16             | 14.0 | 26.2 | 105 | 8   | ●               |
| <b>1616H38 11 W</b>         | 11  | G7/16    | 16             | 16.0 | 37.9 | 105 | 8   | ●               |



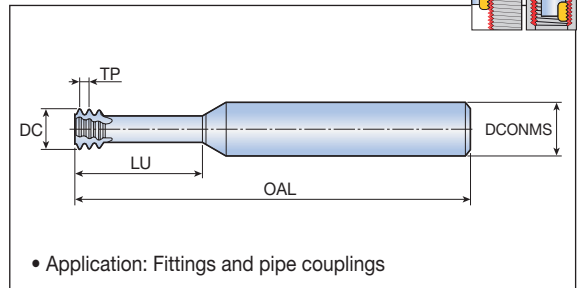
●: Standard items

# MTECS-W

## Solid carbide threading end mills with short cutting flutes for low cutting loads



BSF  
BSP  
BSW



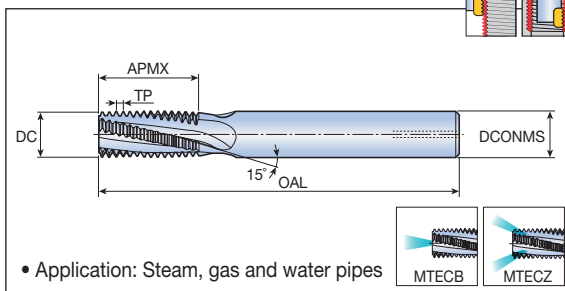
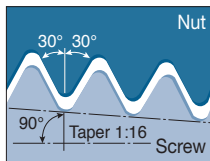
| Designation                | TPI | TDZ      | Dimension (mm) |      |      |     | NOF | Grade<br>TT9030 |
|----------------------------|-----|----------|----------------|------|------|-----|-----|-----------------|
|                            |     |          | DCONMS         | DC   | LU   | OAL |     |                 |
| <b>MTECS 08078C19 28 W</b> | 28  | G1/8     | 8              | 7.8  | 19.5 | 64  | 3   | ●               |
| <b>1010D30 19 W</b>        | 19  | G1/4-3/8 | 10             | 10.0 | 30.0 | 73  | 4   | ●               |
| <b>1212D37 14 W</b>        | 14  | G1/2-7/8 | 12             | 12.0 | 37.0 | 84  | 4   | ●               |
| <b>1616D44 11 W</b>        | 11  | G ≥ 1    | 16             | 16.0 | 44.0 | 105 | 4   | ●               |



► TDZ: Thread diameter size  
► NOF: Number of flutes

●: Standard items

**TS-THREAD**

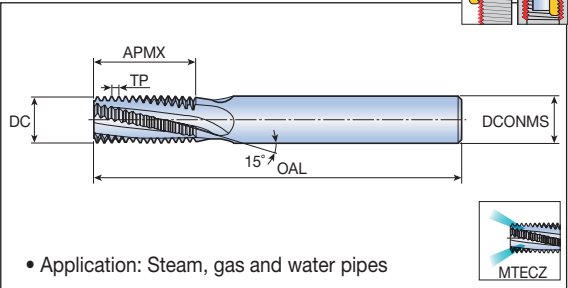
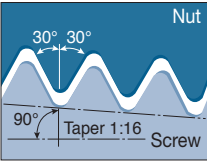
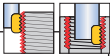
[illegible]

- ▶ TDZ: Thread diameter size
- ▶ NOF: Number of flutes

●: Standard items

# MTEC-NPTF / MTECZ-NPTF

Solid carbide threading end mills



• Application: Steam, gas and water pipes

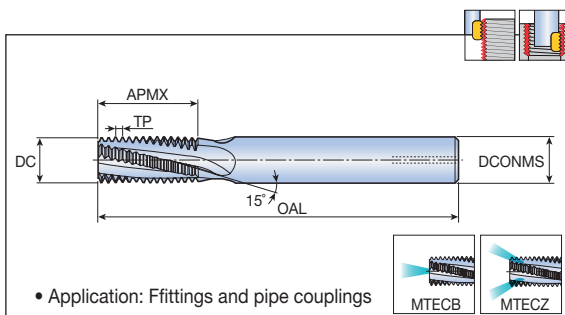
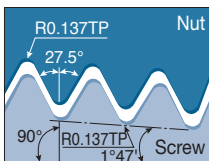
| Designation |          |    |      | TPI | TDZ      | Dimension (mm) |      |      |     | NOF | Grade<br>TT9030 |
|-------------|----------|----|------|-----|----------|----------------|------|------|-----|-----|-----------------|
|             |          |    |      |     |          | DCONMS         | DC   | APMX | OAL |     |                 |
| MTEC        | 0606C9   | 27 | NPTF | 27  | 1/16-1/8 | 6              | 6.0  | 9.9  | 58  | 3   | ●               |
|             | 0808C14  | 18 | NPTF | 18  | 1/4-3/8  | 8              | 8.0  | 14.8 | 64  | 3   | ●               |
|             | 1212D20  | 14 | NPTF | 14  | 1/2-3/4  | 12             | 12.0 | 20.9 | 84  | 4   | ●               |
| MTECZ       | 08076C10 | 27 | NPTF | 27  | 1/8      | 8              | 7.6  | 10.8 | 64  | 3   | ●               |
|             | 1010D16  | 18 | NPTF | 18  | 1/4-3/8  | 10             | 10.0 | 16.2 | 73  | 4   | ●               |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |
|             |          |    |      |     |          |                |      |      |     |     |                 |



► TDZ: Thread diameter size  
► NOF: Number of flutes

●: Standard items

**TS-THREAD**

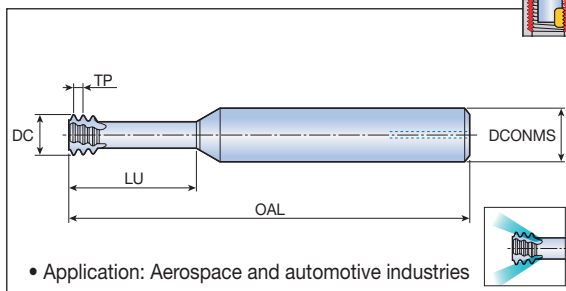
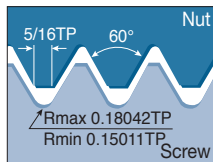
[illegible]

- ▶ TDZ: Thread diameter size
- ▶ NOF: Number of flutes

●: Standard items

## TS-THREAD

A diagram showing a cross-section of a piston and crank mechanism. A yellow piston pin is shown connecting the piston to the crankshaft. The piston is blue, and the crankshaft is red. The diagram illustrates the mechanical connection between the two components.

[illegible]

●: Standard items



# Tool Designation System

## End mills

|           |          |            |          |          |          |          |           |            |          |           |
|-----------|----------|------------|----------|----------|----------|----------|-----------|------------|----------|-----------|
| <b>MT</b> | <b>E</b> | <b>D25</b> | <b>-</b> | <b>1</b> | <b>-</b> | <b>W</b> | <b>20</b> | <b>(C)</b> | <b>-</b> | <b>21</b> |
| <b>1</b>  | <b>2</b> | <b>3</b>   |          | <b>4</b> |          | <b>5</b> | <b>6</b>  | <b>7</b>   |          | <b>8</b>  |

### 1 Mill thread

**M** - Mill  
**T** - Thread

### 2 Tool type

**E** - End mills type

### 3 Cutting diameter

**D25** - 25.0mm

### 4 Number of insert

**1** 1 insert  
**2** 2 inserts

### 5 Shank type

**W** - Weldon shank  
**C** - Cylindrical type

### 6 Shank diameter

**20** - 20.0mm

### 7 Shank material

**C** Carbide shank

### 8 Insert size (APMX)

**12** 12.0 mm  
**14** 14.0 mm  
**21** 21.0 mm  
**30** 30.0 mm  
**40** 40.0 mm

## Cutters

|           |          |             |          |          |          |           |          |           |
|-----------|----------|-------------|----------|----------|----------|-----------|----------|-----------|
| <b>MT</b> | <b>F</b> | <b>D063</b> | <b>-</b> | <b>5</b> | <b>-</b> | <b>22</b> | <b>-</b> | <b>21</b> |
| <b>1</b>  | <b>2</b> | <b>3</b>    |          | <b>4</b> |          | <b>5</b>  |          | <b>6</b>  |

### 1 Mill thread

**M** - Mill  
**T** - Thread

### 2 Tool type

**F** - Facemill type

### 3 Cutting diameter

**D063** - 63.0mm

### 4 Number of insert

**4** 4 inserts  
**5** 5 inserts

### 5 Bore diameter

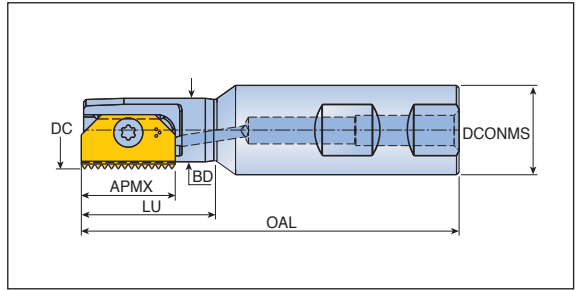
**22** 22.0 mm  
**27** 27.0 mm  
**32** 32.0 mm

### 6 Insert size (APMX)

**21** 21.0 mm  
**30** 30.0 mm  
**40** 40.0 mm



## Indexable threading end mills - Weldon shank



| Designation                              |   | Dimension (mm) |      |        |      |       |     | Shank | Coolant hole | Kg   | Insert |
|------------------------------------------|---|----------------|------|--------|------|-------|-----|-------|--------------|------|--------|
|                                          |   | APMX           | DC   | DCONMS | BD   | LU    | OAL |       |              |      |        |
| <b>MTE D09.5-1-W20-12</b> <sup>(1)</sup> | 1 | 12             | 9.5  | 20     | 7.5  | 15.5  | 85  | W     | ●            | 0.16 | TTMT12 |
| <b>D09.9-1-W20-12</b>                    | 1 | 12             | 9.9  | 20     | 7.5  | 16.0  | 85  | W     | ●            | 0.16 | TTMT12 |
| <b>D12.2-1-W20-14</b>                    | 1 | 14             | 12.2 | 20     | 8.8  | 20.0  | 75  | W     | ●            | 0.15 | TTMT14 |
| <b>D14.5-1-W20-14</b>                    | 1 | 14             | 14.5 | 20     | 10.8 | 27.1  | 85  | W     | ●            | 0.16 | TTMT14 |
| <b>D17.0-1-W20-14</b>                    | 1 | 14             | 17.0 | 20     | 12.8 | 30.0  | 85  | W     | ●            | 0.23 | TTMT14 |
| <b>D18-1-W20-21</b> <sup>(2)</sup>       | 1 | 21             | 18.5 | 20     | 14.2 | 30.0  | 85  | W     | ●            | 0.20 | TTMT21 |
| <b>D21-1-W20-21</b>                      | 1 | 21             | 21.0 | 20     | 15.9 | 40.0  | 94  | W     | ●            | 0.23 | TTMT21 |
| <b>D25-1-W20-21</b>                      | 1 | 21             | 25.0 | 20     | 20.0 | 61.0  | 115 | W     | ●            | 0.24 | TTMT21 |
| <b>D29-1-W25-30</b>                      | 1 | 30             | 29.0 | 25     | 22.2 | 50.0  | 110 | W     | ●            | 0.32 | TTMT30 |
| <b>D31-1-W25-30</b>                      | 1 | 30             | 31.0 | 25     | 25.0 | 90.0  | 150 | W     | ●            | 0.60 | TTMT30 |
| <b>D38-1-W32-30</b>                      | 1 | 30             | 38.0 | 32     | 32.0 | 86.0  | 150 | W     | ●            | 0.90 | TTMT30 |
| <b>D48-1-W40-40</b>                      | 1 | 40             | 48.0 | 40     | 35.0 | 78.0  | 153 | W     | ●            | 1.30 | TTMT40 |
| <b>D48-1-W40-40-B</b>                    | 1 | 40             | 48.0 | 40     | 36.5 | 138.0 | 210 | W     | ●            | 1.50 | TTMT40 |
|                                          |   |                |      |        |      |       |     |       |              |      |        |
|                                          |   |                |      |        |      |       |     |       |              |      |        |
|                                          |   |                |      |        |      |       |     |       |              |      |        |
|                                          |   |                |      |        |      |       |     |       |              |      |        |
|                                          |   |                |      |        |      |       |     |       |              |      |        |
|                                          |   |                |      |        |      |       |     |       |              |      |        |
|                                          |   |                |      |        |      |       |     |       |              |      |        |

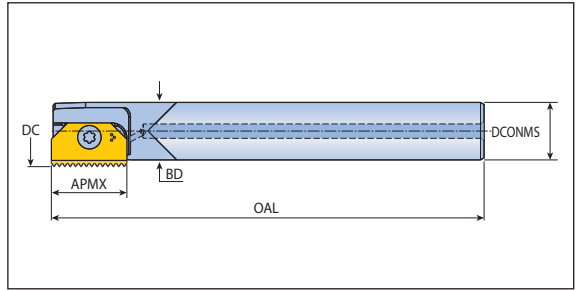
- ▶ Minimum bore should be one-third larger than DC (diameter)
- ▶ All end mills are equipped with a bore for internal coolant
- ▶ <sup>(1)</sup> Not suitable for inserts: TTMT12 18 NPT, TTMT12 18 NPTF, TTMT12 19 BSPT
- ▶ <sup>(2)</sup> Not suitable for inserts: TTMT21 1 3.50 ISO, TTMT21 1 7 UN, TTMT21 11.5 NPT, TTMT21 11.5 NPTF

## Spare parts

| Designation              | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                          |  |  |  |  |
| <b>MTE D...12</b>        | SR M2.5-T8-MT                                                                       | BLD T08/M7                                                                          | SW4-SD                                                                              | -                                                                                   |
| <b>MTE D...14</b>        | SR M2.6-L6.7-S11                                                                    | BLD T08/M7                                                                          | SW4-SD                                                                              | -                                                                                   |
| <b>MTE D...21</b>        | SR M4-IP15-MT                                                                       | BLD IP15/S7                                                                         | SW6-SD                                                                              | -                                                                                   |
| <b>MTE D...30/40(-B)</b> | SR M5-IP25-MT                                                                       | BLD IP25/S7                                                                         | -                                                                                   | SW6-T                                                                               |
|                          |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

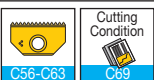


**TS-THREAD**



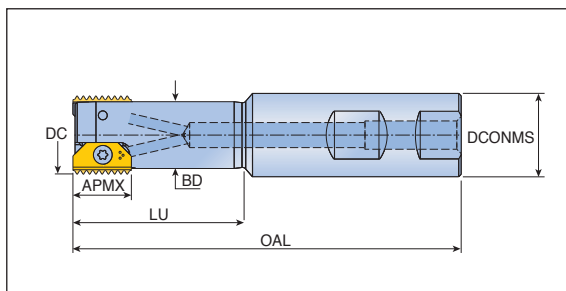
- For holders with long overhang, reduce the cutting speed and feed rate, between 20 to 40% (depending on workpiece, material, pitch and overhang)
- All end mills are equipped with a bore for internal coolant

| Designation               | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                           |  |  |  |  |
| <b>MTE D...C...12</b>     | SR M2.5-T8-MT                                                                       | BLD T08/M7                                                                          | SW4-SD                                                                              | -                                                                                   |
| <b>MTE D...C...14(-B)</b> | SR M2.6-L6.7-S11                                                                    | BLD T08/M7                                                                          | SW4-SD                                                                              | -                                                                                   |
| <b>MTE D...C...21(-B)</b> | SR M4-IP15-MT                                                                       | BLD IP15/S7                                                                         | SW6-SD                                                                              | -                                                                                   |
| <b>MTE D...C...30</b>     | SR M5-IP25-MT-S                                                                     | BLD IP25/S7                                                                         | -                                                                                   | SW6-T                                                                               |
|                           |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



## MTE D-2

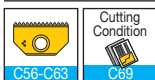
### Double insert thread milling end mills - Weldon shank

[illegible]

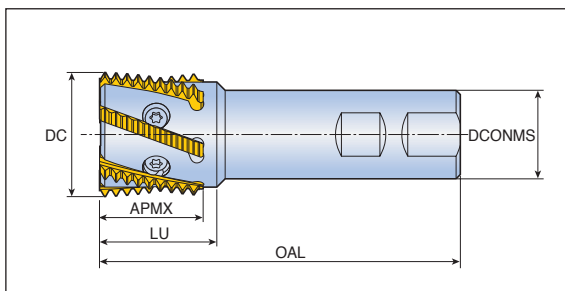
- ▶ Minimum bore should be one-third larger than DC (diameter)
- ▶ All end mills are equipped with a bore for internal coolant

## Spare parts

| Designation              | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                          |  |  |  |  |
| <b>MTE D...W...14</b>    | SR M2.6-L6.7-S11                                                                    | BLD T08/M7                                                                          | SW4-SD                                                                              | -                                                                                   |
| <b>MTE D...W...21</b>    | SR M4-IP15-MT                                                                       | BLD IP15/S7                                                                         | SW6-SD                                                                              | -                                                                                   |
| <b>MTE D...W...30/40</b> | SR M5-IP25-MT                                                                       | BLD IP25/S7                                                                         | -                                                                                   | SW6-T                                                                               |
|                          |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

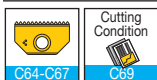


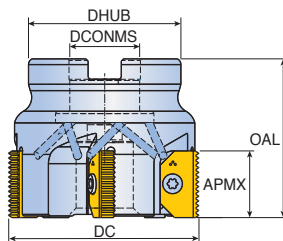
## TS-THREAD

[illegible]

## Spare parts

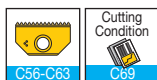
| Designation      | Screw                                                                               | Wrench                                                                              |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                  |  |  |  |  |
| <b>TMTSRH 23</b> | SR M4X0.7-MTH23                                                                     | T-15/5                                                                              |  |  |
| <b>TMTSRH 32</b> | SR 8-32UNC-MTH32                                                                    | T-20/5                                                                              |  |  |
| <b>TMTSRH 45</b> | SR M5X0.8-MTH45                                                                     | TK40                                                                                |  |  |
|                  |                                                                                     |                                                                                     |  |  |





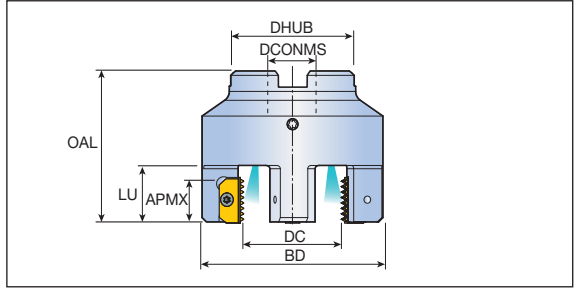
- ▶ All shell mills are equipped with a bore for internal coolant

| Designation             | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |                                                                                     |  |
|-------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                         |  |  |  |  |  |
| <b>MTF D063...21</b>    | SR M4-IP15-MT                                                                       | BLD IP15/S7                                                                         | SW6-SD                                                                              | -                                                                                   |  |
| <b>MTF D063...30</b>    | SR M5-IP25-MT                                                                       | BLD IP25/S7                                                                         | -                                                                                   | SW6-T                                                                               |  |
| <b>MTF D080...30/40</b> | SR M5-IP25-MT                                                                       | BLD IP25/S7                                                                         | -                                                                                   | SW6-T                                                                               |  |
| <b>MTF D100...30/40</b> | SR M5-IP25-MT                                                                       | BLD IP25/S7                                                                         | -                                                                                   | SW6-T                                                                               |  |
|                         |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



## MTFLE D

### External multi-tooth threading shell mills

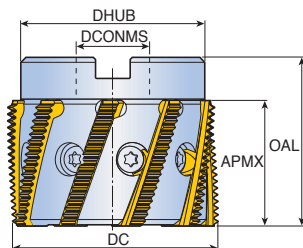
[illegible]

► All shell mills are equipped with a bore for internal coolant

## Spare parts

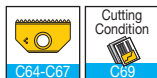
| Designation  | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |
|--------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|              |  |  |  |  |
| MTFLE D...21 | SR M4-IP15-MT                                                                       | BLD IP15/S7                                                                         | SW6-SD                                                                              |  |
|              |                                                                                     |                                                                                     |                                                                                     |  |
|              |                                                                                     |                                                                                     |                                                                                     |  |
|              |                                                                                     |                                                                                     |                                                                                     |  |
|              |                                                                                     |                                                                                     |                                                                                     |  |





- ▶ All shell mills are equipped with a bore for internal coolant

| Designation      | Screw                                                                               | Wrench                                                                              |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                  |  |  |  |  |
| <b>TMTSRH 32</b> | SR 8-32UNC-MTH32S                                                                   | T-20/5                                                                              |  |  |
| <b>TMTSRH 45</b> | SR M5X0.8-MTH45                                                                     | TK40                                                                                |  |  |
| <b>TMTSRH 63</b> | SR M5X0.8-MTH63                                                                     | TK40                                                                                |  |  |
|                  |                                                                                     |                                                                                     |  |  |



Thread milling inserts

|         |    |   |     |     |        |
|---------|----|---|-----|-----|--------|
| TTMT(H) | 30 | E | 1.5 | ISO | TT9030 |
| 1       | 2  | 3 | 4   | 5   | 6      |

1 TaeguTec mill thread

|    |                  |
|----|------------------|
| TT | - TaeguTec       |
| M  | - Mill           |
| T  | - Thread         |
| H  | - Helical insert |

2 Insert size (INSL)

|    |         |
|----|---------|
| 12 | 12.0 mm |
| 14 | 14.0 mm |
| 21 | 21.0 mm |
| 30 | 30.0 mm |
| 40 | 40.0 mm |



3 Application

|   |                       |
|---|-----------------------|
| E | - External            |
| I | - Internal            |
| □ | - External + internal |

4 Thread pitch

|           |                        |
|-----------|------------------------|
| 0.5 - 6.0 | mm (Thread pitch)      |
| 32 - 4    | TPI (Threads per inch) |

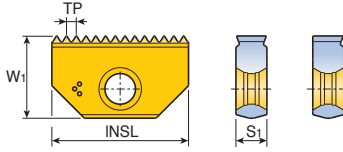
5 Thread standard

|      |
|------|
| ISO  |
| UN   |
| WHIT |
| NPT  |
| NPTF |
| BSPT |

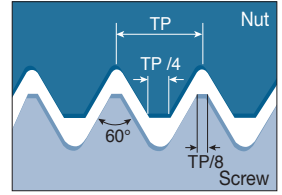
6 Grades

|        |
|--------|
| Coated |
| TT9030 |





TTMT12 I <sup>(1)</sup>



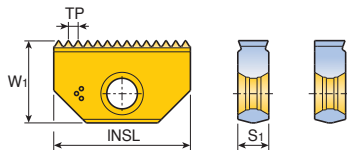
| Insert | Designation                      | TP<br>(mm) | Dimension (mm) |      |     | Grade |
|--------|----------------------------------|------------|----------------|------|-----|-------|
|        |                                  |            | INSL           | W1   | S1  |       |
|        | TTMT12 I 0.5 ISO <sup>(1)</sup>  | 0.50       | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 0.75 ISO <sup>(1)</sup> | 0.75       | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 1.0 ISO <sup>(1)</sup>  | 1.00       | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 1.25 ISO <sup>(1)</sup> | 1.25       | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 1.5 ISO <sup>(1)</sup>  | 1.50       | 12             | 6.5  | 2.9 | ●     |
|        | TTMT14 I 0.5 ISO                 | 0.50       | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 0.75 ISO              | 0.75       | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 1.0 ISO               | 1.00       | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 1.25 ISO              | 1.25       | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 1.5 ISO               | 1.50       | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 1.75 ISO              | 1.75       | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 2.0 ISO               | 2.00       | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 2.5 ISO               | 2.50       | 14             | 7.9  | 3.2 | ●     |
|        | TTMT21 E/I 1.0 ISO               | 1.00       | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 1.5 ISO               | 1.50       | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 I 1.75 ISO                | 1.75       | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 2.0 ISO               | 2.00       | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 2.5 ISO               | 2.50       | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 3.0 ISO               | 3.00       | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 I 3.5 ISO                 | 3.50       | 21             | 12.6 | 4.8 | ●     |
|        | TTMT30 E/I 1.5 ISO               | 1.50       | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 2.0 ISO               | 2.00       | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 3.0 ISO               | 3.00       | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 3.5 ISO               | 3.50       | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 4.0 ISO               | 4.00       | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 I 4.5 ISO                 | 4.50       | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 I 5.0 ISO                 | 5.00       | 30             | 16.7 | 5.6 | ●     |
|        | TTMT40 E/I 1.5 ISO               | 1.50       | 40             | 20.8 | 6.4 | ●     |
|        | TTMT40 E/I 2.0 ISO               | 2.00       | 40             | 20.8 | 6.4 | ●     |
|        | TTMT40 E/I 3.0 ISO               | 3.00       | 40             | 20.8 | 6.4 | ●     |
|        | TTMT40 I 3.5 ISO                 | 3.50       | 40             | 20.8 | 6.4 | ●     |
|        | TTMT40 E/I 4.0 ISO               | 4.00       | 40             | 20.8 | 6.4 | ●     |
|        | TTMT40 I 4.5 ISO                 | 4.50       | 40             | 20.8 | 6.4 | ●     |
|        | TTMT40 E/I 5.0 ISO               | 5.00       | 40             | 20.8 | 6.4 | ●     |
|        | TTMT40 I 5.5 ISO                 | 5.50       | 40             | 20.8 | 6.4 | ●     |
|        | TTMT40 E/I 6.0 ISO               | 6.00       | 40             | 20.8 | 6.4 | ●     |
|        |                                  |            |                |      |     |       |
|        |                                  |            |                |      |     |       |



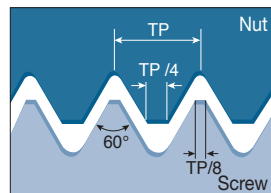
► <sup>(1)</sup> TTMT12 insert is only available with a single cutting edge

●: Standard items

UN, UNC, UNF, UNEF, UNS



TTMT12 I <sup>(1)</sup>

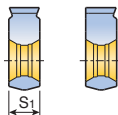
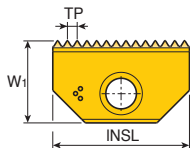
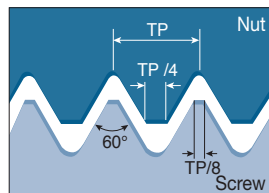


| Insert | Designation                   | TPI | Dimension (mm) |      |     | Grade |
|--------|-------------------------------|-----|----------------|------|-----|-------|
|        |                               |     | INSL           | W1   | S1  |       |
|        | TTMT12 I 32 UN <sup>(1)</sup> | 32  | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 28 UN <sup>(1)</sup> | 28  | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 24 UN <sup>(1)</sup> | 24  | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 20 UN <sup>(1)</sup> | 20  | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 18 UN <sup>(1)</sup> | 18  | 12             | 6.5  | 2.9 | ●     |
|        | TTMT12 I 16 UN <sup>(1)</sup> | 16  | 12             | 6.5  | 2.9 | ●     |
|        | TTMT14 E/I 32 UN              | 32  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 28 UN              | 28  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 I 27 UN                | 27  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 24 UN              | 24  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 20 UN              | 20  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 18 UN              | 18  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 16 UN              | 16  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 14 UN              | 14  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 E/I 12 UN              | 12  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 I 11 UN                | 11  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT14 I 10 UN                | 10  | 14             | 7.9  | 3.2 | ●     |
|        | TTMT21 E/I 24 UN              | 24  | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 20 UN              | 20  | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 18 UN              | 18  | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 16 UN              | 16  | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 14 UN              | 14  | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 12 UN              | 12  | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 E/I 10 UN              | 10  | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 I 8 UN                 | 8   | 21             | 12.6 | 4.8 | ●     |
|        | TTMT21 I 7 UN                 | 7   | 21             | 12.6 | 4.8 | ●     |
|        | TTMT30 E/I 20 UN              | 20  | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 18 UN              | 18  | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 16 UN              | 16  | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 14 UN              | 14  | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 12 UN              | 12  | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 10 UN              | 10  | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 8 UN               | 8   | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 E/I 6 UN               | 6   | 30             | 16.7 | 5.6 | ●     |
|        | TTMT30 I 5 UN                 | 5   | 30             | 16.7 | 5.6 | ●     |
|        |                               |     |                |      |     |       |
|        |                               |     |                |      |     |       |
|        |                               |     |                |      |     |       |



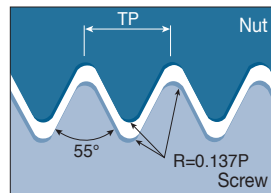
► <sup>(1)</sup> TTMT12 insert is only available with a single cutting edge

●: Standard items

TTMT12 I <sup>(1)</sup>[illegible]

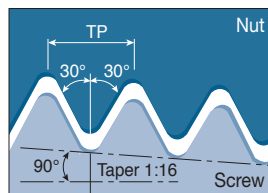
► <sup>(1)</sup> TTMT12 insert is only available with a single cutting edge

●: Standard items

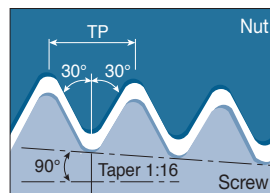
[illegible]

●: Standard items

**NPT - National pipe taper thread**

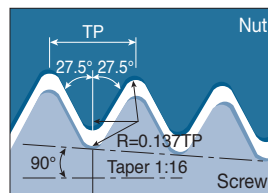


## TS-THREAD

[illegible]

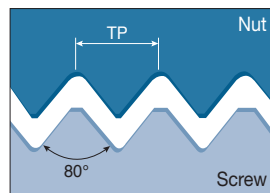
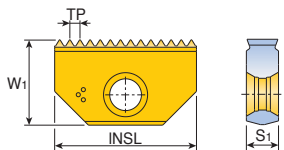
- ▶ The same insert for external and internal threading
- ▶ Conical pipe thread Inserts are single-sided

●: Standard items

[illegible]

- ▶ The same insert for external and internal threading
- ▶ Conical pipe thread inserts are single-sided

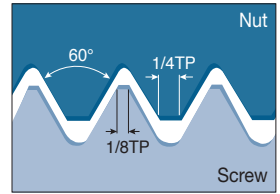
●: Standard items

[illegible]

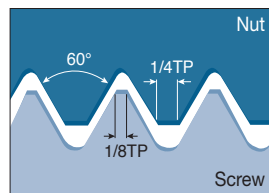
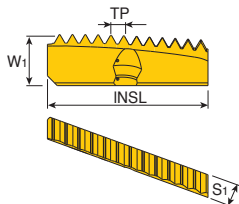
► The same insert for external and internal threading

●: Standard items





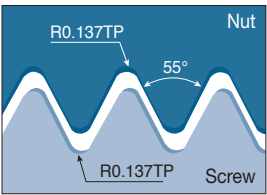
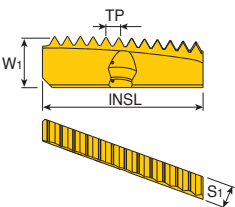
### Helical inserts for UN, UNC, UNF, UNEF, UNS threads (Internal)

[illegible]

- ▶ THID: Thread designation inside

●: Standard items

Helical inserts for whitworth threads, BSW, BSF, BSP (Internal and external)



| Insert | Designation         | TPI | THID      | THOD  | Dimension (mm) |      |     | Tool        | Grade |
|--------|---------------------|-----|-----------|-------|----------------|------|-----|-------------|-------|
|        |                     |     |           |       | INSL           | W1   | S1  |             |       |
|        | <b>TMTH 23 11 W</b> | 11  | ≥G 1"     | ≥G 1" | 27             | 8.0  | 3.5 | TMTSRH 23-2 | ●     |
|        | <b>TMTH 32 11 W</b> | 11  | ≥G 1 1/8" | ≥G 1" | 32             | 9.0  | 4.0 | TMTSRH 32-5 | ●     |
|        | <b>TMTH 45 11 W</b> | 11  | ≥G 1 3/4" | ≥G 1" | 37             | 11.9 | 5.0 | TMTSRH 45-6 | ●     |
|        | <b>TMTH 63 11 W</b> | 11  | ≥G 2 1/2" | ≥G 1" | 38             | 11.9 | 5.0 | TMTSRH 63-9 | ●     |
|        |                     |     |           |       |                |      |     |             |       |
|        |                     |     |           |       |                |      |     |             |       |
|        |                     |     |           |       |                |      |     |             |       |
|        |                     |     |           |       |                |      |     |             |       |

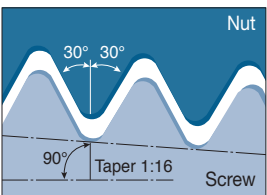
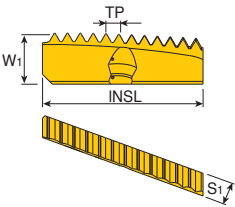


► THID: Thread designation inside  
► THOD: Thread designation outside

●: Standard item

TMTH-NPT

Helical inserts for NPT threads (Internal and external)



| Insert | Designation             | TPI  | THID          | THOD      | Dimension (mm) |      |     | Tool        | Grade |
|--------|-------------------------|------|---------------|-----------|----------------|------|-----|-------------|-------|
|        |                         |      |               |           | INSL           | W1   | S1  |             |       |
|        | <b>TMTH 23 11.5 NPT</b> | 11.5 | 1"-2" NPT     | 1"-2" NPT | 27             | 8.0  | 3.5 | TMTSRH 23-2 | ●     |
|        | <b>TMTH 32 11.5 NPT</b> | 11.5 | 1 1/4"-2" NPT | 1"-2" NPT | 32             | 9.0  | 4.0 | TMTSRH 32-5 | ●     |
|        | <b>TMTH 45 11.5 NPT</b> | 11.5 | 2" NPT        | 1"-2" NPT | 37             | 11.9 | 5.0 | TMTSRH 45-6 | ●     |
|        | <b>TMTH 63 11.5 NPT</b> | 11.5 | -             | ≥1" NPT   | 38             | 11.9 | 5.0 | TMTSRH 63-9 | ●     |
|        |                         |      |               |           |                |      |     |             |       |
|        |                         |      |               |           |                |      |     |             |       |
|        |                         |      |               |           |                |      |     |             |       |
|        |                         |      |               |           |                |      |     |             |       |



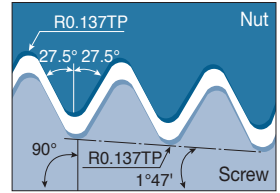
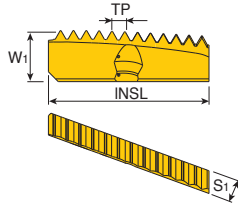
► THID: Thread designation inside  
► THOD: Thread designation outside

●: Standard items

# TMTH-BSPT

TS-THREAD

Helical inserts for BSPT threads (Internal and external)



| Insert | Designation            | TPI | THID         | THOD     | Dimension (mm) |      |     | Tool        | Grade |
|--------|------------------------|-----|--------------|----------|----------------|------|-----|-------------|-------|
|        |                        |     |              |          | INSL           | W1   | S1  |             |       |
|        | <b>TMTH 23 11 BSPT</b> | 11  | ≥1" BSPT     | ≥1" BSPT | 27             | 8.0  | 3.5 | TMTSRH 23-2 | ●     |
|        | <b>TMTH 32 11 BSPT</b> | 11  | ≥1 1/8" BSPT | ≥1" BSPT | 32             | 9.0  | 4.0 | TMTSRH 32-5 | ●     |
|        | <b>TMTH 45 11 BSPT</b> | 11  | ≥1 3/4" BSPT | ≥1" BSPT | 37             | 11.9 | 5.0 | TMTSRH 45-6 | ●     |
|        | <b>TMTH 63 11 BSPT</b> | 11  | ≥2 1/2" BSPT | ≥1" BSPT | 38             | 11.9 | 5.0 | TMTSRH 63-9 | ●     |
|        |                        |     |              |          |                |      |     |             |       |
|        |                        |     |              |          |                |      |     |             |       |
|        |                        |     |              |          |                |      |     |             |       |
|        |                        |     |              |          |                |      |     |             |       |



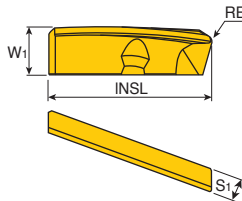
► THID: Thread designation inside  
► THOD: Thread designation outside

●: Standard Item

# TMTH-F

TS-THREAD

Helical long edge finishing inserts



| Insert | Designation          | Dimension (mm) |      |     |     | Tool        | Grade |
|--------|----------------------|----------------|------|-----|-----|-------------|-------|
|        |                      | INSL           | W1   | S1  | RE  |             |       |
|        | <b>TMTH 23F R0.2</b> | 27             | 8.0  | 3.5 | 0.2 | TMTSRH 23-2 | ●     |
|        | <b>TMTH 23F R0.5</b> | 27             | 8.0  | 3.5 | 0.5 | TMTSRH 23-2 | ●     |
|        | <b>TMTH 23F R1.0</b> | 27             | 8.0  | 3.5 | 1.0 | TMTSRH 23-2 | ●     |
|        | <b>TMTH 32F R0.2</b> | 32             | 9.0  | 4.0 | 0.2 | TMTSRH 32-5 | ●     |
|        | <b>TMTH 32F R0.5</b> | 32             | 9.0  | 4.0 | 0.5 | TMTSRH 32-5 | ●     |
|        | <b>TMTH 32F R1.0</b> | 32             | 9.0  | 4.0 | 1.0 | TMTSRH 32-5 | ●     |
|        | <b>TMTH 45F R0.2</b> | 37             | 11.9 | 5.0 | 0.2 | TMTSRH 45-6 | ●     |
|        |                      |                |      |     |     |             |       |



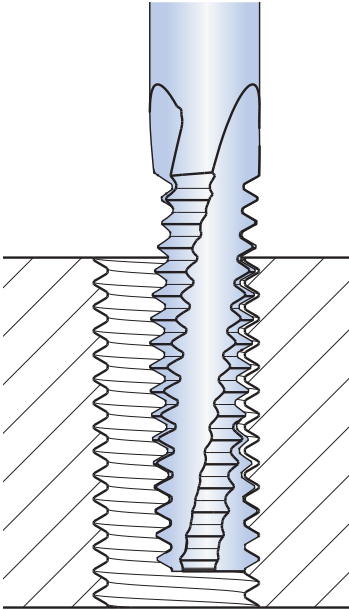
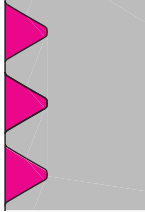
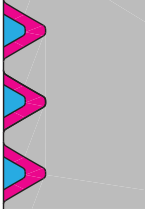
●: Standard items

## Radial depth per pass

### Recommended number of passes

| ISO | Material                    | Material No. | Number of passes by pitch |          |          |         |
|-----|-----------------------------|--------------|---------------------------|----------|----------|---------|
|     |                             |              | 0.25-1.0                  | 1.25-1.5 | 1.75-2.0 | 2.5-6.0 |
| P   | Steels                      | 1-11         | 1                         | 1        | 2        | 3       |
| M   | Stainless steels            | 12-14        | 1                         | 1        | 2        | 3       |
| K   | Cast iron                   | 15-20        | 1                         | 1        | 2        | 3       |
| N   | Aluminum                    | 21-24        | 1                         | 1        | 1        | 1       |
|     | High temp. cast alloys      | 25           | 1                         | 1        | 2        | 3       |
|     | Copper alloys, non metallic | 26-30        | 1                         | 1        | 1        | 1       |
| S   | High temperature alloys     | 31-37        | 2                         | 2        | 2        | 3       |
| H   | Chilled cast iron           | 40           | 3                         | 3        | 3        | 3       |
|     | Hardened cast iron nodular  | 41           | 2                         | 2        | 2        | 3       |

### Recommended depths per pass

| Number of passes                                                                  |          | Radial depths                                                                       |                                                                          |
|-----------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|  | 1 pass   |    | 1 <sup>st</sup> : 100%                                                   |
|                                                                                   | 2 passes |   | 1 <sup>st</sup> : 75%<br>2 <sup>nd</sup> : 100%                          |
|                                                                                   | 3 passes |  | 1 <sup>st</sup> : 65%<br>2 <sup>nd</sup> : 75%<br>3 <sup>rd</sup> : 100% |

# Recommended Cutting Conditions

## Machining data for indexable insert of threading cutters

| ISO | Material                                                                    | Condition                        | Tensile strength<br>(N/mm <sup>2</sup> ) | Hardness<br>HB | Material<br>No. | Cutting speed<br>Vc(m/min) |
|-----|-----------------------------------------------------------------------------|----------------------------------|------------------------------------------|----------------|-----------------|----------------------------|
|     |                                                                             |                                  |                                          |                |                 | TT9030                     |
| P   | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C<br>Annealed              | 420                                      | 125            | 1               | 100-200                    |
|     |                                                                             | >=0.25%C<br>Annealed             | 650                                      | 190            | 2               | 95-190                     |
|     |                                                                             | <0.55%C<br>Quenched and tempered | 850                                      | 250            | 3               | 90-180                     |
|     |                                                                             | >=0.55%C<br>Annealed             | 750                                      | 220            | 4               | 90-170                     |
|     |                                                                             | Quenched and tempered            | 1000                                     | 300            | 5               | 80-150                     |
|     | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) | Annealed                         | 600                                      | 200            | 6               | 120-170                    |
|     |                                                                             | Quenched and tempered            | 930                                      | 275            | 7               | 115-160                    |
|     |                                                                             |                                  | 1000                                     | 300            | 8               | 105-150                    |
|     |                                                                             |                                  | 1200                                     | 350            | 9               | 140                        |
|     | High alloy steel, cast steel<br>and tool steel                              | Annealed                         | 680                                      | 200            | 10              | 90-170                     |
|     |                                                                             | Quenched and tempered            | 1100                                     | 325            | 11              | 75-145                     |
| M   | Stainless steel<br>and cast steel                                           | Ferritic / martensitic           | 680                                      | 200            | 12              | 110-170                    |
|     |                                                                             | Martensitic                      | 820                                      | 240            | 13              | 100-160                    |
|     |                                                                             | Austenitic                       | 600                                      | 180            | 14              | 90-145                     |
| K   | Gray cast iron<br>(GG)                                                      | Ferritic                         |                                          | 160            | 15              | 65-135                     |
|     |                                                                             | Pearlitic                        |                                          | 250            | 16              | 65-110                     |
|     | Cast iron nodular<br>(GGG)                                                  | Ferritic                         |                                          | 180            | 17              | 65-135                     |
|     |                                                                             | Pearlitic                        |                                          | 260            | 18              | 60-100                     |
|     | Malleable cast iron                                                         | Ferritic                         |                                          | 130            | 19              | 65-135                     |
|     |                                                                             | Pearlitic                        |                                          | 230            | 20              | 60-120                     |
| N   | Aluminum - Wrought alloy                                                    | Not cureable                     |                                          | 60             | 21              | 110-260                    |
|     |                                                                             | Cured                            |                                          | 100            | 22              | 110-200                    |
|     | Aluminum-<br>cast, alloyed                                                  | <=12% Si<br>Not cureable         |                                          | 75             | 23              | 145-350                    |
|     |                                                                             | Cured                            |                                          | 90             | 24              | 145-275                    |
|     |                                                                             | >12% Si<br>High temp.            |                                          | 130            | 25              | 95-225                     |
|     | Copper alloys                                                               | >1% Pb<br>Free cutting           |                                          | 110            | 26              | 145-350                    |
|     |                                                                             | Brass                            |                                          | 90             | 27              | 145-350                    |
|     |                                                                             | Electrolitic copper              |                                          | 100            | 28              | 145-350                    |
| S   | High temp.<br>alloys                                                        | Fe based<br>Annealed             |                                          | 200            | 31              | 20-60                      |
|     |                                                                             |                                  |                                          | 280            | 32              | 20-50                      |
|     |                                                                             | Ni or<br>Co based<br>Annealed    |                                          | 250            | 33              | 20-30                      |
|     |                                                                             |                                  |                                          | 350            | 34              | 10-20                      |
|     |                                                                             |                                  |                                          | 320            | 35              | 15-25                      |
|     | Titanium, Ti alloys                                                         | Pure                             | Rm 400                                   | 190            | 36              | 30-90                      |
|     |                                                                             | Alpha-beta alloys cured          | Rm 1050                                  | 310            | 37              | 20-70                      |
| H   | Hardened steel                                                              | Hardened                         |                                          | 55HRC          | 38              | 25-60                      |
|     |                                                                             | Hardened                         |                                          | 60HRC          | 39              | 20-40                      |
|     | Chilled cast iron                                                           | Cast                             |                                          | 400            | 40              | 25-60                      |
|     | Cast iron nodular                                                           | Hardened                         |                                          | 55HRC          | 41              | 20-50                      |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

► Feed rate: 0.05 - 0.15 mm/tooth

# Recommended Cutting Conditions

Machining data for MTEC, MTECB, MTECQ, MTECZ, MTECH, MTECI

| ISO | Material                                                           | Condition                     | Tensile strength<br>(N/mm²) | Hardness<br>HB | Material<br>No. | Cutting speed<br>Vc(m/min) |         |
|-----|--------------------------------------------------------------------|-------------------------------|-----------------------------|----------------|-----------------|----------------------------|---------|
|     |                                                                    |                               |                             |                |                 | TT9030                     | TT5515  |
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C Annealed              | 420                         | 125            | 1               | 100-250                    | 100-250 |
|     |                                                                    | >=0.25%C Annealed             | 650                         | 190            | 2               | 80-210                     | 80-210  |
|     |                                                                    | <0.55%C Quenched and tempered | 850                         | 250            | 3               | 65-170                     | 65-170  |
|     |                                                                    | >=0.55%C Annealed             | 750                         | 220            | 4               | 110-180                    | 110-180 |
|     |                                                                    | Quenched and tempered         | 1000                        | 300            | 5               | 95-160                     | 95-160  |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed                      | 600                         | 200            | 6               | 90-160                     | 90-160  |
|     |                                                                    |                               | 930                         | 275            | 7               | 65-200                     | 65-200  |
|     |                                                                    | Quenched and tempered         | 1000                        | 300            | 8               | 70-210                     | 70-210  |
|     |                                                                    |                               | 1200                        | 350            | 9               | 95-160                     | 95-160  |
|     | High alloy steel, cast steel and tool steel                        | Annealed                      | 680                         | 200            | 10              | 130-170                    | 130-170 |
|     |                                                                    | Quenched and tempered         | 1100                        | 325            | 11              | 75-100                     | 75-100  |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic        | 680                         | 200            | 12              | 110-170                    | 110-170 |
|     |                                                                    | Martensitic                   | 820                         | 240            | 13              | 70-155                     | 70-155  |
|     |                                                                    | Austenitic                    | 600                         | 180            | 14              | 85-100                     | 85-100  |
| K   | Gray cast iron (GG)                                                | Ferritic                      |                             | 160            | 15              | 70-150                     | 70-150  |
|     |                                                                    | Pearlitic                     |                             | 250            | 16              | 110-140                    | 110-140 |
|     | Cast iron nodular (GGG)                                            | Ferritic                      |                             | 180            | 17              | 120-160                    | 120-160 |
|     |                                                                    | Pearlitic                     |                             | 260            | 18              | 75-160                     | 75-160  |
|     | Malleable cast iron                                                | Ferritic                      |                             | 130            | 19              | 120-160                    | 120-160 |
|     |                                                                    | Pearlitic                     |                             | 230            | 20              | 110-140                    | 110-140 |
| N   | Aluminum - Wrought alloy                                           | Not cureable                  |                             | 60             | 21              | 160-300                    | 160-300 |
|     |                                                                    | Cured                         |                             | 100            | 22              |                            |         |
|     | Aluminum-cast, alloyed                                             | <=12% Si Not cureable         |                             | 75             | 23              | 150-350                    | 150-350 |
|     |                                                                    | Cured                         |                             | 90             | 24              |                            |         |
|     |                                                                    | >12% Si High temp.            |                             | 130            | 25              | 100-250                    | 100-250 |
|     | Copper alloys                                                      | >1% Pb Free cutting           |                             | 110            | 26              |                            |         |
|     |                                                                    | Brass                         |                             | 90             | 27              |                            |         |
|     |                                                                    | Electrolitic copper           |                             | 100            | 28              |                            |         |
|     | Non-metallic                                                       | Duroplastics, fiber plastics  |                             |                | 29              | 100-400                    | 100-400 |
|     |                                                                    | Hard rubber                   |                             |                | 30              |                            |         |
| S   | High temp. alloys                                                  | Fe based Annealed             |                             | 200            | 31              |                            |         |
|     |                                                                    |                               |                             | 280            | 32              |                            |         |
|     |                                                                    | Ni or Co based Annealed       |                             | 250            | 33              | 20-80                      | 20-80   |
|     |                                                                    |                               |                             | 350            | 34              |                            |         |
|     |                                                                    |                               |                             | 320            | 35              |                            |         |
|     | Titanium, Ti alloys                                                | Pure                          | Rm 400                      |                | 36              |                            |         |
|     |                                                                    | Alpha+beta alloys cured       | Rm 1050                     |                | 37              | 20-80                      | 30-100  |
| H   | Hardened steel                                                     | Hardened                      |                             | 55HRC          | 38              | 55-65                      | 60-80   |
|     |                                                                    | Hardened                      |                             | 60HRC          | 39              | 45-55                      | 50-70   |
|     | Chilled cast iron                                                  | Cast                          |                             | 400            | 40              | 90-105                     | 100-120 |
|     | Cast iron nodular                                                  | Hardened                      |                             | 55HRC          | 41              | 55-65                      | 60-80   |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



Machining data for MTEC, MTECB, MTECQ, MTECZ, MTECH, MTECI

| Feed (mm/tooth) for diameter (mm) |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Ø2                                | Ø3   | Ø4   | Ø6   | Ø8   | Ø10  | Ø12  | Ø14  | Ø16  | Ø20  | Ø25  | Ø30  |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
| 0.02                              | 0.03 | 0.03 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.15 | 0.18 |
| 0.02                              | 0.03 | 0.03 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.15 | 0.18 |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.11 |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.11 |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.11 |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.11 |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.11 |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.11 |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.11 |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.11 |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
| 0.03                              | 0.04 | 0.04 | 0.06 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.15 | 0.18 | 0.21 |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
| 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.1  | 0.12 |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
| 0.05                              | 0.06 | 0.07 | 0.09 | 0.1  | 0.11 | 0.12 | 0.13 | 0.15 | 0.18 | 0.22 | 0.25 |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
| 0.02                              | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
| 0.02                              | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |



# Recommended Cutting Conditions



## Machining data for MTECBF, MTECM, MTECK

| ISO | Material                                                                    |                   | Condition                    | Tensile strength<br>(N/mm²) | Hardness<br>HB | Material<br>No. | Cutting speed<br>Vc(m/min) |
|-----|-----------------------------------------------------------------------------|-------------------|------------------------------|-----------------------------|----------------|-----------------|----------------------------|
|     |                                                                             |                   |                              |                             |                |                 | TT9030                     |
| P   | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C           | Annealed                     | 420                         | 125            | 1               | 70-120                     |
|     |                                                                             | >=0.25%C          | Annealed                     | 650                         | 190            | 2               | 65-115                     |
|     |                                                                             | <0.55%C           | Quenched and tempered        | 850                         | 250            | 3               | 60-110                     |
|     |                                                                             | >=0.55%C          | Annealed                     | 750                         | 220            | 4               | 70-90                      |
|     |                                                                             |                   | Quenched and tempered        | 1000                        | 300            | 5               | 60-85                      |
|     | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                   | Quenched and tempered        | 600                         | 200            | 6               | 60-80                      |
|     |                                                                             |                   |                              | 930                         | 275            | 7               | 60-75                      |
|     |                                                                             |                   |                              | 1000                        | 300            | 8               | 55-75                      |
|     |                                                                             |                   |                              | 1200                        | 350            | 9               | 55-70                      |
|     | High alloy steel, cast steel<br>and tool steel                              |                   | Annealed                     | 680                         | 200            | 10              | 50-65                      |
|     |                                                                             |                   | Quenched and tempered        | 1100                        | 325            | 11              | 50-63                      |
| M   | Stainless steel<br>and cast steel                                           |                   | Ferritic / martensitic       | 680                         | 200            | 12              | 50-60                      |
|     |                                                                             |                   | Martensitic                  | 820                         | 240            | 13              | 50-70                      |
|     |                                                                             |                   | Austenitic                   | 600                         | 180            | 14              | 60-90                      |
| K   | Gray cast iron<br>(GG)                                                      |                   | Ferritic                     |                             | 160            | 15              | 60-80                      |
|     |                                                                             |                   | Pearlitic                    |                             | 250            | 16              | 60-75                      |
|     | Cast iron nodular<br>(GGG)                                                  |                   | Ferritic                     |                             | 180            | 17              | 50-70                      |
|     |                                                                             |                   | Pearlitic                    |                             | 260            | 18              | 40-65                      |
|     | Malleable cast iron                                                         |                   | Ferritic                     |                             | 130            | 19              | 50-70                      |
|     |                                                                             |                   | Pearlitic                    |                             | 230            | 20              | 40-65                      |
| N   | Aluminum - Wrought alloy                                                    |                   | Not cureable                 |                             | 60             | 21              | 150                        |
|     |                                                                             |                   | Cured                        |                             | 100            | 22              | 110-                       |
|     | Aluminum-<br>cast, alloyed                                                  | <=12% Si          | Not cureable                 |                             | 75             | 23              | 120-                       |
|     |                                                                             |                   | Cured                        |                             | 90             | 24              | 120-                       |
|     |                                                                             | >12% Si           | High temp.                   |                             | 130            | 25              | 80-110                     |
|     | Copper alloys                                                               | >1% Pb            | Free cutting                 |                             | 110            | 26              | 85-120                     |
|     |                                                                             |                   | Brass                        |                             | 90             | 27              | 85-120                     |
|     |                                                                             |                   | Electrolitic copper          |                             | 100            | 28              | 70-100                     |
|     | Non-metallic                                                                |                   | Duroplastics, fiber plastics |                             |                | 29              | 120-                       |
|     |                                                                             |                   | Hard rubber                  |                             |                | 30              | 120-                       |
| S   | High temp.<br>alloys                                                        | Fe based          | Annealed                     |                             | 200            | 31              | 40-60                      |
|     |                                                                             |                   | Cured                        |                             | 280            | 32              | 30-50                      |
|     |                                                                             | Ni or<br>Co based | Annealed                     |                             | 250            | 33              | 25-40                      |
|     |                                                                             |                   | Cured                        |                             | 350            | 34              | 20-35                      |
|     |                                                                             |                   | Cast                         |                             | 320            | 35              | 20-40                      |
|     | Titanium, Ti alloys                                                         |                   | Pure                         | Rm 400                      |                | 36              | 30-45                      |
|     |                                                                             |                   | Alpha+beta alloys cured      | Rm 1050                     |                | 37              | 30-40                      |
| H   | Hardened steel                                                              |                   | Hardened                     |                             | 55HRC          | 38              |                            |
|     |                                                                             |                   | Hardened                     |                             | 60HRC          | 39              |                            |
|     | Chilled cast iron                                                           |                   | Cast                         |                             | 400            | 40              |                            |
|     | Cast iron nodular                                                           |                   | Hardened                     |                             | 55HRC          | 41              |                            |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel ■ Stainless steel ■ Cast iron ■ Nonferrous ■ High temp. alloys ■ Hardened steel

# Recommended Cutting Conditions



Machining data for MTECBF, MTECM, MTECK

| Feed (mm/tooth) for diameter (mm) |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Ø1.5                              | Ø2   | Ø3   | Ø4   | Ø5   | Ø6   | Ø7   | Ø8   | Ø9   | Ø10  | Ø12  | Ø14  | Ø15  |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.04                              | 0.05 | 0.06 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 | 0.14 | 0.16 | 0.17 | 0.18 |
| 0.04                              | 0.05 | 0.06 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 | 0.14 | 0.16 | 0.17 | 0.18 |
| 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| 0.03                              | 0.03 | 0.04 | 0.05 | 0.06 | 0.06 | 0.07 | 0.08 | 0.09 | 0.1  | 0.11 | 0.12 | 0.13 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| 0.1                               | 0.11 | 0.12 | 0.14 | 0.16 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.2  | 0.2  |
| 0.1                               | 0.11 | 0.12 | 0.14 | 0.16 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.2  | 0.2  |
| 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
| 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
| 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
| 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
| 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
| 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
| 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
|                                   |      |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |      |
|                                   |      |      |      |      |      |      |      |      |      |      |      |      |

# Recommended Cutting Conditions



Machining data for MTECS, MTECSH, MTECD

| ISO | Material                                 |           | Cutting speed<br>Vc (m/min) |        | Feed (mm/tooth) for diameter (mm) |      |      |      |      |      |      |      |      |      |      |      |      |
|-----|------------------------------------------|-----------|-----------------------------|--------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|     |                                          |           | TT9030                      | TT1040 | Ø1.5                              | Ø2   | Ø3   | Ø4   | Ø5   | Ø6   | Ø7   | Ø8   | Ø9   | Ø10  | Ø12  | Ø14  | Ø15  |
| P   | Low & medium carbon steels               |           | 60-120                      | 60-120 | 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
|     | High carbon steels                       |           | 60-90                       | 60-90  | 0.04                              | 0.05 | 0.06 | 0.08 | 0.09 | 0.10 | 0.12 | 0.13 | 0.14 | 0.14 | 0.16 | 0.17 | 0.18 |
|     | Alloy steels, treated steels             |           | 50-80                       | 50-80  | 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
|     | Cast steels                              |           | 70-90                       | 70-90  | 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.1  | 0.12 | 0.13 | 0.14 |
| M   | Stainless steels                         |           | 60-90                       | 60-90  | 0.03                              | 0.03 | 0.04 | 0.05 | 0.06 | 0.06 | 0.07 | 0.08 | 0.09 | 0.1  | 0.11 | 0.12 | 0.13 |
| K   | Cast Iron                                |           | 40-80                       | 40-80  | 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
| N   | Aluminum                                 |           | 80-150                      | 80-150 | 0.05                              | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.18 |
|     | Synthetics, duroplastics, thermoplastics |           | 50-200                      | 50-200 | 0.10                              | 0.11 | 0.12 | 0.14 | 0.16 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.20 | 0.20 |
| S   | Nickel alloys, titanium alloys.          |           | 20-40                       | 20-40  | 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 |
| H   | Hardened steel                           | HrC 45-50 | 35-50                       | 60-70  | 0.04                              | 0.04 | 0.05 | 0.05 | 0.06 | 0.06 | 0.07 | 0.07 | 0.08 |      |      |      |      |
|     |                                          | HrC 51-55 | 25-40                       | 50-60  | 0.03                              | 0.03 | 0.04 | 0.04 | 0.05 | 0.05 | 0.06 | 0.06 | 0.07 |      |      |      |      |
|     |                                          | HrC 56-62 | 15-30                       | 40-50  | 0.02                              | 0.02 | 0.03 | 0.03 | 0.04 | 0.04 | 0.05 | 0.05 | 0.06 |      |      |      |      |

Steel    Stainless steel    Cast iron    Nonferrous    High temp. alloys    Hardened steel

***T-TAP***

# Tapping





1 TaeguTec T-Tap

|   |          |
|---|----------|
| T | TaeguTec |
| P | PM       |
| H | HSSE     |

2 Standard

|   |        |
|---|--------|
| 4 | DIN371 |
| 5 | DIN374 |
| 6 | DIN376 |

3 ISO grade

|   |       |
|---|-------|
| 5 | Multi |
|---|-------|

4 Flute

|   |                             |
|---|-----------------------------|
| 2 | Straight flute-spiral point |
| 4 | Right-hand spiral 40°       |

5 Chamfer

|   |             |
|---|-------------|
| B | 4-5 threads |
| C | 2-3 threads |

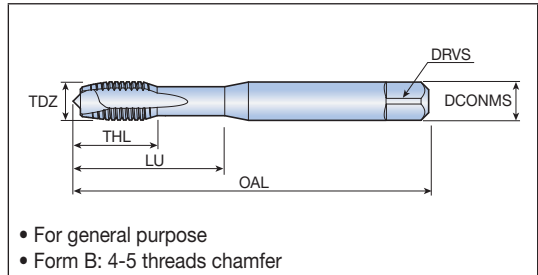
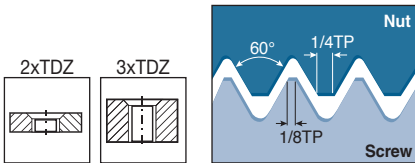
6 Coating

|      |          |
|------|----------|
| None | Uncoated |
| 05   | S.T.     |
| 10   | TiN      |

7 Tap X Pitch

|          |                      |
|----------|----------------------|
| M2 X 0.4 | M2 size<br>0.4 pitch |
|----------|----------------------|

## Straight flute with spiral point - Uncoated



Metric ISO standard thread DIN 13 standard

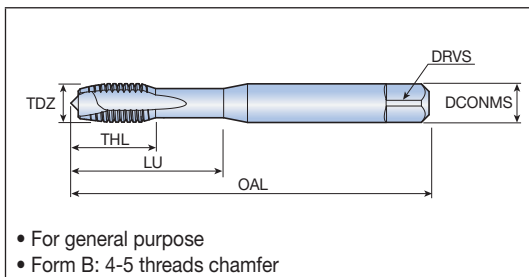
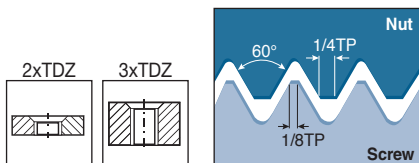
| Designation              | TDZ  | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|--------------------------|------|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                          |      |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| <b>TPH452B M2x0.4</b>    | M2   | 0.4     | DIN371         | ISO 2-6H  | 45             | 8   | -  | 2.8    | 2.1  | 1.6       |
| <b>TPH452B M2.5x0.45</b> | M2.5 | 0.45    |                |           | 50             | 9   | -  | 2.8    | 2.1  | 2.05      |
| <b>TPH452B M3x0.5</b>    | M3   | 0.5     |                |           | 56             | 10  | 18 | 3.5    | 2.7  | 2.5       |
| <b>TPH452B M4x0.7</b>    | M4   | 0.7     |                |           | 63             | 12  | 21 | 4.5    | 3.4  | 3.3       |
| <b>TPH452B M5x0.8</b>    | M5   | 0.8     |                |           | 70             | 14  | 25 | 6      | 4.9  | 4.2       |
| <b>TPH452B M6x1.0</b>    | M6   | 1       |                |           | 80             | 16  | 30 | 6      | 4.9  | 5         |
| <b>TPH452B M8x1.25</b>   | M8   | 1.25    |                |           | 90             | 18  | 35 | 8      | 6.2  | 6.8       |
| <b>TPH452B M10x1.5</b>   | M10  | 1.5     |                |           | 100            | 20  | 39 | 10     | 8    | 8.5       |
| <b>TPH652B M12x1.75</b>  | M12  | 1.75    | DIN376         | ISO 2-6H  | 110            | 22  | -  | 9      | 7    | 10.2      |
| <b>TPH652B M14x2.0</b>   | M14  | 2       |                |           | 110            | 24  | -  | 11     | 9    | 12        |
| <b>TPH652B M16x2.0</b>   | M16  | 2       |                |           | 110            | 26  | -  | 12     | 9    | 14        |
| <b>TPH652B M20x2.5</b>   | M20  | 2.5     |                |           | 140            | 30  | -  | 16     | 12   | 17.5      |
|                          |      |         |                |           |                |     |    |        |      |           |
|                          |      |         |                |           |                |     |    |        |      |           |
|                          |      |         |                |           |                |     |    |        |      |           |
|                          |      |         |                |           |                |     |    |        |      |           |
|                          |      |         |                |           |                |     |    |        |      |           |
|                          |      |         |                |           |                |     |    |        |      |           |

Metric ISO fine thread DIN 13 standard

| Designation              | TDZ | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|--------------------------|-----|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                          |     |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| <b>TPH552B MF8x1.0</b>   | M8  | 1       | DIN374         | ISO 2-6H  | 90             | 15  | -  | 6      | 4.9  | 7         |
| <b>TPH552B MF10x1.25</b> | M10 | 1.25    |                |           | 100            | 18  | -  | 7      | 5.5  | 8.8       |
| <b>TPH552B MF12x1.5</b>  | M12 | 1.5     |                |           | 100            | 18  | -  | 9      | 7    | 10.5      |
| <b>TPH552B MF14x1.5</b>  | M14 | 1.5     |                |           | 100            | 18  | -  | 11     | 9    | 12.5      |
| <b>TPH552B MF16x1.5</b>  | M16 | 1.5     |                |           | 100            | 18  | -  | 12     | 9    | 14.5      |
|                          |     |         |                |           |                |     |    |        |      |           |
|                          |     |         |                |           |                |     |    |        |      |           |
|                          |     |         |                |           |                |     |    |        |      |           |
|                          |     |         |                |           |                |     |    |        |      |           |
|                          |     |         |                |           |                |     |    |        |      |           |



## Straight flute with spiral point - Steam tempered



Metric ISO standard thread DIN 13 standard

| Designation                | TDZ  | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|----------------------------|------|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                            |      |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| <b>TPH452B05 M2x0.4</b>    | M2   | 0.4     | DIN371         | ISO 2-6H  | 45             | 8   | -  | 2.8    | 2.1  | 1.6       |
| <b>TPH452B05 M2.5x0.45</b> | M2.5 | 0.45    |                |           | 50             | 9   | -  | 2.8    | 2.1  | 2.05      |
| <b>TPH452B05 M3x0.5</b>    | M3   | 0.5     |                |           | 56             | 10  | 18 | 3.5    | 2.7  | 2.5       |
| <b>TPH452B05 M4x0.7</b>    | M4   | 0.7     |                |           | 63             | 12  | 21 | 4.5    | 3.4  | 3.3       |
| <b>TPH452B05 M5x0.8</b>    | M5   | 0.8     |                |           | 70             | 14  | 25 | 6      | 4.9  | 4.2       |
| <b>TPH452B05 M6x1.0</b>    | M6   | 1       |                |           | 80             | 16  | 30 | 6      | 4.9  | 5         |
| <b>TPH452B05 M8x1.25</b>   | M8   | 1.25    |                |           | 90             | 18  | 35 | 8      | 6.2  | 6.8       |
| <b>TPH452B05 M10x1.5</b>   | M10  | 1.5     |                |           | 100            | 20  | 39 | 10     | 8    | 8.5       |
| <b>TPH652B05 M12x1.75</b>  | M12  | 1.75    | DIN376         | ISO 2-6H  | 110            | 22  | -  | 9      | 7    | 10.2      |
| <b>TPH652B05 M14x2.0</b>   | M14  | 2       |                |           | 110            | 24  | -  | 11     | 9    | 12        |
| <b>TPH652B05 M16x2.0</b>   | M16  | 2       |                |           | 110            | 26  | -  | 12     | 9    | 14        |
| <b>TPH652B05 M20x2.5</b>   | M20  | 2.5     |                |           | 140            | 30  | -  | 16     | 12   | 17.5      |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |

Metric ISO fine thread DIN 13 standard

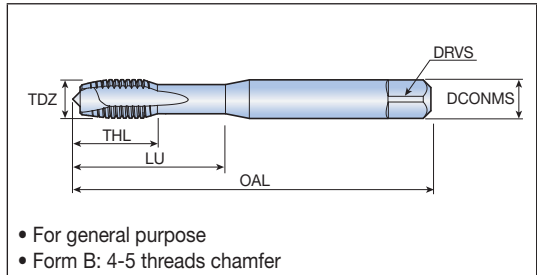
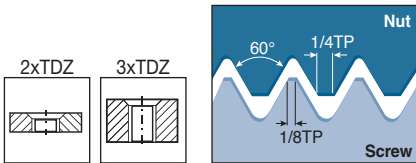
| Designation                | TDZ | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|----------------------------|-----|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                            |     |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| <b>TPH552B05 MF8x1.0</b>   | M8  | 1       | DIN374         | ISO 2-6H  | 90             | 15  | -  | 6      | 4.9  | 7         |
| <b>TPH552B05 MF10x1.25</b> | M10 | 1.25    |                |           | 100            | 18  | -  | 7      | 5.5  | 8.8       |
| <b>TPH552B05 MF12x1.5</b>  | M12 | 1.5     |                |           | 100            | 18  | -  | 9      | 7    | 10.5      |
| <b>TPH552B05 MF14x1.5</b>  | M14 | 1.5     |                |           | 100            | 18  | -  | 11     | 9    | 12.5      |
| <b>TPH552B05 MF16x1.5</b>  | M16 | 1.5     |                |           | 100            | 18  | -  | 12     | 9    | 14.5      |
|                            |     |         |                |           |                |     |    |        |      |           |
|                            |     |         |                |           |                |     |    |        |      |           |
|                            |     |         |                |           |                |     |    |        |      |           |
|                            |     |         |                |           |                |     |    |        |      |           |
|                            |     |         |                |           |                |     |    |        |      |           |



# TPH...52B10



Straight flute with spiral point - TiN coated



Metric ISO standard thread DIN 13 standard

| Designation                | TDZ  | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|----------------------------|------|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                            |      |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| <b>TPH452B10 M2x0.4</b>    | M2   | 0.4     | DIN371         | ISO 2-6H  | 45             | 8   | -  | 2.8    | 2.1  | 1.6       |
| <b>TPH452B10 M2.5x0.45</b> | M2.5 | 0.45    |                |           | 50             | 9   | -  | 2.8    | 2.1  | 2.05      |
| <b>TPH452B10 M3x0.5</b>    | M3   | 0.5     |                |           | 56             | 10  | 18 | 3.5    | 2.7  | 2.5       |
| <b>TPH452B10 M4x0.7</b>    | M4   | 0.7     |                |           | 63             | 12  | 21 | 4.5    | 3.4  | 3.3       |
| <b>TPH452B10 M5x0.8</b>    | M5   | 0.8     |                |           | 70             | 14  | 25 | 6      | 4.9  | 4.2       |
| <b>TPH452B10 M6x1.0</b>    | M6   | 1       |                |           | 80             | 16  | 30 | 6      | 4.9  | 5         |
| <b>TPH452B10 M8x1.25</b>   | M8   | 1.25    |                |           | 90             | 18  | 35 | 8      | 6.2  | 6.8       |
| <b>TPH452B10 M10x1.5</b>   | M10  | 1.5     |                |           | 100            | 20  | 39 | 10     | 8    | 8.5       |
| <b>TPH652B10 M12x1.75</b>  | M12  | 1.75    | DIN376         | ISO 2-6H  | 110            | 22  | -  | 9      | 7    | 10.2      |
| <b>TPH652B10 M14x2.0</b>   | M14  | 2       |                |           | 110            | 24  | -  | 11     | 9    | 12        |
| <b>TPH652B10 M16x2.0</b>   | M16  | 2       |                |           | 110            | 26  | -  | 12     | 9    | 14        |
| <b>TPH652B10 M20x2.5</b>   | M20  | 2.5     |                |           | 140            | 30  | -  | 16     | 12   | 17.5      |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |
|                            |      |         |                |           |                |     |    |        |      |           |

Metric ISO fine thread DIN 13 standard

| Designation                | TDZ | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|----------------------------|-----|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                            |     |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| <b>TPH552B10 MF8x1.0</b>   | M8  | 1       | DIN374         | ISO 2-6H  | 90             | 15  | -  | 6      | 4.9  | 7         |
| <b>TPH552B10 MF10x1.25</b> | M10 | 1.25    |                |           | 100            | 18  | -  | 7      | 5.5  | 8.8       |
| <b>TPH552B10 MF12x1.5</b>  | M12 | 1.5     |                |           | 100            | 18  | -  | 9      | 7    | 10.5      |
| <b>TPH552B10 MF14x1.5</b>  | M14 | 1.5     |                |           | 100            | 18  | -  | 11     | 9    | 12.5      |
| <b>TPH552B10 MF16x1.5</b>  | M16 | 1.5     |                |           | 100            | 18  | -  | 12     | 9    | 14.5      |
|                            |     |         |                |           |                |     |    |        |      |           |
|                            |     |         |                |           |                |     |    |        |      |           |
|                            |     |         |                |           |                |     |    |        |      |           |
|                            |     |         |                |           |                |     |    |        |      |           |
|                            |     |         |                |           |                |     |    |        |      |           |



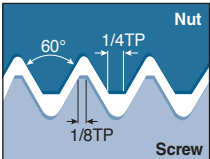
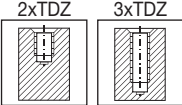


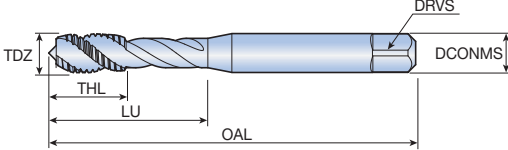
# TPH...54C



Right-hand spiral flute (40°) - Uncoated







- For general purpose
- Form C: 2-3 threads chamfer

Metric ISO standard thread DIN 13 standard

| Designation       | TDZ  | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|-------------------|------|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                   |      |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| TPH454C M2x0.4    | M2   | 0.4     | DIN371         | ISO 2-6H  | 45             | 6   | 10 | 2.8    | 2.1  | 1.6       |
| TPH454C M2.5x0.45 | M2.5 | 0.45    |                |           | 50             | 6   | 12 | 2.8    | 2.1  | 2.05      |
| TPH454C M3x0.5    | M3   | 0.5     |                |           | 56             | 7   | 18 | 3.5    | 2.7  | 2.5       |
| TPH454C M4x0.7    | M4   | 0.7     |                |           | 63             | 8   | 21 | 4.5    | 3.4  | 3.3       |
| TPH454C M5x0.8    | M5   | 0.8     |                |           | 70             | 10  | 25 | 6      | 4.9  | 4.2       |
| TPH454C M6x1.0    | M6   | 1       |                |           | 80             | 12  | 30 | 6      | 4.9  | 5         |
| TPH454C M8x1.25   | M8   | 1.25    |                |           | 90             | 15  | 35 | 8      | 6.2  | 6.8       |
| TPH454C M10x1.5   | M10  | 1.5     |                |           | 100            | 18  | 39 | 10     | 8    | 8.5       |
| TPH654C M12x1.75  | M12  | 1.75    | DIN376         | ISO 2-6H  | 110            | 18  | -  | 9      | 7    | 10.2      |
| TPH654C M14x2.0   | M14  | 2       |                |           | 110            | 20  | -  | 11     | 9    | 12        |
| TPH654C M16x2.0   | M16  | 2       |                |           | 110            | 20  | -  | 12     | 9    | 14        |
| TPH654C M20x2.5   | M20  | 2.5     |                |           | 140            | 25  | -  | 16     | 12   | 17.5      |
|                   |      |         |                |           |                |     |    |        |      |           |
|                   |      |         |                |           |                |     |    |        |      |           |
|                   |      |         |                |           |                |     |    |        |      |           |
|                   |      |         |                |           |                |     |    |        |      |           |
|                   |      |         |                |           |                |     |    |        |      |           |
|                   |      |         |                |           |                |     |    |        |      |           |

Metric ISO fine thread DIN 13 standard

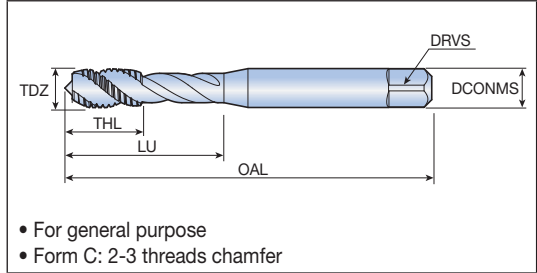
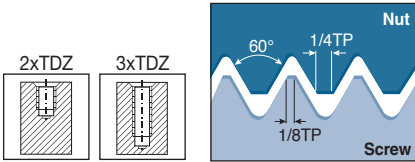
| Designation       | TDZ | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|-------------------|-----|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                   |     |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| TPH554C MF8x1.0   | M8  | 1       | DIN374         | ISO 2-6H  | 90             | 15  | -  | 6      | 4.9  | 7         |
| TPH554C MF10x1.25 | M10 | 1.25    |                |           | 100            | 18  | -  | 7      | 5.5  | 8.8       |
| TPH554C MF12x1.5  | M12 | 1.5     |                |           | 100            | 18  | -  | 9      | 7    | 10.5      |
| TPH554C MF14x1.5  | M14 | 1.5     |                |           | 100            | 18  | -  | 11     | 9    | 12.5      |
| TPH554C MF16x1.5  | M16 | 1.5     |                |           | 100            | 18  | -  | 12     | 9    | 14.5      |
|                   |     |         |                |           |                |     |    |        |      |           |
|                   |     |         |                |           |                |     |    |        |      |           |
|                   |     |         |                |           |                |     |    |        |      |           |
|                   |     |         |                |           |                |     |    |        |      |           |
|                   |     |         |                |           |                |     |    |        |      |           |
|                   |     |         |                |           |                |     |    |        |      |           |



# TPH...54C05



Right-hand spiral flute (40°) - Steam tempered



Metric ISO standard thread DIN 13 standard

| Designation         | TDZ  | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|---------------------|------|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                     |      |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| TPH454C05 M2x0.4    | M2   | 0.4     | DIN371         | ISO 2-6H  | 45             | 6   | 10 | 2.8    | 2.1  | 1.6       |
| TPH454C05 M2.5x0.45 | M2.5 | 0.45    |                |           | 50             | 6   | 12 | 2.8    | 2.1  | 2.05      |
| TPH454C05 M3x0.5    | M3   | 0.5     |                |           | 56             | 7   | 18 | 3.5    | 2.7  | 2.5       |
| TPH454C05 M4x0.7    | M4   | 0.7     |                |           | 63             | 8   | 21 | 4.5    | 3.4  | 3.3       |
| TPH454C05 M5x0.8    | M5   | 0.8     |                |           | 70             | 10  | 25 | 6      | 4.9  | 4.2       |
| TPH454C05 M6x1.0    | M6   | 1       |                |           | 80             | 12  | 30 | 6      | 4.9  | 5         |
| TPH454C05 M8x1.25   | M8   | 1.25    |                |           | 90             | 15  | 35 | 8      | 6.2  | 6.8       |
| TPH454C05 M10x1.5   | M10  | 1.5     |                |           | 100            | 18  | 39 | 10     | 8    | 8.5       |
| TPH654C05 M12x1.75  | M12  | 1.75    | DIN376         | ISO 2-6H  | 110            | 18  | -  | 9      | 7    | 10.2      |
| TPH654C05 M14x2.0   | M14  | 2       |                |           | 110            | 20  | -  | 11     | 9    | 12        |
| TPH654C05 M16x2.0   | M16  | 2       |                |           | 110            | 20  | -  | 12     | 9    | 14        |
| TPH654C05 M20x2.5   | M20  | 2.5     |                |           | 140            | 25  | -  | 16     | 12   | 17.5      |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |

Metric ISO fine thread DIN 13 standard

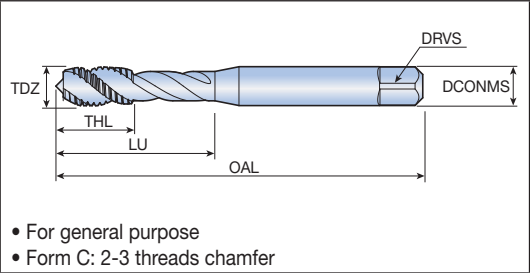
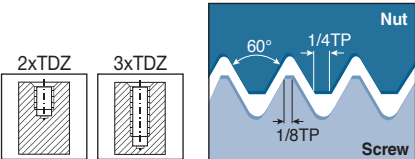
| Designation         | TDZ | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|---------------------|-----|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                     |     |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| TPH554C05 MF8x1.0   | M8  | 1       | DIN374         | ISO 2-6H  | 90             | 15  | -  | 6      | 4.9  | 7         |
| TPH554C05 MF10x1.25 | M10 | 1.25    |                |           | 100            | 18  | -  | 7      | 5.5  | 8.8       |
| TPH554C05 MF12x1.5  | M12 | 1.5     |                |           | 100            | 18  | -  | 9      | 7    | 10.5      |
| TPH554C05 MF14x1.5  | M14 | 1.5     |                |           | 100            | 18  | -  | 11     | 9    | 12.5      |
| TPH554C05 MF16x1.5  | M16 | 1.5     |                |           | 100            | 18  | -  | 12     | 9    | 14.5      |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |



# TPH...54C10



Right-hand spiral flute (40°) - TiN coated



Metric ISO standard thread DIN 13 standard

| Designation         | TDZ  | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|---------------------|------|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                     |      |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| TPH454C10 M2x0.4    | M2   | 0.4     | DIN371         | ISO 2-6H  | 45             | 6   | 10 | 2.8    | 2.1  | 1.6       |
| TPH454C10 M2.5x0.45 | M2.5 | 0.45    |                |           | 50             | 6   | 12 | 2.8    | 2.1  | 2.05      |
| TPH454C10 M3x0.5    | M3   | 0.5     |                |           | 56             | 7   | 18 | 3.5    | 2.7  | 2.5       |
| TPH454C10 M4x0.7    | M4   | 0.7     |                |           | 63             | 8   | 21 | 4.5    | 3.4  | 3.3       |
| TPH454C10 M5x0.8    | M5   | 0.8     |                |           | 70             | 10  | 25 | 6      | 4.9  | 4.2       |
| TPH454C10 M6x1.0    | M6   | 1       |                |           | 80             | 12  | 30 | 6      | 4.9  | 5         |
| TPH454C10 M8x1.25   | M8   | 1.25    |                |           | 90             | 15  | 35 | 8      | 6.2  | 6.8       |
| TPH454C10 M10x1.5   | M10  | 1.5     |                |           | 100            | 18  | 39 | 10     | 8    | 8.5       |
| TPH654C10 M12x1.75  | M12  | 1.75    | DIN376         | ISO 2-6H  | 110            | 18  | -  | 9      | 7    | 10.2      |
| TPH654C10 M14x2.0   | M14  | 2       |                |           | 110            | 20  | -  | 11     | 9    | 12        |
| TPH654C10 M16x2.0   | M16  | 2       |                |           | 110            | 20  | -  | 12     | 9    | 14        |
| TPH654C10 M20x2.5   | M20  | 2.5     |                |           | 140            | 25  | -  | 16     | 12   | 17.5      |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |
|                     |      |         |                |           |                |     |    |        |      |           |

Metric ISO fine thread DIN 13 standard

| Designation         | TDZ | TP (mm) | Standard (DIN) | Tolerance | Dimension (mm) |     |    |        |      |           |
|---------------------|-----|---------|----------------|-----------|----------------|-----|----|--------|------|-----------|
|                     |     |         |                |           | OAL            | THL | LU | DCONMS | DRVS | Core hole |
| TPH554C10 MF8x1.0   | M8  | 1       | DIN374         | ISO 2-6H  | 90             | 15  | -  | 6      | 4.9  | 7         |
| TPH554C10 MF10x1.25 | M10 | 1.25    |                |           | 100            | 18  | -  | 7      | 5.5  | 8.8       |
| TPH554C10 MF12x1.5  | M12 | 1.5     |                |           | 100            | 18  | -  | 9      | 7    | 10.5      |
| TPH554C10 MF14x1.5  | M14 | 1.5     |                |           | 100            | 18  | -  | 11     | 9    | 12.5      |
| TPH554C10 MF16x1.5  | M16 | 1.5     |                |           | 100            | 18  | -  | 12     | 9    | 14.5      |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |
|                     |     |         |                |           |                |     |    |        |      |           |



# Recommended Cutting Conditions



## Machining data for straight flute with spiral point tap

Cutting speed Vc(m/min)

| ISO                                         | Material                                                           |                              | Condition             | Straight flute with spiral point tap |                |            | Lubrication |
|---------------------------------------------|--------------------------------------------------------------------|------------------------------|-----------------------|--------------------------------------|----------------|------------|-------------|
|                                             |                                                                    |                              |                       | Uncoated                             | Steam tempered | TiN coated |             |
| P                                           | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                      | Annealed              | 5-25                                 | 5-25 *         | 15-45 *    | E/O         |
|                                             |                                                                    | >=0.25%C                     | Annealed              | 5-20                                 | 5-20 *         | 10-40 *    | E/O         |
|                                             |                                                                    | <0.55%C                      | Quenched and tempered | -                                    | 2-15 *         | 5-25 *     | E/O         |
|                                             |                                                                    | >=0.55%C                     | Annealed              | 5-20                                 | 5-20 *         | 10-40 *    | E/O         |
|                                             | Low alloy steel and cast steel (Less than 5% of alloying elements) |                              | Quenched and tempered | -                                    | 2-15 *         | 5-25 *     | E/O         |
|                                             |                                                                    |                              | Annealed              | 5-25                                 | 5-25 *         | 15-45 *    | E/O         |
|                                             |                                                                    |                              | Quenched and tempered | -                                    | 2-15 *         | 5-20 *     | E/O         |
|                                             |                                                                    |                              | Annealed              | 5-20                                 | 5-20           | 10-40 *    | E/O         |
| High alloy steel, cast steel and tool steel |                                                                    | Quenched and tempered        | -                     | -                                    | 5-20           | O/S        |             |
|                                             |                                                                    |                              |                       |                                      |                |            |             |
| M                                           | Stainless steel and cast steel                                     | Ferritic / martensitic       | -                     | 2-10 *                               | 5-20 *         | E/O        |             |
|                                             |                                                                    | Martensitic                  | -                     | 2-10 *                               | 5-20 *         | E/O        |             |
|                                             |                                                                    | Austenitic                   | -                     | 2-10 *                               | 5-20 *         | E/O        |             |
| K                                           | Gray cast iron (GG)                                                | Ferritic                     | 10-15                 | 10-25                                | 15-45          | E/D        |             |
|                                             |                                                                    | Pearlitic                    | 10-15                 | 10-25                                | 10-40          | E/D        |             |
|                                             | Cast iron nodular (GGG)                                            | Ferritic                     | 8-12                  | 5-20                                 | 10-30          | E/D        |             |
|                                             |                                                                    | Pearlitic                    | 8-12                  | 5-15                                 | 10-25          | E/D        |             |
|                                             | Malleable cast iron                                                | Ferritic                     | 10-15                 | 10-25                                | 15-45          | E/D        |             |
|                                             |                                                                    | Pearlitic                    | 10-15                 | 10-20                                | 10-40          | E/D        |             |
| N                                           | Aluminum - wrought alloy                                           | Not cureable                 | 15-25 *               | 15-25                                | 15-25          | E/O        |             |
|                                             |                                                                    | Cured                        | 15-25 *               | 15-25                                | 15-25          | E/O        |             |
|                                             | Aluminum-cast, alloyed                                             | <=12% Si                     | Not cureable          | 15-20 *                              | 10-20          | 15-40 *    | E/O         |
|                                             |                                                                    |                              | Cured                 | 15-20 *                              | 10-20          | 15-40 *    | E/O         |
|                                             | >12% Si                                                            | High temp.                   | 15-20 *               | 15-20                                | 10-30          | E/O        |             |
|                                             |                                                                    |                              |                       |                                      |                |            |             |
|                                             | Copper alloys                                                      | >1% Pb                       | Free cutting          | 15-25 *                              | 15-25          | 10-30      | E/O         |
|                                             |                                                                    |                              | Brass                 | 10-40                                | 10-40          | 20-60      | E/O         |
|                                             |                                                                    |                              | Electrolitic copper   | 10-15 *                              | 2-10           | 5-25       | E/O         |
|                                             |                                                                    |                              |                       |                                      |                |            |             |
| Non-metallic                                |                                                                    | Duroplastics, fiber plastics | -                     | 10-20                                | 10-20          | D          |             |
|                                             |                                                                    | Hard rubber                  | -                     | 10-20                                | 10-20          | D          |             |
| S                                           | High temp. alloys                                                  | Fe based                     | Annealed              | -                                    | -              | 3-5        | S           |
|                                             |                                                                    |                              | Cured                 | -                                    | -              | 3-5        | S           |
|                                             |                                                                    | Ni or Co based               | Annealed              | -                                    | -              | 2-4        | S           |
|                                             |                                                                    |                              | Cured                 | -                                    | -              | 2-4        | S           |
|                                             |                                                                    |                              | Cast                  | -                                    | -              | 2-4        | S           |
|                                             |                                                                    |                              |                       |                                      |                |            |             |
|                                             | Titanium, Ti alloys                                                | Pure                         | -                     | -                                    | 4-6            | S          |             |
| Alpha+beta alloys cured                     |                                                                    | -                            | -                     | 4-6                                  | S              |            |             |

\* : Recommended

► For more information of material groups, see the materials & grades "material conversion table"

Steel Stainless steel Cast iron Nonferrous High temp. alloys Hardened steel

► Lubrication E: Emulsion O: Cutting oil S: Special cutting oil D: Dry/air

# Recommended Cutting Conditions



## Machining data for 40° Right-hand spiral flute tap

Cutting speed Vc(m/min)

| ISO | Material                                                           |                              | Condition             | 40° Right-hand spiral flute tap |                |            | Lubrication |
|-----|--------------------------------------------------------------------|------------------------------|-----------------------|---------------------------------|----------------|------------|-------------|
|     |                                                                    |                              |                       | Uncoated                        | Steam tempered | TiN coated |             |
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                      | Annealed              | 5-25                            | 5-25 *         | 15-45 *    | E/O         |
|     |                                                                    | >=0.25%C                     | Annealed              | 5-20                            | 5-20 *         | 10-40 *    | E/O         |
|     |                                                                    | <0.55%C                      | Quenched and tempered | -                               | 2-15 *         | 5-25 *     | E/O         |
|     |                                                                    | >=0.55%C                     | Annealed              | 5-20                            | 5-20 *         | 10-40 *    | E/O         |
|     |                                                                    |                              | Quenched and tempered | -                               | 2-15 *         | 5-25 *     | E/O         |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed                     | 5-25                  | 5-25 *                          | 15-45 *        | E/O        |             |
|     |                                                                    | Quenched and tempered        | -                     | 2-15 *                          | 5-20 *         | E/O        |             |
|     | High alloy steel, cast steel and tool steel                        | Annealed                     | 5-20                  | 5-20                            | 10-40 *        | E/O        |             |
|     | Quenched and tempered                                              | -                            | -                     | 5-20                            | O/S            |            |             |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic       | -                     | 2-10 *                          | 5-20 *         | E/O        |             |
|     |                                                                    | Martensitic                  | -                     | 2-10 *                          | 5-20 *         | E/O        |             |
|     |                                                                    | Austenitic                   | -                     | 2-10 *                          | 5-20 *         | E/O        |             |
| K   | Gray cast iron (GG)                                                | Ferritic                     | 10-15                 | 10-25                           | 15-45          | E/D        |             |
|     |                                                                    | Pearlitic                    | 10-15                 | 10-20                           | 10-40          | E/D        |             |
|     | Cast iron nodular (GGG)                                            | Ferritic                     | 8-12                  | 5-20                            | 10-30          | E/D        |             |
|     |                                                                    | Pearlitic                    | 8-12                  | 5-15                            | 10-25          | E/D        |             |
|     | Malleable cast iron                                                | Ferritic                     | 10-15                 | 10-25                           | 15-45          | E/D        |             |
|     |                                                                    | Pearlitic                    | 10-15                 | 10-20                           | 10-40          | E/D        |             |
| N   | Aluminum - wrought alloy                                           | Not cureable                 | 15-25 *               | 15-25                           | 15-25          | E/O        |             |
|     |                                                                    | Cured                        | 15-25 *               | 15-25                           | 15-25          | E/O        |             |
|     | Aluminum-cast, alloyed                                             | <=12% Si                     | Not cureable          | 15-20 *                         | 10-20          | 15-40 *    | E/O         |
|     |                                                                    |                              | Cured                 | 15-20 *                         | 10-20          | 15-40 *    | E/O         |
|     |                                                                    | >12% Si                      | High temp.            | 15-20 *                         | 15-20          | 10-30      | E/O         |
|     | Copper alloys                                                      | >1% Pb                       | Free cutting          | 15-25 *                         | 15-25          | 10-30      | E/O         |
|     |                                                                    |                              | Brass                 | 10-40                           | 10-40          | 50-60      | E/O         |
|     |                                                                    |                              | Electrolitic copper   | 10-15 *                         | 2-10           | 5-25       | E/O         |
|     | Non-metallic                                                       | Duroplastics, fiber plastics | -                     | 10-20                           | 10-20          | D          |             |
|     |                                                                    | Hard rubber                  | -                     | 10-20                           | 10-20          | D          |             |
| S   | High temp. alloys                                                  | Fe based                     | Annealed              | -                               | -              | 3-5        | S           |
|     |                                                                    |                              | Cured                 | -                               | -              | 3-5        | S           |
|     |                                                                    | Ni or Co based               | Annealed              | -                               | -              | 2-4        | S           |
|     |                                                                    |                              | Cured                 | -                               | -              | 2-4        | S           |
|     |                                                                    |                              | Cast                  | -                               | -              | 2-4        | S           |
|     | Titanium, Ti alloys                                                | Pure                         | -                     | -                               | 4-6            | S          |             |
|     |                                                                    | Alpha+beta alloys cured      | -                     | -                               | 4-6            | S          |             |

\* : Recommended

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel ■ Stainless steel ■ Cast iron ■ Nonferrous ■ High temp. alloys ■ Hardened steel

► **Lubrication** E: Emulsion O: Cutting oil S: Special cutting oil D: Dry/air

# HOLEMAKING



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|                                   |      |
|-----------------------------------|------|
| <b>Tool Selection Guide</b>       | D4   |
| <b>Grades</b>                     | D16  |
| <b>Indexable Drills</b>           |      |
| TOP-DRILL (Ø12-Ø80)               | D18  |
| T-DRILL (Ø12.5-Ø80)               | D34  |
| <b>Head Changeable Drills</b>     |      |
| DRILL-SFEED (Ø12-Ø25.9)           | D55  |
| WIN-DRILL (Small dia. Ø4-Ø5.9)    | D58  |
| DRILL-RUSH (Ø6-Ø25.9)             | D59  |
| WIN-DRILL (Modular type Ø6-Ø20.9) | D71  |
| MODU-R-DRILL (Ø26-Ø50)            | D75  |
| SPADE-RUSH (Ø20-Ø41)              | D80  |
| <b>Solid Drills</b>               |      |
| SOLID-3-DRILL (Ø4-Ø12)            | D83  |
| H-DRILL (Ø3-Ø12)                  | D89  |
| T-CHAMFER (Ø7-Ø20)                | D125 |
| <b>Multifunctional Tools</b>      |      |
| TOP-CAP (Ø8-Ø32)                  | D51  |

Guide to Icons



➤ External Coolant



➤ Internal Coolant



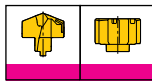
➤ Through Hole



➤ Blind Hole



➤ Tube Page



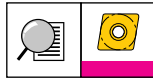
➤ Head Page



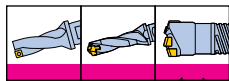
➤ Pad Page



➤ Cartridge Page



➤ Insert Page



➤ Drill Body & Deep Drill Head Page



➤ Assembly Page



➤ Technical Data Page



➤ Cutting Condition Page



Reaming Tools

|                     |      |
|---------------------|------|
| XM-REAM (Ø8-Ø12)    | D130 |
| TM-REAM (Ø11.5-Ø32) | D133 |
| TB-REAM (Ø8-Ø32)    | D136 |
| TS-REAM (Ø3-Ø12)    | D140 |

Deep Drilling Tools

|                     |      |
|---------------------|------|
| WIN-GUN (Ø10-Ø25.9) | D143 |
| T-DEEP              | D145 |

Drilling Heads & Inserts

|  |      |
|--|------|
|  | D194 |
|--|------|

Recommended Cutting Conditions

|  |      |
|--|------|
|  | D242 |
|--|------|

Technical Data

|  |      |
|--|------|
|  | D288 |
|--|------|

Tailor-made Order Form

|  |      |
|--|------|
|  | D298 |
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# Tool Selection Guide

## Drilling tools

| Series              |                            |                                                                                     | Indexable drill                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|---------------------|----------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                     |                            |                                                                                     | TOPDRILL                                                                          |                                                                                   | TDRILL                                                                            |                                                                                   | TOPCAP                                                                             |
|                     |                            |                                                                                     | TOP 2/3/4/5                                                                       | TOP-CA                                                                            | TDR 2/3/4/5                                                                       | TDR-CA                                                                            | TCAP                                                                               |
|                     |                            |                                                                                     |  |  |  |  |  |
| Pages               |                            |                                                                                     | D18-D29                                                                           | D30-D33                                                                           | D34-D46                                                                           | D47-D49                                                                           | D51-D53                                                                            |
| DC(mm)              |                            |                                                                                     | Ø12.0-Ø50.0                                                                       | Ø51.0-Ø80.0                                                                       | Ø12.5-Ø50.0                                                                       | Ø51.0-Ø80.0                                                                       | Ø8.0-Ø32.0                                                                         |
| Drilling depth(L/D) |                            |                                                                                     | 2, 3, 4, 5 x Dc                                                                   | 2, 3, 4 x Dc                                                                      | 2, 3, 4, 5 x Dc                                                                   | 2.5, 3.5 x Dc                                                                     | 2.25, 3 x Dc                                                                       |
| Hole tolerance      |                            |                                                                                     | IT 11-13                                                                          | IT 12-13                                                                          | IT 12-13                                                                          | IT 12-13                                                                          | IT 10-12                                                                           |
| Application         | General drilling           |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                     | Cross hole drilling        |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                    |
|                     | Irregular surface drilling |  | ○                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | ●                                                                                  |
|                     | Interrupted drilling       |  | ○                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 |                                                                                    |
|                     | Chamfering                 |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| Coolant supply      |                            |                                                                                     | Internal                                                                          | Internal                                                                          | Internal                                                                          | Internal                                                                          | Internal                                                                           |

# Tool Selection Guide

## Drilling tools

| Head changeable drill                                                                              |                                                                                                   |                                                                                                    |                                                                                   |                                                                                                    |                                                                                    |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  <b>DrillSpeed</b> |  <b>WinDrill</b> |  <b>DrillRush</b> |                                                                                   |  <b>WinDrill</b> |                                                                                    |
| 3ED                                                                                                | TCD...A0                                                                                          | TCD                                                                                                | TCD-M                                                                             | TCD...A0 3/5/8D                                                                                    | TCD-MRS/TCDM                                                                       |
|                   |                  |                   |  |                   |  |
| D55-D57                                                                                            | D58                                                                                               | D59-D67                                                                                            | D68                                                                               | D70                                                                                                | D71-D74                                                                            |
| Ø12.0-Ø25.9                                                                                        | Ø4.0-Ø5.9                                                                                         | Ø6.0-Ø25.9                                                                                         | M8-M24 (ISO)                                                                      | Ø6.0-Ø9.9                                                                                          | Ø6.0-Ø20.9                                                                         |
| 3, 5, 8 x Dc                                                                                       | 3, 5 x Dc                                                                                         | 1.5, 3, 5, 8, 12 x Dc                                                                              |                                                                                   | 3, 5, 8 x Dc                                                                                       | 2, 3, 4 x Dc                                                                       |
| IT 9-10                                                                                            | IT 9-10                                                                                           | IT 9-10                                                                                            | IT 9-10                                                                           | IT 9-10                                                                                            | IT 9-10                                                                            |
| ●                                                                                                  | ●                                                                                                 | ●                                                                                                  | ●                                                                                 | ●                                                                                                  | ●                                                                                  |
| ○                                                                                                  | ●                                                                                                 | ●                                                                                                  |                                                                                   | ●                                                                                                  | ●                                                                                  |
|                                                                                                    |                                                                                                   |                                                                                                    |                                                                                   |                                                                                                    |                                                                                    |
|                                                                                                    |                                                                                                   |                                                                                                    |                                                                                   |                                                                                                    |                                                                                    |
|                                                                                                    |                                                                                                   |                                                                                                    | ●                                                                                 |                                                                                                    |                                                                                    |
| Internal                                                                                           | Internal                                                                                          | Internal                                                                                           | Internal                                                                          | Internal                                                                                           | Internal                                                                           |

● Recommended, ○ Suitable

# Tool Selection Guide

## Drilling tools

| Series              |                            |                                                                                     | Head changeable drill                                                             |                                                                                   |                                                                                   | Solid carbide drill                                                               |                                                                                    |
|---------------------|----------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                     |                            |                                                                                     | <i>WINGUN</i>                                                                     | <i>MODULDRILL</i>                                                                 | <i>SPADERUSH</i>                                                                  | <i>SOLID3DRILL</i>                                                                | <i>HDRILL</i>                                                                      |
|                     |                            |                                                                                     | TCDGN                                                                             | TNDH-TP/ MDB                                                                      | LCD                                                                               | 3HD                                                                               | NHD-PE/PI                                                                          |
|                     |                            |                                                                                     |  |  |  |  |  |
| Pages               |                            |                                                                                     | D143-D144                                                                         | D75-D79                                                                           | D80-D82                                                                           | D83-D88                                                                           | D89-D100                                                                           |
| DC(mm)              |                            |                                                                                     | Ø10.0-Ø25.9                                                                       | Ø26.0-Ø50.0                                                                       | Ø20.0-Ø41.0                                                                       | Ø4.0-Ø12.0                                                                        | Ø3.0-Ø12.0                                                                         |
| Drilling depth(L/D) |                            |                                                                                     | 16, 20 x Dc                                                                       | 3, 5, 7 x Dc                                                                      | 3, 5, 8 x Dc                                                                      | 3, 5, 8, 12 x Dc                                                                  | 3, 5 x Dc                                                                          |
| Hole tolerance      |                            |                                                                                     | IT 9-10                                                                           | IT 10-12                                                                          | IT 9-10                                                                           | IT 8-10                                                                           | IT 8-10                                                                            |
| Application         | General drilling           |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                     | Cross hole drilling        |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                     | Irregular surface drilling |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                     | Interrupted drilling       |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                     | Chamfering                 |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| Coolant supply      |                            |                                                                                     | Internal                                                                          | Internal                                                                          | Internal                                                                          | Internal                                                                          | External / Internal                                                                |

# Tool Selection Guide

## Drilling tools

| Solid carbide drill                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| H-DRILL                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| NHD-KI                                                                            | NHD-NI                                                                            | TED/TEO                                                                           | SHO 10/15/20                                                                      | SHO-M                                                                             | CDF                                                                               |
|  |  |  |  |  |  |
| D101-D102                                                                         | D103-D108                                                                         | D109-D120                                                                         | D122                                                                              | D123                                                                              | D124                                                                              |
| Ø3.0-Ø12.0                                                                        | Ø3.0-Ø12.0                                                                        | Ø3.0-Ø12.0                                                                        | Ø4.0-Ø10.0                                                                        | M4-M10 (ISO)                                                                      | Ø3.0-Ø12.7                                                                        |
| 3, 5 x Dc                                                                         | 3, 5 x Dc                                                                         | 3, 5 x Dc                                                                         | 10, 15, 20 x Dc                                                                   |                                                                                   |                                                                                   |
| IT 8-10                                                                           | IT 8-10                                                                           | IT 8-10                                                                           | IT 8-10                                                                           | IT 8-10                                                                           | IT 8-10                                                                           |
| ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |
| ●                                                                                 | ●                                                                                 | ●                                                                                 | ○                                                                                 |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |
| Internal                                                                          | Internal                                                                          | External / Internal                                                               | Internal                                                                          | Internal                                                                          | External                                                                          |

● Recommended, ○ Suitable

# Tool Selection Guide

## Reaming tools

| Series             |                           |                                                                                     |                                                                                     | Indexable reamer                                                                  |                                                                                   | Solid reamer                                                                      |                                                                                    |
|--------------------|---------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                    |                           |                                                                                     |                                                                                     | <i>XM-REAM</i>                                                                    | <i>TM-REAM</i>                                                                    | <i>TE-REAM</i>                                                                    | <i>TS-REAM</i>                                                                     |
|                    |                           |                                                                                     |                                                                                     | XR-S0                                                                             | TM                                                                                | TB                                                                                | TS                                                                                 |
|                    |                           |                                                                                     |                                                                                     |  |  |  |  |
| Pages              |                           |                                                                                     |                                                                                     | D130-D131                                                                         | D133                                                                              | D136-D138                                                                         | D140-D141                                                                          |
| DC(mm)             |                           |                                                                                     |                                                                                     | Ø8.000-Ø12.999                                                                    | Ø11.501-Ø32.000                                                                   | Ø8.000-Ø32.000                                                                    | Ø3.000-Ø12.000                                                                     |
| Reaming depth(L/D) |                           |                                                                                     |                                                                                     | 3, 5 x Dc                                                                         | 3, 5, 8 x Dc                                                                      | 5-9 x Dc                                                                          | 7.5-10 x Dc                                                                        |
| Hole tolerance     |                           |                                                                                     |                                                                                     | IT 7 ★                                                                            | IT 7 ★                                                                            | IT 6 ★★                                                                           | IT 7                                                                               |
| Application        |                           | Through                                                                             | Blind                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                    | General reaming           |    |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                    | Cross hole reaming        |   |   |                                                                                   |                                                                                   | ●                                                                                 | ●                                                                                  |
|                    | Irregular surface reaming |  |  |                                                                                   |                                                                                   | ●                                                                                 | ●                                                                                  |
|                    | Interrupted reaming       |  |  | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
| Coolant supply     |                           |                                                                                     |                                                                                     | Internal                                                                          | Internal                                                                          | Internal                                                                          | Internal                                                                           |

★ Up to IT 6 tolerance    ★★ Up to IT 5 tolerance

# Tool Selection Guide

## Deep drilling tools

| Series              | Indexable deep drill head                                                         |                                                                                   |                                                                                   |                                                                                   |
|---------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                     |  |                                                                                   |                                                                                   |                                                                                   |
|                     | TRGD/TRGD3<br>/TRGDL                                                              | TBTA3                                                                             | TBTA5                                                                             | TBTA7                                                                             |
|                     |  |  |  |  |
| Pages               | D145-D152                                                                         | D153-155, D159                                                                    | D156-157, D160                                                                    | D158, D161                                                                        |
| DC(mm)              | Ø8.0-Ø36.0                                                                        | Ø38.00-Ø106.99                                                                    | Ø107.00-Ø168.99                                                                   | Ø169.00-Ø232.99                                                                   |
| Drilling depth(L/D) | 10-45 x Dc                                                                        | 100 x Dc                                                                          | 100 x Dc                                                                          | 100 x Dc                                                                          |
| Hole tolerance      | IT 10-11                                                                          | IT 10                                                                             | IT 10                                                                             | IT 10                                                                             |
| Surface finish      |                                                                                   | 3µm                                                                               | 3µm                                                                               | 3µm                                                                               |
| Single tube         | Outer four thread                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |
|                     | Inner single thread                                                               | ●                                                                                 | ●                                                                                 | ●                                                                                 |
| Double tube         | Outer four thread                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   |

★ In case of inner single thread connection TBTA7 series can cover up to dia. 245.99mm

| Series              |                     | Indexable deep drill & boring head                                                 |                                                                                    |                                                                                     | Brazed deep drill head                                                             |                                                                                    |                                                                                     |
|---------------------|---------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |                     |   |                                                                                    |                                                                                     |                                                                                    |                                                                                    |                                                                                     |
|                     |                     | TBTA-FB                                                                            | TBTA-TR                                                                            | TBTA-R                                                                              | BTA-SE/DE                                                                          | BTS-SE                                                                             | BTE...SE4                                                                           |
|                     |                     |  |  |  |  |  |  |
| Pages               |                     | D164-D169                                                                          | D176-D179                                                                          | D170-D175                                                                           | D180-D182                                                                          | D183                                                                               | D184                                                                                |
| DC(mm)              |                     | Ø25.00-Ø89.00                                                                      | Ø14.00-Ø40.00                                                                      | Ø25.00-Ø110.99                                                                      | Ø12.60-Ø65.00                                                                      | Ø8.00-Ø20.00                                                                       | Ø15.60-Ø16.70                                                                       |
| Drilling depth(L/D) |                     | 100 x Dc                                                                           | 100 x Dc                                                                           | 100 x Dc                                                                            | 100 x Dc                                                                           | 100 x Dc                                                                           | 100 x Dc                                                                            |
| Hole tolerance      |                     | IT 10                                                                              | IT 10                                                                              | IT 7 - IT 9                                                                         | IT 9                                                                               | IT 9                                                                               |                                                                                     |
| Surface finish      |                     | 3µm                                                                                | 3µm                                                                                | 1-2µm                                                                               | 2µm                                                                                | 2µm                                                                                |                                                                                     |
| Single tube         | Outer four thread   | ●                                                                                  | ●                                                                                  | ●                                                                                   | ●                                                                                  | ●★                                                                                 |                                                                                     |
|                     | Inner single thread | ●                                                                                  | ●                                                                                  | ●                                                                                   |                                                                                    |                                                                                    |                                                                                     |
| Double tube         | Outer four thread   | ●                                                                                  | ●                                                                                  |                                                                                     | ●                                                                                  |                                                                                    |                                                                                     |

★ Two start thread: Diameter 12.60 to 15.59mm

● Recommended

# Tool Selection Guide

## Drill inserts

| Series      |                            |                                                                                     | TOPDRILL                                                                          | TDRILL                                                                            | DRILLSPEED                                                                        |                                                                                    |
|-------------|----------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|             |                            |                                                                                     | SOMT                                                                              | SPMG / SPGG                                                                       | 3ED-P+                                                                            | 3ED-F                                                                              |
|             |                            |                                                                                     |  |  |  |  |
| Pages       |                            |                                                                                     | D195-D196                                                                         | D197-D198                                                                         | D199-D201                                                                         | D202                                                                               |
| Size        |                            |                                                                                     | 04/05/06/07/08<br>09/11/13/15                                                     | 05/06/07/09<br>11/12/14                                                           | Ø12.0-Ø25.9                                                                       | Ø12.0-Ø25.9                                                                        |
| Chip former |                            |                                                                                     | DP, DK, DL, DA                                                                    | DG, DK, DA                                                                        | P+                                                                                | F                                                                                  |
| Grades      |                            |                                                                                     | TT9080, TT9300<br>TT8020, TT6080, K10                                             | TT9030, TT8020<br>TT7400, TT6030, K10                                             | TT5130                                                                            | TT5130                                                                             |
| Application | General drilling           |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|             | Cross hole drilling        |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|             | Irregular surface drilling |  | ○                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                  |
|             | Interrupted drilling       |  | ○                                                                                 | ○                                                                                 |                                                                                   |                                                                                    |
|             | Chamfering                 |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## Drill inserts

| WinDRILL                                                                         |                                                                                   | DRILLRUSH                                                                         |                                                                                   |                                                                                   |                                                                                    |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| TCD-P                                                                            | TCD-P/M/K/N                                                                       | TCD-P+                                                                            | TCD-F                                                                             | AOMT                                                                              | CRNG                                                                               |
|  |  |  |  |  |  |
| D203                                                                             | D204-D210                                                                         | D211-D214                                                                         | D215-D216                                                                         | D217                                                                              | D217                                                                               |
| Ø4.0-Ø5.9                                                                        | Ø6.0-Ø25.9                                                                        | Ø6.0-Ø25.9                                                                        | Ø8.0-Ø25.9                                                                        | 03,04,06-C30/C45                                                                  | 08-45CD                                                                            |
| P                                                                                | P/M/K/N                                                                           | P+                                                                                | F                                                                                 | -                                                                                 | -                                                                                  |
| TT9080                                                                           | TT9080<br>UF10                                                                    | TT9080                                                                            | TT9080                                                                            | TT9080                                                                            | TT9080                                                                             |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                    |
| ○                                                                                | ○                                                                                 | ○                                                                                 | ○                                                                                 |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 | ●                                                                                  |

● Recommended, ○ Suitable



# Tool Selection Guide

## Drill inserts

| Series      |                            |                                                                                     | MODULDRILL                                                                        |                                                                                   | SPADERUSH                                                                         |                                                                                    |
|-------------|----------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|             |                            |                                                                                     | TCD-P-CO+                                                                         | SPGX...DW                                                                         | LCD-P                                                                             | LCD-P+                                                                             |
|             |                            |                                                                                     |  |  |  |  |
| Pages       |                            |                                                                                     | D218                                                                              | D218                                                                              | D219-D220                                                                         | D221                                                                               |
| Size        |                            |                                                                                     | Ø15.9-Ø25.9                                                                       | 06/07/09/11/14                                                                    | Ø20.0-Ø41.0                                                                       | Ø20.0-Ø34.5                                                                        |
| Chip former |                            |                                                                                     | P-CO+                                                                             | DW                                                                                | P                                                                                 | P+                                                                                 |
| Grades      |                            |                                                                                     | TT9080                                                                            | TT9080                                                                            | TT9080                                                                            | TT9080                                                                             |
| Application | General drilling           |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|             | Cross hole drilling        |   | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|             | Irregular surface drilling |  | ○                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                  |
|             | Interrupted drilling       |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|             | Chamfering                 |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

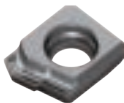
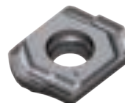
## Drill inserts

| SPADERUSH                                                                        | TCHAMFER                                                                          | TOPCAP                                                                            | TDEEP                                                                             |                                                                                   |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| LCD-F                                                                            | XCGT-C                                                                            | XCGT-TA<br>XCMT                                                                   | NPHT<br>NPMT                                                                      | NPMX<br>TPMX                                                                      |
|  |  |  |  |  |
| D222-D223                                                                        | D224                                                                              | D225-D226                                                                         | D227 -D229                                                                        | D230                                                                              |
| Ø20.0-Ø41.0                                                                      | 06/09                                                                             | 04/05/06/07/08<br>10/13/17                                                        | 06/07/08/09<br>10/11/13                                                           | 08/14/17/24/28                                                                    |
| F                                                                                | C30/C45/C60                                                                       | TA/GV/TC                                                                          | R(L)-G... /R(L)-HF...                                                             | R-B/R-G                                                                           |
| TT9080                                                                           | TT9080                                                                            | TT9080, TT8020,<br>TT9030, K10                                                    | TT9030, TT9130,<br>TT8125, TT6130,<br>TT5030                                      | TT9030, TT9130,<br>TT8125, TT7200,<br>TT6130, TT6020,<br>TT5100, TT5030           |
| ●                                                                                |                                                                                   | ●                                                                                 | ●                                                                                 | ●                                                                                 |
| ●                                                                                |                                                                                   |                                                                                   | ○                                                                                 | ○                                                                                 |
| ○                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | ●                                                                                 |                                                                                   |                                                                                   |                                                                                   |

● Recommended, ○ Suitable

# Tool Selection Guide

## Drill inserts

|             |                                  |                                                                                     | TD <sup>DEEP</sup>                                                                |                                                                                   |                                                                                   |                                                                                    |
|-------------|----------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Series      |                                  |                                                                                     | TOGT                                                                              | ZSGT                                                                              | LOGT                                                                              | TPMX<br>XPMT                                                                       |
|             |                                  |                                                                                     |  |  |  |  |
| Pages       |                                  |                                                                                     | D232                                                                              | D231                                                                              | D231                                                                              | D233                                                                               |
| Size        |                                  |                                                                                     | 07/08/09/10/11<br>/12/13/14                                                       | 04/05/06                                                                          | 06                                                                                | 14/16/17/24                                                                        |
| Chip former |                                  |                                                                                     | RS/GF                                                                             | RS                                                                                | RS                                                                                | LG/-45                                                                             |
| Grades      |                                  |                                                                                     | TT9030, TT9130                                                                    | TT9130                                                                            | TT9030, TT9130                                                                    | TT9030, TT9130,<br>TT6020, TT5030                                                  |
| Application | General<br>drilling              |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|             | Cross<br>hole<br>drilling        |    |                                                                                   |                                                                                   |                                                                                   | ○                                                                                  |
|             | Irregular<br>surface<br>drilling |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|             | Interrupted<br>drilling          |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|             | Chamfering                       |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## Reamer heads & blades

|             |                           |                                                                                     |                                                                                     | <i><b>XN-REAM</b></i>                                                                                      | <i><b>TN-REAM</b></i>                                                                                      | <i><b>TB-REAM</b></i>                                                                                       |
|-------------|---------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Series      |                           |                                                                                     |                                                                                     | <div>XR</div> <div></div> | <div>TM</div> <div></div> | <div>TB</div> <div></div> |
| Pages       |                           |                                                                                     |                                                                                     | D132                                                                                                       | D134 - D135                                                                                                | D139                                                                                                        |
| Size        |                           |                                                                                     |                                                                                     | Ø8.000-Ø12.000                                                                                             | Ø11.50-Ø32.000                                                                                             | 1/2/3/4                                                                                                     |
| Chip former |                           |                                                                                     |                                                                                     | AS/BL                                                                                                      | AS/BL                                                                                                      | A06/B06/B12                                                                                                 |
| Grades      |                           |                                                                                     |                                                                                     | TT9030                                                                                                     | TT9030                                                                                                     | TT5030, TT5050                                                                                              |
| Application |                           | Through                                                                             | Blind                                                                               |                                                                                                            |                                                                                                            |                                                                                                             |
|             | General reaming           |    |    | ●                                                                                                          | ●                                                                                                          | ●                                                                                                           |
|             | Cross hole reaming        |  |  |                                                                                                            |                                                                                                            |                                                                                                             |
|             | Irregular surface reaming |  |  |                                                                                                            |                                                                                                            |                                                                                                             |
|             | Interrupted reaming       |  |  |                                                                                                            |                                                                                                            |                                                                                                             |

● Recommended, ○ Suitable

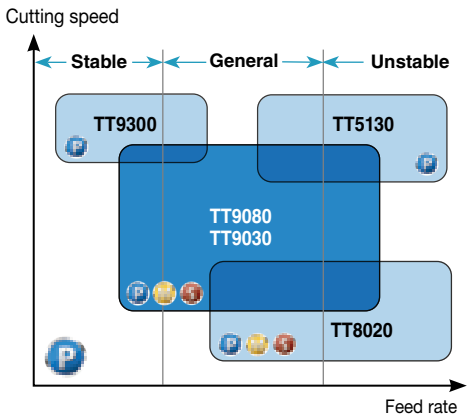
# Grades

## Holemaking grades

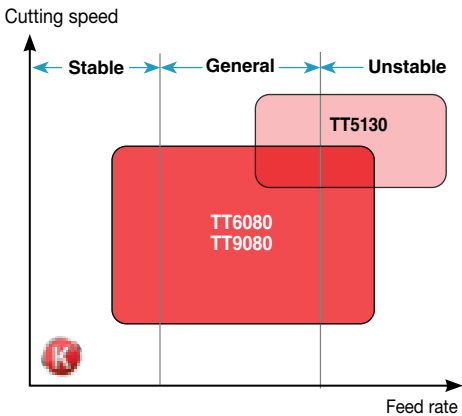
| Grades                       | ISO                                                      | Characteristics & applications                                                                                                                                                                                                    |
|------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TT6080</b><br>PVD carbide | <b>K05 – K25</b><br><b>H05 – H25</b>                     | <ul style="list-style-type: none"> <li>• General machining for gray and ductile cast iron</li> <li>• Finish and medium machining of hardened steel</li> </ul>                                                                     |
| <b>TT9300</b><br>CVD carbide | <b>P10 – P25</b>                                         | <ul style="list-style-type: none"> <li>• High speed drilling of carbon &amp; alloy steel</li> </ul>                                                                                                                               |
| <b>TT5130</b><br>PVD carbide | <b>P20 – P40</b><br><b>K20 – K40</b>                     | <ul style="list-style-type: none"> <li>• High speed drilling of carbon &amp; alloy steel</li> </ul>                                                                                                                               |
| <b>TT9080</b><br>PVD carbide | <b>P20 – P40</b><br><b>M20 – M40</b><br><b>S20 – S40</b> | <ul style="list-style-type: none"> <li>• General machining of steel</li> <li>• General machining of stainless steel</li> <li>• General machining of heat-resistant alloy</li> </ul>                                               |
| <b>TT9030</b><br>PVD carbide | <b>P20 – P40</b><br><b>M20 – M40</b><br><b>S20 – S40</b> | <ul style="list-style-type: none"> <li>• General machining of steel</li> <li>• General machining of stainless steel</li> <li>• General machining of heat-resistant alloy</li> </ul>                                               |
| <b>TT8020</b><br>PVD carbide | <b>P30 – P50</b><br><b>M30 – M50</b><br><b>S30 – S50</b> | <ul style="list-style-type: none"> <li>• Interrupted and rough machining of steel</li> <li>• Interrupted and rough machining of stainless steel</li> <li>• Low speed and interrupted machining of heat-resistant alloy</li> </ul> |
| <b>K10</b><br>Uncoated       | <b>K05 – K15</b><br><b>N05 – N15</b><br><b>S05 – S15</b> | <ul style="list-style-type: none"> <li>• General machining of cast iron</li> <li>• General machining of aluminum alloys and non-ferrous materials</li> <li>• General machining of heat-resistant alloy</li> </ul>                 |
| <b>UF1A/UF10</b><br>Uncoated | <b>N10 – N25</b><br><b>S10 – S30</b>                     | <ul style="list-style-type: none"> <li>• General machining of aluminum alloys and non-ferrous materials</li> <li>• General machining of heat-resistant alloy</li> </ul>                                                           |

## Selection guide for holemaking grades

### For steel



### For cast iron



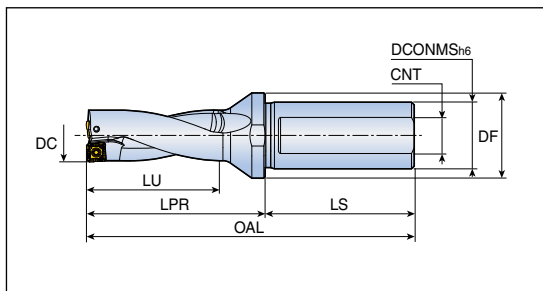
# Drilling Tools



## Indexable drill holders



- Drilling depth: 2x diameter



| Designation             | Dimension (mm) |        |    |    |     |    |         | Insert                |
|-------------------------|----------------|--------|----|----|-----|----|---------|-----------------------|
|                         | DC             | DCONMS | DF | LU | LPR | LS | CNT     |                       |
| <b>TOP 2120-20T2-04</b> | 12.0           | 20     | 25 | 24 | 44  | 50 | M13X1.0 | SOMT 04...DP          |
| <b>2125-20T2-04</b>     | 12.5           | 20     | 25 | 26 | 46  | 50 | M13X1.0 | D195                  |
| <b>2130-20T2-04</b>     | 13.0           | 20     | 25 | 26 | 46  | 50 | M13X1.0 |                       |
| <b>2135-20T2-04</b>     | 13.5           | 20     | 25 | 28 | 46  | 50 | M13X1.0 |                       |
| <b>2140-20T2-05</b>     | 14.0           | 20     | 25 | 28 | 46  | 50 | M13X1.0 |                       |
| <b>2145-20T2-05</b>     | 14.5           | 20     | 25 | 30 | 49  | 50 | M13X1.0 | SOMT 05...DP/DL/DK/DA |
| <b>2150-20T2-05</b>     | 15.0           | 20     | 25 | 30 | 49  | 50 | M13X1.0 | D195-D196             |
| <b>2155-20T2-05</b>     | 15.5           | 20     | 25 | 32 | 52  | 50 | M13X1.0 |                       |
| <b>2160-20T2-05</b>     | 16.0           | 20     | 25 | 32 | 52  | 50 | M13X1.0 |                       |
| <b>2165-25T2-06</b>     | 16.5           | 25     | 32 | 34 | 54  | 56 | M16X1.5 |                       |
| <b>2170-25T2-06</b>     | 17.0           | 25     | 32 | 34 | 54  | 56 | M16X1.5 | SOMT 06...DP/DL/DK/DA |
| <b>2175-25T2-06</b>     | 17.5           | 25     | 32 | 36 | 57  | 56 | M16X1.5 | D195-D196             |
| <b>2180-25T2-06</b>     | 18.0           | 25     | 32 | 36 | 57  | 56 | M16X1.5 |                       |
| <b>2185-25T2-06</b>     | 18.5           | 25     | 32 | 38 | 59  | 56 | M16X1.5 |                       |
| <b>2190-25T2-06</b>     | 19.0           | 25     | 32 | 38 | 59  | 56 | M16X1.5 |                       |
| <b>2195-25T2-07</b>     | 19.5           | 25     | 32 | 40 | 63  | 56 | M16X1.5 | SOMT 07...DP/DL/DK/DA |
| <b>2200-25T2-07</b>     | 20.0           | 25     | 32 | 40 | 63  | 56 | M16X1.5 | D195-D196             |
| <b>2205-25T2-07</b>     | 20.5           | 25     | 32 | 42 | 65  | 56 | M16X1.5 |                       |
| <b>2210-25T2-07</b>     | 21.0           | 25     | 32 | 42 | 65  | 56 | M16X1.5 |                       |
| <b>2215-25T2-07</b>     | 21.5           | 25     | 32 | 44 | 67  | 56 | M16X1.5 |                       |
| <b>2220-25T2-07</b>     | 22.0           | 25     | 32 | 44 | 67  | 56 | M16X1.5 | D195-D196             |
| <b>2225-25T2-08</b>     | 22.5           | 25     | 32 | 46 | 68  | 56 | M16X1.5 |                       |
| <b>2230-25T2-08</b>     | 23.0           | 25     | 32 | 46 | 68  | 56 | M16X1.5 |                       |
| <b>2230-32T2-08</b>     | 23.0           | 32     | 40 | 46 | 68  | 60 | M22X2.0 |                       |
| <b>2235-25T2-08</b>     | 23.5           | 25     | 32 | 48 | 70  | 56 | M16X1.5 | D195-D196             |
| <b>2235-32T2-08</b>     | 23.5           | 32     | 40 | 48 | 70  | 60 | M22X2.0 |                       |
| <b>2240-25T2-08</b>     | 24.0           | 25     | 32 | 48 | 70  | 56 | M16X1.5 |                       |
| <b>2240-32T2-08</b>     | 24.0           | 32     | 40 | 48 | 70  | 60 | M22X2.0 |                       |
| <b>2245-25T2-08</b>     | 24.5           | 25     | 32 | 50 | 72  | 56 | M16X1.5 | D195-D196             |
| <b>2245-32T2-08</b>     | 24.5           | 32     | 40 | 50 | 72  | 60 | M22X2.0 |                       |
| <b>2250-25T2-08</b>     | 25.0           | 25     | 32 | 50 | 72  | 56 | M16X1.5 |                       |
| <b>2250-32T2-08</b>     | 25.0           | 32     | 40 | 50 | 72  | 60 | M22X2.0 |                       |
| <b>2255-25T2-08</b>     | 25.5           | 25     | 32 | 52 | 73  | 56 | M16X1.5 | D195-D196             |
| <b>2255-32T2-08</b>     | 25.5           | 32     | 40 | 52 | 73  | 60 | M22X2.0 |                       |
| <b>2260-25T2-08</b>     | 26.0           | 25     | 32 | 52 | 73  | 56 | M16X1.5 |                       |
| <b>2260-32T2-08</b>     | 26.0           | 32     | 40 | 52 | 73  | 60 | M22X2.0 |                       |

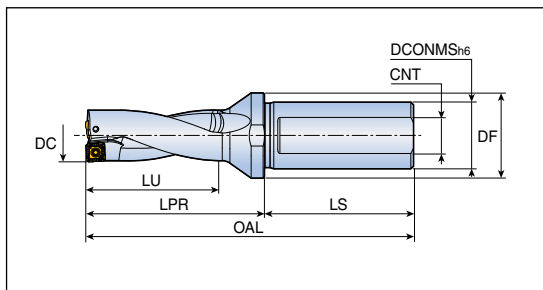


► OAL: LPR + LS

## Indexable drill holders



- Drilling depth: 2x diameter



| Designation             | Dimension (mm) |        |    |    |     |    |         | Insert                             |
|-------------------------|----------------|--------|----|----|-----|----|---------|------------------------------------|
|                         | DC             | DCONMS | DF | LU | LPR | LS | CNT     |                                    |
| <b>TOP 2265-32T2-09</b> | 26.5           | 32     | 40 | 54 | 77  | 60 | M22X2.0 | SOMT 09...DP/DL/DK/DA<br>D195-D196 |
| <b>2270-25T2-09</b>     | 27.0           | 25     | 40 | 54 | 77  | 56 | M16X1.5 |                                    |
| <b>2270-32T2-09</b>     | 27.0           | 32     | 40 | 54 | 77  | 60 | M22X2.0 |                                    |
| <b>2275-32T2-09</b>     | 27.5           | 32     | 40 | 56 | 79  | 60 | M22X2.0 |                                    |
| <b>2280-25T2-09</b>     | 28.0           | 25     | 40 | 56 | 79  | 56 | M16X1.5 |                                    |
| <b>2280-32T2-09</b>     | 28.0           | 32     | 40 | 56 | 79  | 60 | M22X2.0 |                                    |
| <b>2285-32T2-09</b>     | 28.5           | 32     | 40 | 58 | 81  | 60 | M22X2.0 |                                    |
| <b>2290-25T2-09</b>     | 29.0           | 25     | 40 | 58 | 81  | 56 | M16X1.5 |                                    |
| <b>2290-32T2-09</b>     | 29.0           | 32     | 40 | 58 | 81  | 60 | M22X2.0 |                                    |
| <b>2295-32T2-09</b>     | 29.5           | 32     | 40 | 60 | 83  | 60 | M22X2.0 |                                    |
| <b>2300-32T2-09</b>     | 30.0           | 32     | 40 | 60 | 83  | 60 | M22X2.0 | SOMT 11...DP/DL/DK/DA<br>D195-D196 |
| <b>2305-32T2-09</b>     | 30.5           | 32     | 40 | 62 | 85  | 60 | M22X2.0 |                                    |
| <b>2310-32T2-09</b>     | 31.0           | 32     | 40 | 62 | 85  | 60 | M22X2.0 |                                    |
| <b>2320-32T2-11</b>     | 32.0           | 32     | 40 | 64 | 87  | 60 | M22X2.0 |                                    |
| <b>2320-40T2-11</b>     | 32.0           | 40     | 50 | 64 | 87  | 70 | M30X2.0 |                                    |
| <b>2330-32T2-11</b>     | 33.0           | 32     | 40 | 66 | 89  | 60 | M22X2.0 |                                    |
| <b>2330-40T2-11</b>     | 33.0           | 40     | 50 | 66 | 89  | 70 | M30X2.0 |                                    |
| <b>2340-32T2-11</b>     | 34.0           | 32     | 40 | 68 | 91  | 60 | M22X2.0 |                                    |
| <b>2340-40T2-11</b>     | 34.0           | 40     | 50 | 68 | 91  | 70 | M30X2.0 |                                    |
| <b>2350-32T2-11</b>     | 35.0           | 32     | 40 | 70 | 93  | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>2350-40T2-11</b>     | 35.0           | 40     | 50 | 70 | 93  | 70 | M30X2.0 |                                    |
| <b>2360-32T2-11</b>     | 36.0           | 32     | 40 | 72 | 95  | 60 | M22X2.0 |                                    |
| <b>2360-40T2-11</b>     | 36.0           | 40     | 50 | 72 | 95  | 70 | M30X2.0 |                                    |
| <b>2370-32T2-13</b>     | 37.0           | 32     | 50 | 74 | 102 | 60 | M22X2.0 |                                    |
| <b>2370-40T2-13</b>     | 37.0           | 40     | 50 | 74 | 102 | 70 | M30X2.0 |                                    |
| <b>2380-32T2-13</b>     | 38.0           | 32     | 50 | 76 | 104 | 60 | M22X2.0 |                                    |
| <b>2380-40T2-13</b>     | 38.0           | 40     | 50 | 76 | 104 | 70 | M30X2.0 |                                    |
| <b>2390-32T2-13</b>     | 39.0           | 32     | 50 | 78 | 106 | 60 | M22X2.0 |                                    |
| <b>2390-40T2-13</b>     | 39.0           | 40     | 50 | 78 | 106 | 70 | M30X2.0 |                                    |
| <b>2400-32T2-13</b>     | 40.0           | 32     | 50 | 80 | 108 | 60 | M22X2.0 |                                    |
| <b>2400-40T2-13</b>     | 40.0           | 40     | 50 | 80 | 108 | 70 | M30X2.0 |                                    |
| <b>2410-40T2-13</b>     | 41.0           | 40     | 50 | 82 | 110 | 70 | M30X2.0 |                                    |
| <b>2420-40T2-13</b>     | 42.0           | 40     | 50 | 84 | 112 | 70 | M30X2.0 |                                    |
| <b>2430-40T2-13</b>     | 43.0           | 40     | 50 | 86 | 114 | 70 | M30X2.0 |                                    |



► OAL: LPR+LS



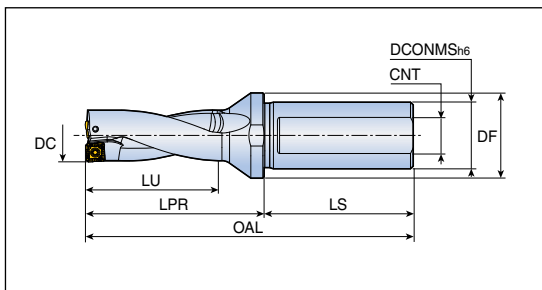
## TOP 2...-T2



## Indexable drill holders



- Drilling depth:  $2 \times \text{diameter}$

[illegible]

► OAL: LPR+LS

## Spare parts

| Designation            | Screw                                                                               | Wrench                                                                              | Plug*                                                                               |  |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                        |  |  |  |  |
| <b>TOP 2120 - 2135</b> | TS 180411/HG                                                                        | TD 6P                                                                               | SL 20M                                                                              |  |
| <b>TOP 2140 - 2160</b> | TS 200431/HG-P                                                                      | TD 6P                                                                               | SL 20M                                                                              |  |
| <b>TOP 2165 - 2220</b> | TS 220521/HG-P                                                                      | TD 7P                                                                               | SL 25M                                                                              |  |
| <b>TOP 2225 - 2260</b> | SO 25065I                                                                           | TD 7                                                                                | SL 25M / SL 32M                                                                     |  |
| <b>TOP 2265 - 2360</b> | TS 35088I                                                                           | TD 10                                                                               | SL 25M / SL 32M / SL 40M                                                            |  |
| <b>TOP 2370 - 2430</b> | TS 40093I                                                                           | TD 15                                                                               | SL 32M / SL 40M                                                                     |  |
| <b>TOP 2440 - 2550</b> | TS 50115I                                                                           | TD 20                                                                               | SL 40M                                                                              |  |



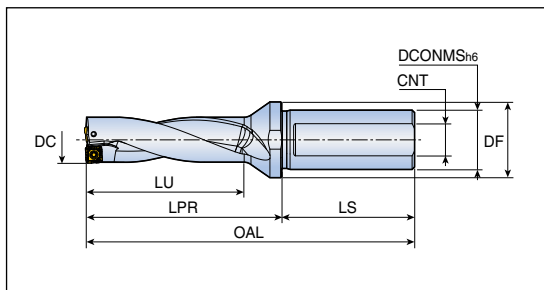
- \*Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm: SL 25M

# TOP 3...-T2

## Indexable drill holders



- Drilling depth: 3x diameter



| Designation             | Dimension (mm) |        |    |    |     |    |         | Insert       |
|-------------------------|----------------|--------|----|----|-----|----|---------|--------------|
|                         | DC             | DCONMS | DF | LU | LPR | LS | CNT     |              |
| <b>TOP 3120-20T2-04</b> | 12.0           | 20     | 25 | 36 | 56  | 50 | M13X1.0 | SOMT 04...DP |
| <b>3125-20T2-04</b>     | 12.5           | 20     | 25 | 39 | 59  | 50 | M13X1.0 | D195         |
| <b>3130-20T2-04</b>     | 13.0           | 20     | 25 | 39 | 59  | 50 | M13X1.0 |              |
| <b>3135-20T2-04</b>     | 13.5           | 20     | 25 | 42 | 60  | 50 | M13X1.0 |              |
| <b>3140-20T2-05</b>     | 14.0           | 20     | 25 | 42 | 60  | 50 | M13X1.0 |              |
| <b>3145-20T2-05</b>     | 14.5           | 20     | 25 | 45 | 64  | 50 | M13X1.0 | D195-D196    |
| <b>3150-20T2-05</b>     | 15.0           | 20     | 25 | 45 | 64  | 50 | M13X1.0 |              |
| <b>3155-20T2-05</b>     | 15.5           | 20     | 25 | 48 | 68  | 50 | M13X1.0 |              |
| <b>3160-20T2-05</b>     | 16.0           | 20     | 25 | 48 | 68  | 50 | M13X1.0 |              |
| <b>3165-25T2-06</b>     | 16.5           | 25     | 32 | 51 | 71  | 56 | M16X1.5 | D195-D196    |
| <b>3167-25T2-06 *</b>   | 16.7           | 25     | 32 | 51 | 71  | 56 | M16X1.5 |              |
| <b>3170-25T2-06</b>     | 17.0           | 25     | 32 | 51 | 71  | 56 | M16X1.5 |              |
| <b>3175-25T2-06</b>     | 17.5           | 25     | 32 | 54 | 75  | 56 | M16X1.5 |              |
| <b>3180-25T2-06</b>     | 18.0           | 25     | 32 | 54 | 75  | 56 | M16X1.5 | D195-D196    |
| <b>3185-25T2-06</b>     | 18.5           | 25     | 32 | 57 | 78  | 56 | M16X1.5 |              |
| <b>3190-25T2-06</b>     | 19.0           | 25     | 32 | 57 | 78  | 56 | M16X1.5 |              |
| <b>3195-25T2-07</b>     | 19.5           | 25     | 32 | 60 | 83  | 56 | M16X1.5 |              |
| <b>3200-25T2-07</b>     | 20.0           | 25     | 32 | 60 | 83  | 56 | M16X1.5 | D195-D196    |
| <b>3205-25T2-07</b>     | 20.5           | 25     | 32 | 63 | 86  | 56 | M16X1.5 |              |
| <b>3210-25T2-07</b>     | 21.0           | 25     | 32 | 63 | 86  | 56 | M16X1.5 |              |
| <b>3215-25T2-07</b>     | 21.5           | 25     | 32 | 66 | 89  | 56 | M16X1.5 |              |
| <b>3220-25T2-07</b>     | 22.0           | 25     | 32 | 66 | 89  | 56 | M16X1.5 | D195-D196    |
| <b>3222-25T2-07 *</b>   | 22.2           | 25     | 32 | 66 | 89  | 56 | M16X1.5 |              |
| <b>3225-25T2-08</b>     | 22.5           | 25     | 32 | 69 | 91  | 56 | M16X1.5 |              |
| <b>3230-25T2-08</b>     | 23.0           | 25     | 32 | 69 | 91  | 56 | M16X1.5 |              |
| <b>3230-32T2-08</b>     | 23.0           | 32     | 40 | 69 | 91  | 60 | M22X2.0 | D195-D196    |
| <b>3235-25T2-08</b>     | 23.5           | 25     | 32 | 72 | 94  | 56 | M16X1.5 |              |
| <b>3235-32T2-08</b>     | 23.5           | 32     | 40 | 72 | 94  | 60 | M22X2.0 |              |
| <b>3240-25T2-08</b>     | 24.0           | 25     | 32 | 72 | 94  | 56 | M16X1.5 |              |
| <b>3240-32T2-08</b>     | 24.0           | 32     | 40 | 72 | 94  | 60 | M22X2.0 | D195-D196    |
| <b>3245-25T2-08</b>     | 24.5           | 25     | 32 | 75 | 97  | 56 | M16X1.5 |              |
| <b>3245-32T2-08</b>     | 24.5           | 32     | 40 | 75 | 97  | 60 | M22X2.0 |              |
| <b>3250-25T2-08</b>     | 25.0           | 25     | 32 | 75 | 97  | 56 | M16X1.5 |              |
| <b>3250-32T2-08</b>     | 25.0           | 32     | 40 | 75 | 97  | 60 | M22X2.0 |              |
| <b>3254-25T2-08 *</b>   | 25.4           | 25     | 32 | 75 | 97  | 56 | M16X1.5 |              |

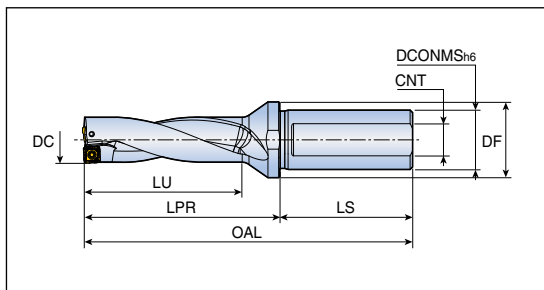


- \*: Inch sized hole
- OAL: LPR+LS

## Indexable drill holders



- Drilling depth: 3x diameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                             |
|-------------------------|----------------|--------|----|-----|-----|----|---------|------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                                    |
| <b>TOP 3255-25T2-08</b> | 25.5           | 25     | 32 | 78  | 99  | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA<br>D195-D196 |
| <b>3255-32T2-08</b>     | 25.5           | 32     | 40 | 78  | 99  | 60 | M22X2.0 |                                    |
| <b>3260-25T2-08</b>     | 26.0           | 25     | 32 | 78  | 99  | 56 | M16X1.5 |                                    |
| <b>3260-32T2-08</b>     | 26.0           | 32     | 32 | 78  | 99  | 60 | M22X2.0 |                                    |
| <b>3265-25T2-09</b>     | 26.5           | 25     | 40 | 81  | 104 | 56 | M16X1.5 | SOMT 09...DP/DL/DK/DA<br>D195-D196 |
| <b>3265-32T2-09</b>     | 26.5           | 32     | 40 | 81  | 104 | 60 | M22X2.0 |                                    |
| <b>3270-25T2-09</b>     | 27.0           | 25     | 40 | 81  | 104 | 56 | M16X1.5 |                                    |
| <b>3270-32T2-09</b>     | 27.0           | 32     | 40 | 81  | 104 | 60 | M22X2.0 |                                    |
| <b>3275-25T2-09</b>     | 27.5           | 25     | 40 | 84  | 107 | 56 | M16X1.5 |                                    |
| <b>3275-32T2-09</b>     | 27.5           | 32     | 40 | 84  | 107 | 60 | M22X2.0 |                                    |
| <b>3280-25T2-09</b>     | 28.0           | 25     | 40 | 84  | 107 | 56 | M16X1.5 |                                    |
| <b>3280-32T2-09</b>     | 28.0           | 32     | 40 | 84  | 107 | 60 | M22X2.0 |                                    |
| <b>3285-25T2-09</b>     | 28.5           | 25     | 40 | 87  | 110 | 56 | M16X1.5 |                                    |
| <b>3285-32T2-09</b>     | 28.5           | 32     | 40 | 87  | 110 | 60 | M22X2.0 |                                    |
| <b>3290-25T2-09</b>     | 29.0           | 25     | 40 | 87  | 110 | 56 | M16X1.5 |                                    |
| <b>3290-32T2-09</b>     | 29.0           | 32     | 40 | 87  | 110 | 60 | M22X2.0 |                                    |
| <b>3295-32T2-09</b>     | 29.5           | 32     | 40 | 90  | 113 | 60 | M22X2.0 |                                    |
| <b>3300-32T2-09</b>     | 30.0           | 32     | 40 | 90  | 113 | 60 | M22X2.0 |                                    |
| <b>3305-32T2-09</b>     | 30.5           | 32     | 40 | 93  | 116 | 60 | M22X2.0 |                                    |
| <b>3310-32T2-09</b>     | 31.0           | 32     | 40 | 93  | 116 | 60 | M22X2.0 |                                    |
| <b>3320-32T2-11</b>     | 32.0           | 32     | 40 | 96  | 119 | 60 | M22X2.0 | SOMT 11...DP/DL/DK/DA<br>D195-D196 |
| <b>3320-40T2-11</b>     | 32.0           | 40     | 50 | 96  | 119 | 70 | M30X2.0 |                                    |
| <b>3330-32T2-11</b>     | 33.0           | 32     | 40 | 99  | 122 | 60 | M22X2.0 |                                    |
| <b>3330-40T2-11</b>     | 33.0           | 40     | 50 | 99  | 122 | 70 | M30X2.0 |                                    |
| <b>3340-32T2-11</b>     | 34.0           | 32     | 40 | 102 | 125 | 60 | M22X2.0 |                                    |
| <b>3340-40T2-11</b>     | 34.0           | 40     | 50 | 102 | 125 | 70 | M30X2.0 |                                    |
| <b>3350-32T2-11</b>     | 35.0           | 32     | 40 | 105 | 128 | 60 | M22X2.0 |                                    |
| <b>3350-40T2-11</b>     | 35.0           | 40     | 50 | 105 | 128 | 70 | M30X2.0 |                                    |
| <b>3360-32T2-11</b>     | 36.0           | 32     | 40 | 108 | 131 | 60 | M22X2.0 |                                    |
| <b>3360-40T2-11</b>     | 36.0           | 40     | 50 | 108 | 131 | 70 | M30X2.0 |                                    |
| <b>3370-32T2-13</b>     | 37.0           | 32     | 50 | 111 | 139 | 60 | M22X2.0 |                                    |
| <b>3370-40T2-13</b>     | 37.0           | 40     | 50 | 111 | 139 | 70 | M30X2.0 |                                    |
| <b>3380-32T2-13</b>     | 38.0           | 32     | 50 | 114 | 142 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>3380-40T2-13</b>     | 38.0           | 40     | 50 | 114 | 142 | 70 | M30X2.0 |                                    |
| <b>3390-32T2-13</b>     | 39.0           | 32     | 50 | 117 | 145 | 60 | M22X2.0 |                                    |

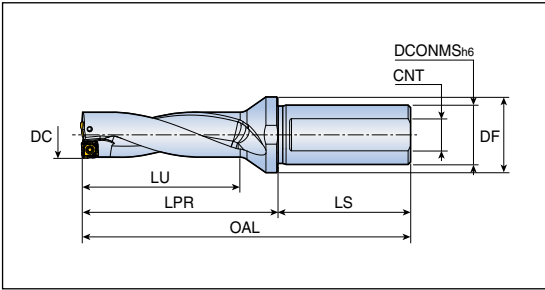


► OAL: LPR + LS

Indexable drill holders



- Drilling depth: 3xdiameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                             |
|-------------------------|----------------|--------|----|-----|-----|----|---------|------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                                    |
| <b>TOP 3390-40T2-13</b> | 39.0           | 40     | 50 | 117 | 145 | 70 | M30X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>3400-32T2-13</b>     | 40.0           | 32     | 50 | 120 | 148 | 60 | M22X2.0 |                                    |
| <b>3400-40T2-13</b>     | 40.0           | 40     | 50 | 120 | 148 | 70 | M30X2.0 |                                    |
| <b>3410-40T2-13</b>     | 41.0           | 40     | 50 | 123 | 151 | 70 | M30X2.0 |                                    |
| <b>3420-40T2-13</b>     | 42.0           | 40     | 50 | 126 | 154 | 70 | M30X2.0 |                                    |
| <b>3430-40T2-13</b>     | 43.0           | 40     | 50 | 129 | 157 | 70 | M30X2.0 | SOMT 15...DP/DL/DK/DA<br>D195-D196 |
| <b>3440-40T2-15</b>     | 44.0           | 40     | 60 | 132 | 167 | 70 | M30X2.0 |                                    |
| <b>3450-40T2-15</b>     | 45.0           | 40     | 60 | 135 | 170 | 70 | M30X2.0 |                                    |
| <b>3460-40T2-15</b>     | 46.0           | 40     | 60 | 138 | 173 | 70 | M30X2.0 |                                    |
| <b>3470-40T2-15</b>     | 47.0           | 40     | 60 | 141 | 176 | 70 | M30X2.0 |                                    |
| <b>3480-40T2-15</b>     | 48.0           | 40     | 60 | 144 | 179 | 70 | M30X2.0 |                                    |
| <b>3490-40T2-15</b>     | 49.0           | 40     | 60 | 147 | 182 | 70 | M30X2.0 |                                    |
| <b>3500-40T2-15</b>     | 50.0           | 40     | 60 | 150 | 185 | 70 | M30X2.0 |                                    |
|                         |                |        |    |     |     |    |         |                                    |
|                         |                |        |    |     |     |    |         |                                    |
|                         |                |        |    |     |     |    |         |                                    |
|                         |                |        |    |     |     |    |         |                                    |
|                         |                |        |    |     |     |    |         |                                    |

► OAL: LPR+LS

Spare parts

| Designation            | Screw          | Wrench | Plug*                    |  |
|------------------------|----------------|--------|--------------------------|--|
|                        |                |        |                          |  |
| <b>TOP 3120 - 3135</b> | TS 18041/HG    | TD 6P  | SL 20M                   |  |
| <b>TOP 3140 - 3160</b> | TS 20043I/HG-P | TD 6P  | SL 20M                   |  |
| <b>TOP 3165 - 3220</b> | TS 22052I/HG-P | TD 7P  | SL 25M                   |  |
| <b>TOP 3225 - 3260</b> | SO 25065I      | TD 7   | SL 25M / SL 32M          |  |
| <b>TOP 3265 - 3360</b> | TS 35088I      | TD 10  | SL 25M / SL 32M / SL 40M |  |
| <b>TOP 3370 - 3430</b> | TS 40093I      | TD 15  | SL 32M / SL 40M          |  |
| <b>TOP 3440 - 3500</b> | TS 50115I      | TD 20  | SL 40M                   |  |

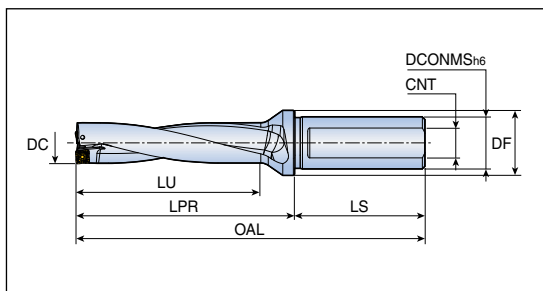
► \* Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm: SL 25M



## Indexable drill holders



- Drilling depth: 4x diameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                       |
| <b>TOP 4120-20T2-04</b> | 12.0           | 20     | 25 | 48  | 68  | 50 | M13X1.0 | SOMT 04...DP          |
| <b>4125-20T2-04</b>     | 12.5           | 20     | 25 | 52  | 72  | 50 | M13X1.0 | D195                  |
| <b>4130-20T2-04</b>     | 13.0           | 20     | 25 | 52  | 72  | 50 | M13X1.0 |                       |
| <b>4135-20T2-04</b>     | 13.5           | 20     | 25 | 56  | 74  | 50 | M13X1.0 |                       |
| <b>4140-20T2-05</b>     | 14.0           | 20     | 25 | 56  | 74  | 50 | M13X1.0 | SOMT 05...DP/DL/DK/DA |
| <b>4145-20T2-05</b>     | 14.5           | 20     | 25 | 60  | 79  | 50 | M13X1.0 | D195-D196             |
| <b>4150-20T2-05</b>     | 15.0           | 20     | 25 | 60  | 79  | 50 | M13X1.0 |                       |
| <b>4155-20T2-05</b>     | 15.5           | 20     | 25 | 64  | 84  | 50 | M13X1.0 |                       |
| <b>4160-20T2-05</b>     | 16.0           | 20     | 25 | 64  | 84  | 50 | M13X1.0 |                       |
| <b>4165-25T2-06</b>     | 16.5           | 25     | 32 | 68  | 88  | 56 | M16X1.5 | SOMT 06...DP/DL/DK/DA |
| <b>4170-25T2-06</b>     | 17.0           | 25     | 32 | 68  | 88  | 56 | M16X1.5 | D195-D196             |
| <b>4175-25T2-06</b>     | 17.5           | 25     | 32 | 72  | 93  | 56 | M16X1.5 |                       |
| <b>4180-25T2-06</b>     | 18.0           | 25     | 32 | 72  | 93  | 56 | M16X1.5 |                       |
| <b>4185-25T2-06</b>     | 18.5           | 25     | 32 | 76  | 97  | 56 | M16X1.5 |                       |
| <b>4190-25T2-06</b>     | 19.0           | 25     | 32 | 76  | 97  | 56 | M16X1.5 |                       |
| <b>4195-25T2-07</b>     | 19.5           | 25     | 32 | 80  | 103 | 56 | M16X1.5 | SOMT 07...DP/DL/DK/DA |
| <b>4200-25T2-07</b>     | 20.0           | 25     | 32 | 80  | 103 | 56 | M16X1.5 | D195-D196             |
| <b>4205-25T2-07</b>     | 20.5           | 25     | 32 | 84  | 107 | 56 | M16X1.5 |                       |
| <b>4210-25T2-07</b>     | 21.0           | 25     | 32 | 84  | 107 | 56 | M16X1.5 |                       |
| <b>4215-25T2-07</b>     | 21.5           | 25     | 32 | 88  | 111 | 56 | M16X1.5 |                       |
| <b>4220-25T2-07</b>     | 22.0           | 25     | 32 | 88  | 111 | 56 | M16X1.5 |                       |
| <b>4225-25T2-08</b>     | 22.5           | 25     | 32 | 92  | 114 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA |
| <b>4230-25T2-08</b>     | 23.0           | 25     | 32 | 92  | 114 | 56 | M16X1.5 | D195-D196             |
| <b>4230-32T2-08</b>     | 23.0           | 32     | 40 | 92  | 114 | 60 | M22X2.0 |                       |
| <b>4235-25T2-08</b>     | 23.5           | 25     | 32 | 96  | 118 | 56 | M16X1.5 |                       |
| <b>4235-32T2-08</b>     | 23.5           | 32     | 40 | 96  | 118 | 60 | M22X2.0 |                       |
| <b>4240-25T2-08</b>     | 24.0           | 25     | 32 | 96  | 118 | 56 | M16X1.5 |                       |
| <b>4240-32T2-08</b>     | 24.0           | 32     | 40 | 96  | 118 | 60 | M22X2.0 |                       |
| <b>4245-25T2-08</b>     | 24.5           | 25     | 32 | 100 | 122 | 56 | M16X1.5 |                       |
| <b>4245-32T2-08</b>     | 24.5           | 32     | 40 | 100 | 122 | 60 | M22X2.0 |                       |
| <b>4250-25T2-08</b>     | 25.0           | 25     | 32 | 100 | 122 | 56 | M16X1.5 |                       |
| <b>4250-32T2-08</b>     | 25.0           | 32     | 40 | 100 | 122 | 60 | M22X2.0 |                       |
| <b>4254-25T2-08 *</b>   | 25.4           | 25     | 32 | 100 | 122 | 56 | M16X1.5 |                       |
| <b>4255-25T2-08</b>     | 25.5           | 25     | 32 | 104 | 125 | 56 | M16X1.5 |                       |
| <b>4255-32T2-08</b>     | 25.5           | 32     | 40 | 104 | 125 | 60 | M22X2.0 |                       |

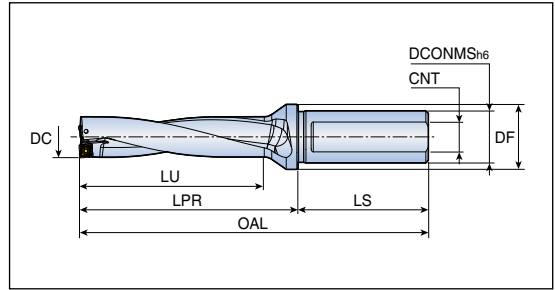


- \*: Inch sized hole
- OAL: LPR+LS

## Indexable drill holders



- Drilling depth: 4x diameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                             |
|-------------------------|----------------|--------|----|-----|-----|----|---------|------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                                    |
| <b>TOP 4260-25T2-08</b> | 26.0           | 25     | 32 | 104 | 125 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA<br>D195-D196 |
| <b>4260-32T2-08</b>     | 26.0           | 32     | 40 | 104 | 125 | 60 | M22X2.0 |                                    |
| <b>4265-25T2-09</b>     | 26.5           | 25     | 40 | 108 | 131 | 56 | M16X1.5 | SOMT 09...DP/DL/DK/DA<br>D195-D196 |
| <b>4265-32T2-09</b>     | 26.5           | 32     | 40 | 108 | 131 | 60 | M22X2.0 |                                    |
| <b>4270-25T2-09</b>     | 27.0           | 25     | 40 | 108 | 131 | 56 | M16X1.5 | SOMT 11...DP/DL/DK/DA<br>D195-D196 |
| <b>4270-32T2-09</b>     | 27.0           | 32     | 40 | 108 | 131 | 60 | M22X2.0 |                                    |
| <b>4275-25T2-09</b>     | 27.5           | 25     | 40 | 112 | 135 | 56 | M16X1.5 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4275-32T2-09</b>     | 27.5           | 32     | 40 | 112 | 135 | 60 | M22X2.0 |                                    |
| <b>4280-25T2-09</b>     | 28.0           | 25     | 40 | 112 | 135 | 56 | M16X1.5 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4280-32T2-09</b>     | 28.0           | 32     | 40 | 112 | 135 | 60 | M22X2.0 |                                    |
| <b>4285-25T2-09</b>     | 28.5           | 25     | 40 | 116 | 139 | 56 | M16X1.5 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4285-32T2-09</b>     | 28.5           | 32     | 40 | 116 | 139 | 60 | M22X2.0 |                                    |
| <b>4286-32T2-09 *</b>   | 28.6           | 32     | 40 | 116 | 139 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4290-25T2-09</b>     | 29.0           | 25     | 40 | 116 | 139 | 56 | M16X1.5 |                                    |
| <b>4290-32T2-09</b>     | 29.0           | 32     | 40 | 116 | 139 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4295-32T2-09</b>     | 29.5           | 32     | 40 | 120 | 143 | 60 | M22X2.0 |                                    |
| <b>4300-32T2-09</b>     | 30.0           | 32     | 40 | 120 | 143 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4305-32T2-09</b>     | 30.5           | 32     | 40 | 124 | 147 | 60 | M22X2.0 |                                    |
| <b>4310-32T2-09</b>     | 31.0           | 32     | 40 | 124 | 147 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4318-32T2-11 *</b>   | 31.8           | 32     | 40 | 128 | 151 | 60 | M22X2.0 |                                    |
| <b>4320-32T2-11</b>     | 32.0           | 32     | 40 | 128 | 151 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4320-40T2-11</b>     | 32.0           | 40     | 50 | 128 | 151 | 70 | M30X2.0 |                                    |
| <b>4330-32T2-11</b>     | 33.0           | 32     | 40 | 132 | 155 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4330-40T2-11</b>     | 33.0           | 40     | 50 | 132 | 155 | 70 | M30X2.0 |                                    |
| <b>4340-32T2-11</b>     | 34.0           | 32     | 40 | 136 | 159 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4340-40T2-11</b>     | 34.0           | 40     | 50 | 136 | 159 | 70 | M30X2.0 |                                    |
| <b>4349-40T2-11 *</b>   | 34.9           | 40     | 50 | 140 | 163 | 70 | M30X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4350-32T2-11</b>     | 35.0           | 32     | 40 | 140 | 163 | 60 | M22X2.0 |                                    |
| <b>4350-40T2-11</b>     | 35.0           | 40     | 50 | 140 | 163 | 70 | M30X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4360-32T2-11</b>     | 36.0           | 32     | 40 | 144 | 167 | 60 | M22X2.0 |                                    |
| <b>4360-40T2-11</b>     | 36.0           | 40     | 50 | 144 | 167 | 70 | M30X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4370-32T2-13</b>     | 37.0           | 32     | 50 | 148 | 176 | 60 | M22X2.0 |                                    |
| <b>4370-40T2-13</b>     | 37.0           | 40     | 50 | 148 | 176 | 70 | M30X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4371-40T2-13 *</b>   | 37.1           | 40     | 50 | 148 | 176 | 70 | M30X2.0 |                                    |

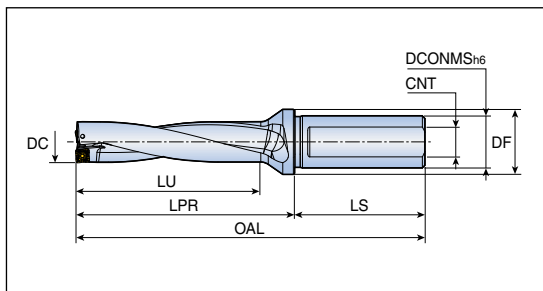


- \*: Inch sized hole
- OAL: LPR+LS

## Indexable drill holders



- Drilling depth: 4x diameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                             |
|-------------------------|----------------|--------|----|-----|-----|----|---------|------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                                    |
| <b>TOP 4380-32T2-13</b> | 38.0           | 32     | 50 | 152 | 180 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA<br>D195-D196 |
| <b>4380-40T2-13</b>     | 38.0           | 40     | 50 | 152 | 180 | 70 | M30X2.0 |                                    |
| <b>4381-40T2-13 *</b>   | 38.1           | 40     | 50 | 152 | 180 | 70 | M30X2.0 |                                    |
| <b>4390-32T2-13</b>     | 39.0           | 32     | 50 | 156 | 184 | 60 | M22X2.0 |                                    |
| <b>4390-40T2-13</b>     | 39.0           | 40     | 50 | 156 | 184 | 70 | M30X2.0 |                                    |
| <b>4400-32T2-13</b>     | 40.0           | 32     | 50 | 160 | 188 | 60 | M22X2.0 |                                    |
| <b>4400-40T2-13</b>     | 40.0           | 40     | 50 | 160 | 188 | 70 | M30X2.0 |                                    |
| <b>4410-40T2-13</b>     | 41.0           | 40     | 50 | 164 | 192 | 70 | M30X2.0 |                                    |
| <b>4413-40T2-13 *</b>   | 41.3           | 40     | 50 | 164 | 192 | 70 | M30X2.0 |                                    |
| <b>4420-40T2-13</b>     | 42.0           | 40     | 50 | 168 | 196 | 70 | M30X2.0 |                                    |
| <b>4429-40T2-13 *</b>   | 42.9           | 40     | 50 | 172 | 200 | 70 | M30X2.0 | SOMT 15...DP/DL/DK/DA<br>D195-D196 |
| <b>4430-40T2-13</b>     | 43.0           | 40     | 50 | 172 | 200 | 70 | M30X2.0 |                                    |
| <b>4440-40T2-15</b>     | 44.0           | 40     | 60 | 176 | 211 | 70 | M30X2.0 |                                    |
| <b>4445-40T2-15 *</b>   | 44.5           | 40     | 60 | 180 | 215 | 70 | M30X2.0 |                                    |
| <b>4450-40T2-15</b>     | 45.0           | 40     | 60 | 180 | 215 | 70 | M30X2.0 |                                    |
| <b>4460-40T2-15</b>     | 46.0           | 40     | 60 | 184 | 219 | 70 | M30X2.0 |                                    |
| <b>4470-40T2-15</b>     | 47.0           | 40     | 60 | 188 | 223 | 70 | M30X2.0 |                                    |
| <b>4476-40T2-15 *</b>   | 47.6           | 40     | 60 | 192 | 227 | 70 | M30X2.0 |                                    |
| <b>4480-40T2-15</b>     | 48.0           | 40     | 60 | 192 | 227 | 70 | M30X2.0 |                                    |
| <b>4490-40T2-15</b>     | 49.0           | 40     | 60 | 196 | 231 | 70 | M30X2.0 |                                    |
| <b>4500-40T2-15</b>     | 50.0           | 40     | 60 | 200 | 235 | 70 | M30X2.0 |                                    |
| <b>4508-40T2-15 *</b>   | 50.8           | 40     | 60 | 204 | 239 | 70 | M30X2.0 |                                    |

► \*: Inch sized hole

► OAL: LPR+LS

## Spare parts

| Designation            | Screw<br>      | Wrench<br> | Plug*<br>                |  |
|------------------------|----------------|------------|--------------------------|--|
| <b>TOP 4120 - 4135</b> | TS 18041/HG    | TD 6P      | SL 20M                   |  |
| <b>TOP 4140 - 4160</b> | TS 20043I/HG-P | TD 6P      | SL 20M                   |  |
| <b>TOP 4165 - 4220</b> | TS 22052I/HG-P | TD 7P      | SL 25M                   |  |
| <b>TOP 4225 - 4260</b> | SO 25065I      | TD 7       | SL 25M / SL 32M          |  |
| <b>TOP 4265 - 4360</b> | TS 35088I      | TD 10      | SL 25M / SL 32M / SL 40M |  |
| <b>TOP 4370 - 4430</b> | TS 40093I      | TD 15      | SL 32M / SL 40M          |  |
| <b>TOP 4440 - 4508</b> | TS 50115I      | TD 20      | SL 40M                   |  |



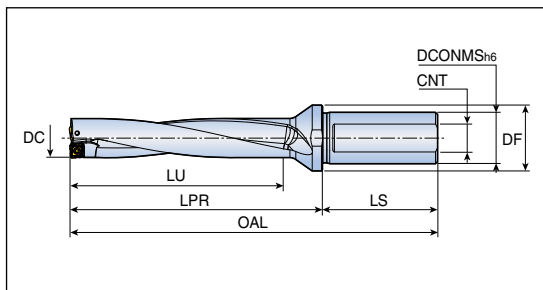
- \* Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm: SL 25M

# TOP 5...-T2

## Indexable drill holders



- Drilling depth: 5xdiameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                             |
|-------------------------|----------------|--------|----|-----|-----|----|---------|------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                                    |
| <b>TOP 5120-20T2-04</b> | 12.0           | 20     | 25 | 60  | 80  | 50 | M13X1.0 | SOMT 04...DP<br>D195               |
| <b>5125-20T2-04</b>     | 12.5           | 20     | 25 | 65  | 85  | 50 | M13X1.0 |                                    |
| <b>5130-20T2-04</b>     | 13.0           | 20     | 25 | 65  | 85  | 50 | M13X1.0 |                                    |
| <b>5135-20T2-04</b>     | 13.5           | 20     | 25 | 70  | 88  | 50 | M13X1.0 |                                    |
| <b>5140-20T2-05</b>     | 14.0           | 20     | 25 | 70  | 88  | 50 | M13X1.0 | SOMT 05...DP/DL/DK/DA<br>D195-D196 |
| <b>5145-20T2-05</b>     | 14.5           | 20     | 25 | 75  | 94  | 50 | M13X1.0 |                                    |
| <b>5150-20T2-05</b>     | 15.0           | 20     | 25 | 75  | 94  | 50 | M13X1.0 |                                    |
| <b>5155-20T2-05</b>     | 15.5           | 20     | 25 | 80  | 100 | 50 | M13X1.0 |                                    |
| <b>5160-20T2-05</b>     | 16.0           | 20     | 25 | 80  | 100 | 50 | M13X1.0 | SOMT 06...DP/DL/DK/DA<br>D195-D196 |
| <b>5165-25T2-06</b>     | 16.5           | 25     | 32 | 85  | 105 | 56 | M16X1.5 |                                    |
| <b>5170-25T2-06</b>     | 17.0           | 25     | 32 | 85  | 105 | 56 | M16X1.5 |                                    |
| <b>5175-25T2-06</b>     | 17.5           | 25     | 32 | 90  | 111 | 56 | M16X1.5 |                                    |
| <b>5180-25T2-06</b>     | 18.0           | 25     | 32 | 90  | 111 | 56 | M16X1.5 | SOMT 07...DP/DL/DK/DA<br>D195-D196 |
| <b>5185-25T2-06</b>     | 18.5           | 25     | 32 | 95  | 116 | 56 | M16X1.5 |                                    |
| <b>5190-25T2-06</b>     | 19.0           | 25     | 32 | 95  | 116 | 56 | M16X1.5 |                                    |
| <b>5195-25T2-07</b>     | 19.5           | 25     | 32 | 100 | 123 | 56 | M16X1.5 |                                    |
| <b>5200-25T2-07</b>     | 20.0           | 25     | 32 | 100 | 123 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA<br>D195-D196 |
| <b>5205-25T2-07</b>     | 20.5           | 25     | 32 | 105 | 128 | 56 | M16X1.5 |                                    |
| <b>5210-25T2-07</b>     | 21.0           | 25     | 32 | 105 | 128 | 56 | M16X1.5 |                                    |
| <b>5215-25T2-07</b>     | 21.5           | 25     | 32 | 110 | 133 | 56 | M16X1.5 |                                    |
| <b>5220-25T2-07</b>     | 22.0           | 25     | 32 | 110 | 133 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA<br>D195-D196 |
| <b>5222-25T2-07 *</b>   | 22.2           | 25     | 32 | 110 | 133 | 56 | M16X1.5 |                                    |
| <b>5225-25T2-08</b>     | 22.5           | 25     | 32 | 115 | 137 | 56 | M16X1.5 |                                    |
| <b>5230-25T2-08</b>     | 23.0           | 25     | 32 | 115 | 137 | 56 | M16X1.5 |                                    |
| <b>5230-32T2-08</b>     | 23.0           | 32     | 40 | 115 | 137 | 60 | M22X2.0 | SOMT 08...DP/DL/DK/DA<br>D195-D196 |
| <b>5235-25T2-08</b>     | 23.5           | 25     | 32 | 120 | 142 | 56 | M16X1.5 |                                    |
| <b>5235-32T2-08</b>     | 23.5           | 32     | 40 | 120 | 142 | 60 | M22X2.0 |                                    |
| <b>5240-25T2-08</b>     | 24.0           | 25     | 32 | 120 | 142 | 56 | M16X1.5 |                                    |
| <b>5240-32T2-08</b>     | 24.0           | 32     | 40 | 120 | 142 | 60 | M22X2.0 | SOMT 08...DP/DL/DK/DA<br>D195-D196 |
| <b>5245-25T2-08</b>     | 24.5           | 25     | 32 | 125 | 147 | 56 | M16X1.5 |                                    |
| <b>5245-32T2-08</b>     | 24.5           | 32     | 40 | 125 | 147 | 60 | M22X2.0 |                                    |
| <b>5250-25T2-08</b>     | 25.0           | 25     | 32 | 125 | 147 | 56 | M16X1.5 |                                    |
| <b>5250-32T2-08</b>     | 25.0           | 32     | 40 | 125 | 147 | 60 | M22X2.0 | SOMT 08...DP/DL/DK/DA<br>D195-D196 |
| <b>5255-25T2-08</b>     | 25.5           | 25     | 32 | 130 | 151 | 56 | M16X1.5 |                                    |
| <b>5255-32T2-08</b>     | 25.5           | 32     | 40 | 130 | 151 | 60 | M22X2.0 |                                    |



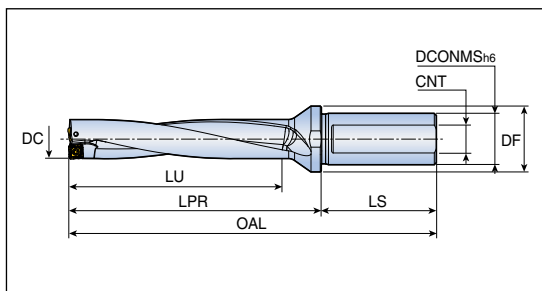
- \*: Inch sized hole
- OAL: LPR+LS



## Indexable drill holders



- Drilling depth: 5x diameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                       |
| <b>TOP 5260-25T2-08</b> | 26.0           | 25     | 32 | 130 | 151 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA |
| <b>5260-32T2-08</b>     | 26.0           | 32     | 40 | 130 | 151 | 60 | M22X2.0 | D195-D196             |
| <b>5265-32T2-09</b>     | 26.5           | 32     | 40 | 135 | 158 | 60 | M22X2.0 | SOMT 09...DP/DL/DK/DA |
| <b>5270-25T2-09</b>     | 27.0           | 25     | 40 | 135 | 158 | 56 | M16X1.5 | D195-D196             |
| <b>5270-32T2-09</b>     | 27.0           | 32     | 40 | 135 | 158 | 60 | M22X2.0 |                       |
| <b>5275-32T2-09</b>     | 27.5           | 32     | 40 | 140 | 163 | 60 | M22X2.0 |                       |
| <b>5280-25T2-09</b>     | 28.0           | 25     | 40 | 140 | 163 | 56 | M16X1.5 |                       |
| <b>5280-32T2-09</b>     | 28.0           | 32     | 40 | 140 | 163 | 60 | M22X2.0 |                       |
| <b>5282-32T2-09 *</b>   | 28.2           | 32     | 40 | 140 | 163 | 60 | M22X2.0 |                       |
| <b>5285-32T2-09</b>     | 28.5           | 32     | 40 | 145 | 168 | 60 | M22X2.0 |                       |
| <b>5290-25T2-09</b>     | 29.0           | 25     | 40 | 145 | 168 | 56 | M16X1.5 |                       |
| <b>5290-32T2-09</b>     | 29.0           | 32     | 40 | 145 | 168 | 60 | M22X2.0 |                       |
| <b>5295-32T2-09</b>     | 29.5           | 32     | 40 | 150 | 173 | 60 | M22X2.0 |                       |
| <b>5300-32T2-09</b>     | 30.0           | 32     | 40 | 150 | 173 | 60 | M22X2.0 |                       |
| <b>5305-32T2-09</b>     | 30.5           | 32     | 40 | 155 | 178 | 60 | M22X2.0 |                       |
| <b>5310-32T2-09</b>     | 31.0           | 32     | 40 | 155 | 178 | 60 | M22X2.0 |                       |
| <b>5320-32T2-11</b>     | 32.0           | 32     | 40 | 160 | 183 | 60 | M22X2.0 | SOMT 11...DP/DL/DK/DA |
| <b>5320-40T2-11</b>     | 32.0           | 40     | 50 | 160 | 183 | 70 | M30X2.0 | D195-D196             |
| <b>5330-32T2-11</b>     | 33.0           | 32     | 40 | 165 | 188 | 60 | M22X2.0 |                       |
| <b>5330-40T2-11</b>     | 33.0           | 40     | 50 | 165 | 188 | 70 | M30X2.0 |                       |
| <b>5340-32T2-11</b>     | 34.0           | 32     | 40 | 170 | 193 | 60 | M22X2.0 |                       |
| <b>5340-40T2-11</b>     | 34.0           | 40     | 50 | 170 | 193 | 70 | M30X2.0 |                       |
| <b>5350-32T2-11</b>     | 35.0           | 32     | 40 | 175 | 198 | 60 | M22X2.0 |                       |
| <b>5350-40T2-11</b>     | 35.0           | 40     | 50 | 175 | 198 | 70 | M30X2.0 |                       |
| <b>5360-32T2-11</b>     | 36.0           | 32     | 40 | 180 | 203 | 60 | M22X2.0 |                       |
| <b>5360-40T2-11</b>     | 36.0           | 40     | 50 | 180 | 203 | 70 | M30X2.0 |                       |
| <b>5370-32T2-13</b>     | 37.0           | 32     | 50 | 185 | 213 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA |
| <b>5370-40T2-13</b>     | 37.0           | 40     | 50 | 185 | 213 | 70 | M30X2.0 | D195-D196             |
| <b>5380-32T2-13</b>     | 38.0           | 32     | 50 | 190 | 218 | 60 | M22X2.0 |                       |
| <b>5380-40T2-13</b>     | 38.0           | 40     | 50 | 190 | 218 | 70 | M30X2.0 |                       |
| <b>5390-32T2-13</b>     | 39.0           | 32     | 50 | 195 | 223 | 60 | M22X2.0 |                       |
| <b>5390-40T2-13</b>     | 39.0           | 40     | 50 | 195 | 223 | 70 | M30X2.0 |                       |
| <b>5400-32T2-13</b>     | 40.0           | 32     | 50 | 200 | 228 | 60 | M22X2.0 |                       |
| <b>5400-40T2-13</b>     | 40.0           | 40     | 50 | 200 | 228 | 70 | M30X2.0 |                       |

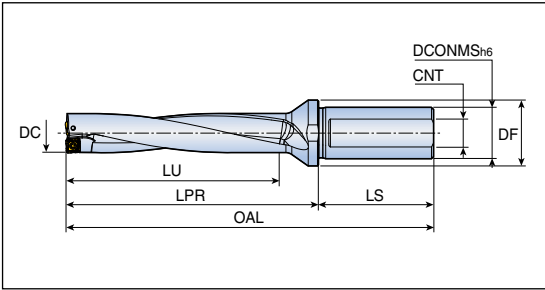


- \*: Inch sized hole
- OAL: LPR+LS

Indexable drill holders



- Drilling depth: 5xdiameter



| Designation        | Dimension (mm) |        |    |     |     |    |         | Insert                |
|--------------------|----------------|--------|----|-----|-----|----|---------|-----------------------|
|                    | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                       |
| TOP 5410 - 40T2-13 | 41.0           | 40     | 50 | 205 | 233 | 70 | M30X2.0 | SOMT 13...DP/DL/DK/DA |
| 5420 - 40T2-13     | 42.0           | 40     | 50 | 210 | 238 | 70 | M30X2.0 | 🔧 D195-D196           |
| 5430 - 40T2-13     | 43.0           | 40     | 50 | 215 | 243 | 70 | M30X2.0 |                       |
| 5440 - 40T2-15     | 44.0           | 40     | 60 | 220 | 255 | 70 | M30X2.0 | SOMT 15...DP/DL/DK/DA |
| 5450 - 40T2-15     | 45.0           | 40     | 60 | 225 | 260 | 70 | M30X2.0 | 🔧 D195-D196           |
| 5460 - 40T2-15     | 46.0           | 40     | 60 | 230 | 265 | 70 | M30X2.0 |                       |
| 5470 - 40T2-15     | 47.0           | 40     | 60 | 235 | 270 | 70 | M30X2.0 |                       |
| 5480 - 40T2-15     | 48.0           | 40     | 60 | 240 | 275 | 70 | M30X2.0 |                       |
| 5490 - 40T2-15     | 49.0           | 40     | 60 | 245 | 280 | 70 | M30X2.0 |                       |
| 5500 - 40T2-15     | 50.0           | 40     | 60 | 250 | 285 | 70 | M30X2.0 |                       |
|                    |                |        |    |     |     |    |         |                       |
|                    |                |        |    |     |     |    |         |                       |
|                    |                |        |    |     |     |    |         |                       |
|                    |                |        |    |     |     |    |         |                       |
|                    |                |        |    |     |     |    |         |                       |
|                    |                |        |    |     |     |    |         |                       |
|                    |                |        |    |     |     |    |         |                       |

► OAL: LPR+LS

Spare parts

| Designation     | Screw          | Wrench | Plug*                    |  |
|-----------------|----------------|--------|--------------------------|--|
|                 |                |        |                          |  |
| TOP 5120 - 5135 | TS 18041I/HG   | TD 6P  | SL 20M                   |  |
| TOP 5140 - 5160 | TS 20043I/HG-P | TD 6P  | SL 20M                   |  |
| TOP 5165 - 5220 | TS 22052I/HG-P | TD 7P  | SL 25M                   |  |
| TOP 5225 - 5260 | SO 25065I      | TD 7   | SL 25M / SL 32M          |  |
| TOP 5265 - 5360 | TS 35088I      | TD 10  | SL 25M / SL 32M / SL 40M |  |
| TOP 5370 - 5430 | TS 40093I      | TD 15  | SL 32M / SL 40M          |  |
| TOP 5440 - 5500 | TS 50115I      | TD 20  | SL 40M                   |  |



► \* Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm: SL 25M

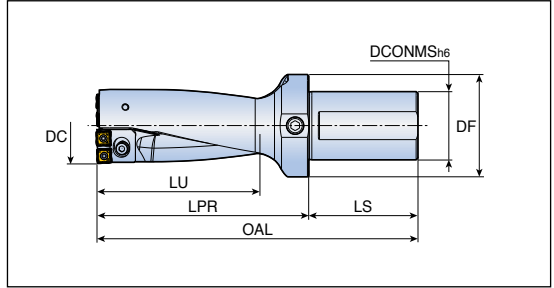
# TOP 20...CA



## Indexable drill holders for cartridge



- Drilling depth: 2x diameter



| Designation                  | Dimension (mm) |        |    |     |     |     |    | Setting Plate | Insert      |
|------------------------------|----------------|--------|----|-----|-----|-----|----|---------------|-------------|
|                              | DC             | DCONMS | DF | OAL | LU  | LPR | LS |               |             |
| <b>TOP 2051-55-50T2-09CA</b> | 51             | 50     | 64 | 223 | 110 | 143 | 80 | -             | SOMT 09...  |
|                              | 52             | 50     | 64 | 223 | 110 | 143 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 53             | 50     | 64 | 223 | 110 | 143 | 80 | TOP-0902      | D195-D196   |
|                              | 54             | 50     | 64 | 223 | 110 | 143 | 80 | TOP-0903      |             |
|                              | 55             | 50     | 64 | 223 | 110 | 143 | 80 | TOP-0904      |             |
| <b>TOP 2056-60-50T2-11CA</b> | 56             | 50     | 64 | 236 | 120 | 156 | 80 | -             | SOMT 11...  |
|                              | 57             | 50     | 64 | 236 | 120 | 156 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 58             | 50     | 64 | 236 | 120 | 156 | 80 | TOP-0902      | D195-D196   |
|                              | 59             | 50     | 64 | 236 | 120 | 156 | 80 | TOP-0903      |             |
|                              | 60             | 50     | 64 | 236 | 120 | 156 | 80 | TOP-0904      |             |
| <b>TOP 2061-65-50T2-11CA</b> | 61             | 50     | 69 | 249 | 130 | 169 | 80 | -             | SOMT 11...  |
|                              | 62             | 50     | 69 | 249 | 130 | 169 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 63             | 50     | 69 | 249 | 130 | 169 | 80 | TOP-0902      | D195-D196   |
|                              | 64             | 50     | 69 | 249 | 130 | 169 | 80 | TOP-0903      |             |
|                              | 65             | 50     | 69 | 249 | 130 | 169 | 80 | TOP-0904      |             |
| <b>TOP 2066-70-50T2-11CA</b> | 66             | 50     | 69 | 262 | 140 | 182 | 80 | -             | SOMT 11...  |
|                              | 67             | 50     | 69 | 262 | 140 | 182 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 68             | 50     | 69 | 262 | 140 | 182 | 80 | TOP-0902      | D195-D196   |
|                              | 69             | 50     | 69 | 262 | 140 | 182 | 80 | TOP-0903      |             |
|                              | 70             | 50     | 69 | 262 | 140 | 182 | 80 | TOP-0904      |             |
| <b>TOP 2071-75-50T2-13CA</b> | 71             | 50     | 74 | 275 | 150 | 195 | 80 | -             | SOMT 13...  |
|                              | 72             | 50     | 74 | 275 | 150 | 195 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 73             | 50     | 74 | 275 | 150 | 195 | 80 | TOP-0902      | D195-D196   |
|                              | 74             | 50     | 74 | 275 | 150 | 195 | 80 | TOP-0903      |             |
|                              | 75             | 50     | 74 | 275 | 150 | 195 | 80 | TOP-0904      |             |
| <b>TOP 2076-80-50T2-13CA</b> | 76             | 50     | 74 | 288 | 160 | 208 | 80 | -             | SOMT 13...  |
|                              | 77             | 50     | 74 | 288 | 160 | 208 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 78             | 50     | 74 | 288 | 160 | 208 | 80 | TOP-0902      | D195-D196   |
|                              | 79             | 50     | 74 | 288 | 160 | 208 | 80 | TOP-0903      |             |
|                              | 80             | 50     | 74 | 288 | 160 | 208 | 80 | TOP-0904      |             |
|                              |                |        |    |     |     |     |    |               |             |
|                              |                |        |    |     |     |     |    |               |             |
|                              |                |        |    |     |     |     |    |               |             |
|                              |                |        |    |     |     |     |    |               |             |
|                              |                |        |    |     |     |     |    |               |             |



► OAL: LPR+LS

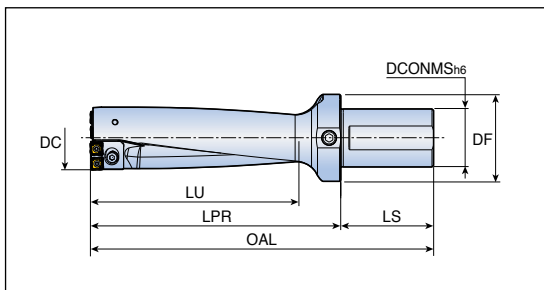
# TOP 30...CA



## Indexable drill holders for cartridge



- Drilling depth: 3x diameter



| Designation                  | Dimension (mm) |        |    |     |     |     |    | Setting Plate | Insert                    |
|------------------------------|----------------|--------|----|-----|-----|-----|----|---------------|---------------------------|
|                              | DC             | DCONMS | DF | OAL | LU  | LPR | LS |               |                           |
| <b>TOP 3051-55-50T2-09CA</b> | 51             | 50     | 64 | 278 | 165 | 198 | 80 | -             | SOMT 09...<br>DP/DL/DK/DA |
|                              | 52             | 50     | 64 | 278 | 165 | 198 | 80 | TOP-0901      | D195-D196                 |
|                              | 53             | 50     | 64 | 278 | 165 | 198 | 80 | TOP-0902      |                           |
|                              | 54             | 50     | 64 | 278 | 165 | 198 | 80 | TOP-0903      |                           |
|                              | 55             | 50     | 64 | 278 | 165 | 198 | 80 | TOP-0904      |                           |
| <b>TOP 3056-60-50T2-11CA</b> | 56             | 50     | 64 | 296 | 180 | 216 | 80 | -             | SOMT 11...<br>DP/DL/DK/DA |
|                              | 57             | 50     | 64 | 296 | 180 | 216 | 80 | TOP-0901      | D195-D196                 |
|                              | 58             | 50     | 64 | 296 | 180 | 216 | 80 | TOP-0902      |                           |
|                              | 59             | 50     | 64 | 296 | 180 | 216 | 80 | TOP-0903      |                           |
|                              | 60             | 50     | 64 | 296 | 180 | 216 | 80 | TOP-0904      |                           |
| <b>TOP 3061-65-50T2-11CA</b> | 61             | 50     | 69 | 314 | 195 | 234 | 80 | -             | SOMT 11...<br>DP/DL/DK/DA |
|                              | 62             | 50     | 69 | 314 | 195 | 234 | 80 | TOP-0901      | D195-D196                 |
|                              | 63             | 50     | 69 | 314 | 195 | 234 | 80 | TOP-0902      |                           |
|                              | 64             | 50     | 69 | 314 | 195 | 234 | 80 | TOP-0903      |                           |
|                              | 65             | 50     | 69 | 314 | 195 | 234 | 80 | TOP-0904      |                           |
| <b>TOP 3066-70-50T2-11CA</b> | 66             | 50     | 69 | 332 | 210 | 252 | 80 | -             | SOMT 11...<br>DP/DL/DK/DA |
|                              | 67             | 50     | 69 | 332 | 210 | 252 | 80 | TOP-0901      | D195-D196                 |
|                              | 68             | 50     | 69 | 332 | 210 | 252 | 80 | TOP-0902      |                           |
|                              | 69             | 50     | 69 | 332 | 210 | 252 | 80 | TOP-0903      |                           |
|                              | 70             | 50     | 69 | 332 | 210 | 252 | 80 | TOP-0904      |                           |
| <b>TOP 3071-75-50T2-13CA</b> | 71             | 50     | 74 | 350 | 225 | 270 | 80 | -             | SOMT 13...<br>DP/DL/DK/DA |
|                              | 72             | 50     | 74 | 350 | 225 | 270 | 80 | TOP-0901      | D195-D196                 |
|                              | 73             | 50     | 74 | 350 | 225 | 270 | 80 | TOP-0902      |                           |
|                              | 74             | 50     | 74 | 350 | 225 | 270 | 80 | TOP-0903      |                           |
|                              | 75             | 50     | 74 | 350 | 225 | 270 | 80 | TOP-0904      |                           |
| <b>TOP 3076-80-50T2-13CA</b> | 76             | 50     | 74 | 368 | 240 | 288 | 80 | -             | SOMT 13...<br>DP/DL/DK/DA |
|                              | 77             | 50     | 74 | 368 | 240 | 288 | 80 | TOP-0901      | D195-D196                 |
|                              | 78             | 50     | 74 | 368 | 240 | 288 | 80 | TOP-0902      |                           |
|                              | 79             | 50     | 74 | 368 | 240 | 288 | 80 | TOP-0903      |                           |
|                              | 80             | 50     | 74 | 368 | 240 | 288 | 80 | TOP-0904      |                           |
|                              |                |        |    |     |     |     |    |               |                           |
|                              |                |        |    |     |     |     |    |               |                           |
|                              |                |        |    |     |     |     |    |               |                           |
|                              |                |        |    |     |     |     |    |               |                           |
|                              |                |        |    |     |     |     |    |               |                           |



► OAL: LPR+LS

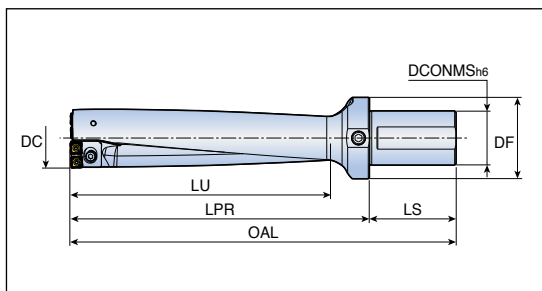
# TOP 40...CA



## Indexable drill holders for cartridge



- Drilling depth: 4xdiameter



| Designation                  | Dimension (mm) |        |    |     |     |     |    | Setting Plate | Insert      |
|------------------------------|----------------|--------|----|-----|-----|-----|----|---------------|-------------|
|                              | DC             | DCONMS | DF | OAL | LU  | LPR | LS |               |             |
| <b>TOP 4051-55-50T2-09CA</b> | 51             | 50     | 64 | 333 | 220 | 253 | 80 | -             | SOMT 09...  |
|                              | 52             | 50     | 64 | 333 | 220 | 253 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 53             | 50     | 64 | 333 | 220 | 253 | 80 | TOP-0902      | D195-D196   |
|                              | 54             | 50     | 64 | 333 | 220 | 253 | 80 | TOP-0903      |             |
|                              | 55             | 50     | 64 | 333 | 220 | 253 | 80 | TOP-0904      |             |
| <b>TOP 4056-60-50T2-11CA</b> | 56             | 50     | 64 | 356 | 240 | 276 | 80 | -             | SOMT 11...  |
|                              | 57             | 50     | 64 | 356 | 240 | 276 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 58             | 50     | 64 | 356 | 240 | 276 | 80 | TOP-0902      | D195-D196   |
|                              | 59             | 50     | 64 | 356 | 240 | 276 | 80 | TOP-0903      |             |
|                              | 60             | 50     | 64 | 356 | 240 | 276 | 80 | TOP-0904      |             |
| <b>TOP 4061-65-50T2-11CA</b> | 61             | 50     | 69 | 379 | 260 | 299 | 80 | -             | SOMT 11...  |
|                              | 62             | 50     | 69 | 379 | 260 | 299 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 63             | 50     | 69 | 379 | 260 | 299 | 80 | TOP-0902      | D195-D196   |
|                              | 64             | 50     | 69 | 379 | 260 | 299 | 80 | TOP-0903      |             |
|                              | 65             | 50     | 69 | 379 | 260 | 299 | 80 | TOP-0904      |             |
| <b>TOP 4066-70-50T2-11CA</b> | 66             | 50     | 69 | 402 | 280 | 322 | 80 | -             | SOMT 11...  |
|                              | 67             | 50     | 69 | 402 | 280 | 322 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 68             | 50     | 69 | 402 | 280 | 322 | 80 | TOP-0902      | D195-D196   |
|                              | 69             | 50     | 69 | 402 | 280 | 322 | 80 | TOP-0903      |             |
|                              | 70             | 50     | 69 | 402 | 280 | 322 | 80 | TOP-0904      |             |
| <b>TOP 4071-75-50T2-13CA</b> | 71             | 50     | 74 | 425 | 300 | 345 | 80 | -             | SOMT 13...  |
|                              | 72             | 50     | 74 | 425 | 300 | 345 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 73             | 50     | 74 | 425 | 300 | 345 | 80 | TOP-0902      | D195-D196   |
|                              | 74             | 50     | 74 | 425 | 300 | 345 | 80 | TOP-0903      |             |
|                              | 75             | 50     | 74 | 425 | 300 | 345 | 80 | TOP-0904      |             |
| <b>TOP 4076-80-50T2-13CA</b> | 76             | 50     | 74 | 448 | 320 | 368 | 80 | -             | SOMT 13...  |
|                              | 77             | 50     | 74 | 448 | 320 | 368 | 80 | TOP-0901      | DP/DL/DK/DA |
|                              | 78             | 50     | 74 | 448 | 320 | 368 | 80 | TOP-0902      | D195-D196   |
|                              | 79             | 50     | 74 | 448 | 320 | 368 | 80 | TOP-0903      |             |
|                              | 80             | 50     | 74 | 448 | 320 | 368 | 80 | TOP-0904      |             |
|                              |                |        |    |     |     |     |    |               |             |
|                              |                |        |    |     |     |     |    |               |             |
|                              |                |        |    |     |     |     |    |               |             |
|                              |                |        |    |     |     |     |    |               |             |
|                              |                |        |    |     |     |     |    |               |             |



► OAL: LPR+LS

## Indexable drill holders for cartridge

### Spare parts

| Designation                  | Insert<br> | Insert screw<br> | Cartridge for peripheral<br> | Cartridge for center<br> |
|------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>TOP ..51-55-50T2-09CA</b> | SOMT 09                                                                                     | TS 35088I                                                                                         | TOP 09CA-P1                                                                                                   | TOP 09CA-C1                                                                                               |
| <b>TOP ..56-60-50T2-11CA</b> | SOMT 09                                                                                     | TS 35088I                                                                                         | TOP 11CA-P1                                                                                                   | TOP 11CA-C1                                                                                               |
| <b>TOP ..61-65-50T2-11CA</b> | SOMT 11                                                                                     | TS 35088I                                                                                         | TOP 11CA-P2                                                                                                   | TOP 11CA-C2                                                                                               |
| <b>TOP ..66-70-50T2-11CA</b> | SOMT 11                                                                                     | TS 35088I                                                                                         | TOP 11CA-P3                                                                                                   | TOP 11CA-C3                                                                                               |
| <b>TOP ..71-75-50T2-13CA</b> | SOMT 13                                                                                     | TS 40093I                                                                                         | TOP 13CA-P1                                                                                                   | TOP 13CA-C1                                                                                               |
| <b>TOP ..76-80-50T2-13CA</b> | SOMT 13                                                                                     | TS 40093I                                                                                         | TOP 13CA-P2                                                                                                   | TOP 13CA-C2                                                                                               |

### Spare parts for cartridge

| Designation        | Cartridge clamping screw | Washer    | Setting plate screw |
|--------------------|--------------------------|-----------|---------------------|
| <b>TOP 09CA-P1</b> | SH M4x0.7x16             | MW 4.3x8  | TS 20043I/HG-P      |
| <b>TOP 09CA-C1</b> | SH M4x0.7x16             | MW 4.3x8  | -                   |
| <b>TOP 11CA-P1</b> | SH M5x0.8x16             | MW 5.5x10 | TS 20043I/HG-P      |
| <b>TOP 11CA-C1</b> | SH M5x0.8x16             | MW 5.5x10 | -                   |
| <b>TOP 11CA-P2</b> | SH M5x0.8x16             | MW 5.5x10 | TS 20043I/HG-P      |
| <b>TOP 11CA-C2</b> | SH M5x0.8x16             | MW 5.5x10 | -                   |
| <b>TOP 11CA-P3</b> | SH M5x0.8x16             | MW 5.5x10 | TS 20043I/HG-P      |
| <b>TOP 11CA-C3</b> | SH M5x0.8x16             | MW 5.5x10 | -                   |
| <b>TOP 13CA-P1</b> | SH M6x1.0x20             | MW 6.4x12 | TS 20043I/HG-P      |
| <b>TOP 13CA-C1</b> | SH M6x1.0x20             | MW 6.4x12 | -                   |
| <b>TOP 13CA-P2</b> | SH M6x1.0x20             | MW 6.4x12 | TS 20043I/HG-P      |
| <b>TOP 13CA-C2</b> | SH M6x1.0x20             | MW 6.4x12 | -                   |

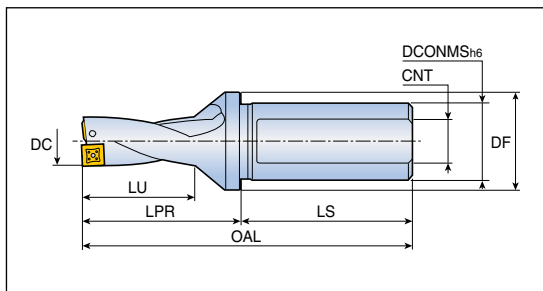
# TDR 2...-T2



## Indexable drill holders



- Drilling depth: 2x diameter



| Designation             | Dimension (mm) |        |    |    |     |    |         | Insert                                                 |
|-------------------------|----------------|--------|----|----|-----|----|---------|--------------------------------------------------------|
|                         | DC             | DCONMS | DF | LU | LPR | LS | CNT     |                                                        |
| <b>TDR 2125-20T2-05</b> | 12.5           | 20     | 25 | 26 | 44  | 50 | M13X1.0 | SPMG 05...<br>DG/DK<br>SPGG 05..DA<br><b>D197-D198</b> |
| <b>2130-20T2-05</b>     | 13.0           | 20     | 25 | 26 | 44  | 50 | M13X1.0 |                                                        |
| <b>2135-20T2-05</b>     | 13.5           | 20     | 25 | 28 | 46  | 50 | M13X1.0 |                                                        |
| <b>2140-20T2-05</b>     | 14.0           | 20     | 25 | 28 | 46  | 50 | M13X1.0 |                                                        |
| <b>2145-20T2-05</b>     | 14.5           | 20     | 25 | 30 | 49  | 50 | M13X1.0 |                                                        |
| <b>2150-20T2-05</b>     | 15.0           | 20     | 25 | 30 | 49  | 50 | M13X1.0 |                                                        |
| <b>2155-25T2-06</b>     | 15.5           | 25     | 32 | 32 | 52  | 56 | M16X1.5 |                                                        |
| <b>2160-25T2-06</b>     | 16.0           | 25     | 32 | 32 | 52  | 56 | M16X1.5 |                                                        |
| <b>2165-25T2-06</b>     | 16.5           | 25     | 32 | 34 | 54  | 56 | M16X1.5 |                                                        |
| <b>2170-25T2-06</b>     | 17.0           | 25     | 32 | 34 | 54  | 56 | M16X1.5 |                                                        |
| <b>2175-25T2-06</b>     | 17.5           | 25     | 32 | 36 | 57  | 56 | M16X1.5 | SPMG 06...<br>DG/DK<br>SPGG 06..DA<br><b>D197-D198</b> |
| <b>2180-25T2-06</b>     | 18.0           | 25     | 32 | 36 | 57  | 56 | M16X1.5 |                                                        |
| <b>2185-25T2-06</b>     | 18.5           | 25     | 32 | 38 | 59  | 56 | M16X1.5 |                                                        |
| <b>2190-25T2-06</b>     | 19.0           | 25     | 32 | 38 | 59  | 56 | M16X1.5 |                                                        |
| <b>2195-25T2-06</b>     | 19.5           | 25     | 32 | 40 | 63  | 56 | M16X1.5 |                                                        |
| <b>2200-25T2-06</b>     | 20.0           | 25     | 32 | 40 | 63  | 56 | M16X1.5 |                                                        |
| <b>2205-25T2-06</b>     | 20.5           | 25     | 32 | 42 | 65  | 56 | M16X1.5 |                                                        |
| <b>2210-25T2-06</b>     | 21.0           | 25     | 32 | 42 | 65  | 56 | M16X1.5 |                                                        |
| <b>2215-25T2-06</b>     | 21.5           | 25     | 32 | 44 | 67  | 56 | M16X1.5 |                                                        |
| <b>2220-25T2-07</b>     | 22.0           | 25     | 32 | 44 | 67  | 56 | M16X1.5 | SPMG 07...<br>DG/DK<br>SPGG 07..DA<br><b>D197-D198</b> |
| <b>2225-25T2-07</b>     | 22.5           | 25     | 32 | 46 | 71  | 56 | M16X1.5 |                                                        |
| <b>2225-32T2-07</b>     | 22.5           | 32     | 40 | 46 | 71  | 60 | M22X2.0 |                                                        |
| <b>2230-25T2-07</b>     | 23.0           | 25     | 32 | 46 | 71  | 56 | M16X1.5 |                                                        |
| <b>2230-32T2-07</b>     | 23.0           | 32     | 40 | 46 | 71  | 60 | M22X2.0 |                                                        |
| <b>2235-25T2-07</b>     | 23.5           | 25     | 32 | 48 | 74  | 56 | M16X1.5 |                                                        |
| <b>2235-32T2-07</b>     | 23.5           | 32     | 40 | 48 | 74  | 60 | M22X2.0 |                                                        |
| <b>2240-25T2-07</b>     | 24.0           | 25     | 32 | 48 | 74  | 56 | M16X1.5 |                                                        |
| <b>2240-32T2-07</b>     | 24.0           | 32     | 40 | 48 | 74  | 60 | M22X2.0 |                                                        |
| <b>2245-25T2-07</b>     | 24.5           | 25     | 32 | 50 | 77  | 56 | M16X1.5 |                                                        |
| <b>2245-32T2-07</b>     | 24.5           | 32     | 40 | 50 | 77  | 60 | M22X2.0 |                                                        |
| <b>2250-25T2-07</b>     | 25.0           | 25     | 32 | 50 | 77  | 56 | M16X1.5 |                                                        |
| <b>2250-32T2-07</b>     | 25.0           | 32     | 40 | 50 | 77  | 60 | M22X2.0 |                                                        |
| <b>2255-25T2-07</b>     | 25.5           | 25     | 32 | 52 | 79  | 56 | M16X1.5 |                                                        |
| <b>2255-32T2-07</b>     | 25.5           | 32     | 40 | 52 | 79  | 60 | M22X2.0 |                                                        |
| <b>2260-25T2-07</b>     | 26.0           | 25     | 32 | 52 | 79  | 56 | M16X1.5 |                                                        |



► OAL: LPR+LS

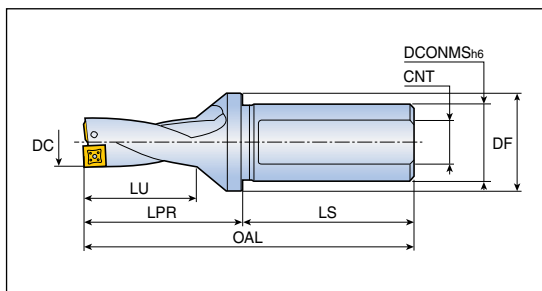
# TDR 2...-T2



## Indexable drill holders



- Drilling depth: 2x diameter



| Designation             | Dimension (mm) |        |    |    |     |    |         | Insert                                           |
|-------------------------|----------------|--------|----|----|-----|----|---------|--------------------------------------------------|
|                         | DC             | DCONMS | DF | LU | LPR | LS | CNT     |                                                  |
| <b>TDR 2260-32T2-07</b> | 26.0           | 32     | 40 | 52 | 79  | 60 | M22X2.0 | SPMG 07...<br>DG/DK<br>SPGG 07...DA<br>D197-D198 |
| <b>2265-25T2-07</b>     | 26.5           | 25     | 32 | 54 | 81  | 56 | M16X1.5 |                                                  |
| <b>2265-32T2-07</b>     | 26.5           | 32     | 40 | 54 | 81  | 60 | M22X2.0 |                                                  |
| <b>2270-25T2-07</b>     | 27.0           | 25     | 32 | 54 | 81  | 56 | M16X1.5 |                                                  |
| <b>2270-32T2-07</b>     | 27.0           | 32     | 40 | 54 | 81  | 60 | M22X2.0 |                                                  |
| <b>2275-25T2-07</b>     | 27.5           | 25     | 32 | 56 | 84  | 56 | Rc 1/8  |                                                  |
| <b>2275-32T2-07</b>     | 27.5           | 32     | 40 | 56 | 84  | 60 | Rc 1/4  |                                                  |
| <b>2280-25T2-09</b>     | 28.0           | 25     | 40 | 56 | 84  | 56 | Rc 1/8  | SPMG 09...<br>DG/DK<br>SPGG 09...DA<br>D197-D198 |
| <b>2280-32T2-09</b>     | 28.0           | 32     | 40 | 56 | 84  | 60 | Rc 1/4  |                                                  |
| <b>2285-25T2-09</b>     | 28.5           | 25     | 40 | 58 | 86  | 56 | Rc 1/8  |                                                  |
| <b>2285-32T2-09</b>     | 28.5           | 32     | 40 | 58 | 86  | 60 | Rc 1/4  |                                                  |
| <b>2290-25T2-09</b>     | 29.0           | 25     | 40 | 58 | 86  | 56 | Rc 1/8  |                                                  |
| <b>2290-32T2-09</b>     | 29.0           | 32     | 40 | 58 | 86  | 60 | Rc 1/4  |                                                  |
| <b>2295-32T2-09</b>     | 29.5           | 32     | 40 | 60 | 91  | 60 | Rc 1/4  |                                                  |
| <b>2295-40T2-09</b>     | 29.5           | 40     | 50 | 60 | 91  | 70 | Rc 1/4  |                                                  |
| <b>2300-32T2-09</b>     | 30.0           | 32     | 40 | 60 | 91  | 60 | Rc 1/4  |                                                  |
| <b>2300-40T2-09</b>     | 30.0           | 40     | 50 | 60 | 91  | 70 | Rc 1/4  |                                                  |
| <b>2305-32T2-09</b>     | 30.5           | 32     | 40 | 62 | 94  | 60 | Rc 1/4  |                                                  |
| <b>2305-40T2-09</b>     | 30.5           | 40     | 50 | 62 | 94  | 70 | Rc 1/4  |                                                  |
| <b>2310-32T2-09</b>     | 31.0           | 32     | 40 | 62 | 94  | 60 | Rc 1/4  |                                                  |
| <b>2310-40T2-09</b>     | 31.0           | 40     | 50 | 62 | 94  | 70 | Rc 1/4  |                                                  |
| <b>2315-32T2-09</b>     | 31.5           | 32     | 40 | 64 | 96  | 60 | Rc 1/4  |                                                  |
| <b>2315-40T2-09</b>     | 31.5           | 40     | 50 | 64 | 96  | 70 | Rc 1/4  |                                                  |
| <b>2320-32T2-09</b>     | 32.0           | 32     | 40 | 64 | 96  | 60 | Rc 1/4  |                                                  |
| <b>2320-40T2-09</b>     | 32.0           | 40     | 50 | 64 | 96  | 70 | Rc 1/4  |                                                  |
| <b>2325-32T2-09</b>     | 32.5           | 32     | 40 | 66 | 99  | 60 | Rc 1/4  |                                                  |
| <b>2325-40T2-09</b>     | 32.5           | 40     | 50 | 66 | 99  | 70 | Rc 1/4  |                                                  |
| <b>2330-32T2-09</b>     | 33.0           | 32     | 40 | 66 | 99  | 60 | Rc 1/4  | SPMG 11...<br>DG/DK<br>SPGG 11...DA<br>D197-D198 |
| <b>2330-40T2-09</b>     | 33.0           | 40     | 50 | 66 | 99  | 70 | Rc 1/4  |                                                  |
| <b>2340-32T2-11</b>     | 34.0           | 32     | 50 | 68 | 101 | 60 | Rc 1/4  |                                                  |
| <b>2340-40T2-11</b>     | 34.0           | 40     | 55 | 68 | 101 | 70 | Rc 1/4  |                                                  |
| <b>2350-32T2-11</b>     | 35.0           | 32     | 50 | 70 | 104 | 60 | Rc 1/4  |                                                  |
| <b>2350-40T2-11</b>     | 35.0           | 40     | 55 | 70 | 104 | 70 | Rc 1/4  |                                                  |
| <b>2360-32T2-11</b>     | 36.0           | 32     | 50 | 72 | 107 | 60 | Rc 1/4  |                                                  |
| <b>2360-40T2-11</b>     | 36.0           | 40     | 55 | 72 | 107 | 70 | Rc 1/4  |                                                  |

► OAL: LPR+LS





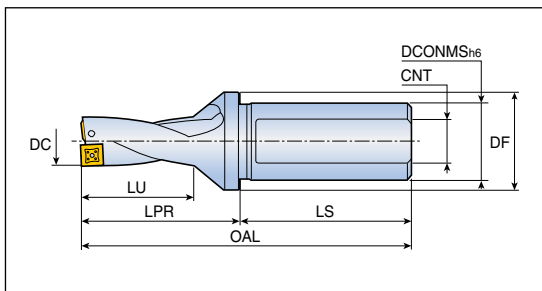
# TDR 2...-T2



## Indexable drill holders



- Drilling depth: 2x diameter



| Designation             | Dimension (mm) |        |    |     |     |    |        | Insert                                          |
|-------------------------|----------------|--------|----|-----|-----|----|--------|-------------------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT    |                                                 |
| <b>TDR 2370-32T2-11</b> | 37.0           | 32     | 50 | 74  | 110 | 60 | Rc 1/4 | SPMG 11...<br>DG/DK<br>SPGG 11..DA<br>D197-D198 |
| <b>2370-40T2-11</b>     | 37.0           | 40     | 55 | 74  | 110 | 70 | Rc 1/4 |                                                 |
| <b>2380-32T2-11</b>     | 38.0           | 32     | 50 | 76  | 113 | 60 | Rc 1/4 |                                                 |
| <b>2380-40T2-11</b>     | 38.0           | 40     | 55 | 76  | 113 | 70 | Rc 1/4 |                                                 |
| <b>2390-32T2-11</b>     | 39.0           | 32     | 50 | 78  | 115 | 60 | Rc 1/4 |                                                 |
| <b>2390-40T2-11</b>     | 39.0           | 40     | 55 | 78  | 115 | 70 | Rc 1/4 |                                                 |
| <b>2400-32T2-11</b>     | 40.0           | 32     | 50 | 80  | 118 | 60 | Rc 1/4 |                                                 |
| <b>2400-40T2-11</b>     | 40.0           | 40     | 55 | 80  | 118 | 70 | Rc 1/4 |                                                 |
| <b>2410-40T2-11</b>     | 41.0           | 40     | 55 | 82  | 121 | 70 | Rc 1/4 |                                                 |
| <b>2420-40T2-14</b>     | 42.0           | 40     | 60 | 84  | 123 | 70 | Rc 1/4 | SPMG 14...<br>DG/DK<br>SPGG 14..DA<br>D197-D198 |
| <b>2430-40T2-14</b>     | 43.0           | 40     | 60 | 86  | 126 | 70 | Rc 1/4 |                                                 |
| <b>2440-40T2-14</b>     | 44.0           | 40     | 60 | 88  | 128 | 70 | Rc 1/4 |                                                 |
| <b>2450-40T2-14</b>     | 45.0           | 40     | 60 | 90  | 132 | 70 | Rc 1/4 |                                                 |
| <b>2460-40T2-14</b>     | 46.0           | 40     | 60 | 92  | 135 | 70 | Rc 1/4 |                                                 |
| <b>2470-40T2-14</b>     | 47.0           | 40     | 60 | 94  | 137 | 70 | Rc 1/4 |                                                 |
| <b>2480-40T2-14</b>     | 48.0           | 40     | 60 | 96  | 140 | 70 | Rc 1/4 |                                                 |
| <b>2490-40T2-14</b>     | 49.0           | 40     | 60 | 98  | 142 | 70 | Rc 1/4 |                                                 |
| <b>2500-40T2-14</b>     | 50.0           | 40     | 60 | 100 | 145 | 70 | Rc 1/4 |                                                 |

► OAL: LPR+LS

## Spare parts

| Designation            | Screw          | Wrench | Plug*             |  |
|------------------------|----------------|--------|-------------------|--|
|                        |                |        |                   |  |
| <b>TDR 2125 - 2150</b> | TS 20043I/HG-P | TD 6P  | SL 20 M           |  |
| <b>TDR 2155 - 2215</b> | TS 22052I/HG   | TD 7   | SL 25 M           |  |
| <b>TDR 2220 - 2270</b> | TS 25064I      | TD 8   | SL 25 M / SL 32 M |  |
| <b>TDR 2275</b>        | TS 25064I      | TD 8   | -                 |  |
| <b>TDR 2280 - 2330</b> | TS 35088I      | TD 10  | -                 |  |
| <b>TDR 2340 - 2390</b> | TS 40093I      | TD 15  | -                 |  |
| <b>TDR 2400 - 2410</b> | TS 40093I      | TD 15  | -                 |  |
| <b>TDR 2420 - 2500</b> | SO 50090I      | TD 20  | -                 |  |



- \* Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm: SL 25M

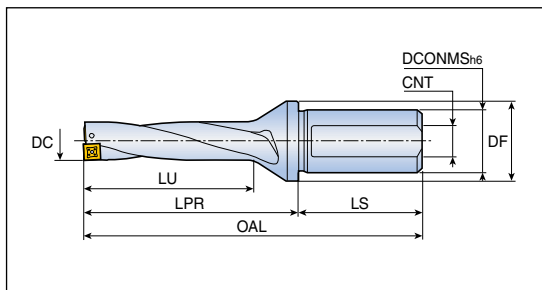
# TDR 3...-T2



## Indexable drill holders



- Drilling depth: 3x diameter



| Designation             | Dimension (mm) |        |    |    |     |    |         | Insert                                          |
|-------------------------|----------------|--------|----|----|-----|----|---------|-------------------------------------------------|
|                         | DC             | DCONMS | DF | LU | LPR | LS | CNT     |                                                 |
| <b>TDR 3125-20T2-05</b> | 12.5           | 20     | 25 | 39 | 57  | 50 | M13X1.0 | SPMG 05...<br>DG/DK<br>SPGG 05..DA<br>D197-D198 |
| <b>3130-20T2-05</b>     | 13.0           | 20     | 25 | 39 | 57  | 50 | M13X1.0 |                                                 |
| <b>3135-20T2-05</b>     | 13.5           | 20     | 25 | 42 | 60  | 50 | M13X1.0 |                                                 |
| <b>3140-20T2-05</b>     | 14.0           | 20     | 25 | 42 | 60  | 50 | M13X1.0 |                                                 |
| <b>3145-20T2-05</b>     | 14.5           | 20     | 25 | 45 | 64  | 50 | M13X1.0 |                                                 |
| <b>3150-20T2-05</b>     | 15.0           | 20     | 25 | 45 | 64  | 50 | M13X1.0 | SPMG 06...<br>DG/DK<br>SPGG 06..DA<br>D197-D198 |
| <b>3155-25T2-06</b>     | 15.5           | 25     | 32 | 48 | 68  | 56 | M16X1.5 |                                                 |
| <b>3160-25T2-06</b>     | 16.0           | 25     | 32 | 48 | 68  | 56 | M16X1.5 |                                                 |
| <b>3165-25T2-06</b>     | 16.5           | 25     | 32 | 51 | 71  | 56 | M16X1.5 |                                                 |
| <b>3170-25T2-06</b>     | 17.0           | 25     | 32 | 51 | 71  | 56 | M16X1.5 |                                                 |
| <b>3175-25T2-06</b>     | 17.5           | 25     | 32 | 54 | 75  | 56 | M16X1.5 |                                                 |
| <b>3180-25T2-06</b>     | 18.0           | 25     | 32 | 54 | 75  | 56 | M16X1.5 |                                                 |
| <b>3185-25T2-06</b>     | 18.5           | 25     | 32 | 57 | 78  | 56 | M16X1.5 |                                                 |
| <b>3190-25T2-06</b>     | 19.0           | 25     | 32 | 57 | 78  | 56 | M16X1.5 |                                                 |
| <b>3195-25T2-06</b>     | 19.5           | 25     | 32 | 60 | 83  | 56 | M16X1.5 |                                                 |
| <b>3200-25T2-06 *</b>   | 20.0           | 25     | 32 | 60 | 83  | 56 | M16X1.5 |                                                 |
| <b>3205-25T2-06</b>     | 20.5           | 25     | 32 | 63 | 86  | 56 | M16X1.5 |                                                 |
| <b>3209-25T2-06 *</b>   | 20.9           | 25     | 32 | 63 | 86  | 56 | M16X1.5 |                                                 |
| <b>3210-25T2-06</b>     | 21.0           | 25     | 32 | 63 | 86  | 56 | M16X1.5 |                                                 |
| <b>3215-25T2-06</b>     | 21.5           | 25     | 32 | 66 | 89  | 56 | M16X1.5 | SPMG 07...<br>DG/DK<br>SPGG 07..DA<br>D197-D198 |
| <b>3220-25T2-07</b>     | 22.0           | 25     | 32 | 66 | 89  | 56 | M16X1.5 |                                                 |
| <b>3225-25T2-07</b>     | 22.5           | 25     | 32 | 69 | 94  | 56 | M16X1.5 |                                                 |
| <b>3225-32T2-07</b>     | 22.5           | 32     | 40 | 69 | 94  | 60 | M22X2.0 |                                                 |
| <b>3230-25T2-07</b>     | 23.0           | 25     | 32 | 69 | 94  | 56 | M16X1.5 |                                                 |
| <b>3230-32T2-07</b>     | 23.0           | 32     | 40 | 69 | 94  | 60 | M22X2.0 |                                                 |
| <b>3235-25T2-07</b>     | 23.5           | 25     | 32 | 72 | 98  | 56 | M16X1.5 |                                                 |
| <b>3235-32T2-07</b>     | 23.5           | 32     | 40 | 72 | 98  | 60 | M22X2.0 |                                                 |
| <b>3239-25T2-07 *</b>   | 23.9           | 25     | 32 | 72 | 98  | 56 | M16X1.5 |                                                 |
| <b>3239-32T2-07 *</b>   | 23.9           | 32     | 40 | 72 | 98  | 60 | M22X2.0 |                                                 |
| <b>3240-25T2-07</b>     | 24.0           | 25     | 32 | 72 | 98  | 56 | M16X1.5 |                                                 |
| <b>3240-32T2-07</b>     | 24.0           | 32     | 40 | 72 | 98  | 60 | M22X2.0 |                                                 |
| <b>3245-25T2-07</b>     | 24.5           | 25     | 32 | 75 | 102 | 56 | M16X1.5 |                                                 |
| <b>3245-32T2-07</b>     | 24.5           | 32     | 40 | 75 | 102 | 60 | M22X2.0 |                                                 |
| <b>3250-25T2-07</b>     | 25.0           | 25     | 32 | 75 | 102 | 56 | M16X1.5 |                                                 |
| <b>3250-32T2-07</b>     | 25.0           | 32     | 40 | 75 | 102 | 60 | M22X2.0 |                                                 |



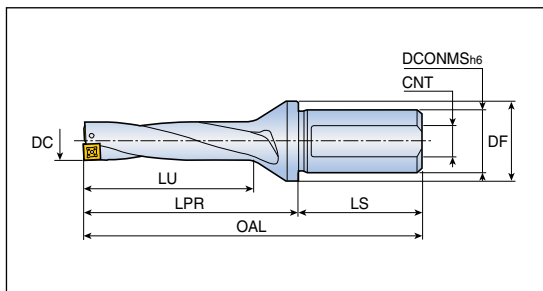
- \*: Pre-thread hole making
- OAL: LPR+LS

# TDR 3...-T2

## Indexable drill holders



- Drilling depth: 3x diameter



| Designation             | Dimension (mm) |        |    |    |     |    |         | Insert                                          |
|-------------------------|----------------|--------|----|----|-----|----|---------|-------------------------------------------------|
|                         | DC             | DCONMS | DF | LU | LPR | LS | CNT     |                                                 |
| <b>TDR 3255-25T2-07</b> | 25.5           | 25     | 32 | 78 | 105 | 56 | M16X1.5 | SPMG 07...<br>DG/DK<br>SPGG 07..DA<br>D197-D198 |
| <b>3255-32T2-07</b>     | 25.5           | 32     | 40 | 78 | 105 | 60 | M22X2.0 |                                                 |
| <b>3260-25T2-07</b>     | 26.0           | 25     | 32 | 78 | 105 | 56 | M16X1.5 |                                                 |
| <b>3260-32T2-07</b>     | 26.0           | 32     | 40 | 78 | 105 | 60 | M22X2.0 |                                                 |
| <b>3264-25T2-07 *</b>   | 26.4           | 25     | 45 | 81 | 108 | 56 | M16X1.5 |                                                 |
| <b>3264-32T2-07 *</b>   | 26.4           | 32     | 45 | 81 | 108 | 60 | M22X2.0 |                                                 |
| <b>3265-25T2-07</b>     | 26.5           | 25     | 32 | 81 | 108 | 56 | M16X1.5 |                                                 |
| <b>3265-32T2-07</b>     | 26.5           | 32     | 40 | 81 | 108 | 60 | M22X2.0 |                                                 |
| <b>3270-25T2-07</b>     | 27.0           | 25     | 32 | 81 | 108 | 56 | M16X1.5 |                                                 |
| <b>3270-32T2-07</b>     | 27.0           | 32     | 40 | 81 | 108 | 60 | M22X2.0 |                                                 |
| <b>3275-25T2-07</b>     | 27.5           | 25     | 32 | 84 | 112 | 56 | Rc 1/8  |                                                 |
| <b>3275-32T2-07</b>     | 27.5           | 32     | 40 | 84 | 112 | 60 | Rc 1/4  |                                                 |
| <b>3280-25T2-09</b>     | 28.0           | 25     | 40 | 84 | 112 | 56 | Rc 1/8  | SPMG 09...<br>DG/DK<br>SPGG 09..DA<br>D197-D198 |
| <b>3280-32T2-09</b>     | 28.0           | 32     | 40 | 84 | 112 | 60 | Rc 1/4  |                                                 |
| <b>3285-25T2-09</b>     | 28.5           | 25     | 40 | 87 | 115 | 56 | Rc 1/8  |                                                 |
| <b>3285-32T2-09</b>     | 28.5           | 32     | 40 | 87 | 115 | 56 | Rc 1/4  |                                                 |
| <b>3290-25T2-09</b>     | 29.0           | 25     | 40 | 87 | 115 | 56 | Rc 1/8  |                                                 |
| <b>3290-32T2-09</b>     | 29.0           | 32     | 40 | 87 | 115 | 60 | Rc 1/4  |                                                 |
| <b>3294-32T2-09 *</b>   | 29.4           | 32     | 55 | 90 | 121 | 60 | Rc 1/4  |                                                 |
| <b>3294-40T2-09 *</b>   | 29.4           | 40     | 55 | 90 | 121 | 70 | Rc 1/4  |                                                 |
| <b>3295-32T2-09</b>     | 29.5           | 32     | 40 | 90 | 121 | 60 | Rc 1/4  |                                                 |
| <b>3295-40T2-09</b>     | 29.5           | 40     | 50 | 90 | 121 | 70 | Rc 1/4  |                                                 |
| <b>3300-32T2-09</b>     | 30.0           | 32     | 40 | 90 | 121 | 60 | Rc 1/4  |                                                 |
| <b>3300-40T2-09</b>     | 30.0           | 40     | 50 | 90 | 121 | 70 | Rc 1/4  |                                                 |
| <b>3305-32T2-09</b>     | 30.5           | 32     | 40 | 93 | 125 | 60 | Rc 1/4  |                                                 |
| <b>3305-40T2-09</b>     | 30.5           | 40     | 50 | 93 | 125 | 70 | Rc 1/4  |                                                 |
| <b>3310-32T2-09</b>     | 31.0           | 32     | 40 | 93 | 125 | 60 | Rc 1/4  |                                                 |
| <b>3310-40T2-09</b>     | 31.0           | 40     | 50 | 93 | 125 | 70 | Rc 1/4  |                                                 |
| <b>3315-32T2-09</b>     | 31.5           | 32     | 40 | 96 | 128 | 60 | Rc 1/4  |                                                 |
| <b>3315-40T2-09</b>     | 31.5           | 40     | 50 | 96 | 128 | 70 | Rc 1/4  |                                                 |
| <b>3320-32T2-09</b>     | 32.0           | 32     | 40 | 96 | 128 | 60 | Rc 1/4  |                                                 |
| <b>3320-40T2-09</b>     | 32.0           | 40     | 50 | 96 | 128 | 70 | Rc 1/4  |                                                 |
|                         |                |        |    |    |     |    |         |                                                 |
|                         |                |        |    |    |     |    |         |                                                 |
|                         |                |        |    |    |     |    |         |                                                 |
|                         |                |        |    |    |     |    |         |                                                 |

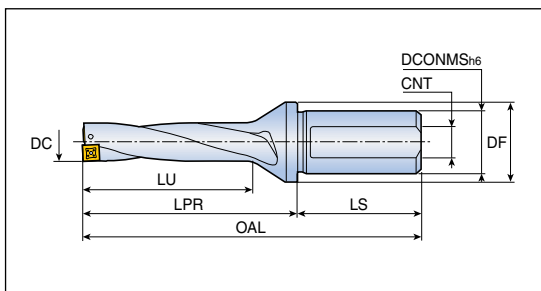


- \*: Pre-thread hole making
- OAL: LPR + LS

## Indexable drill holders



- 

[illegible]

- ▶ \*: Pre-thread hole making
- ▶ OAL: LPR+LS

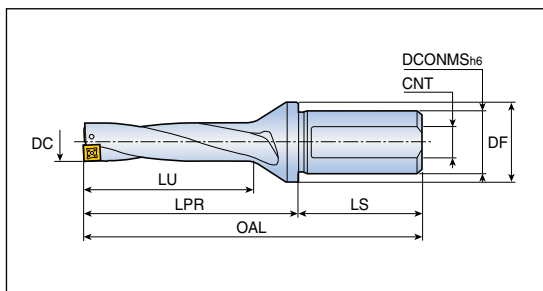
## TDR 3...-T2



## Indexable drill holders



- Drilling depth:  $3 \times \text{diameter}$

[illegible]

► OAL: LPR+LS

## Spare parts

| Designation            | Screw                                                                               | Wrench                                                                              | Plug*                                                                               |  |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                        |  |  |  |  |
| <b>TDR 3125 - 3150</b> | TS 20043I/HG-P                                                                      | TD 6P                                                                               | SL 20 M                                                                             |  |
| <b>TDR 3155 - 3215</b> | TS 22052I/HG                                                                        | TD 7                                                                                | SL 25 M                                                                             |  |
| <b>TDR 3220 - 3270</b> | TS 25064I                                                                           | TD 8                                                                                | SL 25 M / SL 32 M                                                                   |  |
| <b>TDR 3275</b>        | TS 25064I                                                                           | TD 8                                                                                | -                                                                                   |  |
| <b>TDR 3280 - 3330</b> | TS 35088I                                                                           | TD 10                                                                               | -                                                                                   |  |
| <b>TDR 3340 - 3390</b> | TS 40093I                                                                           | TD 15                                                                               | -                                                                                   |  |
| <b>TDR 3400 - 3410</b> | TS 40093I                                                                           | TD 15                                                                               | -                                                                                   |  |
| <b>TDR 3420 - 3500</b> | SO 50090I                                                                           | TD 20                                                                               | -                                                                                   |  |



- \* Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm : SL 25M

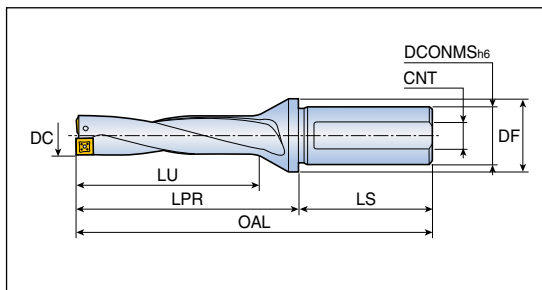
# TDR 4...-T2



## Indexable drill holders



- Drilling depth: 4xdiameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                                          |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-------------------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                                                 |
| <b>TDR 4125-20T2-05</b> | 12.5           | 20     | 25 | 52  | 70  | 50 | M13X1.0 | SPMG 05...<br>DG/DK<br>SPGG 05..DA<br>D197-D198 |
| <b>4130-20T2-05</b>     | 13.0           | 20     | 25 | 52  | 70  | 50 | M13X1.0 |                                                 |
| <b>4135-20T2-05</b>     | 13.5           | 20     | 25 | 56  | 74  | 50 | M13X1.0 |                                                 |
| <b>4140-20T2-05</b>     | 14.0           | 20     | 25 | 56  | 74  | 50 | M13X1.0 |                                                 |
| <b>4145-20T2-05</b>     | 14.5           | 20     | 25 | 60  | 79  | 50 | M13X1.0 |                                                 |
| <b>4150-20T2-05</b>     | 15.0           | 20     | 25 | 60  | 79  | 50 | M13X1.0 | SPMG 06...<br>DG/DK<br>SPGG 06..DA<br>D197-D198 |
| <b>4155-25T2-06</b>     | 15.5           | 25     | 32 | 64  | 84  | 56 | M16X1.5 |                                                 |
| <b>4160-25T2-06</b>     | 16.0           | 25     | 32 | 64  | 84  | 56 | M16X1.5 |                                                 |
| <b>4165-25T2-06</b>     | 16.5           | 25     | 32 | 68  | 88  | 56 | M16X1.5 |                                                 |
| <b>4170-25T2-06</b>     | 17.0           | 25     | 32 | 68  | 88  | 56 | M16X1.5 |                                                 |
| <b>4175-25T2-06</b>     | 17.5           | 25     | 32 | 72  | 93  | 56 | M16X1.5 |                                                 |
| <b>4180-25T2-06</b>     | 18.0           | 25     | 32 | 72  | 93  | 56 | M16X1.5 |                                                 |
| <b>4185-25T2-06</b>     | 18.5           | 25     | 32 | 76  | 97  | 56 | M16X1.5 |                                                 |
| <b>4190-25T2-06</b>     | 19.0           | 25     | 32 | 76  | 97  | 56 | M16X1.5 |                                                 |
| <b>4195-25T2-06</b>     | 19.5           | 25     | 32 | 80  | 103 | 56 | M16X1.5 |                                                 |
| <b>4200-25T2-06</b>     | 20.0           | 25     | 32 | 80  | 103 | 56 | M16X1.5 |                                                 |
| <b>4205-25T2-06</b>     | 20.5           | 25     | 32 | 84  | 107 | 56 | M16X1.5 |                                                 |
| <b>4210-25T2-06</b>     | 21.0           | 25     | 32 | 84  | 107 | 56 | M16X1.5 |                                                 |
| <b>4215-25T2-06</b>     | 21.5           | 25     | 32 | 88  | 111 | 56 | M16X1.5 |                                                 |
| <b>4220-25T2-07</b>     | 22.0           | 25     | 32 | 88  | 111 | 56 | M16X1.5 | SPMG 07...<br>DG/DK<br>SPGG 07..DA<br>D197-D198 |
| <b>4225-25T2-07</b>     | 22.5           | 25     | 32 | 92  | 117 | 56 | M16X1.5 |                                                 |
| <b>4225-32T2-07</b>     | 22.5           | 32     | 40 | 92  | 117 | 60 | M22X2.0 |                                                 |
| <b>4230-25T2-07</b>     | 23.0           | 25     | 32 | 92  | 117 | 56 | M16X1.5 |                                                 |
| <b>4230-32T2-07</b>     | 23.0           | 32     | 40 | 92  | 117 | 60 | M22X2.0 |                                                 |
| <b>4235-25T2-07</b>     | 23.5           | 25     | 32 | 96  | 122 | 56 | M16X1.5 |                                                 |
| <b>4235-32T2-07</b>     | 23.5           | 32     | 40 | 96  | 122 | 60 | M22X2.0 |                                                 |
| <b>4240-25T2-07</b>     | 24.0           | 25     | 32 | 96  | 122 | 56 | M16X1.5 |                                                 |
| <b>4240-32T2-07</b>     | 24.0           | 32     | 40 | 96  | 122 | 60 | M22X2.0 |                                                 |
| <b>4245-25T2-07</b>     | 24.5           | 25     | 32 | 100 | 127 | 56 | M16X1.5 |                                                 |
| <b>4245-32T2-07</b>     | 24.5           | 32     | 40 | 100 | 127 | 60 | M22X2.0 |                                                 |
| <b>4250-25T2-07</b>     | 25.0           | 25     | 32 | 100 | 127 | 56 | M16X1.5 |                                                 |
| <b>4250-32T2-07</b>     | 25.0           | 32     | 40 | 100 | 127 | 60 | M22X2.0 |                                                 |
| <b>4255-25T2-07</b>     | 25.5           | 25     | 32 | 104 | 131 | 56 | M16X1.5 |                                                 |
| <b>4255-32T2-07</b>     | 25.5           | 32     | 40 | 104 | 131 | 60 | M22X2.0 |                                                 |
| <b>4260-25T2-07</b>     | 26.0           | 25     | 32 | 104 | 131 | 56 | M16X1.5 |                                                 |

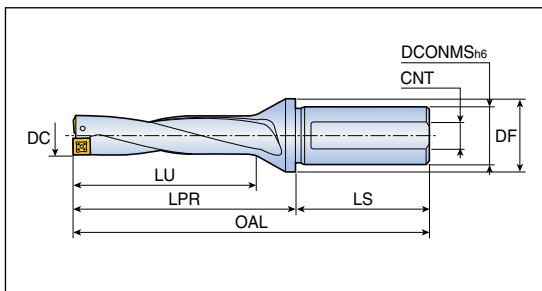


► OAL: LPR+LS

## Indexable drill holders



- Drilling depth: 4x diameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                                          |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-------------------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                                                 |
| <b>TDR 4260-32T2-07</b> | 26.0           | 32     | 40 | 104 | 131 | 60 | M22X2.0 | SPMG 07...<br>DG/DK<br>SPGG 07..DA<br>D197-D198 |
| <b>4265-25T2-07</b>     | 26.5           | 25     | 32 | 108 | 135 | 56 | M16X1.5 |                                                 |
| <b>4265-32T2-07</b>     | 26.5           | 32     | 40 | 108 | 135 | 60 | M22X2.0 |                                                 |
| <b>4270-25T2-07</b>     | 27.0           | 25     | 32 | 108 | 135 | 56 | M16X1.5 |                                                 |
| <b>4270-32T2-07</b>     | 27.0           | 32     | 40 | 108 | 135 | 60 | M22X2.0 |                                                 |
| <b>4275-25T2-07</b>     | 27.5           | 25     | 32 | 112 | 140 | 56 | Rc 1/8  |                                                 |
| <b>4275-32T2-07</b>     | 27.5           | 32     | 40 | 112 | 140 | 60 | Rc 1/4  |                                                 |
| <b>4280-25T2-09</b>     | 28.0           | 25     | 40 | 112 | 140 | 56 | Rc 1/8  | SPMG 09...<br>DG/DK<br>SPGG 09..DA<br>D197-D198 |
| <b>4280-32T2-09</b>     | 28.0           | 32     | 40 | 112 | 140 | 60 | Rc 1/4  |                                                 |
| <b>4285-25T2-09</b>     | 28.5           | 25     | 40 | 116 | 144 | 56 | Rc 1/8  |                                                 |
| <b>4285-32T2-09</b>     | 28.5           | 32     | 40 | 116 | 144 | 60 | Rc 1/4  |                                                 |
| <b>4290-25T2-09</b>     | 29.0           | 25     | 40 | 116 | 144 | 56 | Rc 1/8  |                                                 |
| <b>4290-32T2-09</b>     | 29.0           | 32     | 40 | 116 | 144 | 60 | Rc 1/4  |                                                 |
| <b>4295-32T2-09</b>     | 29.5           | 32     | 40 | 120 | 151 | 60 | Rc 1/4  |                                                 |
| <b>4295-40T2-09</b>     | 29.5           | 40     | 50 | 120 | 151 | 70 | Rc 1/4  |                                                 |
| <b>4300-32T2-09</b>     | 30.0           | 32     | 40 | 120 | 151 | 60 | Rc 1/4  |                                                 |
| <b>4300-40T2-09</b>     | 30.0           | 40     | 50 | 120 | 151 | 70 | Rc 1/4  |                                                 |
| <b>4305-32T2-09</b>     | 30.5           | 32     | 40 | 124 | 156 | 60 | Rc 1/4  |                                                 |
| <b>4305-40T2-09</b>     | 30.5           | 40     | 50 | 124 | 156 | 70 | Rc 1/4  |                                                 |
| <b>4310-32T2-09</b>     | 31.0           | 32     | 40 | 124 | 156 | 60 | Rc 1/4  |                                                 |
| <b>4310-40T2-09</b>     | 31.0           | 40     | 50 | 124 | 156 | 70 | Rc 1/4  |                                                 |
| <b>4315-32T2-09</b>     | 31.5           | 32     | 40 | 128 | 160 | 60 | Rc 1/4  |                                                 |
| <b>4315-40T2-09</b>     | 31.5           | 40     | 50 | 128 | 160 | 70 | Rc 1/4  |                                                 |
| <b>4320-32T2-09</b>     | 32.0           | 32     | 40 | 128 | 160 | 60 | Rc 1/4  | SPMG 11...<br>DG/DK<br>SPGG 11..DA<br>D197-D198 |
| <b>4320-40T2-09</b>     | 32.0           | 40     | 50 | 128 | 160 | 70 | Rc 1/4  |                                                 |
| <b>4325-32T2-09</b>     | 32.5           | 32     | 40 | 132 | 165 | 60 | Rc 1/4  |                                                 |
| <b>4325-40T2-09</b>     | 32.5           | 40     | 50 | 132 | 165 | 70 | Rc 1/4  |                                                 |
| <b>4330-32T2-09</b>     | 33.0           | 32     | 40 | 132 | 165 | 60 | Rc 1/4  |                                                 |
| <b>4330-40T2-09</b>     | 33.0           | 40     | 50 | 132 | 165 | 70 | Rc 1/4  |                                                 |
| <b>4340-32T2-11</b>     | 34.0           | 32     | 50 | 136 | 169 | 60 | Rc 1/4  |                                                 |
| <b>4340-40T2-11</b>     | 34.0           | 40     | 55 | 136 | 169 | 70 | Rc 1/4  |                                                 |
| <b>4350-32T2-11</b>     | 35.0           | 32     | 50 | 140 | 174 | 60 | Rc 1/4  | SPMG 11...<br>DG/DK<br>SPGG 11..DA<br>D197-D198 |
| <b>4350-40T2-11</b>     | 35.0           | 40     | 55 | 140 | 174 | 70 | Rc 1/4  |                                                 |
| <b>4360-32T2-11</b>     | 36.0           | 32     | 50 | 144 | 179 | 60 | Rc 1/4  |                                                 |
| <b>4360-40T2-11</b>     | 36.0           | 40     | 55 | 144 | 179 | 70 | Rc 1/4  |                                                 |



► OAL: LPR + LS

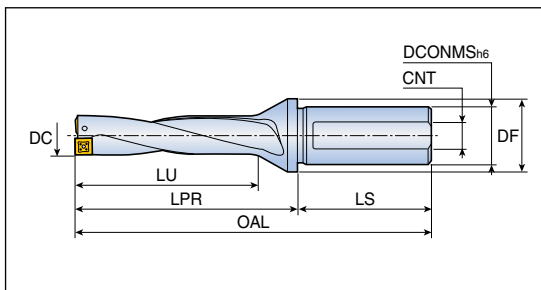
# TDR 4...-T2



## Indexable drill holders



- Drilling depth: 4xdiameter



| Designation             | Dimension (mm) |        |    |     |     |    |        | Insert                                          |
|-------------------------|----------------|--------|----|-----|-----|----|--------|-------------------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT    |                                                 |
| <b>TDR 4370-32T2-11</b> | 37.0           | 32     | 50 | 148 | 184 | 60 | Rc 1/4 | SPMG 11...<br>DG/DK<br>SPGG 11..DA<br>D197-D198 |
| <b>4370-40T2-11</b>     | 37.0           | 40     | 55 | 148 | 184 | 70 | Rc 1/4 |                                                 |
| <b>4380-32T2-11</b>     | 38.0           | 32     | 50 | 152 | 189 | 60 | Rc 1/4 |                                                 |
| <b>4380-40T2-11</b>     | 38.0           | 40     | 55 | 152 | 189 | 70 | Rc 1/4 |                                                 |
| <b>4390-32T2-11</b>     | 39.0           | 32     | 50 | 156 | 193 | 60 | Rc 1/4 |                                                 |
| <b>4390-40T2-11</b>     | 39.0           | 40     | 55 | 156 | 193 | 70 | Rc 1/4 |                                                 |
| <b>4400-32T2-11</b>     | 40.0           | 32     | 50 | 160 | 198 | 60 | Rc 1/4 |                                                 |
| <b>4400-40T2-11</b>     | 40.0           | 40     | 55 | 160 | 198 | 70 | Rc 1/4 |                                                 |
| <b>4410-40T2-11</b>     | 41.0           | 40     | 55 | 164 | 203 | 70 | Rc 1/4 |                                                 |
| <b>4420-40T2-14</b>     | 42.0           | 40     | 60 | 168 | 207 | 70 | Rc 1/4 | SPMG 14...<br>DG/DK<br>SPGG 14..DA<br>D197-D198 |
| <b>4430-40T2-14</b>     | 43.0           | 40     | 60 | 172 | 212 | 70 | Rc 1/4 |                                                 |
| <b>4440-40T2-14</b>     | 44.0           | 40     | 60 | 176 | 216 | 70 | Rc 1/4 |                                                 |
| <b>4450-40T2-14</b>     | 45.0           | 40     | 60 | 180 | 222 | 70 | Rc 1/4 |                                                 |
| <b>4460-40T2-14</b>     | 46.0           | 40     | 60 | 184 | 227 | 70 | Rc 1/4 |                                                 |
| <b>4470-40T2-14</b>     | 47.0           | 40     | 60 | 188 | 231 | 70 | Rc 1/4 |                                                 |
| <b>4480-40T2-14</b>     | 48.0           | 40     | 60 | 192 | 236 | 70 | Rc 1/4 |                                                 |
| <b>4490-40T2-14</b>     | 49.0           | 40     | 60 | 196 | 240 | 70 | Rc 1/4 |                                                 |
| <b>4500-40T2-14</b>     | 50.0           | 40     | 60 | 200 | 245 | 70 | Rc 1/4 |                                                 |

► OAL = LPR+LS

## Spare parts

| Designation            | Screw          | Wrench | Plug*             |  |
|------------------------|----------------|--------|-------------------|--|
|                        |                |        |                   |  |
| <b>TDR 4125 - 4150</b> | TS 20043I/HG-P | TD 6P  | SL 20 M           |  |
| <b>TDR 4155 - 4215</b> | TS 22052I/HG   | TD 7   | SL 25 M           |  |
| <b>TDR 4220 - 4270</b> | TS 25064I      | TD 8   | SL 25 M / SL 32 M |  |
| <b>TDR 4275</b>        | TS 25064I      | TD 8   | -                 |  |
| <b>TDR 4280 - 4330</b> | TS 35088I      | TD 10  | -                 |  |
| <b>TDR 4340 - 4390</b> | TS 40093I      | TD 15  | -                 |  |
| <b>TDR 4400 - 4410</b> | TS 40093I      | TD 15  | -                 |  |
| <b>TDR 4420 - 4500</b> | SO 50090I      | TD 20  | -                 |  |



► \* Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm: SL 25M



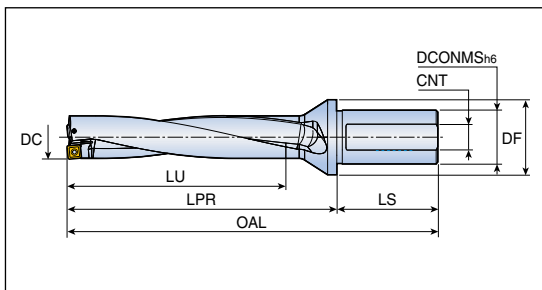
# TDR 5...-T2



## Indexable drill holders



- Drilling depth: 5x diameter



| Designation             | Dimension (mm) |        |    |     |     |    |         | Insert                                                                                        |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------------------------------------------------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT     |                                                                                               |
| <b>TDR 5125-20T2-05</b> | 12.5           | 20     | 25 | 65  | 83  | 50 | M13X1.0 | SPMG 05...                                                                                    |
| <b>5130-20T2-05</b>     | 13.0           | 20     | 25 | 65  | 83  | 50 | M13X1.0 | DG/DK                                                                                         |
| <b>5135-20T2-05</b>     | 13.5           | 20     | 25 | 70  | 88  | 50 | M13X1.0 | SPGG 05..DA                                                                                   |
| <b>5140-20T2-05</b>     | 14.0           | 20     | 25 | 70  | 88  | 50 | M13X1.0 |  D197-D198   |
| <b>5145-20T2-05</b>     | 14.5           | 20     | 25 | 75  | 94  | 50 | M13X1.0 |                                                                                               |
| <b>5150-20T2-05</b>     | 15.0           | 20     | 25 | 75  | 94  | 50 | M13X1.0 |                                                                                               |
| <b>5155-25T2-06</b>     | 15.5           | 25     | 32 | 80  | 100 | 56 | M16X1.5 | SPMG 06...                                                                                    |
| <b>5160-25T2-06</b>     | 16.0           | 25     | 32 | 80  | 100 | 56 | M16X1.5 | DG/DK                                                                                         |
| <b>5165-25T2-06</b>     | 16.5           | 25     | 32 | 85  | 105 | 56 | M16X1.5 | SPGG 06..DA                                                                                   |
| <b>5170-25T2-06</b>     | 17.0           | 25     | 32 | 85  | 105 | 56 | M16X1.5 |  D197-D198   |
| <b>5175-25T2-06</b>     | 17.5           | 25     | 32 | 90  | 111 | 56 | M16X1.5 |                                                                                               |
| <b>5180-25T2-06</b>     | 18.0           | 25     | 32 | 90  | 111 | 56 | M16X1.5 |                                                                                               |
| <b>5185-25T2-06</b>     | 18.5           | 25     | 32 | 95  | 116 | 56 | M16X1.5 |                                                                                               |
| <b>5190-25T2-06</b>     | 19.0           | 25     | 32 | 95  | 116 | 56 | M16X1.5 |                                                                                               |
| <b>5195-25T2-06</b>     | 19.5           | 25     | 32 | 100 | 123 | 56 | M16X1.5 |                                                                                               |
| <b>5200-25T2-06</b>     | 20.0           | 25     | 32 | 100 | 123 | 56 | M16X1.5 |                                                                                               |
| <b>5205-25T2-06</b>     | 20.5           | 25     | 32 | 105 | 128 | 56 | M16X1.5 |                                                                                               |
| <b>5210-25T2-06</b>     | 21.0           | 25     | 32 | 105 | 128 | 56 | M16X1.5 |                                                                                               |
| <b>5215-25T2-06</b>     | 21.5           | 25     | 32 | 110 | 133 | 56 | M16X1.5 |                                                                                               |
| <b>5220-25T2-07</b>     | 22.0           | 25     | 32 | 110 | 133 | 56 | M22X2.0 | SPMG 07...                                                                                    |
| <b>5225-32T2-07</b>     | 22.5           | 32     | 40 | 115 | 140 | 60 | M22X2.0 | DG/DK                                                                                         |
| <b>5230-32T2-07</b>     | 23.0           | 32     | 40 | 115 | 140 | 60 | M22X2.0 | SPGG 07..DA                                                                                   |
| <b>5235-32T2-07</b>     | 23.5           | 32     | 40 | 120 | 146 | 60 | M22X2.0 |  D197-D198 |
| <b>5240-32T2-07</b>     | 24.0           | 32     | 40 | 120 | 146 | 60 | M22X2.0 |                                                                                               |
| <b>5245-32T2-07</b>     | 24.5           | 32     | 40 | 125 | 152 | 60 | M22X2.0 |                                                                                               |
| <b>5250-32T2-07</b>     | 25.0           | 32     | 40 | 125 | 152 | 60 | M22X2.0 |                                                                                               |
| <b>5255-32T2-07</b>     | 25.5           | 32     | 40 | 130 | 157 | 60 | M22X2.0 |                                                                                               |
| <b>5260-32T2-07</b>     | 26.0           | 32     | 40 | 130 | 157 | 60 | M22X2.0 |                                                                                               |
| <b>5265-32T2-07</b>     | 26.5           | 32     | 40 | 135 | 162 | 60 | M22X2.0 |                                                                                               |
| <b>5270-32T2-07</b>     | 27.0           | 32     | 40 | 135 | 162 | 60 | M22X2.0 |                                                                                               |
| <b>5275-32T2-07</b>     | 27.5           | 32     | 40 | 140 | 168 | 60 | Rc 1/4  |                                                                                               |
|                         |                |        |    |     |     |    |         |                                                                                               |
|                         |                |        |    |     |     |    |         |                                                                                               |
|                         |                |        |    |     |     |    |         |                                                                                               |
|                         |                |        |    |     |     |    |         |                                                                                               |



► OAL: LPR + LS

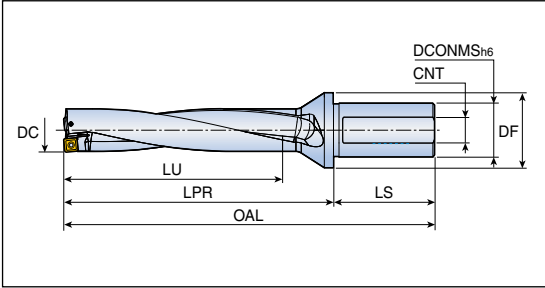
TDR 5...-T2



Indexable drill holders



- Drilling depth: 5xdiameter



| Designation             | Dimension (mm) |        |    |     |     |    |        | Insert                                                 |
|-------------------------|----------------|--------|----|-----|-----|----|--------|--------------------------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT    |                                                        |
| <b>TDR 5280-32T2-09</b> | 28.0           | 32     | 40 | 140 | 168 | 60 | Rc 1/4 | SPMG 09...<br>DG/DK<br>SPGG 09..DA<br><b>D197-D198</b> |
| <b>5285-32T2-09</b>     | 28.5           | 32     | 40 | 145 | 173 | 60 | Rc 1/4 |                                                        |
| <b>5290-32T2-09</b>     | 29.0           | 32     | 40 | 145 | 173 | 60 | Rc 1/4 |                                                        |
| <b>5295-32T2-09</b>     | 29.5           | 32     | 40 | 150 | 181 | 60 | Rc 1/4 |                                                        |
| <b>5300-32T2-09</b>     | 30.0           | 32     | 40 | 150 | 181 | 60 | Rc 1/4 |                                                        |
| <b>5300-40T2-09</b>     | 30.0           | 40     | 50 | 150 | 181 | 70 | Rc 1/4 |                                                        |
| <b>5310-32T2-09</b>     | 31.0           | 32     | 40 | 155 | 187 | 60 | Rc 1/4 |                                                        |
| <b>5310-40T2-09</b>     | 31.0           | 40     | 50 | 155 | 187 | 70 | Rc 1/4 |                                                        |
| <b>5320-32T2-09</b>     | 32.0           | 32     | 40 | 160 | 192 | 60 | Rc 1/4 |                                                        |
| <b>5320-40T2-09</b>     | 32.0           | 40     | 50 | 160 | 192 | 70 | Rc 1/4 |                                                        |
| <b>5330-32T2-09</b>     | 33.0           | 32     | 40 | 165 | 198 | 60 | Rc 1/4 |                                                        |
| <b>5330-40T2-09</b>     | 33.0           | 40     | 50 | 165 | 198 | 70 | Rc 1/4 |                                                        |
| <b>5340-32T2-11</b>     | 34.0           | 32     | 50 | 170 | 203 | 60 | Rc 1/4 | SPMG 11...<br>DG/DK<br>SPGG 11..DA<br><b>D197-D198</b> |
| <b>5340-40T2-11</b>     | 34.0           | 40     | 55 | 170 | 203 | 70 | Rc 1/4 |                                                        |
| <b>5350-32T2-11</b>     | 35.0           | 32     | 50 | 175 | 209 | 60 | Rc 1/4 |                                                        |
| <b>5350-40T2-11</b>     | 35.0           | 40     | 55 | 175 | 209 | 70 | Rc 1/4 |                                                        |
| <b>5360-32T2-11</b>     | 36.0           | 32     | 50 | 180 | 215 | 60 | Rc 1/4 |                                                        |
| <b>5360-40T2-11</b>     | 36.0           | 40     | 55 | 180 | 215 | 70 | Rc 1/4 |                                                        |
| <b>5370-32T2-11</b>     | 37.0           | 32     | 50 | 185 | 221 | 60 | Rc 1/4 |                                                        |
| <b>5370-40T2-11</b>     | 37.0           | 40     | 55 | 185 | 221 | 70 | Rc 1/4 |                                                        |
| <b>5380-32T2-11</b>     | 38.0           | 32     | 50 | 190 | 227 | 60 | Rc 1/4 |                                                        |
| <b>5380-40T2-11</b>     | 38.0           | 40     | 55 | 190 | 227 | 70 | Rc 1/4 |                                                        |
| <b>5390-32T2-11</b>     | 39.0           | 32     | 50 | 195 | 232 | 60 | Rc 1/4 |                                                        |
| <b>5390-40T2-11</b>     | 39.0           | 40     | 55 | 195 | 232 | 70 | Rc 1/4 |                                                        |
| <b>5400-32T2-11</b>     | 40.0           | 32     | 50 | 200 | 238 | 60 | Rc 1/4 |                                                        |
| <b>5400-40T2-11</b>     | 40.0           | 40     | 55 | 200 | 238 | 70 | Rc 1/4 |                                                        |
| <b>5410-40T2-11</b>     | 41.0           | 40     | 55 | 205 | 244 | 70 | Rc 1/4 |                                                        |
|                         |                |        |    |     |     |    |        |                                                        |
|                         |                |        |    |     |     |    |        |                                                        |
|                         |                |        |    |     |     |    |        |                                                        |
|                         |                |        |    |     |     |    |        |                                                        |
|                         |                |        |    |     |     |    |        |                                                        |
|                         |                |        |    |     |     |    |        |                                                        |
|                         |                |        |    |     |     |    |        |                                                        |
|                         |                |        |    |     |     |    |        |                                                        |

► OAL: LPR+LS



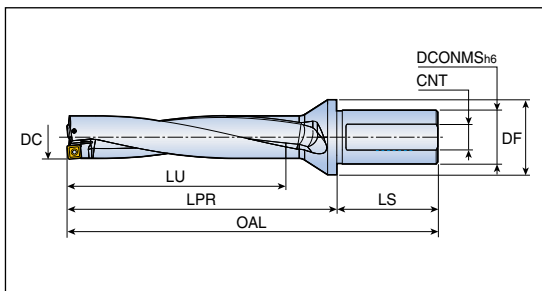
# TDR 5...-T2



## Indexable drill holders



- Drilling depth: 5xdiameter



| Designation             | Dimension (mm) |        |    |     |     |    |        | Insert                                          |
|-------------------------|----------------|--------|----|-----|-----|----|--------|-------------------------------------------------|
|                         | DC             | DCONMS | DF | LU  | LPR | LS | CNT    |                                                 |
| <b>TDR 5420-40T2-14</b> | 42.0           | 40     | 60 | 210 | 249 | 70 | Rc 1/4 | SPMG 14...<br>DG/DK<br>SPGG 14..DA<br>D197-D198 |
| <b>5430-40T2-14</b>     | 43.0           | 40     | 60 | 215 | 255 | 70 | Rc 1/4 |                                                 |
| <b>5440-40T2-14</b>     | 44.0           | 40     | 60 | 220 | 260 | 70 | Rc 1/4 |                                                 |
| <b>5450-40T2-14</b>     | 45.0           | 40     | 60 | 225 | 267 | 70 | Rc 1/4 |                                                 |
| <b>5460-40T2-14</b>     | 46.0           | 40     | 60 | 230 | 273 | 70 | Rc 1/4 |                                                 |
| <b>5470-40T2-14</b>     | 47.0           | 40     | 60 | 235 | 278 | 70 | Rc 1/4 |                                                 |
| <b>5480-40T2-14</b>     | 48.0           | 40     | 60 | 240 | 284 | 70 | Rc 1/4 |                                                 |
| <b>5490-40T2-14</b>     | 49.0           | 40     | 60 | 245 | 289 | 70 | Rc 1/4 |                                                 |
| <b>5500-40T2-14</b>     | 50.0           | 40     | 60 | 250 | 295 | 70 | Rc 1/4 |                                                 |
|                         |                |        |    |     |     |    |        |                                                 |
|                         |                |        |    |     |     |    |        |                                                 |
|                         |                |        |    |     |     |    |        |                                                 |
|                         |                |        |    |     |     |    |        |                                                 |
|                         |                |        |    |     |     |    |        |                                                 |
|                         |                |        |    |     |     |    |        |                                                 |

► OAL: LPR+LS

## Spare parts

| Designation            | Screw          | Wrench | Plug*             |  |
|------------------------|----------------|--------|-------------------|--|
|                        |                |        |                   |  |
| <b>TDR 5125 - 5150</b> | TS 20043I/HG-P | TD 6P  | SL 20 M           |  |
| <b>TDR 5155 - 5215</b> | TS 22052I/HG   | TD 7   | SL 25 M           |  |
| <b>TDR 5220 - 5270</b> | TS 25064I      | TD 8   | SL 25 M / SL 32 M |  |
| <b>TDR 5275</b>        | TS 25064I      | TD 8   | -                 |  |
| <b>TDR 5280 - 5330</b> | TS 35088I      | TD 10  | -                 |  |
| <b>TDR 5340 - 5390</b> | TS 40093I      | TD 15  | -                 |  |
| <b>TDR 5400 - 5410</b> | TS 40093I      | TD 15  | -                 |  |
| <b>TDR 5420 - 5500</b> | SO 50090I      | TD 20  | -                 |  |



- \* Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm: SL 25M

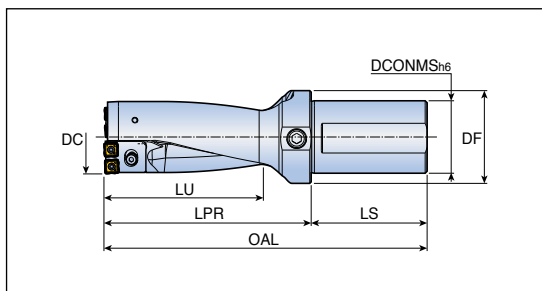
# TDR 25...CA-T



## Indexable cartridge drill holders



- Drilling depth: 2.5x diameter



| Designation                    | Dimension (mm) |        |    |     |     |    | Setting plate | Insert       |
|--------------------------------|----------------|--------|----|-----|-----|----|---------------|--------------|
|                                | DC             | DCONMS | DF | LU  | LPR | LS |               |              |
| <b>TDR 2551-53-50T2-07CA-T</b> | 51             | 50     | 64 | 133 | 170 | 80 | -             | SPMG 07...   |
|                                | 52             | 50     | 64 | 133 | 170 | 80 | TDP-0701      | DG/DK        |
|                                | 53             | 50     | 64 | 133 | 170 | 80 | TDP-0702      | SPGG 07..DA  |
|                                |                |        |    |     |     |    |               | D197-D198    |
| <b>2554-56-50T2-07CA-T</b>     | 54             | 50     | 64 | 140 | 180 | 80 | -             | SPMG 07...   |
|                                | 55             | 50     | 64 | 140 | 180 | 80 | TDP-0701      | DG/DK        |
|                                | 56             | 50     | 64 | 140 | 180 | 80 | TDP-0702      | SPGG 07..DA  |
|                                |                |        |    |     |     |    |               | D197-D198    |
| <b>2557-62-50T2-09CA-T</b>     | 57             | 50     | 64 | 155 | 201 | 80 | -             | SPMG 09...   |
|                                | 58             | 50     | 64 | 155 | 201 | 80 | TDP-0901      | DG/DK        |
|                                | 59             | 50     | 64 | 155 | 201 | 80 | TDP-0902      | SPGG 09..DA  |
|                                | 60             | 50     | 64 | 155 | 201 | 80 | TDP-0903      | D197-D198    |
|                                | 61             | 50     | 64 | 155 | 201 | 80 | TDP-0904      |              |
|                                | 62             | 50     | 64 | 155 | 201 | 80 | TDP-0905      |              |
| <b>2563-66-50T2-09CA-T</b>     | 63             | 50     | 69 | 165 | 215 | 80 | -             | SPMG 09...   |
|                                | 64             | 50     | 69 | 165 | 215 | 80 | TDP-0901      | DG/DK        |
|                                | 65             | 50     | 69 | 165 | 215 | 80 | TDP-0902      | SPGG 09..DA  |
|                                | 66             | 50     | 69 | 165 | 215 | 80 | TDP-0903      | D197-D198    |
| <b>2567-73-50T2-11CA-T</b>     | 67             | 50     | 69 | 183 | 240 | 80 | -             | SPMG 11...   |
|                                | 68             | 50     | 69 | 183 | 240 | 80 | TDP-1101      | DG/DK        |
|                                | 69             | 50     | 69 | 183 | 240 | 80 | TDP-1102      | SPGG 11..DA  |
|                                | 70             | 50     | 69 | 183 | 240 | 80 | TDP-1103      | D197-D198    |
|                                | 71             | 50     | 69 | 183 | 240 | 80 | TDP-1104      |              |
|                                | 72             | 50     | 69 | 183 | 240 | 80 | TDP-1105      |              |
|                                | 73             | 50     | 69 | 183 | 240 | 80 | TDP-1106      |              |
|                                |                |        |    |     |     |    |               |              |
| <b>2574-80-50T2-12CA-T</b>     | 74             | 50     | 74 | 200 | 250 | 80 | -             | SPMG 12...DG |
|                                | 75             | 50     | 74 | 200 | 250 | 80 | TDP-1101      | D197         |
|                                | 76             | 50     | 74 | 200 | 250 | 80 | TDP-1102      |              |
|                                | 77             | 50     | 74 | 200 | 250 | 80 | TDP-1103      |              |
|                                | 78             | 50     | 74 | 200 | 250 | 80 | TDP-1104      |              |
|                                | 79             | 50     | 74 | 200 | 250 | 80 | TDP-1105      |              |
|                                | 80             | 50     | 74 | 200 | 250 | 80 | TDP-1106      |              |
|                                |                |        |    |     |     |    |               |              |



► OAL: LPR+LS

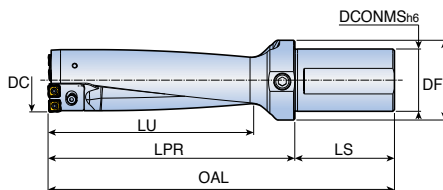
# TDR 35...CA-T



## Indexable cartridge drill holders



- Drilling depth: 3.5xdiameter



| Designation                    | Dimension (mm) |        |    |     |     |    | Setting plate | Insert                             |
|--------------------------------|----------------|--------|----|-----|-----|----|---------------|------------------------------------|
|                                | DC             | DCONMS | DF | LU  | LPR | LS |               |                                    |
| <b>TDR 3551-53-50T2-07CA-T</b> | 51             | 50     | 64 | 186 | 223 | 80 | -             | SPMG 07...<br>DG/DK<br>SPGG 07..DA |
|                                | 52             | 50     | 75 | 186 | 223 | 80 | TDP-0701      |                                    |
|                                | 53             | 50     | 75 | 186 | 223 | 80 | TDP-0702      | D197-D198                          |
|                                |                |        |    |     |     |    |               |                                    |
| <b>3554-56-50T2-07CA-T</b>     | 54             | 50     | 75 | 196 | 236 | 80 | -             | SPMG 07...<br>DG/DK<br>SPGG 07..DA |
|                                | 55             | 50     | 75 | 196 | 236 | 80 | TDP-0701      |                                    |
|                                | 56             | 50     | 75 | 196 | 236 | 80 | TDP-0702      | D197-D198                          |
|                                |                |        |    |     |     |    |               |                                    |
| <b>3557-62-50T2-09CA-T</b>     | 57             | 50     | 75 | 217 | 263 | 80 | -             | SPMG 09...<br>DG/DK<br>SPGG 09..DA |
|                                | 58             | 50     | 75 | 217 | 263 | 80 | TDP-0901      |                                    |
|                                | 59             | 50     | 75 | 217 | 263 | 80 | TDP-0902      |                                    |
|                                | 60             | 50     | 75 | 217 | 263 | 80 | TDP-0903      | D197-D198                          |
|                                | 61             | 50     | 75 | 217 | 263 | 80 | TDP-0904      |                                    |
|                                | 62             | 50     | 75 | 217 | 263 | 80 | TDP-0905      |                                    |
|                                |                |        |    |     |     |    |               |                                    |
| <b>3563-66-50T2-09CA-T</b>     | 63             | 50     | 75 | 231 | 281 | 80 | -             | SPMG 09...<br>DG/DK<br>SPGG 09..DA |
|                                | 64             | 50     | 75 | 231 | 281 | 80 | TDP-0901      |                                    |
|                                | 65             | 50     | 75 | 231 | 281 | 80 | TDP-0902      |                                    |
|                                | 66             | 50     | 75 | 231 | 281 | 80 | TDP-0903      | D197-D198                          |
| <b>3567-73-50T2-11CA-T</b>     | 67             | 50     | 75 | 256 | 313 | 80 | -             | SPMG 11...<br>DG/DK<br>SPGG 11..DA |
|                                | 68             | 50     | 75 | 256 | 313 | 80 | TDP-1101      |                                    |
|                                | 69             | 50     | 75 | 256 | 313 | 80 | TDP-1102      |                                    |
|                                | 70             | 50     | 75 | 256 | 313 | 80 | TDP-1103      | D197-D198                          |
|                                | 71             | 50     | 75 | 256 | 313 | 80 | TDP-1104      |                                    |
|                                | 72             | 50     | 75 | 256 | 313 | 80 | TDP-1105      |                                    |
|                                | 73             | 50     | 75 | 256 | 313 | 80 | TDP-1106      |                                    |
|                                |                |        |    |     |     |    |               |                                    |
|                                |                |        |    |     |     |    |               |                                    |
|                                |                |        |    |     |     |    |               |                                    |
|                                |                |        |    |     |     |    |               |                                    |
|                                |                |        |    |     |     |    |               |                                    |



► OAL: LPR+LS

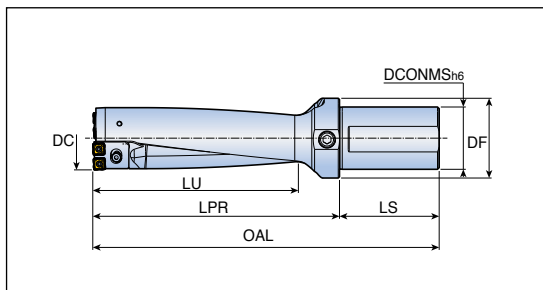
# TDR 35...CA-T



## Indexable cartridge drill holders



- Drilling depth: 3.5x diameter



| Designation                    | Dimension (mm) |        |    |     |     |    | Setting plate | Insert               |
|--------------------------------|----------------|--------|----|-----|-----|----|---------------|----------------------|
|                                | DC             | DCONMS | DF | LU  | LPR | LS |               |                      |
| <b>TDR 3574-80-50T2-12CA-T</b> | 74             | 50     | 75 | 280 | 330 | 80 | -             | SPMG 12...DG<br>D197 |
|                                | 75             | 50     | 75 | 280 | 330 | 80 | TDP-1101      |                      |
|                                | 76             | 50     | 75 | 280 | 330 | 80 | TDP-1102      |                      |
|                                | 77             | 50     | 75 | 280 | 330 | 80 | TDP-1103      |                      |
|                                | 78             | 50     | 75 | 280 | 330 | 80 | TDP-1104      |                      |
|                                | 79             | 50     | 75 | 280 | 330 | 80 | TDP-1105      |                      |
|                                | 80             | 50     | 75 | 280 | 330 | 80 | TDP-1106      |                      |

► OAL: LPR+LS

## Spare parts

| Designation           | Screw     | Cartridge for peripheral | Cartridge for center |
|-----------------------|-----------|--------------------------|----------------------|
|                       |           |                          |                      |
| <b>TDR.. 51-53...</b> | TS 25064I | TDR 07CA-P1-T            | TDR 07CA-C1-T        |
| <b>TDR.. 54-56...</b> | TS 25064I | TDR 07CA-P2-T            | TDR 07CA-C2-T        |
| <b>TDR.. 57-62...</b> | TS 35088I | TDR 09CA-P1-T            | TDR 09CA-C1-T        |
| <b>TDR.. 63-66...</b> | TS 35088I | TDR 09CA-P2-T            | TDR 09CA-C2-T        |
| <b>TDR.. 67-73...</b> | TS 40093I | TDR 11CA-P1-T            | TDR 11CA-C1-T        |
| <b>TDR.. 74-80...</b> | TS 40093I | TDR 12CA-P2-T            | TDR 12CA-C2-T        |

## Spare parts for cartridges

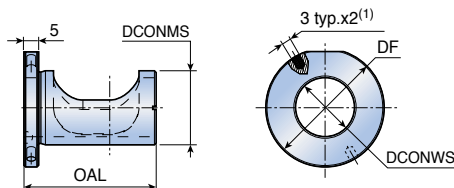
| Designation          | Cartridge clamping screw | Washer    | Setting plate screw |
|----------------------|--------------------------|-----------|---------------------|
| <b>TDR 07CA-P1-T</b> | SH M4x0.7x16             | MW 4.3x8  | TS 20043I/HG-P      |
| <b>TDR 07CA-C1-T</b> | SH M4x0.7x16             | MW 4.3x8  | -                   |
| <b>TDR 07CA-P2-T</b> | SH M4x0.7x16             | MW 4.3x8  | TS 20043I/HG-P      |
| <b>TDR 07CA-C2-T</b> | SH M4x0.7x16             | MW 4.3x8  | -                   |
| <b>TDR 09CA-P1-T</b> | SH M5x0.8x16             | MW 5.5x10 | SO 30055I           |
| <b>TDR 09CA-C1-T</b> | SH M5x0.8x16             | MW 5.5x10 | -                   |
| <b>TDR 09CA-P2-T</b> | SH M5x0.8x16             | MW 5.5x10 | SO 30055I           |
| <b>TDR 09CA-C2-T</b> | SH M5x0.8x16             | MW 5.5x10 | -                   |
| <b>TDR 11CA-P1-T</b> | SH M6x1.0x20             | MW 6.4x12 | SO 30055I           |
| <b>TDR 11CA-C1-T</b> | SH M6x1.0x20             | MW 6.4x12 | -                   |
| <b>TDR 12CA-P2-T</b> | SH M6x1.0x20             | MW 6.4x12 | SO 30055I           |
| <b>TDR 12CA-C2-T</b> | SH M6x1.0x20             | MW 6.4x12 | -                   |



## ECCENTER SLEEVE



### Drill center adjustment sleeves / eccentric sleeve

[illegible]

► <sup>(1)</sup> Holes for inserting a pin are used to facilitate radial adjustment of the sleeve (Pin is not supplied)

**TOPCAP**



Multi

- 

- ▶ OAL: LPR+LS
- ▶ Grooving insert is available for right handed type

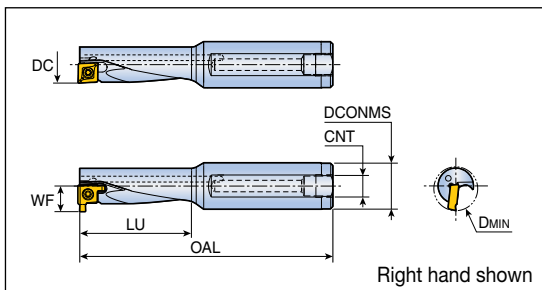
**Cutting Condition**



**TOPCAP**



- 



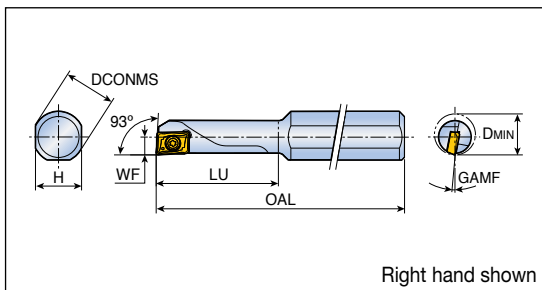
- ▶ OA: LPR+LS
- ▶ Grooving insert is available for right handed type

| Designation    | Screw                                                                               | Wrench                                                                              |                                                                                     |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                |  |  |  |  |
| <b>TCAP 08</b> | TS 18034/HG-P                                                                       | T 6P                                                                                | -                                                                                   |  |
| <b>TCAP 10</b> | TS 20038/HG-P                                                                       | T 6P                                                                                | -                                                                                   |  |
| <b>TCAP 12</b> | TS 22052/HG-P                                                                       | T 7P                                                                                | -                                                                                   |  |
| <b>TCAP 14</b> | TS 25064/HG-P                                                                       | T 8P                                                                                | -                                                                                   |  |
| <b>TCAP 16</b> | TS 30100/HG-P                                                                       | -                                                                                   | TD 9P                                                                               |  |
| <b>TCAP 20</b> | TS 35088/HG-P                                                                       | -                                                                                   | TD10P                                                                               |  |
| <b>TCAP 25</b> | TS 45A100/HG                                                                        | -                                                                                   | TD 20                                                                               |  |
| <b>TCAP 32</b> | TS 45A100/HG                                                                        | -                                                                                   | TD 20                                                                               |  |



**TOPCAP**

- 

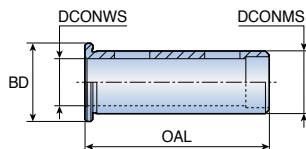
[illegible]

## Spare parts

| Designation               | Screw                                                                               | Wrench                                                                              |  |  |
|---------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                           |  |  |  |  |
| <b>S10H SXUCR/L 04-06</b> | TS 18034I/HG-P                                                                      | T 6P                                                                                |  |  |
| <b>S10J SXUCR/L 04-07</b> | TS 18034I/HG-P                                                                      | T 6P                                                                                |  |  |
| <b>S10J SXUCR/L 04-08</b> | TS 18034I/HG-P                                                                      | T 6P                                                                                |  |  |
| <b>S10K SXUCR/L 05-10</b> | TS 20038I/HG-P                                                                      | T 6P                                                                                |  |  |
|                           |                                                                                     |                                                                                     |  |  |
|                           |                                                                                     |                                                                                     |  |  |
|                           |                                                                                     |                                                                                     |  |  |
|                           |                                                                                     |                                                                                     |  |  |



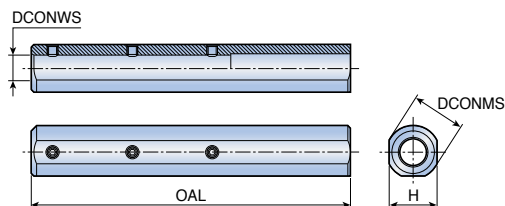
## Sleeves for clamping unit



| Designation      | Dimension (mm) |        |    |     | Toolholders   |
|------------------|----------------|--------|----|-----|---------------|
|                  | DCONMS         | DCONWS | BD | OAL |               |
| <b>TSL 16-12</b> | 16             | 12     | 20 | 47  | TCAP 10R/L... |
| <b>25-20</b>     | 25             | 20     | 32 | 55  | TCAP 16R/L... |

# TBSL

## Sleeves for boring bar



| Designation           | Dimension (mm) |        |     |    |
|-----------------------|----------------|--------|-----|----|
|                       | DCONMS         | DCONWS | OAL | H  |
| <b>TBSL 20-10-120</b> | 20             | 10     | 120 | 18 |

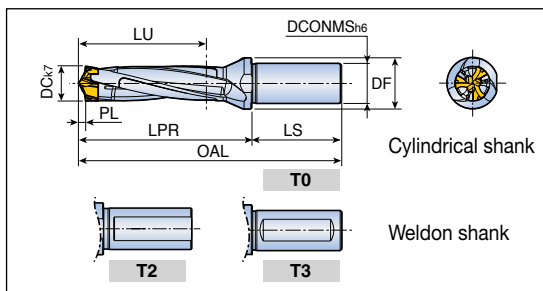
## Spare parts

| Designation           | Screw       | Wrench |  |  |
|-----------------------|-------------|--------|--|--|
| <b>TBSL 20-10-120</b> | SS M4x0.7x4 | L-W 2  |  |  |
|                       |             |        |  |  |
|                       |             |        |  |  |
|                       |             |        |  |  |
|                       |             |        |  |  |

### Head changeable 3 flute drill holder



- Drilling depth:  $3 \times \text{diameter}$



D199-D202



- ▶ OAL: LPR+LS
- ▶ SSC: Seat size code

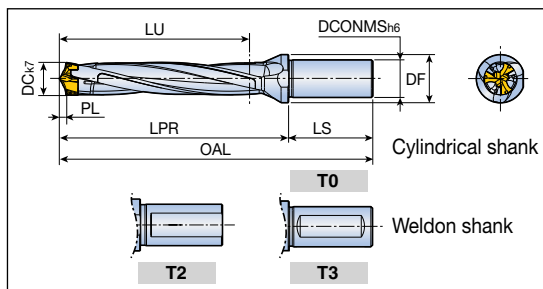
# 3ED...T...-5D



## Head changeable 3 flute drill holder



- Drilling depth: 5x diameter



| Designation                   | Dimension (mm) |        |    |       |       |    |      |     | Clamping key  |
|-------------------------------|----------------|--------|----|-------|-------|----|------|-----|---------------|
|                               | DC             | DCONMS | DF | LU    | LPR   | LS | PL   | SSC |               |
| <b>3ED 120-124-16T3/T0-5D</b> | 12.0-12.4      | 16     | 20 | 64.0  | 84.7  | 48 | 2.74 | 12  | K 3ED D12-D13 |
| <b>125-129-16T3/T0-5D</b>     | 12.5-12.9      | 16     | 20 | 66.5  | 87.5  | 48 | 2.76 | 12  |               |
| <b>130-134-16T3/T0-5D</b>     | 13.0-13.4      | 16     | 20 | 69.0  | 90.8  | 48 | 2.91 | 13  |               |
| <b>135-139-16T3/T0-5D</b>     | 13.5-13.9      | 16     | 20 | 71.5  | 93.6  | 48 | 2.93 | 13  |               |
| <b>140-144-16T3/T0-5D</b>     | 14.0-14.4      | 16     | 20 | 74.0  | 96.9  | 48 | 3.17 | 14  | K 3ED D14-D15 |
| <b>145-149-16T3/T0-5D</b>     | 14.5-14.9      | 16     | 20 | 76.5  | 99.7  | 48 | 3.19 | 14  |               |
| <b>150-159-20T3/T0-5D</b>     | 15.0-15.9      | 20     | 25 | 79.0  | 103.9 | 50 | 3.31 | 15  |               |
| <b>160-169-20T3/T0-5D</b>     | 16.0-16.9      | 20     | 25 | 84.0  | 111.0 | 50 | 3.70 | 16  |               |
| <b>170-179-20T3/T0-5D</b>     | 17.0-17.9      | 20     | 25 | 89.0  | 118.0 | 50 | 3.88 | 17  | K 3ED D16-D17 |
| <b>180-189-25T2/T0-5D</b>     | 18.0-18.9      | 25     | 32 | 94.0  | 126.1 | 56 | 4.07 | 18  |               |
| <b>190-199-25T2/T0-5D</b>     | 19.0-19.9      | 25     | 32 | 99.0  | 132.7 | 56 | 4.26 | 19  |               |
| <b>200-209-25T2/T0-5D</b>     | 20.0-20.9      | 25     | 32 | 104.0 | 139.3 | 56 | 4.44 | 20  |               |
| <b>210-219-25T2/T0-5D</b>     | 21.0-21.9      | 25     | 32 | 109.0 | 145.8 | 56 | 4.62 | 21  | K 3ED D18-D19 |
| <b>220-229-25T2/T0-5D</b>     | 22.0-22.9      | 25     | 32 | 114.0 | 152.4 | 56 | 4.78 | 22  |               |
| <b>230-239-32T2/T0-5D</b>     | 23.0-23.9      | 32     | 42 | 119.0 | 158.8 | 60 | 5.02 | 23  |               |
| <b>240-249-32T2/T0-5D</b>     | 24.0-24.9      | 32     | 42 | 124.0 | 165.4 | 60 | 5.18 | 24  |               |
| <b>250-259-32T2/T0-5D</b>     | 25.0-25.9      | 32     | 42 | 129.0 | 172.0 | 60 | 5.29 | 25  | K 3ED D20-D21 |
|                               |                |        |    |       |       |    |      |     |               |
|                               |                |        |    |       |       |    |      |     |               |
|                               |                |        |    |       |       |    |      |     |               |
|                               |                |        |    |       |       |    |      |     | K 3ED D22-D23 |
|                               |                |        |    |       |       |    |      |     |               |
|                               |                |        |    |       |       |    |      |     |               |
|                               |                |        |    |       |       |    |      |     |               |
|                               |                |        |    |       |       |    |      |     | K 3ED D24-D25 |
|                               |                |        |    |       |       |    |      |     |               |
|                               |                |        |    |       |       |    |      |     |               |
|                               |                |        |    |       |       |    |      |     |               |



D199-D202



D256

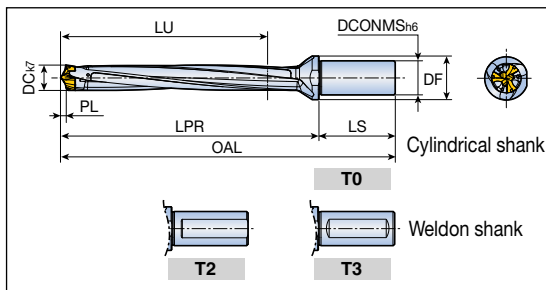
- OAL: LPR+LS
- SSC: Seat size code

# 3ED...T...-8D

## Head changeable 3 flute drill holder



- Drilling depth: 8x diameter



| Designation                   | Dimension (mm) |        |    |     |       |    |      |     | Clamping key  |
|-------------------------------|----------------|--------|----|-----|-------|----|------|-----|---------------|
|                               | DC             | DCONMS | DF | LU  | LPR   | LS | PL   | SSC |               |
| <b>3ED 120-124-16T3/T0-8D</b> | 12.0-12.4      | 16     | 20 | 100 | 120.7 | 48 | 2.74 | 12  | K 3ED D12-D13 |
| <b>125-129-16T3/T0-8D</b>     | 12.5-12.9      | 16     | 20 | 104 | 125.0 | 48 | 2.76 | 12  |               |
| <b>130-134-16T3/T0-8D</b>     | 13.0-13.4      | 16     | 20 | 108 | 129.8 | 48 | 2.91 | 13  |               |
| <b>135-139-16T3/T0-8D</b>     | 13.5-13.9      | 16     | 20 | 112 | 134.1 | 48 | 2.93 | 13  |               |
| <b>140-144-16T3/T0-8D</b>     | 14.0-14.4      | 16     | 20 | 116 | 138.9 | 48 | 3.17 | 14  | K 3ED D14-D15 |
| <b>145-149-16T3/T0-8D</b>     | 14.5-14.9      | 16     | 20 | 120 | 143.2 | 48 | 3.19 | 14  |               |
| <b>150-159-20T3/T0-8D</b>     | 15.0-15.9      | 20     | 25 | 124 | 148.9 | 50 | 3.31 | 15  |               |
| <b>160-169-20T3/T0-8D</b>     | 16.0-16.9      | 20     | 25 | 132 | 159.0 | 50 | 3.70 | 16  |               |
| <b>170-179-20T3/T0-8D</b>     | 17.0-17.9      | 20     | 25 | 140 | 169.0 | 50 | 3.88 | 17  | K 3ED D16-D17 |
| <b>180-189-25T2/T0-8D</b>     | 18.0-18.9      | 25     | 32 | 148 | 180.1 | 56 | 4.07 | 18  |               |
| <b>190-199-25T2/T0-8D</b>     | 19.0-19.9      | 25     | 32 | 156 | 189.7 | 56 | 4.26 | 19  |               |
| <b>200-209-25T2/T0-8D</b>     | 20.0-20.9      | 25     | 32 | 164 | 199.3 | 56 | 4.44 | 20  |               |
| <b>210-219-25T2/T0-8D</b>     | 21.0-21.9      | 25     | 32 | 172 | 208.8 | 56 | 4.62 | 21  | K 3ED D18-D19 |
| <b>220-229-25T2/T0-8D</b>     | 22.0-22.9      | 25     | 32 | 180 | 218.4 | 56 | 4.78 | 22  |               |
| <b>230-239-32T2/T0-8D</b>     | 23.0-23.9      | 32     | 42 | 188 | 227.8 | 60 | 5.02 | 23  |               |
| <b>240-249-32T2/T0-8D</b>     | 24.0-24.9      | 32     | 42 | 196 | 237.4 | 60 | 5.18 | 24  |               |
| <b>250-259-32T2/T0-8D</b>     | 25.0-25.9      | 32     | 42 | 204 | 247.0 | 60 | 5.29 | 25  | K 3ED D20-D21 |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |
|                               |                |        |    |     |       |    |      |     |               |



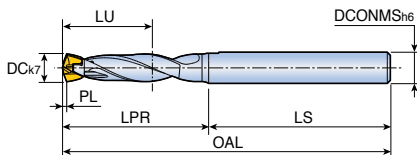
- OAL: LPR+LS
- SSC: Seat size code

# TCD...-3D

Head changeable drill holders for small diameter holes - Cylindrical type shank



- Drilling depth: 3xdiameter



| Designation                | Dimension (mm) |        |    |      |    |      |     | Clamping key    |
|----------------------------|----------------|--------|----|------|----|------|-----|-----------------|
|                            | DC             | DCONMS | LU | LPR  | LS | PL   | SSC |                 |
| <b>TCD 040-044-06A0-3D</b> | 4.0-4.4        | 6      | 13 | 22.7 | 35 | 0.62 | 4   | K TCD D040-D049 |
| <b>045-049-06A0-3D</b>     | 4.5-4.9        | 6      | 14 | 24.7 | 35 | 0.66 | 4.5 |                 |
| <b>050-054-06A0-3D</b>     | 5.0-5.4        | 6      | 16 | 26.3 | 35 | 0.73 | 5   | K TCD D050-D059 |
| <b>055-059-06A0-3D</b>     | 5.5-5.9        | 6      | 17 | 28.2 | 35 | 0.80 | 5.5 |                 |



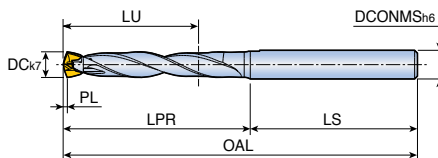
- OAL: LPR+LS
- SSC: Seat size code

# TCD...-5D

Head changeable drill holders for small diameter holes - Cylindrical type shank



- Drilling depth: 5xdiameter



| Designation                | Dimension (mm) |        |    |      |    |      |     | Clamping key    |
|----------------------------|----------------|--------|----|------|----|------|-----|-----------------|
|                            | DC             | DCONMS | LU | LPR  | LS | PL   | SSC |                 |
| <b>TCD 040-044-06A0-5D</b> | 4.0-4.4        | 6      | 21 | 30.7 | 35 | 0.62 | 4   | K TCD D040-D049 |
| <b>045-049-06A0-5D</b>     | 4.5-4.9        | 6      | 23 | 33.7 | 35 | 0.66 | 4.5 |                 |
| <b>050-054-06A0-5D</b>     | 5.0-5.4        | 6      | 26 | 36.3 | 35 | 0.73 | 5   | K TCD D050-D059 |
| <b>055-059-06A0-5D</b>     | 5.5-5.9        | 6      | 28 | 39.2 | 35 | 0.80 | 5.5 |                 |

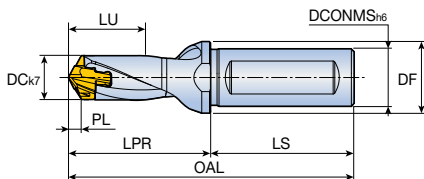


- OAL: LPR+LS
- SSC: Seat size code

# DRILL RUSH



- 



D204-D216

D127



D258

- ▶ OAL: LPR+LS
- ▶ SSC: Seat size code

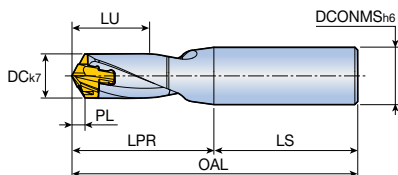


# TCD...S0-1.5D

## Head changeable drill holders - Cylindrical type shank



- Drilling depth: 1.5x diameter



| Designation                  | Dimension (mm) |        |    |      |    |      |     | Clamping key    |
|------------------------------|----------------|--------|----|------|----|------|-----|-----------------|
|                              | DC             | DCONMS | LU | LPR  | LS | PL   | SSC |                 |
| <b>TCD 060-064-12S0-1.5D</b> | 6.0-6.4        | 12     | 10 | 23.0 | 45 | 0.96 | 6   | K TCD D060-D099 |
| <b>065-069-12S0-1.5D</b>     | 6.5-6.9        | 12     | 11 | 24.1 | 45 | 1.18 | 6.5 |                 |
| <b>070-074-12S0-1.5D</b>     | 7.0-7.4        | 12     | 12 | 25.1 | 45 | 1.01 | 7   |                 |
| <b>075-079-12S0-1.5D</b>     | 7.5-7.9        | 12     | 12 | 25.9 | 45 | 1.10 | 7   |                 |
| <b>080-089-12S0-1.5D</b>     | 8.0-8.9        | 12     | 13 | 27.4 | 45 | 1.20 | 8   |                 |
| <b>090-099-12S0-1.5D</b>     | 9.0-9.9        | 12     | 15 | 29.3 | 45 | 1.35 | 9   | K TCD D100-D199 |
| <b>100-109-16S0-1.5D</b>     | 10.0-10.9      | 16     | 17 | 31.2 | 48 | 1.50 | 10  |                 |
| <b>110-119-16S0-1.5D</b>     | 11.0-11.9      | 16     | 19 | 33.1 | 48 | 1.67 | 11  |                 |
| <b>120-129-16S0-1.5D</b>     | 12.0-12.9      | 16     | 20 | 35.0 | 48 | 1.82 | 12  |                 |
| <b>130-139-16S0-1.5D</b>     | 13.0-13.9      | 16     | 22 | 37.1 | 48 | 1.96 | 13  |                 |
| <b>140-149-16S0-1.5D</b>     | 14.0-14.9      | 16     | 23 | 41.1 | 48 | 2.12 | 14  | K TCD D200-D269 |
| <b>150-159-20S0-1.5D</b>     | 15.0-15.9      | 20     | 25 | 46.2 | 50 | 2.27 | 15  |                 |
| <b>160-169-20S0-1.5D</b>     | 16.0-16.9      | 20     | 26 | 49.3 | 50 | 2.42 | 16  |                 |
| <b>170-179-20S0-1.5D</b>     | 17.0-17.9      | 20     | 29 | 52.4 | 50 | 2.59 | 17  |                 |
| <b>180-189-25S0-1.5D</b>     | 18.0-18.9      | 25     | 30 | 55.5 | 56 | 2.73 | 18  |                 |
| <b>190-199-25S0-1.5D</b>     | 19.0-19.9      | 25     | 32 | 58.5 | 56 | 2.88 | 19  |                 |
| <b>200-209-25S0-1.5D</b>     | 20.0-20.9      | 25     | 33 | 61.6 | 56 | 3.02 | 20  |                 |
| <b>210-219-25S0-1.5D</b>     | 21.0-21.9      | 25     | 35 | 64.7 | 56 | 3.18 | 21  |                 |
| <b>220-229-25S0-1.5D</b>     | 22.0-22.9      | 25     | 36 | 67.8 | 56 | 3.24 | 22  |                 |
| <b>230-239-32S0-1.5D</b>     | 23.0-23.9      | 32     | 38 | 70.8 | 60 | 3.46 | 23  |                 |
| <b>240-249-32S0-1.5D</b>     | 24.0-24.9      | 32     | 40 | 73.9 | 60 | 3.62 | 24  |                 |
| <b>250-259-32S0-1.5D</b>     | 25.0-25.9      | 32     | 42 | 77.0 | 60 | 3.80 | 25  |                 |
|                              |                |        |    |      |    |      |     |                 |
|                              |                |        |    |      |    |      |     |                 |
|                              |                |        |    |      |    |      |     |                 |
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D204-D216



D258

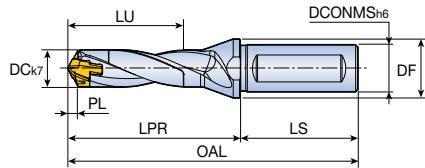
- OAL: LPR+LS
- SSC: Seat size code

# TCD...T...-3D

## Head changeable drill holders - Weldon type shank



- Drilling depth: 3x diameter



| Designation                | Dimension (mm) |        |    |    |       |    |      |     | Clamping key    |
|----------------------------|----------------|--------|----|----|-------|----|------|-----|-----------------|
|                            | DC             | DCONMS | DF | LU | LPR   | LS | PL   | SSC |                 |
| <b>TCD 060-064-12T3-3D</b> | 6.0-6.4        | 12     | 16 | 19 | 32.0  | 45 | 0.96 | 6   | K TCD D060-D099 |
| <b>065-069-12T3-3D</b>     | 6.5-6.9        | 12     | 16 | 21 | 33.8  | 45 | 1.18 | 6.5 |                 |
| <b>070-074-12T3-3D</b>     | 7.0-7.4        | 12     | 16 | 22 | 35.6  | 45 | 1.01 | 7   |                 |
| <b>075-079-12T3-3D</b>     | 7.5-7.9        | 12     | 16 | 24 | 37.1  | 45 | 1.10 | 7   |                 |
| <b>080-084-12T3-3D</b>     | 8.0-8.4        | 12     | 16 | 25 | 39.4  | 45 | 1.20 | 8   |                 |
| <b>085-089-12T3-3D</b>     | 8.5-8.9        | 12     | 16 | 27 | 40.9  | 45 | 1.29 | 8   |                 |
| <b>090-094-12T3-3D</b>     | 9.0-9.4        | 12     | 16 | 28 | 42.8  | 45 | 1.35 | 9   |                 |
| <b>095-099-12T3-3D</b>     | 9.5-9.9        | 12     | 16 | 30 | 44.3  | 45 | 1.44 | 9   |                 |
| <b>100-104-16T3-3D</b>     | 10.0-10.4      | 16     | 20 | 32 | 46.2  | 48 | 1.50 | 10  | K TCD D100-D199 |
| <b>105-109-16T3-3D</b>     | 10.5-10.9      | 16     | 20 | 34 | 47.7  | 48 | 1.59 | 10  |                 |
| <b>110-114-16T3-3D</b>     | 11.0-11.4      | 16     | 20 | 35 | 49.6  | 48 | 1.67 | 11  |                 |
| <b>115-119-16T3-3D</b>     | 11.5-11.9      | 16     | 20 | 37 | 51.1  | 48 | 1.76 | 11  |                 |
| <b>120-124-16T3-3D</b>     | 12.0-12.4      | 16     | 20 | 38 | 53.0  | 48 | 1.82 | 12  |                 |
| <b>125-129-16T3-3D</b>     | 12.5-12.9      | 16     | 20 | 39 | 54.5  | 48 | 1.91 | 12  |                 |
| <b>130-134-16T3-3D</b>     | 13.0-13.4      | 16     | 20 | 41 | 56.6  | 48 | 1.96 | 13  |                 |
| <b>135-139-16T3-3D</b>     | 13.5-13.9      | 16     | 20 | 43 | 58.1  | 48 | 2.05 | 13  |                 |
| <b>140-144-16T3-3D</b>     | 14.0-14.4      | 16     | 20 | 44 | 62.2  | 48 | 2.12 | 14  |                 |
| <b>145-149-16T3-3D</b>     | 14.5-14.9      | 16     | 20 | 46 | 63.7  | 48 | 2.21 | 14  |                 |
| <b>150-159-20T3-3D</b>     | 15.0-15.9      | 20     | 25 | 47 | 68.7  | 50 | 2.27 | 15  | K TCD D200-D269 |
| <b>160-169-20T3-3D</b>     | 16.0-16.9      | 20     | 25 | 50 | 73.3  | 50 | 2.42 | 16  |                 |
| <b>170-179-20T3-3D</b>     | 17.0-17.9      | 20     | 25 | 54 | 77.9  | 50 | 2.59 | 17  |                 |
| <b>180-189-25T2-3D</b>     | 18.0-18.9      | 25     | 32 | 57 | 82.5  | 56 | 2.73 | 18  |                 |
| <b>190-199-25T2-3D</b>     | 19.0-19.9      | 25     | 32 | 60 | 87.0  | 56 | 2.88 | 19  |                 |
| <b>200-209-25T2-3D</b>     | 20.0-20.9      | 25     | 32 | 63 | 91.6  | 56 | 3.02 | 20  |                 |
| <b>210-219-25T2-3D</b>     | 21.0-21.9      | 25     | 32 | 66 | 96.2  | 56 | 3.18 | 21  |                 |
| <b>220-229-25T2-3D</b>     | 22.0-22.9      | 25     | 32 | 69 | 100.8 | 56 | 3.24 | 22  |                 |
| <b>230-239-32T2-3D</b>     | 23.0-23.9      | 32     | 42 | 72 | 105.3 | 60 | 3.46 | 23  |                 |
| <b>240-249-32T2-3D</b>     | 24.0-24.9      | 32     | 42 | 76 | 109.9 | 60 | 3.62 | 24  |                 |
| <b>250-259-32T2-3D</b>     | 25.0-25.9      | 32     | 42 | 79 | 114.5 | 60 | 3.80 | 25  |                 |
|                            |                |        |    |    |       |    |      |     |                 |
|                            |                |        |    |    |       |    |      |     |                 |
|                            |                |        |    |    |       |    |      |     |                 |
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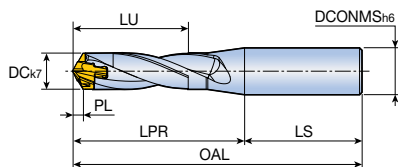
- OAL: LPR+LS
- SSC: Seat size code

# TCD...S0-3D

## Head changeable drill holders - Cylindrical type shank



- Drilling depth: 3x diameter



| Designation                | Dimension (mm) |        |    |       |    |      |     | Clamping key    |
|----------------------------|----------------|--------|----|-------|----|------|-----|-----------------|
|                            | DC             | DCONMS | LU | LPR   | LS | PL   | SSC |                 |
| <b>TCD 060-064-12S0-3D</b> | 6.0-6.4        | 12     | 19 | 32.0  | 45 | 0.96 | 6   | K TCD D060-D099 |
| <b>065-069-12S0-3D</b>     | 6.5-6.9        | 12     | 21 | 33.8  | 45 | 1.18 | 6.5 |                 |
| <b>070-074-12S0-3D</b>     | 7.0-7.4        | 12     | 22 | 35.6  | 45 | 1.01 | 7   |                 |
| <b>075-079-12S0-3D</b>     | 7.5-7.9        | 12     | 24 | 37.1  | 45 | 1.10 | 7   |                 |
| <b>080-084-12S0-3D</b>     | 8.0-8.4        | 12     | 25 | 39.4  | 45 | 1.20 | 8   |                 |
| <b>085-089-12S0-3D</b>     | 8.5-8.9        | 12     | 27 | 40.9  | 45 | 1.29 | 8   |                 |
| <b>090-094-12S0-3D</b>     | 9.0-9.4        | 12     | 28 | 42.8  | 45 | 1.35 | 9   |                 |
| <b>095-099-12S0-3D</b>     | 9.5-9.9        | 12     | 30 | 44.3  | 45 | 1.44 | 9   |                 |
| <b>100-104-16S0-3D</b>     | 10.0-10.4      | 16     | 32 | 46.2  | 48 | 1.50 | 10  | K TCD D100-D199 |
| <b>105-109-16S0-3D</b>     | 10.5-10.9      | 16     | 34 | 47.7  | 48 | 1.59 | 10  |                 |
| <b>110-114-16S0-3D</b>     | 11.0-11.4      | 16     | 35 | 49.6  | 48 | 1.67 | 11  |                 |
| <b>115-119-16S0-3D</b>     | 11.5-11.9      | 16     | 37 | 51.1  | 48 | 1.76 | 11  |                 |
| <b>120-124-16S0-3D</b>     | 12.0-12.4      | 16     | 38 | 53.0  | 48 | 1.82 | 12  |                 |
| <b>125-129-16S0-3D</b>     | 12.5-12.9      | 16     | 39 | 54.5  | 48 | 1.91 | 12  |                 |
| <b>130-134-16S0-3D</b>     | 13.0-13.4      | 16     | 41 | 56.6  | 48 | 1.96 | 13  |                 |
| <b>135-139-16S0-3D</b>     | 13.5-13.9      | 16     | 43 | 58.1  | 48 | 2.05 | 13  |                 |
| <b>140-144-16S0-3D</b>     | 14.0-14.4      | 16     | 44 | 62.1  | 48 | 2.12 | 14  |                 |
| <b>145-149-16S0-3D</b>     | 14.5-14.9      | 16     | 46 | 63.7  | 48 | 2.21 | 14  |                 |
| <b>150-159-20S0-3D</b>     | 15.0-15.9      | 20     | 47 | 68.7  | 50 | 2.27 | 15  | K TCD D200-D269 |
| <b>160-169-20S0-3D</b>     | 16.0-16.9      | 20     | 50 | 73.3  | 50 | 2.42 | 16  |                 |
| <b>170-179-20S0-3D</b>     | 17.0-17.9      | 20     | 54 | 77.9  | 50 | 2.59 | 17  |                 |
| <b>180-189-25S0-3D</b>     | 18.0-18.9      | 25     | 57 | 82.5  | 56 | 2.73 | 18  |                 |
| <b>190-199-25S0-3D</b>     | 19.0-19.9      | 25     | 60 | 87.0  | 56 | 2.88 | 19  |                 |
| <b>200-209-25S0-3D</b>     | 20.0-20.9      | 25     | 63 | 91.6  | 56 | 3.02 | 20  |                 |
| <b>210-219-25S0-3D</b>     | 21.0-21.9      | 25     | 66 | 96.2  | 56 | 3.18 | 21  |                 |
| <b>220-229-25S0-3D</b>     | 22.0-22.9      | 25     | 69 | 100.8 | 56 | 3.24 | 22  |                 |
| <b>230-239-32S0-3D</b>     | 23.0-23.9      | 32     | 72 | 105.3 | 60 | 3.46 | 23  |                 |
| <b>240-249-32S0-3D</b>     | 24.0-24.9      | 32     | 76 | 109.9 | 60 | 3.62 | 24  |                 |
| <b>250-259-32S0-3D</b>     | 25.0-25.9      | 32     | 79 | 114.5 | 60 | 3.80 | 25  |                 |
|                            |                |        |    |       |    |      |     |                 |
|                            |                |        |    |       |    |      |     |                 |
|                            |                |        |    |       |    |      |     |                 |
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D204-D216



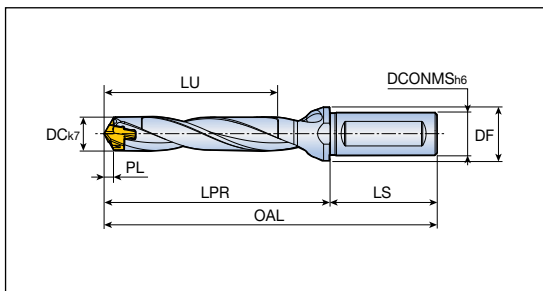
D258

- OAL: LPR+LS
- SSC: Seat size code

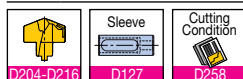
## Head changeable drill holders - Weldon type shank



- Drilling depth: 5xdiameter



| Designation                | Dimension (mm) |        |    |     |       |    |      |     | Clamping key    |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|-----------------|
|                            | DC             | DCONMS | DF | LU  | LPR   | LS | PL   | SSC |                 |
| <b>TCD 060-064-12T3-5D</b> | 6.0-6.4        | 12     | 16 | 31  | 44.0  | 45 | 0.96 | 6   | K TCD D060-D099 |
| <b>065-069-12T3-5D</b>     | 6.5-6.9        | 12     | 16 | 34  | 46.8  | 45 | 1.18 | 6.5 |                 |
| <b>070-074-12T3-5D</b>     | 7.0-7.4        | 12     | 16 | 36  | 49.6  | 45 | 1.01 | 7   |                 |
| <b>075-079-12T3-5D</b>     | 7.5-7.9        | 12     | 16 | 39  | 52.1  | 45 | 1.10 | 7   |                 |
| <b>080-084-12T3-5D</b>     | 8.0-8.4        | 12     | 16 | 41  | 55.4  | 45 | 1.20 | 8   |                 |
| <b>085-089-12T3-5D</b>     | 8.5-8.9        | 12     | 16 | 44  | 57.9  | 45 | 1.29 | 8   |                 |
| <b>090-094-12T3-5D</b>     | 9.0-9.4        | 12     | 16 | 46  | 60.8  | 45 | 1.35 | 9   |                 |
| <b>095-099-12T3-5D</b>     | 9.5-9.9        | 12     | 16 | 49  | 63.3  | 45 | 1.44 | 9   |                 |
| <b>100-104-16T3-5D</b>     | 10.0-10.4      | 16     | 20 | 52  | 66.2  | 48 | 1.50 | 10  | K TCD D100-D199 |
| <b>105-109-16T3-5D</b>     | 10.5-10.9      | 16     | 20 | 55  | 68.7  | 48 | 1.59 | 10  |                 |
| <b>110-114-16T3-5D</b>     | 11.0-11.4      | 16     | 20 | 57  | 71.6  | 48 | 1.67 | 11  |                 |
| <b>115-119-16T3-5D</b>     | 11.5-11.9      | 16     | 20 | 60  | 74.1  | 48 | 1.76 | 11  |                 |
| <b>120-124-16T3-5D</b>     | 12.0-12.4      | 16     | 20 | 62  | 77.0  | 48 | 1.82 | 12  |                 |
| <b>125-129-16T3-5D</b>     | 12.5-12.9      | 16     | 20 | 64  | 79.5  | 48 | 1.91 | 12  |                 |
| <b>130-134-16T3-5D</b>     | 13.0-13.4      | 16     | 20 | 67  | 82.6  | 48 | 1.96 | 13  |                 |
| <b>135-139-16T3-5D</b>     | 13.5-13.9      | 16     | 20 | 70  | 85.1  | 48 | 2.05 | 13  |                 |
| <b>140-144-16T3-5D</b>     | 14.0-14.4      | 16     | 20 | 72  | 90.2  | 48 | 2.12 | 14  |                 |
| <b>145-149-16T3-5D</b>     | 14.5-14.9      | 16     | 20 | 75  | 92.7  | 48 | 2.21 | 14  |                 |
| <b>150-159-20T3-5D</b>     | 15.0-15.9      | 20     | 25 | 77  | 98.7  | 50 | 2.27 | 15  | K TCD D200-D269 |
| <b>160-169-20T3-5D</b>     | 16.0-16.9      | 20     | 25 | 82  | 105.3 | 50 | 2.42 | 16  |                 |
| <b>170-179-20T3-5D</b>     | 17.0-17.9      | 20     | 25 | 88  | 111.9 | 50 | 2.59 | 17  |                 |
| <b>180-189-25T2-5D</b>     | 18.0-18.9      | 25     | 32 | 93  | 118.5 | 56 | 2.73 | 18  |                 |
| <b>190-199-25T2-5D</b>     | 19.0-19.9      | 25     | 32 | 98  | 125.0 | 56 | 2.88 | 19  |                 |
| <b>200-209-25T2-5D</b>     | 20.0-20.9      | 25     | 32 | 103 | 131.6 | 56 | 3.02 | 20  |                 |
| <b>210-219-25T2-5D</b>     | 21.0-21.9      | 25     | 32 | 108 | 138.2 | 56 | 3.18 | 21  |                 |
| <b>220-229-25T2-5D</b>     | 22.0-22.9      | 25     | 32 | 113 | 144.8 | 56 | 3.24 | 22  |                 |
| <b>230-239-32T2-5D</b>     | 23.0-23.9      | 32     | 42 | 118 | 151.3 | 60 | 3.46 | 23  |                 |
| <b>240-249-32T2-5D</b>     | 24.0-24.9      | 32     | 42 | 124 | 157.9 | 60 | 3.62 | 24  |                 |
| <b>250-259-32T2-5D</b>     | 25.0-25.9      | 32     | 42 | 129 | 164.5 | 60 | 3.80 | 25  |                 |
|                            |                |        |    |     |       |    |      |     |                 |
|                            |                |        |    |     |       |    |      |     |                 |
|                            |                |        |    |     |       |    |      |     |                 |
|                            |                |        |    |     |       |    |      |     |                 |
|                            |                |        |    |     |       |    |      |     |                 |
|                            |                |        |    |     |       |    |      |     |                 |

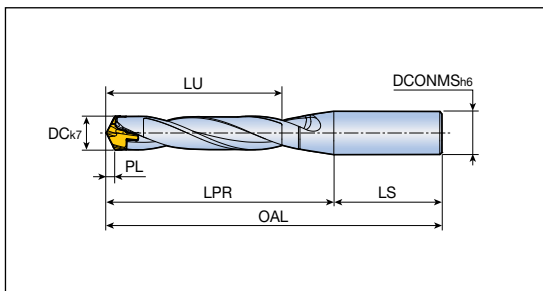


- OAL: LPR+LS
- SSC: Seat size code

## Head changeable drill holders - Cylindrical type shank



- Drilling depth: 5x diameter



| Designation                | Dimension (mm) |        |     |       |    |      |     | Clamping key    |
|----------------------------|----------------|--------|-----|-------|----|------|-----|-----------------|
|                            | DC             | DCONMS | LU  | LPR   | LS | PL   | SSC |                 |
| <b>TCD 060-064-12S0-5D</b> | 6.0-6.4        | 12     | 31  | 44.0  | 45 | 0.96 | 6   | K TCD D060-D099 |
| <b>065-069-12S0-5D</b>     | 6.5-6.9        | 12     | 34  | 46.8  | 45 | 1.18 | 6.5 |                 |
| <b>070-074-12S0-5D</b>     | 7.0-7.4        | 12     | 36  | 49.6  | 45 | 1.01 | 7   |                 |
| <b>075-079-12S0-5D</b>     | 7.5-7.9        | 12     | 39  | 52.1  | 45 | 1.10 | 7   |                 |
| <b>080-084-12S0-5D</b>     | 8.0-8.4        | 12     | 41  | 55.4  | 45 | 1.20 | 8   |                 |
| <b>085-089-12S0-5D</b>     | 8.5-8.9        | 12     | 44  | 57.9  | 45 | 1.29 | 8   |                 |
| <b>090-094-12S0-5D</b>     | 9.0-9.4        | 12     | 46  | 60.8  | 45 | 1.35 | 9   |                 |
| <b>095-099-12S0-5D</b>     | 9.5-9.9        | 12     | 49  | 63.3  | 45 | 1.44 | 9   |                 |
| <b>100-104-16S0-5D</b>     | 10.0-10.4      | 16     | 52  | 66.2  | 48 | 1.50 | 10  | K TCD D100-D199 |
| <b>105-109-16S0-5D</b>     | 10.5-10.9      | 16     | 55  | 68.7  | 48 | 1.59 | 10  |                 |
| <b>110-114-16S0-5D</b>     | 11.0-11.4      | 16     | 57  | 71.6  | 48 | 1.67 | 11  |                 |
| <b>115-119-16S0-5D</b>     | 11.5-11.9      | 16     | 60  | 74.1  | 48 | 1.76 | 11  |                 |
| <b>120-124-16S0-5D</b>     | 12.0-12.4      | 16     | 62  | 77.0  | 48 | 1.82 | 12  |                 |
| <b>125-129-16S0-5D</b>     | 12.5-12.9      | 16     | 64  | 79.5  | 48 | 1.91 | 12  |                 |
| <b>130-134-16S0-5D</b>     | 13.0-13.4      | 16     | 67  | 82.6  | 48 | 1.96 | 13  |                 |
| <b>135-139-16S0-5D</b>     | 13.5-13.9      | 16     | 70  | 85.1  | 48 | 2.05 | 13  |                 |
| <b>140-144-16S0-5D</b>     | 14.0-14.4      | 16     | 72  | 90.2  | 48 | 2.12 | 14  |                 |
| <b>145-149-16S0-5D</b>     | 14.5-14.9      | 16     | 75  | 92.7  | 48 | 2.21 | 14  |                 |
| <b>150-159-20S0-5D</b>     | 15.0-15.9      | 20     | 77  | 98.7  | 50 | 2.27 | 15  | K TCD D200-D269 |
| <b>160-169-20S0-5D</b>     | 16.0-16.9      | 20     | 82  | 105.3 | 50 | 2.42 | 16  |                 |
| <b>170-179-20S0-5D</b>     | 17.0-17.9      | 20     | 88  | 111.9 | 50 | 2.59 | 17  |                 |
| <b>180-189-25S0-5D</b>     | 18.0-18.9      | 25     | 93  | 118.5 | 56 | 2.73 | 18  |                 |
| <b>190-199-25S0-5D</b>     | 19.0-19.9      | 25     | 98  | 125.0 | 56 | 2.88 | 19  |                 |
| <b>200-209-25S0-5D</b>     | 20.0-20.9      | 25     | 103 | 131.6 | 56 | 3.02 | 20  |                 |
| <b>210-219-25S0-5D</b>     | 21.0-21.9      | 25     | 108 | 138.2 | 56 | 3.18 | 21  |                 |
| <b>220-229-25S0-5D</b>     | 22.0-22.9      | 25     | 113 | 144.8 | 56 | 3.24 | 22  |                 |
| <b>230-239-32S0-5D</b>     | 23.0-23.9      | 32     | 118 | 151.3 | 60 | 3.46 | 23  |                 |
| <b>240-249-32S0-5D</b>     | 24.0-24.9      | 32     | 124 | 157.9 | 60 | 3.62 | 24  |                 |
| <b>250-259-32S0-5D</b>     | 25.0-25.9      | 32     | 129 | 164.5 | 60 | 3.80 | 25  |                 |
|                            |                |        |     |       |    |      |     |                 |
|                            |                |        |     |       |    |      |     |                 |
|                            |                |        |     |       |    |      |     |                 |
|                            |                |        |     |       |    |      |     |                 |
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D204-D216



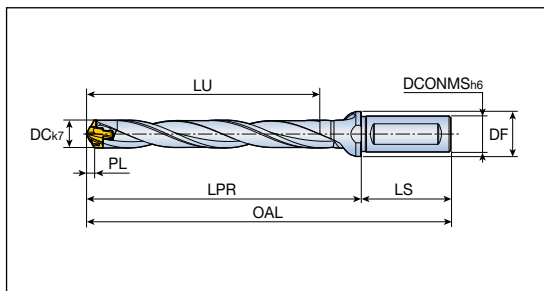
D258

- OAL: LPR+LS
- SSC: Seat size code

## Head changeable drill holders - Weldon type shank



- Drilling depth: 8x diameter



| Designation                | Dimension (mm) |        |    |     |       |    |      |     | Clamping key    |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|-----------------|
|                            | DC             | DCONMS | DF | LU  | LPR   | LS | PL   | SSC |                 |
| <b>TCD 070-074-12T3-8D</b> | 7.0-7.4        | 12     | 16 | 57  | 70.6  | 45 | 1.01 | 7   | K TCD D060-D099 |
| <b>075-079-12T3-8D</b>     | 7.5-7.9        | 12     | 16 | 61  | 74.6  | 45 | 1.10 | 7   |                 |
| <b>080-084-12T3-8D</b>     | 8.0-8.4        | 12     | 16 | 65  | 79.4  | 45 | 1.20 | 8   |                 |
| <b>085-089-12T3-8D</b>     | 8.5-8.9        | 12     | 16 | 69  | 83.4  | 45 | 1.29 | 8   |                 |
| <b>090-094-12T3-8D</b>     | 9.0-9.4        | 12     | 16 | 73  | 87.8  | 45 | 1.35 | 9   |                 |
| <b>095-099-12T3-8D</b>     | 9.5-9.9        | 12     | 16 | 77  | 91.8  | 45 | 1.44 | 9   |                 |
| <b>100-104-16T3-8D</b>     | 10.0-10.4      | 16     | 20 | 82  | 96.2  | 48 | 1.50 | 10  | K TCD D100-D199 |
| <b>105-109-16T3-8D</b>     | 10.5-10.9      | 16     | 20 | 86  | 100.2 | 48 | 1.59 | 10  |                 |
| <b>110-114-16T3-8D</b>     | 11.0-11.4      | 16     | 20 | 90  | 104.6 | 48 | 1.67 | 11  |                 |
| <b>115-119-16T3-8D</b>     | 11.5-11.9      | 16     | 20 | 94  | 108.6 | 48 | 1.76 | 11  |                 |
| <b>120-124-16T3-8D</b>     | 12.0-12.4      | 16     | 20 | 98  | 113.0 | 48 | 1.82 | 12  |                 |
| <b>125-129-16T3-8D</b>     | 12.5-12.9      | 16     | 20 | 102 | 117.0 | 48 | 1.91 | 12  |                 |
| <b>130-134-16T3-8D</b>     | 13.0-13.4      | 16     | 20 | 106 | 121.6 | 48 | 1.96 | 13  |                 |
| <b>135-139-16T3-8D</b>     | 13.5-13.9      | 16     | 20 | 110 | 125.6 | 48 | 2.05 | 13  |                 |
| <b>140-144-16T3-8D</b>     | 14.0-14.4      | 16     | 20 | 114 | 132.2 | 48 | 2.12 | 14  |                 |
| <b>145-149-16T3-8D</b>     | 14.5-14.9      | 16     | 20 | 118 | 136.2 | 48 | 2.21 | 14  |                 |
| <b>150-159-20T3-8D</b>     | 15.0-15.9      | 20     | 25 | 122 | 143.7 | 50 | 2.27 | 15  | K TCD D200-D269 |
| <b>160-169-20T3-8D</b>     | 16.0-16.9      | 20     | 25 | 130 | 153.3 | 50 | 2.42 | 16  |                 |
| <b>170-179-20T3-8D</b>     | 17.0-17.9      | 20     | 25 | 139 | 162.9 | 50 | 2.59 | 17  |                 |
| <b>180-189-25T2-8D</b>     | 18.0-18.9      | 25     | 32 | 147 | 172.5 | 56 | 2.73 | 18  |                 |
| <b>190-199-25T2-8D</b>     | 19.0-19.9      | 25     | 32 | 155 | 182.0 | 56 | 2.88 | 19  |                 |
| <b>200-209-25T2-8D</b>     | 20.0-20.9      | 25     | 32 | 163 | 191.6 | 56 | 3.02 | 20  |                 |
| <b>210-219-25T2-8D</b>     | 21.0-21.9      | 25     | 32 | 171 | 201.2 | 56 | 3.18 | 21  |                 |
| <b>220-229-25T2-8D</b>     | 22.0-22.9      | 25     | 32 | 179 | 210.8 | 56 | 3.24 | 22  |                 |
| <b>230-239-32T2-8D</b>     | 23.0-23.9      | 32     | 42 | 187 | 220.3 | 60 | 3.46 | 23  |                 |
| <b>240-249-32T2-8D</b>     | 24.0-24.9      | 32     | 42 | 196 | 229.9 | 60 | 3.62 | 24  |                 |
| <b>250-259-32T2-8D</b>     | 25.0-25.9      | 32     | 42 | 204 | 239.5 | 60 | 3.80 | 25  |                 |
|                            |                |        |    |     |       |    |      |     |                 |
|                            |                |        |    |     |       |    |      |     |                 |
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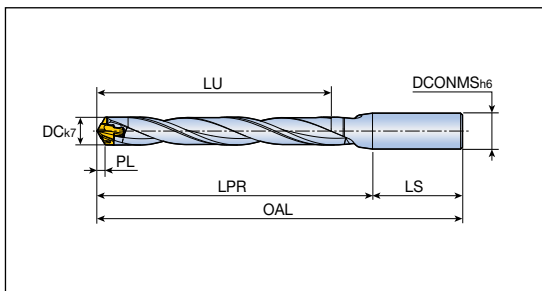


- It is recommended to make the pilot hole with a 1.5D holder
- OAL: LPR+LS
- SSC: Seat size code

## Head changeable drill holders - Cylindrical type shank



- Drilling depth: 8x diameter



| Designation                | Dimension (mm) |        |     |       |    |      |     | Clamping key    |
|----------------------------|----------------|--------|-----|-------|----|------|-----|-----------------|
|                            | DC             | DCONMS | LU  | LPR   | LS | PL   | SSC |                 |
| <b>TCD 060-064-12S0-8D</b> | 6.0-6.4        | 12     | 49  | 62.0  | 45 | 0.96 | 6   | K TCD D060-D099 |
| <b>065-069-12S0-8D</b>     | 6.5-6.9        | 12     | 53  | 66.3  | 45 | 1.18 | 6.5 |                 |
| <b>070-074-12S0-8D</b>     | 7.0-7.4        | 12     | 57  | 70.6  | 45 | 1.01 | 7   |                 |
| <b>075-079-12S0-8D</b>     | 7.5-7.9        | 12     | 61  | 74.6  | 45 | 1.10 | 7   |                 |
| <b>080-084-12S0-8D</b>     | 8.0-8.4        | 12     | 65  | 79.4  | 45 | 1.20 | 8   |                 |
| <b>085-089-12S0-8D</b>     | 8.5-8.9        | 12     | 69  | 83.4  | 45 | 1.29 | 8   |                 |
| <b>090-094-12S0-8D</b>     | 9.0-9.4        | 12     | 73  | 87.8  | 45 | 1.35 | 9   |                 |
| <b>095-099-12S0-8D</b>     | 9.5-9.9        | 12     | 77  | 91.8  | 45 | 1.44 | 9   |                 |
| <b>100-104-16S0-8D</b>     | 10.0-10.4      | 16     | 82  | 96.2  | 48 | 1.50 | 10  | K TCD D100-D199 |
| <b>105-109-16S0-8D</b>     | 10.5-10.9      | 16     | 86  | 100.2 | 48 | 1.59 | 10  |                 |
| <b>110-114-16S0-8D</b>     | 11.0-11.4      | 16     | 90  | 104.6 | 48 | 1.67 | 11  |                 |
| <b>115-119-16S0-8D</b>     | 11.5-11.9      | 16     | 94  | 108.6 | 48 | 1.76 | 11  |                 |
| <b>120-124-16S0-8D</b>     | 12.0-12.4      | 16     | 98  | 113.0 | 48 | 1.82 | 12  |                 |
| <b>125-129-16S0-8D</b>     | 12.5-12.9      | 16     | 102 | 117.0 | 48 | 1.91 | 12  |                 |
| <b>130-134-16S0-8D</b>     | 13.0-13.4      | 16     | 106 | 121.6 | 48 | 1.96 | 13  |                 |
| <b>135-139-16S0-8D</b>     | 13.5-13.9      | 16     | 110 | 125.6 | 48 | 2.05 | 13  |                 |
| <b>140-144-16S0-8D</b>     | 14.0-14.4      | 16     | 114 | 132.2 | 48 | 2.12 | 14  |                 |
| <b>145-149-16S0-8D</b>     | 14.5-14.9      | 16     | 118 | 136.2 | 48 | 2.21 | 14  |                 |
| <b>150-159-20S0-8D</b>     | 15.0-15.9      | 20     | 122 | 143.7 | 50 | 2.27 | 15  | K TCD D200-D269 |
| <b>160-169-20S0-8D</b>     | 16.0-16.9      | 20     | 130 | 153.3 | 50 | 2.42 | 16  |                 |
| <b>170-179-20S0-8D</b>     | 17.0-17.9      | 20     | 139 | 162.9 | 50 | 2.59 | 17  |                 |
| <b>180-189-25S0-8D</b>     | 18.0-18.9      | 25     | 147 | 172.5 | 56 | 2.73 | 18  |                 |
| <b>190-199-25S0-8D</b>     | 19.0-19.9      | 25     | 155 | 182.0 | 56 | 2.88 | 19  |                 |
| <b>200-209-25S0-8D</b>     | 20.0-20.9      | 25     | 163 | 191.6 | 56 | 3.02 | 20  |                 |
| <b>210-219-25S0-8D</b>     | 21.0-21.9      | 25     | 171 | 201.2 | 56 | 3.18 | 21  |                 |
| <b>220-229-25S0-8D</b>     | 22.0-22.9      | 25     | 179 | 210.8 | 56 | 3.24 | 22  |                 |
| <b>230-239-32S0-8D</b>     | 23.0-23.9      | 32     | 187 | 220.3 | 60 | 3.46 | 23  |                 |
| <b>240-249-32S0-8D</b>     | 24.0-24.9      | 32     | 196 | 229.9 | 60 | 3.62 | 24  |                 |
| <b>250-259-32S0-8D</b>     | 25.0-25.9      | 32     | 204 | 239.5 | 60 | 3.80 | 25  |                 |
|                            |                |        |     |       |    |      |     |                 |
|                            |                |        |     |       |    |      |     |                 |
|                            |                |        |     |       |    |      |     |                 |
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|                            |                |        |     |       |    |      |     |                 |



D204-D216

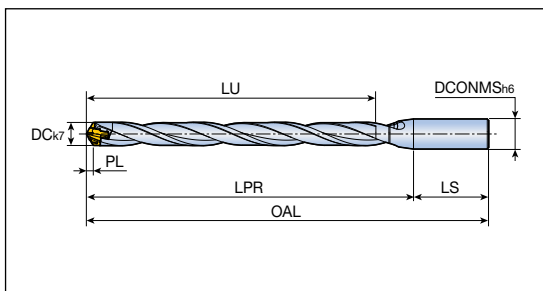


D258

- It is recommended to make the pilot hole with a 1.5D holder
- OAL: LPR+LS
- SSC: Seat size code

# DRILL RUSH

- 



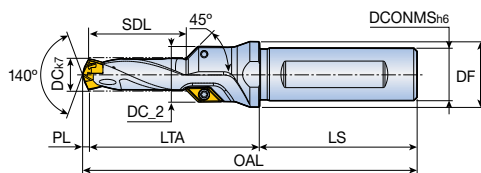
D204-D216



- ▶ It is recommended to make the pilot hole with a 1.5D holder
- ▶ OAL: LPR+LS
- ▶ SSC: Seat size code



## Head changeable drill holders for pre-thread hole



| Designation               | ISO thread | DC   | Dimension (mm) |       |    |      |        |    |      | Drill dia. range | Insert                                                                                                   |
|---------------------------|------------|------|----------------|-------|----|------|--------|----|------|------------------|----------------------------------------------------------------------------------------------------------|
|                           |            |      | SDL            | LTA   | LS | DC_2 | DCONMS | DF | PL   |                  |                                                                                                          |
| <b>TCD 068x21x12T3-M8</b> | M8         | 6.8  | 21             | 43.77 | 45 | 13.5 | 12     | 16 | 1.23 | 6.5-6.9          | AOMT 06...-C45<br> D217 |
| <b>085x26x12T3-M10</b>    | M10        | 8.5  | 26             | 48.71 | 45 | 15.5 | 12     | 16 | 1.29 | 8.5-8.9          |                                                                                                          |
| <b>102x30x16T3-M12</b>    | M12        | 10.2 | 30             | 52.46 | 48 | 17.0 | 16     | 20 | 1.54 | 10.0-10.4        |                                                                                                          |
| <b>120x35x16T3-M14</b>    | M14        | 12.0 | 35             | 59.18 | 48 | 19.0 | 16     | 20 | 1.82 | 12.0-12.4        |                                                                                                          |
| <b>140x39x20T3-M16</b>    | M16        | 14.0 | 39             | 66.88 | 50 | 21.0 | 20     | 25 | 2.12 | 14.0-14.4        |                                                                                                          |
| <b>175x42x20T3-M20</b>    | M20        | 17.5 | 42             | 69.32 | 50 | 24.5 | 20     | 27 | 2.68 | 17.0-17.9        |                                                                                                          |
| <b>210x48x25T2-M24</b>    | M24        | 21.0 | 48             | 76.82 | 56 | 28.0 | 25     | 32 | 3.18 | 21.0-21.9        |                                                                                                          |

► OAL: LTA+LS+PL

## Spare parts

| Designation          | Screw     | Wrench | Clamping key    |  |
|----------------------|-----------|--------|-----------------|--|
|                      |           |        |                 |  |
| <b>TCD 068</b>       | TS 22046I | TD 7   | K TCD D060-D099 |  |
| <b>TCD 085</b>       | TS 22046I | TD 7   | K TCD D060-D099 |  |
| <b>TCD 102 - 175</b> | TS 22046I | TD 7   | K TCD D100-D199 |  |
| <b>TCD 210</b>       | TS 22046I | TD 7   | K TCD D200-D269 |  |
|                      |           |        |                 |  |
|                      |           |        |                 |  |



D204-D216



D127



D258

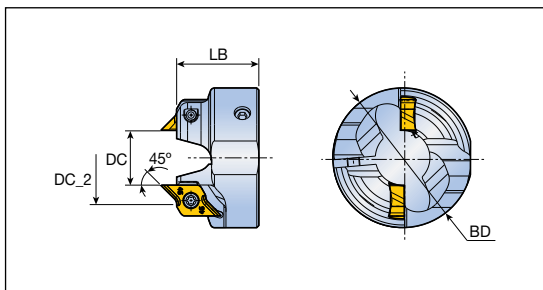
## Plug for coolant supply in a stationary machines

TaeguTec supplies special plugs with an internal thread for coolant connections used on lathes that can be pressed into the cavity on the back end of the shank.

| Description | Shank diameter | Internal thread |
|-------------|----------------|-----------------|
| PL-TCD-12   | 12             | G 1/16          |
| PL-TCD-16   | 16             | G 1/16          |
| PL-TCD-20   | 20             | G 1/8           |
| PL-TCD-25   | 25             | G 1/8           |
| PL-TCD-32   | 32             | G 1/8           |



## Chamfering ring tools



| Designation         | Dimension (mm) |       |    |    | Chamfer size | Chamfer insert          |
|---------------------|----------------|-------|----|----|--------------|-------------------------|
|                     | DC             | DC_2  | BD | LB |              |                         |
| <b>CFR D100-A45</b> | 9.8            | 16.56 | 34 | 20 | 2.5          | CRNG 08...-45CD<br>D217 |
| <b>D105-A45</b>     | 10.3           | 17.06 | 34 | 20 | 2.5          |                         |
| <b>D110-A45</b>     | 10.8           | 17.56 | 34 | 20 | 2.5          |                         |
| <b>D115-A45</b>     | 11.3           | 18.06 | 34 | 20 | 2.5          |                         |
| <b>D120-A45</b>     | 11.8           | 18.56 | 34 | 20 | 2.5          |                         |
| <b>D125-A45</b>     | 12.3           | 19.06 | 34 | 20 | 2.5          |                         |
| <b>D130-A45</b>     | 12.8           | 19.56 | 34 | 20 | 2.5          |                         |
| <b>D135-A45</b>     | 13.3           | 20.06 | 34 | 20 | 2.5          |                         |
| <b>D140-A45</b>     | 13.8           | 20.56 | 38 | 22 | 2.5          |                         |
| <b>D145-A45</b>     | 14.3           | 21.06 | 38 | 22 | 2.5          |                         |
| <b>D150-A45</b>     | 14.6           | 21.36 | 38 | 22 | 2.5          |                         |
| <b>D160-A45</b>     | 15.6           | 22.36 | 42 | 23 | 2.5          |                         |
| <b>D170-A45</b>     | 16.6           | 23.36 | 42 | 23 | 2.5          |                         |
| <b>D180-A45</b>     | 17.6           | 24.36 | 42 | 23 | 2.5          |                         |
| <b>D190-A45</b>     | 18.6           | 25.36 | 42 | 24 | 2.5          |                         |
| <b>D200-A45</b>     | 19.6           | 26.36 | 42 | 24 | 2.5          |                         |
| <b>D210-A45</b>     | 20.6           | 27.36 | 47 | 24 | 2.5          |                         |
| <b>D220-A45</b>     | 21.6           | 28.36 | 47 | 24 | 2.5          |                         |
| <b>D230-A45</b>     | 22.6           | 29.36 | 47 | 24 | 2.5          |                         |
| <b>D240-A45</b>     | 23.6           | 30.36 | 47 | 24 | 2.5          |                         |
| <b>D250-A45</b>     | 24.6           | 31.36 | 47 | 24 | 2.5          |                         |

## Spare parts

| Designation            | Insert screw | Wrench | Clamping screw              | L-wrench |
|------------------------|--------------|--------|-----------------------------|----------|
|                        |              |        |                             |          |
| <b>CFR D100 - D135</b> | SO 25065I    | TD 7   | SH M3x0.5x10 <sup>(1)</sup> | L-W2.5   |
| <b>CFR D140 - D150</b> | SO 25065I    | TD 7   | SH M4x0.7x12 <sup>(2)</sup> | L-W3     |
| <b>CFR D160 - D250</b> | SO 25065I    | TD 7   | SH M5x0.8x16 <sup>(3)</sup> | L-W4     |
|                        |              |        |                             |          |
|                        |              |        |                             |          |
|                        |              |        |                             |          |



► <sup>(1)</sup> Clamping torque: 2-3 [N·m] <sup>(2)</sup> Clamping torque: 3.5-4.5 [N·m] <sup>(3)</sup> Clamping torque: 5-6 [N·m]

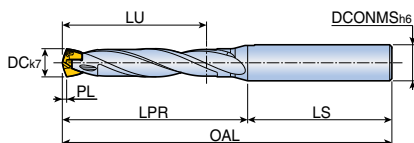
## TCD...A0-3D/5D/8D



## Head changeable drill holders - Cylindrical type shank



- Drilling depth:  $3/5/8 \times \text{diameter}$

[illegible]

D204-216



D258

► OAL: LPR+LS

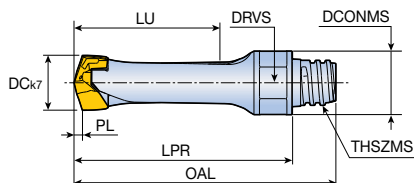
- ▶ SSC: Seat size code



**WINDRILL**  
ADVANCED MACHINING



- 

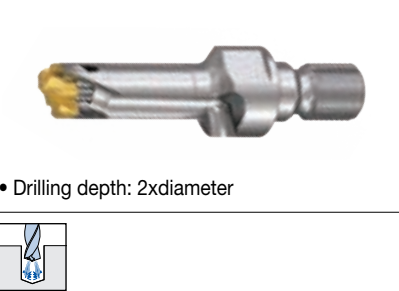
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- ▶ SSC: Seat size code
- ▶ Matched with MAXI-RUSH holder

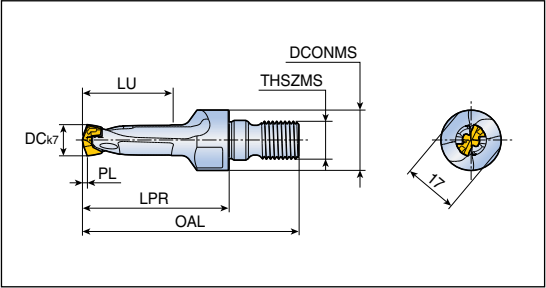
# TCDM...-M12-2D



Head changeable drill holder with T-FLEXTEC type shank



- Drilling depth: 2xdiameter



| Designation                | Dimension (mm) |        |      |      |     |      |        |     | Clamping key    |
|----------------------------|----------------|--------|------|------|-----|------|--------|-----|-----------------|
|                            | DC             | DCONMS | LU   | LPR  | PL  | OAL  | THSZMS | SSC |                 |
| <b>TCDM 100-104-M12-2D</b> | 10.0-10.4      | 19     | 28.7 | 46.2 | 1.5 | 68.2 | M12    | 10  | K TCD D100-D199 |
| <b>105-109-M12-2D</b>      | 10.5-10.9      | 19     | 29.7 | 47.2 | 1.6 | 69.2 | M12    | 10  |                 |
| <b>110-114-M12-2D</b>      | 11.0-11.4      | 19     | 31.1 | 48.6 | 1.7 | 70.6 | M12    | 11  |                 |
| <b>115-119-M12-2D</b>      | 11.5-11.9      | 19     | 32.1 | 49.6 | 1.8 | 71.6 | M12    | 11  |                 |
| <b>120-124-M12-2D</b>      | 12.0-12.4      | 19     | 33.5 | 51.0 | 1.8 | 73.0 | M12    | 12  |                 |
| <b>125-129-M12-2D</b>      | 12.5-12.9      | 19     | 34.5 | 52.0 | 1.9 | 74.0 | M12    | 12  |                 |
| <b>130-134-M12-2D</b>      | 13.0-13.4      | 19     | 36.1 | 53.6 | 2.0 | 75.6 | M12    | 13  |                 |
| <b>135-139-M12-2D</b>      | 13.5-13.9      | 19     | 37.1 | 54.6 | 2.1 | 76.6 | M12    | 13  |                 |
| <b>140-144-M12-2D</b>      | 14.0-14.4      | 19     | 38.7 | 56.2 | 2.1 | 78.2 | M12    | 14  |                 |
| <b>145-149-M12-2D</b>      | 14.5-14.9      | 19     | 39.7 | 57.2 | 2.2 | 79.2 | M12    | 14  |                 |
| <b>150-159-M12-2D</b>      | 15.0-15.9      | 19     | 41.2 | 58.7 | 2.3 | 80.7 | M12    | 15  |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
|                            |                |        |      |      |     |      |        |     |                 |
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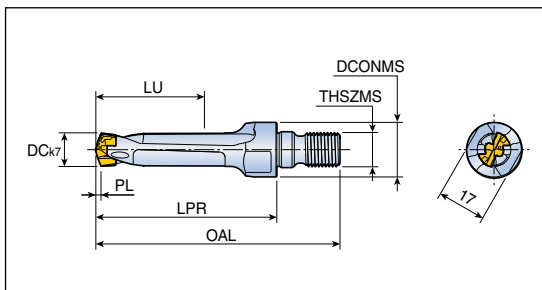
- ▶ SSC: Seat size code
- ▶ Matched with T-FLEXTEC holder



**WINDRILL**  
ADVANCED MACHINING



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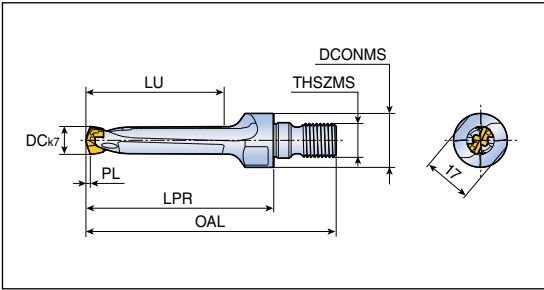
# TCDM...-M12-4D



Head changeable drill holder with T-FLEXTEC type shank



- Drilling depth: 4x diameter



| Designation                | Dimension (mm) |        |      |      |     |       |        |     | Clamping key    |
|----------------------------|----------------|--------|------|------|-----|-------|--------|-----|-----------------|
|                            | DC             | DCONMS | LU   | LPR  | PL  | OAL   | THSZMS | SSC |                 |
| <b>TCDM 100-104-M12-4D</b> | 10.0-10.4      | 19     | 48.7 | 66.2 | 1.5 | 88.2  | M12    | 10  | K TCD D100-D199 |
| <b>105-109-M12-4D</b>      | 10.5-10.9      | 19     | 50.7 | 68.2 | 1.6 | 90.2  | M12    | 10  |                 |
| <b>110-114-M12-4D</b>      | 11.0-11.4      | 19     | 53.1 | 70.6 | 1.7 | 92.6  | M12    | 11  |                 |
| <b>115-119-M12-4D</b>      | 11.5-11.9      | 19     | 55.1 | 72.6 | 1.8 | 94.6  | M12    | 11  |                 |
| <b>120-124-M12-4D</b>      | 12.0-12.4      | 19     | 57.5 | 75.0 | 1.8 | 97.0  | M12    | 12  |                 |
| <b>125-129-M12-4D</b>      | 12.5-12.9      | 19     | 59.5 | 77.0 | 1.9 | 99.0  | M12    | 12  |                 |
| <b>130-134-M12-4D</b>      | 13.0-13.4      | 19     | 62.1 | 79.6 | 2.0 | 101.6 | M12    | 13  |                 |
| <b>135-139-M12-4D</b>      | 13.5-13.9      | 19     | 64.1 | 81.6 | 2.1 | 103.6 | M12    | 13  |                 |
| <b>140-144-M12-4D</b>      | 14.0-14.4      | 19     | 66.7 | 84.2 | 2.1 | 106.2 | M12    | 14  |                 |
| <b>145-149-M12-4D</b>      | 14.5-14.9      | 19     | 68.7 | 86.2 | 2.2 | 108.2 | M12    | 14  |                 |
| <b>150-159-M12-4D</b>      | 15.0-15.9      | 19     | 71.2 | 88.7 | 2.3 | 110.7 | M12    | 15  |                 |

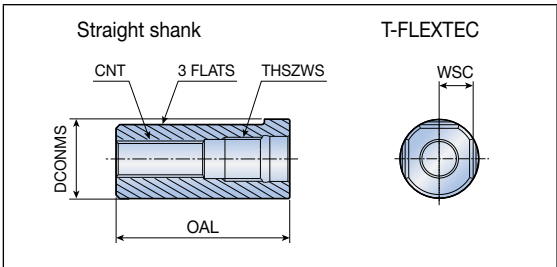


- ▶ SSC: Seat size code
- ▶ Matched with T-FLEXTEC holder

## TFLEX-TCD-M12

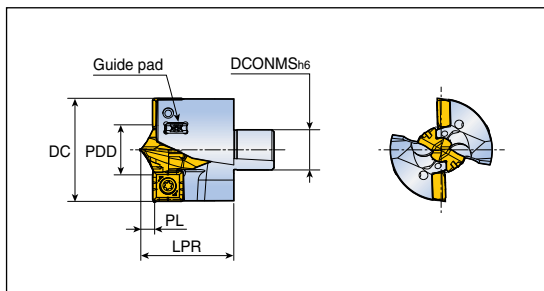


T-FLEXTEC shank



| Designation                 | Dimension (mm) |        |     |     | CNT      |
|-----------------------------|----------------|--------|-----|-----|----------|
|                             | THSZWS         | DCONMS | OAL | WSC |          |
| <b>TFLEX 160X36-TCD-M12</b> | M12            | 16     | 36  | 7.5 | UNF 5/16 |
| <b>190X36-TCD-M12</b>       | M12            | 19.05  | 36  | 8.5 | UNF 5/16 |
| <b>200X36-TCD-M12</b>       | M12            | 20     | 36  | 8.5 | G 1/8    |
| <b>220X48-TCD-M12</b>       | M12            | 22     | 48  | 9.5 | G 1/8    |
| <b>250X54-TCD-M12</b>       | M12            | 25     | 54  | 11  | G 1/8    |
| <b>254X54-TCD-M12</b>       | M12            | 25.4   | 54  | 11  | G 1/8    |

## Modular drill heads



| Designation             | Dimension (mm) |        |      |      |      | Clamping Key     | Insert        |              |
|-------------------------|----------------|--------|------|------|------|------------------|---------------|--------------|
|                         | DC             | DCONMS | LPR  | PL   | PDD  |                  | Center        | Outer        |
| <b>TNDH 2600-C26-TP</b> | 26             | 10.4   | 24.9 | 3.98 | 15.9 | K TCD D15-D16 CO | TCD-159-P-CO+ | SPGX 06...DW |
| <b>2700-C26-TP</b>      | 27             | 10.4   | 25.4 | 4.14 | 16.9 | K TCD D15-D16 CO | TCD-169-P-CO+ | D218         |
| <b>2800-C28-TP</b>      | 28             | 11.2   | 26.9 | 4.29 | 17.9 | K TCD D17-D19 CO | TCD-179-P-CO+ |              |
| <b>2900-C28-TP</b>      | 29             | 11.2   | 26.6 | 3.97 | 15.9 | K TCD D15-D16 CO | TCD-159-P-CO+ | SPGX 07...DW |
| <b>3000-C30-TP</b>      | 30             | 12.0   | 28.3 | 4.14 | 16.9 | K TCD D15-D16 CO | TCD-169-P-CO+ | D218         |
| <b>3100-C30-TP</b>      | 31             | 12.0   | 28.5 | 4.30 | 17.9 | K TCD D17-D19 CO | TCD-179-P-CO+ |              |
| <b>3200-C32-TP</b>      | 32             | 12.8   | 30.3 | 4.46 | 18.9 | K TCD D17-D19 CO | TCD-189-P-CO+ | SPGX 09...DW |
| <b>3300-C32-TP</b>      | 33             | 12.8   | 29.8 | 3.97 | 15.9 | K TCD D15-D16 CO | TCD-159-P-CO+ |              |
| <b>3400-C34-TP</b>      | 34             | 13.6   | 31.6 | 4.14 | 16.9 | K TCD D15-D16 CO | TCD-169-P-CO+ | D218         |
| <b>3500-C34-TP</b>      | 35             | 13.6   | 31.8 | 4.30 | 17.9 | K TCD D17-D19 CO | TCD-179-P-CO+ |              |
| <b>3600-C36-TP</b>      | 36             | 14.4   | 33.5 | 4.46 | 18.9 | K TCD D17-D19 CO | TCD-189-P-CO+ | SPGX 11...DW |
| <b>3700-C36-TP</b>      | 37             | 14.4   | 33.3 | 4.14 | 16.9 | K TCD D15-D16 CO | TCD-169-P-CO+ |              |
| <b>3800-C38-TP</b>      | 38             | 15.2   | 35.0 | 4.30 | 17.9 | K TCD D17-D19 CO | TCD-179-P-CO+ | D218         |
| <b>3900-C38-TP</b>      | 39             | 15.2   | 35.2 | 4.46 | 18.9 | K TCD D17-D19 CO | TCD-189-P-CO+ |              |
| <b>4000-C40-TP</b>      | 40             | 16.0   | 36.9 | 4.62 | 19.9 | K TCD D17-D19 CO | TCD-199-P-CO+ | SPGX 11...DW |
| <b>4100-C40-TP</b>      | 41             | 16.0   | 37.1 | 4.78 | 20.9 | K TCD D20-D21 CO | TCD-209-P-CO+ |              |
| <b>4200-C42-TP</b>      | 42             | 16.8   | 38.9 | 4.95 | 21.9 | K TCD D20-D21 CO | TCD-219-P-CO+ | D218         |
| <b>4300-C42-TP</b>      | 43             | 16.8   | 38.9 | 5.11 | 22.9 | K TCD D22-D23 CO | TCD-229-P-CO+ |              |
|                         |                |        |      |      |      |                  |               |              |
|                         |                |        |      |      |      |                  |               |              |

▶ DCONMS: Holder connection size

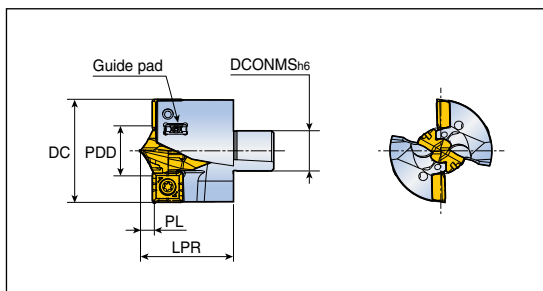
▶ Guide pad is sold separately from drill head

## Spare parts

| Designation           | For double pitch screw |         | For SPGX     |         | For Guide pad  |         |
|-----------------------|------------------------|---------|--------------|---------|----------------|---------|
|                       | Screw1                 | Wrench1 | Screw2       | Wrench2 | Screw3         | Wrench3 |
|                       |                        |         |              |         |                |         |
| <b>TNDH 2600-2800</b> | TDPS 0512-T7           | TD 7    | TS 220521/HG | TD 7    | TS 200431/HG-P | TD 6P   |
| <b>TNDH 2900-3200</b> | TDPS 0512-T7           | TD 7    | TS 250641    | TD 8    | TS 200431/HG-P | TD 6P   |
| <b>TNDH 3300-3500</b> | TDPS 0512-T7           | TD 7    | TS 350881    | TD 10   | TS 200431/HG-P | TD 6P   |
| <b>TNDH 3600</b>      | TDPS 0618-T8           | TD 8    | TS 350881    | TD 10   | TS 200431/HG-P | TD 6P   |
| <b>TNDH 3700-4300</b> | TDPS 0618-T8           | TD 8    | TS 400931    | TD 15   | TS 200431/HG-P | TD 6P   |







- ▶ DCONMS: Holder connection size
- ▶ Guide pad is sold separately from drill head

| Designation           | For double pitch screw                                                              |                                                                                     | For SPGX                                                                            |                                                                                     | For Guide pad                                                                       |                                                                                     |
|-----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                       | Screw1                                                                              | Wrench1                                                                             | Screw2                                                                              | Wrench2                                                                             | Screw3                                                                              | Wrench3                                                                             |
|                       |  |  |  |  |  |  |
| <b>TNDH 4400-4500</b> | TDPS 0722-W3.0                                                                      | F-W3.0                                                                              | TS 40093I                                                                           | TD 15                                                                               | TS 20043I/HG-P                                                                      | TD 6P                                                                               |
| <b>TNDH 4600-5000</b> | TDPS 0722-W3.0                                                                      | F-W3.0                                                                              | SO 50090I                                                                           | TD 20                                                                               | TS 20043I/HG-P                                                                      | TD 6P                                                                               |
|                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



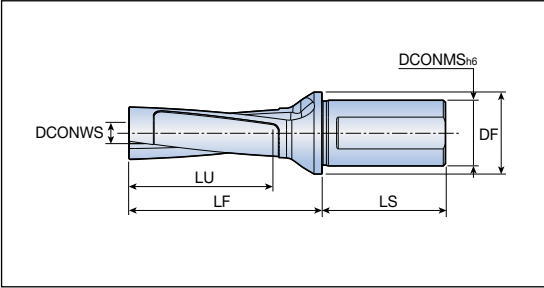
MDB...T2-3



Modular drill holders - Weldon type shank



- Drilling depth: 3xdiameter



| Designation               | Dimension (mm) |        |        |    |     |       |    |
|---------------------------|----------------|--------|--------|----|-----|-------|----|
|                           | DC             | DCONWS | DCONMS | DF | LU  | LF    | LS |
| MDB D26/27-081-32T2-C26-3 | 26-27          | 10.4   | 32     | 40 | 60  | 94.3  | 60 |
| D28/29-087-32T2-C28-3     | 28-29          | 11.2   | 32     | 40 | 64  | 100.5 | 60 |
| D30/31-093-32T2-C30-3     | 30-31          | 12.0   | 32     | 40 | 69  | 105.5 | 60 |
| D32/33-099-32T2-C32-3     | 32-33          | 12.8   | 32     | 40 | 73  | 111.7 | 60 |
| D34/35-105-40T2-C34-3     | 34-35          | 13.6   | 40     | 50 | 78  | 120.2 | 68 |
| D36/37-111-40T2-C36-3     | 36-37          | 14.4   | 40     | 50 | 82  | 126.5 | 68 |
| D38/39-117-40T2-C38-3     | 38-39          | 15.2   | 40     | 50 | 86  | 131.4 | 68 |
| D40/41-123-40T2-C40-3     | 40-41          | 16.0   | 40     | 50 | 91  | 137.6 | 68 |
| D42/43-129-40T2-C42-3     | 42-43          | 16.8   | 40     | 50 | 95  | 143.8 | 68 |
| D44/45-135-40T2-C44-3     | 44-45          | 17.6   | 40     | 50 | 99  | 150.0 | 68 |
| D46/47-141-50T2-C46-3     | 46-47          | 18.4   | 50     | 60 | 104 | 154.5 | 80 |
| D48/50-150-50T2-C48-3     | 48-50          | 19.2   | 50     | 60 | 111 | 160.9 | 80 |
|                           |                |        |        |    |     |       |    |
|                           |                |        |        |    |     |       |    |
|                           |                |        |        |    |     |       |    |
|                           |                |        |        |    |     |       |    |
|                           |                |        |        |    |     |       |    |

- DC: Cutting diameter range
- DCONWS: Modular head connection size
- Refer to the Modular head information on page D75-D76

Spare parts

| Designation         | Wrench         | Wrench handle |  |  |
|---------------------|----------------|---------------|--|--|
|                     |                |               |  |  |
| MDB D26/27-D34/35-3 | BLD H-W2.5x210 | SW6-T-SH      |  |  |
| MDB D36/37-D42/43-3 | BLD H-W3.0x225 | SW6-T-SH      |  |  |
| MDB D44/45-D48/50-3 | BLD H-W4.0x255 | SW6-T-SH      |  |  |
|                     |                |               |  |  |
|                     |                |               |  |  |
|                     |                |               |  |  |

- Wrench: Disassemble the modular head from the modular body (Insert from the rear shank)

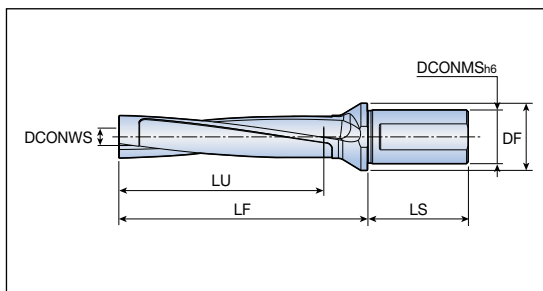


# MDB...T2-5

## Modular drill holders - Weldon type shank



- Drilling depth: 5x diameter



| Designation                      | Dimension (mm) |        |        |    |     |       |    |
|----------------------------------|----------------|--------|--------|----|-----|-------|----|
|                                  | DC             | DCONWS | DCONMS | DF | LU  | LF    | LS |
| <b>MDB D26/27-135-32T2-C26-5</b> | 26-27          | 10.4   | 32     | 40 | 114 | 148.3 | 60 |
| <b>D28/29-145-32T2-C28-5</b>     | 28-29          | 11.2   | 32     | 40 | 122 | 158.5 | 60 |
| <b>D30/31-155-32T2-C30-5</b>     | 30-31          | 12.0   | 32     | 40 | 131 | 167.5 | 60 |
| <b>D32/33-165-32T2-C32-5</b>     | 32-33          | 12.8   | 32     | 40 | 139 | 177.7 | 60 |
| <b>D34/35-175-40T2-C34-5</b>     | 34-35          | 13.6   | 40     | 50 | 148 | 190.2 | 68 |
| <b>D36/37-185-40T2-C36-5</b>     | 36-37          | 14.4   | 40     | 50 | 156 | 200.5 | 68 |
| <b>D38/39-195-40T2-C38-5</b>     | 38-39          | 15.2   | 40     | 50 | 164 | 209.4 | 68 |
| <b>D40/41-205-40T2-C40-5</b>     | 40-41          | 16.0   | 40     | 50 | 173 | 219.6 | 68 |
| <b>D42/43-215-40T2-C42-5</b>     | 42-43          | 16.8   | 40     | 50 | 181 | 229.8 | 68 |
| <b>D44/45-225-40T2-C44-5</b>     | 44-45          | 17.6   | 40     | 50 | 189 | 240.0 | 68 |
| <b>D46/47-235-50T2-C46-5</b>     | 46-47          | 18.4   | 50     | 60 | 198 | 248.5 | 80 |
| <b>D48/50-250-50T2-C48-5</b>     | 48-50          | 19.2   | 50     | 60 | 211 | 258.9 | 80 |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |

- DC: Cutting diameter range
- DCONWS: Modular head connection size
- Refer to the Modular head information on page **D75-D76**

## Spare parts

| Designation                | Wrench         | Wrench handle |  |  |
|----------------------------|----------------|---------------|--|--|
|                            |                |               |  |  |
| <b>MDB D26/27-D34/35-5</b> | BLD H-W2.5x280 | SW6-T-SH      |  |  |
| <b>MDB D36/37-D42/43-5</b> | BLD H-W3.0x310 | SW6-T-SH      |  |  |
| <b>MDB D44/45-D48/50-5</b> | BLD H-W4.0x350 | SW6-T-SH      |  |  |
|                            |                |               |  |  |
|                            |                |               |  |  |
|                            |                |               |  |  |

- Wrench: Disassemble the modular head from the modular body (Insert from the rear shank)



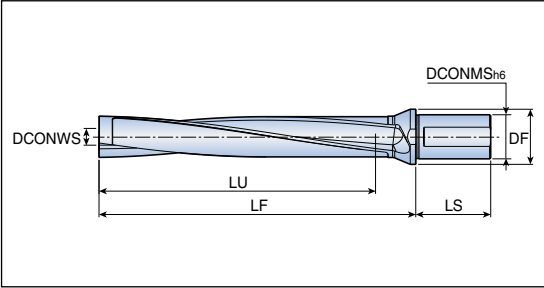
# MDB...T2-7



## Modular drill holders - Weldon type shank



- Drilling depth: 7x diameter



| Designation                      | Dimension (mm) |        |        |    |     |       |    |
|----------------------------------|----------------|--------|--------|----|-----|-------|----|
|                                  | DC             | DCONWS | DCONMS | DF | LU  | LF    | LS |
| <b>MDB D26/27-189-32T2-C26-7</b> | 26-27          | 10.4   | 32     | 40 | 168 | 202.3 | 60 |
| <b>D28/29-203-32T2-C28-7</b>     | 28-29          | 11.2   | 32     | 40 | 180 | 216.5 | 60 |
| <b>D30/31-217-32T2-C30-7</b>     | 30-31          | 12.0   | 32     | 40 | 193 | 229.5 | 60 |
| <b>D32/33-231-32T2-C32-7</b>     | 32-33          | 12.8   | 32     | 40 | 205 | 243.7 | 60 |
| <b>D34/35-245-40T2-C34-7</b>     | 34-35          | 13.6   | 40     | 50 | 218 | 260.2 | 68 |
| <b>D36/37-259-40T2-C36-7</b>     | 36-37          | 14.4   | 40     | 50 | 230 | 274.5 | 68 |
| <b>D38/39-273-40T2-C38-7</b>     | 38-39          | 15.2   | 40     | 50 | 242 | 287.4 | 68 |
| <b>D40/41-287-40T2-C40-7</b>     | 40-41          | 16.0   | 40     | 50 | 255 | 301.6 | 68 |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |
|                                  |                |        |        |    |     |       |    |

- DC: Cutting diameter range
- DCONWS: Modular head connection size
- Refer to the Modular head information on page **D75-D76**

### Spare parts

| Designation                | Wrench         | Wrench handle |  |  |
|----------------------------|----------------|---------------|--|--|
|                            |                |               |  |  |
| <b>MDB D26/27-7</b>        | BLD H-W2.5x280 | SW6-T-SH      |  |  |
| <b>MDB D28/29-D34/35-7</b> | BLD H-W2.5x350 | SW6-T-SH      |  |  |
| <b>MDB D36/37-D40/41-7</b> | BLD H-W3.0x400 | SW6-T-SH      |  |  |
|                            |                |               |  |  |
|                            |                |               |  |  |
|                            |                |               |  |  |

- Wrench: Disassemble the modular head from the modular body (Insert from the rear shank)



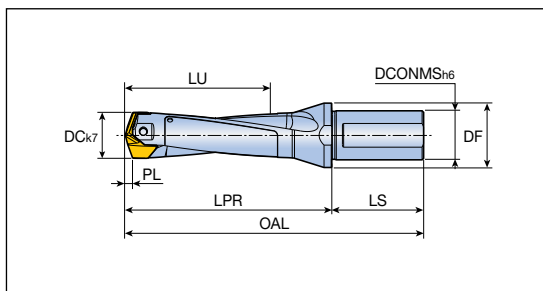
# LCD...T2-3D



## Head changeable drill holders - Weldon type shank



- Drilling depth: 3x diameter



| Designation                | Dimension (mm) |        |    |     |       |    |      |     |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|
|                            | DC             | DCONMS | DF | LU  | LPR   | LS | PL   | SSC |
| <b>LCD 200-209-25T2-3D</b> | 20.0-20.9      | 25     | 32 | 63  | 92.1  | 56 | 3.11 | 20  |
| <b>210-219-25T2-3D</b>     | 21.0-21.9      | 25     | 32 | 66  | 95.3  | 56 | 3.29 | 21  |
| <b>220-229-25T2-3D</b>     | 22.0-22.9      | 25     | 32 | 69  | 98.4  | 56 | 3.42 | 22  |
| <b>230-239-25T2-3D</b>     | 23.0-23.9      | 25     | 32 | 73  | 101.6 | 56 | 3.60 | 23  |
| <b>240-249-32T2-3D</b>     | 24.0-24.9      | 32     | 40 | 76  | 110.7 | 60 | 3.73 | 24  |
| <b>250-259-32T2-3D</b>     | 25.0-25.9      | 32     | 40 | 79  | 113.9 | 60 | 3.91 | 25  |
| <b>260-269-32T2-3D</b>     | 26.0-26.9      | 32     | 40 | 82  | 117.0 | 60 | 4.04 | 26  |
| <b>270-279-32T2-3D</b>     | 27.0-27.9      | 32     | 40 | 85  | 120.2 | 60 | 4.22 | 27  |
| <b>280-289-32T2-3D</b>     | 28.0-28.9      | 32     | 40 | 88  | 128.4 | 60 | 4.35 | 28  |
| <b>290-299-32T2-3D</b>     | 29.0-29.9      | 32     | 40 | 92  | 131.5 | 60 | 4.53 | 29  |
| <b>300-309-32T2-3D</b>     | 30.0-30.9      | 32     | 42 | 95  | 134.7 | 60 | 4.67 | 30  |
| <b>310-319-32T2-3D</b>     | 31.0-31.9      | 32     | 42 | 98  | 137.9 | 60 | 4.85 | 31  |
| <b>320-329-40T2-3D</b>     | 32.0-32.9      | 40     | 48 | 101 | 143.0 | 68 | 4.98 | 32  |
| <b>330-339-40T2-3D</b>     | 33.0-33.9      | 40     | 48 | 104 | 146.2 | 68 | 5.16 | 33  |
| <b>340-349-40T2-3D</b>     | 34.0-34.9      | 40     | 48 | 107 | 149.3 | 68 | 5.34 | 34  |
| <b>350-359-40T2-3D</b>     | 35.0-35.9      | 40     | 48 | 110 | 152.4 | 68 | 5.44 | 35  |
| <b>360-369-40T2-3D</b>     | 36.0-36.9      | 40     | 48 | 114 | 155.6 | 68 | 5.62 | 36  |
| <b>370-379-40T2-3D</b>     | 37.0-37.9      | 40     | 48 | 117 | 158.8 | 68 | 5.80 | 37  |
| <b>380-389-40T2-3D</b>     | 38.0-38.9      | 40     | 50 | 120 | 166.9 | 68 | 5.91 | 38  |
| <b>390-399-40T2-3D</b>     | 39.0-39.9      | 40     | 50 | 123 | 170.1 | 68 | 6.09 | 39  |
| <b>400-410-40T2-3D</b>     | 40.0-41.0      | 40     | 50 | 126 | 173.3 | 68 | 6.27 | 40  |

► OAL: LPR+LS    ► SSC: Seat size code

## Spare parts

| Designation           | Screw       | Wrench     | Wrench handle |  |
|-----------------------|-------------|------------|---------------|--|
| <b>LCD 200-219-3D</b> | TS 40178D25 | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 220-239-3D</b> | TS 40198D28 | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 240-259-3D</b> | TS 40210D3  | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 260-279-3D</b> | TS 50230D3  | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 280-299-3D</b> | TS 50250D35 | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 300-319-3D</b> | TS 60265D4  | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 320-349-3D</b> | TS 60285D42 | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 350-379-3D</b> | TS 60320D5  | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 380-410-3D</b> | TS 80340D6  | BLD T25/S7 | SW6-T-SH      |  |



D219-D223



D262

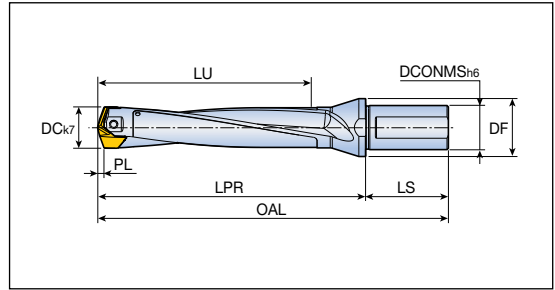
# LCD...T2-5D



## Head changeable drill holders - Weldon type shank



- Drilling depth: 5xdiameter



| Designation                | Dimension (mm) |        |    |     |       |    |      |     |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|
|                            | DC             | DCONMS | DF | LU  | LPR   | LS | PL   | SSC |
| <b>LCD 200-209-25T2-5D</b> | 20.0-20.9      | 25     | 32 | 103 | 132.1 | 56 | 3.11 | 20  |
| <b>210-219-25T2-5D</b>     | 21.0-21.9      | 25     | 32 | 108 | 137.3 | 56 | 3.29 | 21  |
| <b>220-229-25T2-5D</b>     | 22.0-22.9      | 25     | 32 | 113 | 142.4 | 56 | 3.42 | 22  |
| <b>230-239-25T2-5D</b>     | 23.0-23.9      | 25     | 32 | 119 | 147.6 | 56 | 3.60 | 23  |
| <b>240-249-32T2-5D</b>     | 24.0-24.9      | 32     | 40 | 124 | 158.7 | 60 | 3.73 | 24  |
| <b>250-259-32T2-5D</b>     | 25.0-25.9      | 32     | 40 | 129 | 163.9 | 60 | 3.91 | 25  |
| <b>260-269-32T2-5D</b>     | 26.0-26.9      | 32     | 40 | 134 | 169.0 | 60 | 4.04 | 26  |
| <b>270-279-32T2-5D</b>     | 27.0-27.9      | 32     | 40 | 139 | 174.2 | 60 | 4.22 | 27  |
| <b>280-289-32T2-5D</b>     | 28.0-28.9      | 32     | 40 | 144 | 184.4 | 60 | 4.35 | 28  |
| <b>290-299-32T2-5D</b>     | 29.0-29.9      | 32     | 40 | 150 | 189.5 | 60 | 4.53 | 29  |
| <b>300-309-32T2-5D</b>     | 30.0-30.9      | 32     | 42 | 155 | 194.7 | 60 | 4.67 | 30  |
| <b>310-319-32T2-5D</b>     | 31.0-31.9      | 32     | 42 | 160 | 199.9 | 60 | 4.85 | 31  |
| <b>320-329-40T2-5D</b>     | 32.0-32.9      | 40     | 48 | 165 | 207.0 | 68 | 4.98 | 32  |
| <b>330-339-40T2-5D</b>     | 33.0-33.9      | 40     | 48 | 170 | 212.2 | 68 | 5.16 | 33  |
| <b>340-349-40T2-5D</b>     | 34.0-34.9      | 40     | 48 | 175 | 217.3 | 68 | 5.34 | 34  |
| <b>350-359-40T2-5D</b>     | 35.0-35.9      | 40     | 48 | 180 | 222.4 | 68 | 5.44 | 35  |
| <b>360-369-40T2-5D</b>     | 36.0-36.9      | 40     | 48 | 186 | 227.6 | 68 | 5.62 | 36  |
| <b>370-379-40T2-5D</b>     | 37.0-37.9      | 40     | 48 | 191 | 232.8 | 68 | 5.80 | 37  |
| <b>380-389-40T2-5D</b>     | 38.0-38.9      | 40     | 50 | 196 | 242.9 | 68 | 5.91 | 38  |
| <b>390-399-40T2-5D</b>     | 39.0-39.9      | 40     | 50 | 201 | 248.1 | 68 | 6.09 | 39  |
| <b>400-410-40T2-5D</b>     | 40.0-41.0      | 40     | 50 | 206 | 253.3 | 68 | 6.27 | 40  |

► OAL: LPR+LS    ► SSC: Seat size code

## Spare parts

| Designation           | Screw       | Wrench     | Wrench handle |  |
|-----------------------|-------------|------------|---------------|--|
|                       |             |            |               |  |
| <b>LCD 200-219-5D</b> | TS 40178D25 | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 220-239-5D</b> | TS 40198D28 | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 240-259-5D</b> | TS 40210D3  | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 260-279-5D</b> | TS 50230D3  | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 280-299-5D</b> | TS 50250D35 | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 300-319-5D</b> | TS 60265D4  | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 320-349-5D</b> | TS 60285D42 | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 350-379-5D</b> | TS 60320D5  | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 380-410-5D</b> | TS 80340D6  | BLD T25/S7 | SW6-T-SH      |  |



D219-D223

D262

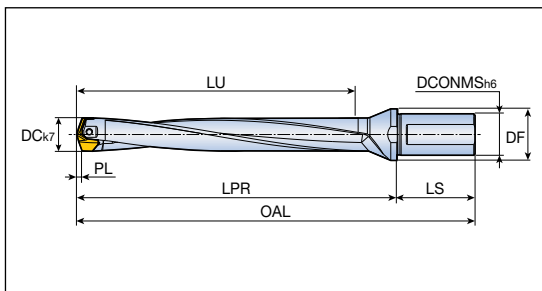
# LCD...T2-8D



## Head changeable drill holders - Weldon type shank



- Drilling depth: 8x diameter



| Designation                | Dimension (mm) |        |    |       |       |    |      |     |
|----------------------------|----------------|--------|----|-------|-------|----|------|-----|
|                            | DC             | DCONMS | DF | LU    | LPR   | LS | PL   | SSC |
| <b>LCD 200-209-25T2-8D</b> | 20.0-20.9      | 25     | 32 | 163.1 | 192.1 | 56 | 3.11 | 20  |
| <b>210-219-25T2-8D</b>     | 21.0-21.9      | 25     | 32 | 171.3 | 200.1 | 56 | 3.29 | 21  |
| <b>220-229-25T2-8D</b>     | 22.0-22.9      | 25     | 32 | 179.4 | 208.4 | 56 | 3.42 | 22  |
| <b>230-239-25T2-8D</b>     | 23.0-23.9      | 25     | 32 | 187.6 | 216.4 | 56 | 3.60 | 23  |
| <b>240-249-32T2-8D</b>     | 24.0-24.9      | 32     | 40 | 195.7 | 230.7 | 60 | 3.73 | 24  |
| <b>250-259-32T2-8D</b>     | 25.0-25.9      | 32     | 40 | 203.9 | 238.7 | 60 | 3.91 | 25  |
| <b>260-269-32T2-8D</b>     | 26.0-26.9      | 32     | 40 | 212.0 | 247.0 | 60 | 4.04 | 26  |
| <b>270-279-32T2-8D</b>     | 27.0-27.9      | 32     | 40 | 220.2 | 255.0 | 60 | 4.22 | 27  |
| <b>280-289-32T2-8D</b>     | 28.0-28.9      | 32     | 40 | 228.4 | 268.4 | 60 | 4.35 | 28  |
| <b>290-299-32T2-8D</b>     | 29.0-29.9      | 32     | 40 | 236.5 | 276.4 | 60 | 4.53 | 29  |
| <b>300-309-32T2-8D</b>     | 30.0-30.9      | 32     | 42 | 244.7 | 284.7 | 60 | 4.67 | 30  |
| <b>310-319-32T2-8D</b>     | 31.0-31.9      | 32     | 42 | 252.9 | 292.7 | 60 | 4.85 | 31  |
| <b>320-329-40T2-8D</b>     | 32.0-32.9      | 40     | 48 | 261.0 | 303.0 | 68 | 4.98 | 32  |
| <b>330-339-40T2-8D</b>     | 33.0-33.9      | 40     | 48 | 269.2 | 311.0 | 68 | 5.16 | 33  |
| <b>340-349-40T2-8D</b>     | 34.0-34.9      | 40     | 48 | 277.3 | 319.0 | 68 | 5.34 | 34  |
| <b>350-359-40T2-8D</b>     | 35.0-35.9      | 40     | 48 | 285.4 | 327.4 | 68 | 5.44 | 35  |
| <b>360-369-40T2-8D</b>     | 36.0-36.9      | 40     | 48 | 293.6 | 335.4 | 68 | 5.62 | 36  |
| <b>370-379-40T2-8D</b>     | 37.0-37.9      | 40     | 48 | 301.8 | 343.4 | 68 | 5.80 | 37  |
| <b>380-389-40T2-8D</b>     | 38.0-38.9      | 40     | 50 | 309.9 | 356.9 | 68 | 5.91 | 38  |
| <b>390-399-40T2-8D</b>     | 39.0-39.9      | 40     | 50 | 318.1 | 364.9 | 68 | 6.09 | 39  |
| <b>400-410-40T2-8D</b>     | 40.0-41.0      | 40     | 50 | 326.3 | 372.9 | 68 | 6.27 | 40  |

- OAL: LPR + LS    ► SSC: Seat size code    ► It is recommended to make the pilot hole with a 3D holder

## Spare parts

| Designation           | Screw       | Wrench     | Wrench handle |  |
|-----------------------|-------------|------------|---------------|--|
| <b>LCD 200-219-8D</b> | TS 40178D25 | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 220-239-8D</b> | TS 40198D28 | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 240-259-8D</b> | TS 40210D3  | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 260-279-8D</b> | TS 50230D3  | BLD T20/S7 | SW6-T-SH      |  |
| <b>LCD 280-299-8D</b> | TS 50250D35 | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 300-319-8D</b> | TS 60265D4  | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 320-349-8D</b> | TS 60285D42 | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 350-379-8D</b> | TS 60320D5  | BLD T25/S7 | SW6-T-SH      |  |
| <b>LCD 380-410-8D</b> | TS 80340D6  | BLD T25/S7 | SW6-T-SH      |  |



D219-D223

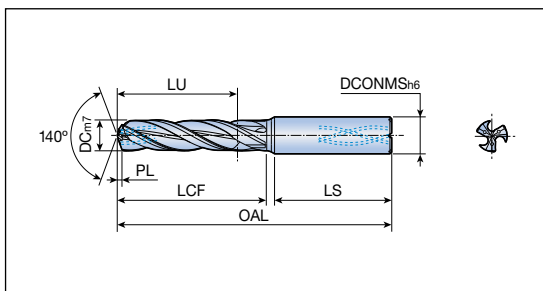


D262

# SOLID3DRILL



- 



Cutting Condition



D264

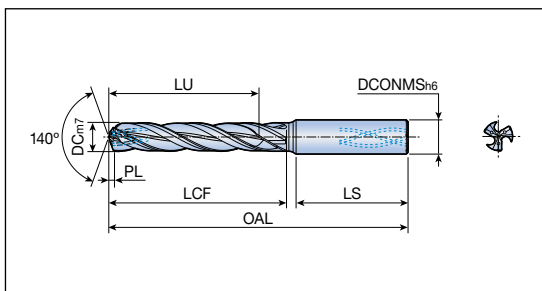




**3 flute solid carbide drills with oil holes**



- Drilling depth:  $5 \times \text{diameter}$



Cutting Condition



D264

●: Standard items

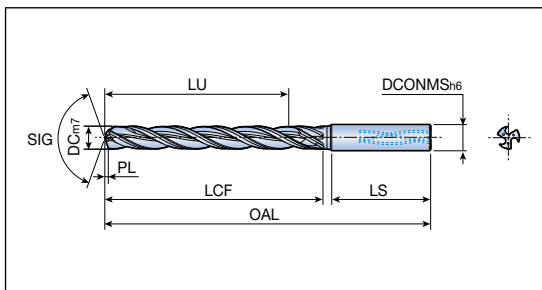
## 3HD...PI8



### 3 flute solid carbide drills with oil holes



- Drilling depth:  $8 \times \text{diameter}$

[illegible]

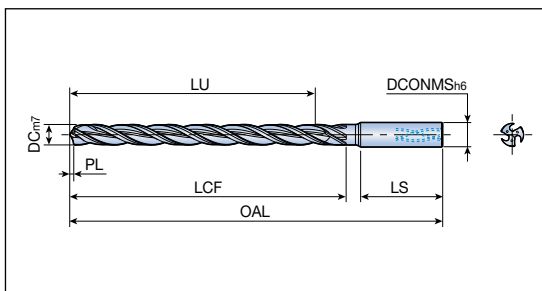
- ▶ Ø4.00-Ø8.00: SIG 140°
- ▶ Ø8.01-Ø12.00: SIG 130°

- : Standard items

**3 flute solid carbide drill with oil holes**



- Drilling depth: 12xdiameter

[illegible]

●: Standard items

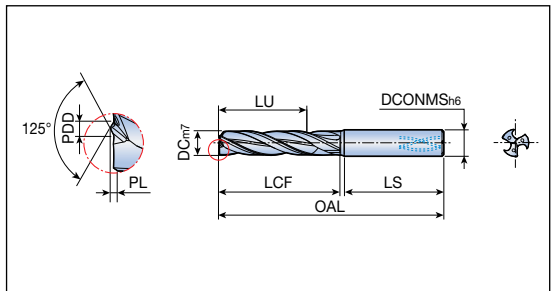
## 3HD...FI3



### 3 flute solid carbide drills for flat bottom holes



- Drilling depth:  $3 \times \text{diameter}$

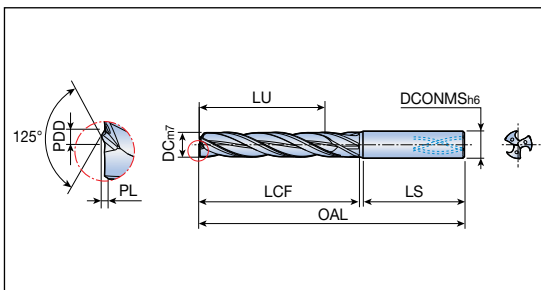
[illegible]

- : Standard items

### 3 flute solid carbide drills for flat bottom holes



- Drilling depth: 5xdiameter



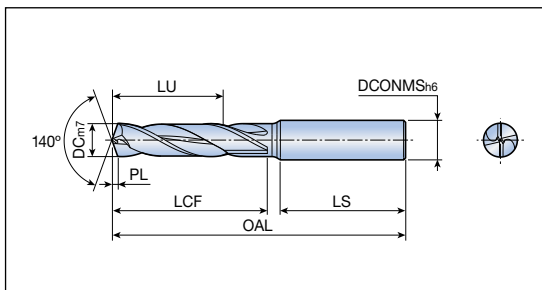
**ADVANCECUTTING**  
TaeguTec

- : Standard items

## Solid carbide drills without oil holes



- Drilling depth: 3xdiameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade  |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | TT9030 |
| <b>NHD 030-014-06 PE3</b> | 3.0            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>031-014-06 PE3</b>     | 3.1            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>032-014-06 PE3</b>     | 3.2            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>033-014-06 PE3</b>     | 3.3            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>034-014-06 PE3</b>     | 3.4            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>035-014-06 PE3</b>     | 3.5            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●      |
| <b>036-014-06 PE3</b>     | 3.6            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●      |
| <b>037-014-06 PE3</b>     | 3.7            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●      |
| <b>038-017-06 PE3</b>     | 3.8            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●      |
| <b>039-017-06 PE3</b>     | 3.9            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●      |
| <b>040-017-06 PE3</b>     | 4.0            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●      |
| <b>041-017-06 PE3</b>     | 4.1            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>042-017-06 PE3</b>     | 4.2            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>043-017-06 PE3</b>     | 4.3            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>044-017-06 PE3</b>     | 4.4            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>045-017-06 PE3</b>     | 4.5            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>046-017-06 PE3</b>     | 4.6            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>047-017-06 PE3</b>     | 4.7            | 6      | 66  | 17 | 25  | 35 | 0.8 | ●      |
| <b>048-020-06 PE3</b>     | 4.8            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>049-020-06 PE3</b>     | 4.9            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>050-020-06 PE3</b>     | 5.0            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>051-020-06 PE3</b>     | 5.1            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>052-020-06 PE3</b>     | 5.2            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>053-020-06 PE3</b>     | 5.3            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>054-020-06 PE3</b>     | 5.4            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>055-020-06 PE3</b>     | 5.5            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>056-020-06 PE3</b>     | 5.6            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>057-020-06 PE3</b>     | 5.7            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>058-020-06 PE3</b>     | 5.8            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>059-020-06 PE3</b>     | 5.9            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>060-020-06 PE3</b>     | 6.0            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>061-024-08 PE3</b>     | 6.1            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |
| <b>062-024-08 PE3</b>     | 6.2            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |
| <b>063-024-08 PE3</b>     | 6.3            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |
| <b>064-024-08 PE3</b>     | 6.4            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |

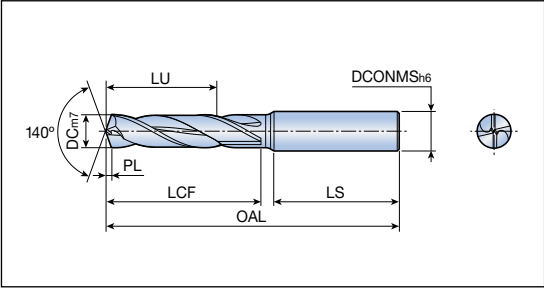
●: Standard items



Solid carbide drills without oil holes



• Drilling depth: 3xdiameter



| Designation        | Dimension (mm) |        |     |    |     |    |     | Grade  |
|--------------------|----------------|--------|-----|----|-----|----|-----|--------|
|                    | DC             | DCONMS | OAL | LU | LCF | LS | PL  | TT9030 |
| NHD 065-024-08 PE3 | 6.5            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |
| 066-024-08 PE3     | 6.6            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |
| 067-024-08 PE3     | 6.7            | 8      | 79  | 24 | 35  | 36 | 1.1 | ●      |
| 068-024-08 PE3     | 6.8            | 8      | 79  | 24 | 35  | 36 | 1.1 | ●      |
| 069-024-08 PE3     | 6.9            | 8      | 79  | 24 | 35  | 36 | 1.1 | ●      |
| 070-024-08 PE3     | 7.0            | 8      | 79  | 24 | 35  | 36 | 1.1 | ●      |
| 071-029-08 PE3     | 7.1            | 8      | 79  | 29 | 42  | 36 | 1.1 | ●      |
| 072-029-08 PE3     | 7.2            | 8      | 79  | 29 | 42  | 36 | 1.1 | ●      |
| 073-029-08 PE3     | 7.3            | 8      | 79  | 29 | 42  | 36 | 1.1 | ●      |
| 074-029-08 PE3     | 7.4            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●      |
| 075-029-08 PE3     | 7.5            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●      |
| 076-029-08 PE3     | 7.6            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●      |
| 077-029-08 PE3     | 7.7            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●      |
| 078-029-08 PE3     | 7.8            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●      |
| 079-029-08 PE3     | 7.9            | 8      | 79  | 29 | 42  | 36 | 1.3 | ●      |
| 080-029-08 PE3     | 8.0            | 8      | 79  | 29 | 42  | 36 | 1.3 | ●      |
| 081-035-10 PE3     | 8.1            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●      |
| 082-035-10 PE3     | 8.2            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●      |
| 083-035-10 PE3     | 8.3            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●      |
| 084-035-10 PE3     | 8.4            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●      |
| 085-035-10 PE3     | 8.5            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●      |
| 086-035-10 PE3     | 8.6            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●      |
| 087-035-10 PE3     | 8.7            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●      |
| 088-035-10 PE3     | 8.8            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●      |
| 089-035-10 PE3     | 8.9            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●      |
| 090-035-10 PE3     | 9.0            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●      |
| 091-035-10 PE3     | 9.1            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●      |
| 092-035-10 PE3     | 9.2            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●      |
| 093-035-10 PE3     | 9.3            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●      |
| 094-035-10 PE3     | 9.4            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●      |
| 095-035-10 PE3     | 9.5            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●      |
| 096-035-10 PE3     | 9.6            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●      |
| 097-035-10 PE3     | 9.7            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●      |
| 098-035-10 PE3     | 9.8            | 10     | 89  | 35 | 48  | 40 | 1.6 | ●      |
| 099-035-10 PE3     | 9.9            | 10     | 89  | 35 | 48  | 40 | 1.6 | ●      |

●: Standard items



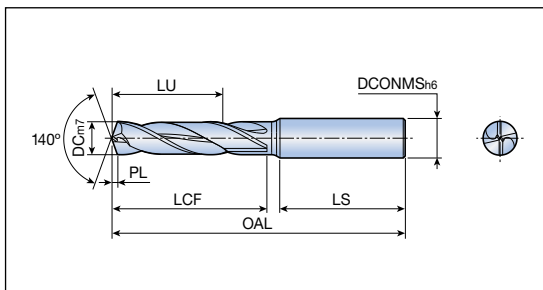
## NHD...PE3



## Solid carbide drills without oil holes



- Drilling depth:  $3 \times \text{diameter}$

[illegible]

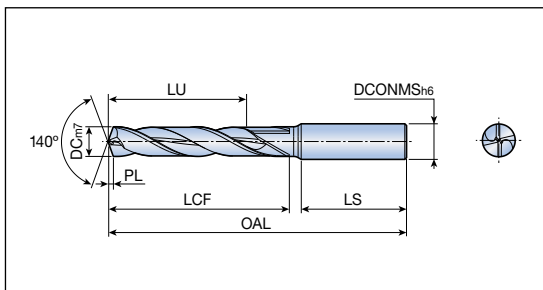
●: Standard items



## Solid carbide drills without oil holes



- Drilling depth: 5xdiameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade<br>TT9030 |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-----------------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  |                 |
| <b>NHD 030-023-06 PE5</b> | 3.0            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●               |
| <b>031-023-06 PE5</b>     | 3.1            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●               |
| <b>032-023-06 PE5</b>     | 3.2            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●               |
| <b>033-023-06 PE5</b>     | 3.3            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●               |
| <b>034-023-06 PE5</b>     | 3.4            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●               |
| <b>035-023-06 PE5</b>     | 3.5            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●               |
| <b>036-023-06 PE5</b>     | 3.6            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●               |
| <b>037-023-06 PE5</b>     | 3.7            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●               |
| <b>038-029-06 PE5</b>     | 3.8            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●               |
| <b>039-029-06 PE5</b>     | 3.9            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●               |
| <b>040-029-06 PE5</b>     | 4.0            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●               |
| <b>041-029-06 PE5</b>     | 4.1            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●               |
| <b>042-029-06 PE5</b>     | 4.2            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●               |
| <b>043-029-06 PE5</b>     | 4.3            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●               |
| <b>044-029-06 PE5</b>     | 4.4            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●               |
| <b>045-029-06 PE5</b>     | 4.5            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●               |
| <b>046-029-06 PE5</b>     | 4.6            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●               |
| <b>047-029-06 PE5</b>     | 4.7            | 6      | 74  | 29 | 37  | 35 | 0.8 | ●               |
| <b>048-035-06 PE5</b>     | 4.8            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●               |
| <b>049-035-06 PE5</b>     | 4.9            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●               |
| <b>050-035-06 PE5</b>     | 5.0            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●               |
| <b>051-035-06 PE5</b>     | 5.1            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●               |
| <b>052-035-06 PE5</b>     | 5.2            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●               |
| <b>053-035-06 PE5</b>     | 5.3            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●               |
| <b>054-035-06 PE5</b>     | 5.4            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●               |
| <b>055-035-06 PE5</b>     | 5.5            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●               |
| <b>056-035-06 PE5</b>     | 5.6            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●               |
| <b>057-035-06 PE5</b>     | 5.7            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●               |
| <b>058-035-06 PE5</b>     | 5.8            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●               |
| <b>059-035-06 PE5</b>     | 5.9            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●               |
| <b>060-035-06 PE5</b>     | 6.0            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●               |
| <b>061-043-08 PE5</b>     | 6.1            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●               |
| <b>062-043-08 PE5</b>     | 6.2            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●               |
| <b>063-043-08 PE5</b>     | 6.3            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●               |
| <b>064-043-08 PE5</b>     | 6.4            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●               |

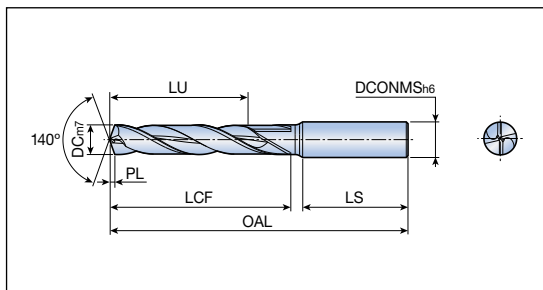
●: Standard items



## Solid carbide drills without oil holes



- Drilling depth: 5xdiameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade  |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | TT9030 |
| <b>NHD 065-043-08 PE5</b> | 6.5            | 8      | 91  | 43 | 54  | 36 | 1.0 | •      |
| <b>066-043-08 PE5</b>     | 6.6            | 8      | 91  | 43 | 54  | 36 | 1.0 | •      |
| <b>067-043-08 PE5</b>     | 6.7            | 8      | 91  | 43 | 54  | 36 | 1.1 | •      |
| <b>068-043-08 PE5</b>     | 6.8            | 8      | 91  | 43 | 54  | 36 | 1.1 | •      |
| <b>069-043-08 PE5</b>     | 6.9            | 8      | 91  | 43 | 54  | 36 | 1.1 | •      |
| <b>070-043-08 PE5</b>     | 7.0            | 8      | 91  | 43 | 54  | 36 | 1.1 | •      |
| <b>071-043-08 PE5</b>     | 7.1            | 8      | 91  | 43 | 54  | 36 | 1.1 | •      |
| <b>072-043-08 PE5</b>     | 7.2            | 8      | 91  | 43 | 54  | 36 | 1.1 | •      |
| <b>073-043-08 PE5</b>     | 7.3            | 8      | 91  | 43 | 54  | 36 | 1.1 | •      |
| <b>074-043-08 PE5</b>     | 7.4            | 8      | 91  | 43 | 54  | 36 | 1.2 | •      |
| <b>075-043-08 PE5</b>     | 7.5            | 8      | 91  | 43 | 54  | 36 | 1.2 | •      |
| <b>076-043-08 PE5</b>     | 7.6            | 8      | 91  | 43 | 54  | 36 | 1.2 | •      |
| <b>077-043-08 PE5</b>     | 7.7            | 8      | 91  | 43 | 54  | 36 | 1.2 | •      |
| <b>078-043-08 PE5</b>     | 7.8            | 8      | 91  | 43 | 54  | 36 | 1.2 | •      |
| <b>079-043-08 PE5</b>     | 7.9            | 8      | 91  | 43 | 54  | 36 | 1.3 | •      |
| <b>080-043-08 PE5</b>     | 8.0            | 8      | 91  | 43 | 54  | 36 | 1.3 | •      |
| <b>081-049-10 PE5</b>     | 8.1            | 10     | 103 | 49 | 62  | 40 | 1.3 | •      |
| <b>082-049-10 PE5</b>     | 8.2            | 10     | 103 | 49 | 62  | 40 | 1.3 | •      |
| <b>083-049-10 PE5</b>     | 8.3            | 10     | 103 | 49 | 62  | 40 | 1.3 | •      |
| <b>084-049-10 PE5</b>     | 8.4            | 10     | 103 | 49 | 62  | 40 | 1.3 | •      |
| <b>085-049-10 PE5</b>     | 8.5            | 10     | 103 | 49 | 62  | 40 | 1.3 | •      |
| <b>086-049-10 PE5</b>     | 8.6            | 10     | 103 | 49 | 62  | 40 | 1.4 | •      |
| <b>087-049-10 PE5</b>     | 8.7            | 10     | 103 | 49 | 62  | 40 | 1.4 | •      |
| <b>088-049-10 PE5</b>     | 8.8            | 10     | 103 | 49 | 62  | 40 | 1.4 | •      |
| <b>089-049-10 PE5</b>     | 8.9            | 10     | 103 | 49 | 62  | 40 | 1.4 | •      |
| <b>090-049-10 PE5</b>     | 9.0            | 10     | 103 | 49 | 62  | 40 | 1.4 | •      |
| <b>091-049-10 PE5</b>     | 9.1            | 10     | 103 | 49 | 62  | 40 | 1.4 | •      |
| <b>092-049-10 PE5</b>     | 9.2            | 10     | 103 | 49 | 62  | 40 | 1.4 | •      |
| <b>093-049-10 PE5</b>     | 9.3            | 10     | 103 | 49 | 62  | 40 | 1.5 | •      |
| <b>094-049-10 PE5</b>     | 9.4            | 10     | 103 | 49 | 62  | 40 | 1.5 | •      |
| <b>095-049-10 PE5</b>     | 9.5            | 10     | 103 | 49 | 62  | 40 | 1.5 | •      |
| <b>096-049-10 PE5</b>     | 9.6            | 10     | 103 | 49 | 62  | 40 | 1.5 | •      |
| <b>097-049-10 PE5</b>     | 9.7            | 10     | 103 | 49 | 62  | 40 | 1.5 | •      |
| <b>098-049-10 PE5</b>     | 9.8            | 10     | 103 | 49 | 62  | 40 | 1.6 | •      |
| <b>099-049-10 PE5</b>     | 9.9            | 10     | 103 | 49 | 62  | 40 | 1.6 | •      |



- : Standard items

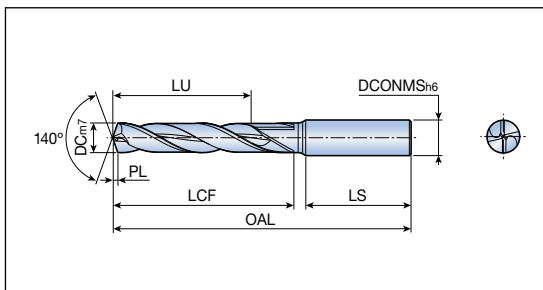
## NHD...PE5



## Solid carbide drills without oil holes



- Drilling depth: 5xdiameter

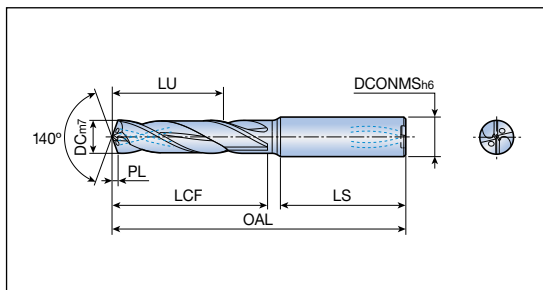
[illegible]

●: Standard items

## Solid carbide drills with oil holes



- Drilling depth: 3xdiameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade  |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | TT9030 |
| <b>NHD 030-014-06 PI3</b> | 3.0            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>031-014-06 PI3</b>     | 3.1            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>032-014-06 PI3</b>     | 3.2            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>033-014-06 PI3</b>     | 3.3            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>034-014-06 PI3</b>     | 3.4            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●      |
| <b>035-014-06 PI3</b>     | 3.5            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●      |
| <b>036-014-06 PI3</b>     | 3.6            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●      |
| <b>037-014-06 PI3</b>     | 3.7            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●      |
| <b>038-017-06 PI3</b>     | 3.8            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●      |
| <b>039-017-06 PI3</b>     | 3.9            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●      |
| <b>040-017-06 PI3</b>     | 4.0            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●      |
| <b>041-017-06 PI3</b>     | 4.1            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>042-017-06 PI3</b>     | 4.2            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>043-017-06 PI3</b>     | 4.3            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>044-017-06 PI3</b>     | 4.4            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>045-017-06 PI3</b>     | 4.5            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>046-017-06 PI3</b>     | 4.6            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●      |
| <b>047-017-06 PI3</b>     | 4.7            | 6      | 66  | 17 | 25  | 35 | 0.8 | ●      |
| <b>048-020-06 PI3</b>     | 4.8            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>049-020-06 PI3</b>     | 4.9            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>050-020-06 PI3</b>     | 5.0            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>051-020-06 PI3</b>     | 5.1            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>052-020-06 PI3</b>     | 5.2            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>053-020-06 PI3</b>     | 5.3            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>054-020-06 PI3</b>     | 5.4            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●      |
| <b>055-020-06 PI3</b>     | 5.5            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>056-020-06 PI3</b>     | 5.6            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>057-020-06 PI3</b>     | 5.7            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>058-020-06 PI3</b>     | 5.8            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>059-020-06 PI3</b>     | 5.9            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>060-020-06 PI3</b>     | 6.0            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●      |
| <b>061-024-08 PI3</b>     | 6.1            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |
| <b>062-024-08 PI3</b>     | 6.2            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |
| <b>063-024-08 PI3</b>     | 6.3            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |
| <b>064-024-08 PI3</b>     | 6.4            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●      |

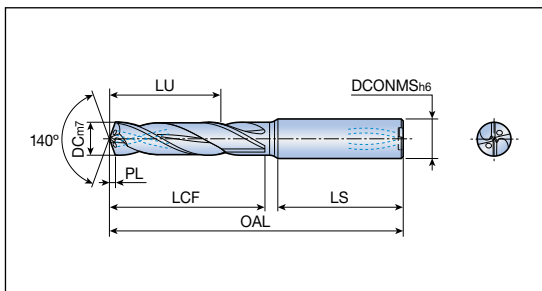
●: Standard items



## Solid carbide drills with oil holes



- Drilling depth: 3x diameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade<br>TT9030 |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-----------------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  |                 |
| <b>NHD 065-024-08 PI3</b> | 6.5            | 8      | 79  | 24 | 35  | 36 | 1.0 | •               |
| <b>066-024-08 PI3</b>     | 6.6            | 8      | 79  | 24 | 35  | 36 | 1.0 | •               |
| <b>067-024-08 PI3</b>     | 6.7            | 8      | 79  | 24 | 35  | 36 | 1.1 | •               |
| <b>068-024-08 PI3</b>     | 6.8            | 8      | 79  | 24 | 35  | 36 | 1.1 | •               |
| <b>069-024-08 PI3</b>     | 6.9            | 8      | 79  | 24 | 35  | 36 | 1.1 | •               |
| <b>070-024-08 PI3</b>     | 7.0            | 8      | 79  | 24 | 35  | 36 | 1.1 | •               |
| <b>071-029-08 PI3</b>     | 7.1            | 8      | 79  | 29 | 42  | 36 | 1.1 | •               |
| <b>072-029-08 PI3</b>     | 7.2            | 8      | 79  | 29 | 42  | 36 | 1.1 | •               |
| <b>073-029-08 PI3</b>     | 7.3            | 8      | 79  | 29 | 42  | 36 | 1.1 | •               |
| <b>074-029-08 PI3</b>     | 7.4            | 8      | 79  | 29 | 42  | 36 | 1.2 | •               |
| <b>075-029-08 PI3</b>     | 7.5            | 8      | 79  | 29 | 42  | 36 | 1.2 | •               |
| <b>076-029-08 PI3</b>     | 7.6            | 8      | 79  | 29 | 42  | 36 | 1.2 | •               |
| <b>077-029-08 PI3</b>     | 7.7            | 8      | 79  | 29 | 42  | 36 | 1.2 | •               |
| <b>078-029-08 PI3</b>     | 7.8            | 8      | 79  | 29 | 42  | 36 | 1.2 | •               |
| <b>079-029-08 PI3</b>     | 7.9            | 8      | 79  | 29 | 42  | 36 | 1.3 | •               |
| <b>080-029-08 PI3</b>     | 8.0            | 8      | 79  | 29 | 42  | 36 | 1.3 | •               |
| <b>081-035-10 PI3</b>     | 8.1            | 10     | 89  | 35 | 48  | 40 | 1.3 | •               |
| <b>082-035-10 PI3</b>     | 8.2            | 10     | 89  | 35 | 48  | 40 | 1.3 | •               |
| <b>083-035-10 PI3</b>     | 8.3            | 10     | 89  | 35 | 48  | 40 | 1.3 | •               |
| <b>084-035-10 PI3</b>     | 8.4            | 10     | 89  | 35 | 48  | 40 | 1.3 | •               |
| <b>085-035-10 PI3</b>     | 8.5            | 10     | 89  | 35 | 48  | 40 | 1.3 | •               |
| <b>086-035-10 PI3</b>     | 8.6            | 10     | 89  | 35 | 48  | 40 | 1.4 | •               |
| <b>087-035-10 PI3</b>     | 8.7            | 10     | 89  | 35 | 48  | 40 | 1.4 | •               |
| <b>088-035-10 PI3</b>     | 8.8            | 10     | 89  | 35 | 48  | 40 | 1.4 | •               |
| <b>089-035-10 PI3</b>     | 8.9            | 10     | 89  | 35 | 48  | 40 | 1.4 | •               |
| <b>090-035-10 PI3</b>     | 9.0            | 10     | 89  | 35 | 48  | 40 | 1.4 | •               |
| <b>091-035-10 PI3</b>     | 9.1            | 10     | 89  | 35 | 48  | 40 | 1.4 | •               |
| <b>092-035-10 PI3</b>     | 9.2            | 10     | 89  | 35 | 48  | 40 | 1.4 | •               |
| <b>093-035-10 PI3</b>     | 9.3            | 10     | 89  | 35 | 48  | 40 | 1.5 | •               |
| <b>094-035-10 PI3</b>     | 9.4            | 10     | 89  | 35 | 48  | 40 | 1.5 | •               |
| <b>095-035-10 PI3</b>     | 9.5            | 10     | 89  | 35 | 48  | 40 | 1.5 | •               |
| <b>096-035-10 PI3</b>     | 9.6            | 10     | 89  | 35 | 48  | 40 | 1.5 | •               |
| <b>097-035-10 PI3</b>     | 9.7            | 10     | 89  | 35 | 48  | 40 | 1.5 | •               |
| <b>098-035-10 PI3</b>     | 9.8            | 10     | 89  | 35 | 48  | 40 | 1.6 | •               |
| <b>099-035-10 PI3</b>     | 9.9            | 10     | 89  | 35 | 48  | 40 | 1.6 | •               |



- Standard items

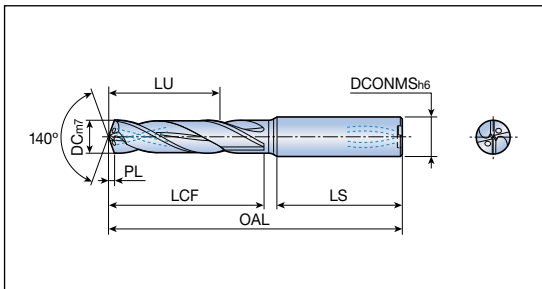
## NHD...PI3



### Solid carbide drills with oil holes



- Drilling depth:  $3 \times \text{diameter}$

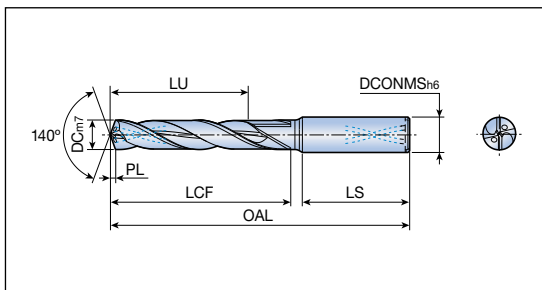
[illegible]

●: Standard items

## Solid carbide drills with oil holes



- Drilling depth: 5x diameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade  |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | TT9030 |
| <b>NHD 030-023-06 PI5</b> | 3.0            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●      |
| <b>031-023-06 PI5</b>     | 3.1            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●      |
| <b>032-023-06 PI5</b>     | 3.2            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●      |
| <b>033-023-06 PI5</b>     | 3.3            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●      |
| <b>034-023-06 PI5</b>     | 3.4            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●      |
| <b>035-023-06 PI5</b>     | 3.5            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●      |
| <b>036-023-06 PI5</b>     | 3.6            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●      |
| <b>037-023-06 PI5</b>     | 3.7            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●      |
| <b>038-029-06 PI5</b>     | 3.8            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●      |
| <b>039-029-06 PI5</b>     | 3.9            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●      |
| <b>040-029-06 PI5</b>     | 4.0            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●      |
| <b>041-029-06 PI5</b>     | 4.1            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●      |
| <b>042-029-06 PI5</b>     | 4.2            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●      |
| <b>043-029-06 PI5</b>     | 4.3            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●      |
| <b>044-029-06 PI5</b>     | 4.4            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●      |
| <b>045-029-06 PI5</b>     | 4.5            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●      |
| <b>046-029-06 PI5</b>     | 4.6            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●      |
| <b>047-029-06 PI5</b>     | 4.7            | 6      | 74  | 29 | 37  | 35 | 0.8 | ●      |
| <b>048-035-06 PI5</b>     | 4.8            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●      |
| <b>049-035-06 PI5</b>     | 4.9            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●      |
| <b>050-035-06 PI5</b>     | 5.0            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●      |
| <b>051-035-06 PI5</b>     | 5.1            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●      |
| <b>052-035-06 PI5</b>     | 5.2            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●      |
| <b>053-035-06 PI5</b>     | 5.3            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●      |
| <b>054-035-06 PI5</b>     | 5.4            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●      |
| <b>055-035-06 PI5</b>     | 5.5            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●      |
| <b>056-035-06 PI5</b>     | 5.6            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●      |
| <b>057-035-06 PI5</b>     | 5.7            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●      |
| <b>058-035-06 PI5</b>     | 5.8            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●      |
| <b>059-035-06 PI5</b>     | 5.9            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●      |
| <b>060-035-06 PI5</b>     | 6.0            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●      |
| <b>061-043-08 PI5</b>     | 6.1            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●      |
| <b>062-043-08 PI5</b>     | 6.2            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●      |
| <b>063-043-08 PI5</b>     | 6.3            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●      |
| <b>064-043-08 PI5</b>     | 6.4            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●      |

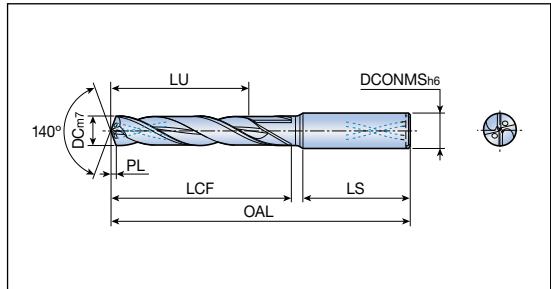
- Standard items



## Solid carbide drills with oil holes



- Drilling depth: 5xdiameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade  |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | TT9030 |
| <b>NHD 065-043-08 PI5</b> | 6.5            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●      |
| <b>066-043-08 PI5</b>     | 6.6            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●      |
| <b>067-043-08 PI5</b>     | 6.7            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●      |
| <b>068-043-08 PI5</b>     | 6.8            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●      |
| <b>069-043-08 PI5</b>     | 6.9            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●      |
| <b>070-043-08 PI5</b>     | 7.0            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●      |
| <b>071-043-08 PI5</b>     | 7.1            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●      |
| <b>072-043-08 PI5</b>     | 7.2            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●      |
| <b>073-043-08 PI5</b>     | 7.3            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●      |
| <b>074-043-08 PI5</b>     | 7.4            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●      |
| <b>075-043-08 PI5</b>     | 7.5            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●      |
| <b>076-043-08 PI5</b>     | 7.6            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●      |
| <b>077-043-08 PI5</b>     | 7.7            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●      |
| <b>078-043-08 PI5</b>     | 7.8            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●      |
| <b>079-043-08 PI5</b>     | 7.9            | 8      | 91  | 43 | 54  | 36 | 1.3 | ●      |
| <b>080-043-08 PI5</b>     | 8.0            | 8      | 91  | 43 | 54  | 36 | 1.3 | ●      |
| <b>081-049-10 PI5</b>     | 8.1            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●      |
| <b>082-049-10 PI5</b>     | 8.2            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●      |
| <b>083-049-10 PI5</b>     | 8.3            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●      |
| <b>084-049-10 PI5</b>     | 8.4            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●      |
| <b>085-049-10 PI5</b>     | 8.5            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●      |
| <b>086-049-10 PI5</b>     | 8.6            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●      |
| <b>087-049-10 PI5</b>     | 8.7            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●      |
| <b>088-049-10 PI5</b>     | 8.8            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●      |
| <b>089-049-10 PI5</b>     | 8.9            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●      |
| <b>090-049-10 PI5</b>     | 9.0            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●      |
| <b>091-049-10 PI5</b>     | 9.1            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●      |
| <b>092-049-10 PI5</b>     | 9.2            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●      |
| <b>093-049-10 PI5</b>     | 9.3            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●      |
| <b>094-049-10 PI5</b>     | 9.4            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●      |
| <b>095-049-10 PI5</b>     | 9.5            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●      |
| <b>096-049-10 PI5</b>     | 9.6            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●      |
| <b>097-049-10 PI5</b>     | 9.7            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●      |
| <b>098-049-10 PI5</b>     | 9.8            | 10     | 103 | 49 | 62  | 40 | 1.6 | ●      |
| <b>099-049-10 PI5</b>     | 9.9            | 10     | 103 | 49 | 62  | 40 | 1.6 | ●      |



●: Standard items



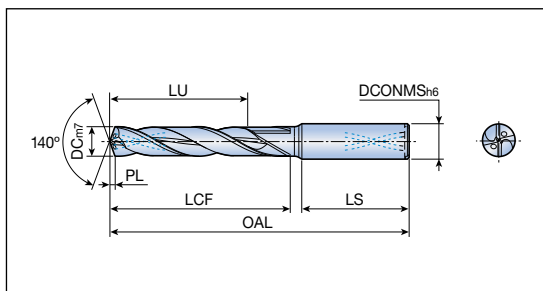
**NHD...PI5**



### Solid carbide drills with oil holes



- Drilling depth:  $5 \times \text{diameter}$

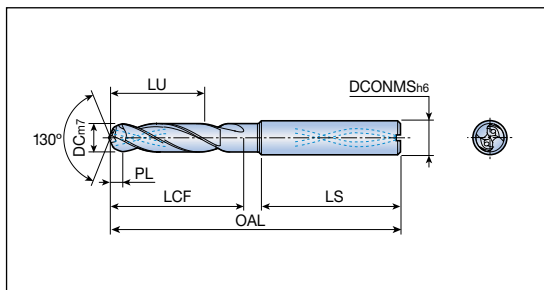
[illegible]

●: Standard items

## Solid carbide drills with oil holes for cast iron machining



- Drilling depth: 3x diameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade  |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | TT9030 |
| <b>NHD 030-014-06 KI3</b> | 3.0            | 6      | 62  | 14 | 20  | 34 | 1.4 | ●      |
| <b>033-014-06 KI3</b>     | 3.3            | 6      | 62  | 14 | 20  | 34 | 1.6 | ●      |
| <b>035-014-06 KI3</b>     | 3.5            | 6      | 62  | 14 | 20  | 34 | 1.7 | ●      |
| <b>040-017-06 KI3</b>     | 4.0            | 6      | 66  | 17 | 24  | 35 | 1.9 | ●      |
| <b>041-017-06 KI3</b>     | 4.1            | 6      | 66  | 17 | 24  | 35 | 2.0 | ●      |
| <b>042-017-06 KI3</b>     | 4.2            | 6      | 66  | 17 | 24  | 35 | 2.0 | ●      |
| <b>045-017-06 KI3</b>     | 4.5            | 6      | 66  | 17 | 24  | 35 | 2.2 | ●      |
| <b>046-017-06 KI3</b>     | 4.6            | 6      | 66  | 17 | 24  | 35 | 2.2 | ●      |
| <b>050-020-06 KI3</b>     | 5.0            | 6      | 66  | 20 | 27  | 36 | 2.4 | ●      |
| <b>051-020-06 KI3</b>     | 5.1            | 6      | 66  | 20 | 27  | 36 | 2.5 | ●      |
| <b>052-020-06 KI3</b>     | 5.2            | 6      | 66  | 20 | 27  | 36 | 2.5 | ●      |
| <b>055-020-06 KI3</b>     | 5.5            | 6      | 66  | 20 | 27  | 36 | 2.6 | ●      |
| <b>060-020-06 KI3</b>     | 6.0            | 6      | 66  | 20 | 27  | 36 | 2.9 | ●      |
| <b>061-024-08 KI3</b>     | 6.1            | 8      | 79  | 24 | 34  | 36 | 2.9 | ●      |
| <b>065-024-08 KI3</b>     | 6.5            | 8      | 79  | 24 | 34  | 36 | 3.1 | ●      |
| <b>067-024-08 KI3</b>     | 6.7            | 8      | 79  | 24 | 34  | 36 | 3.2 | ●      |
| <b>068-024-08 KI3</b>     | 6.8            | 8      | 79  | 24 | 34  | 36 | 3.3 | ●      |
| <b>070-024-08 KI3</b>     | 7.0            | 8      | 79  | 24 | 34  | 36 | 3.4 | ●      |
| <b>075-029-08 KI3</b>     | 7.5            | 8      | 79  | 29 | 40  | 36 | 3.6 | ●      |
| <b>080-029-08 KI3</b>     | 8.0            | 8      | 79  | 29 | 40  | 36 | 3.8 | ●      |
| <b>081-035-10 KI3</b>     | 8.1            | 10     | 89  | 35 | 45  | 40 | 3.9 | ●      |
| <b>085-035-10 KI3</b>     | 8.5            | 10     | 89  | 35 | 45  | 40 | 4.1 | ●      |
| <b>087-035-10 KI3</b>     | 8.7            | 10     | 89  | 35 | 45  | 40 | 4.2 | ●      |
| <b>089-035-10 KI3</b>     | 8.9            | 10     | 89  | 35 | 45  | 40 | 4.3 | ●      |
| <b>090-035-10 KI3</b>     | 9.0            | 10     | 89  | 35 | 45  | 40 | 4.3 | ●      |
| <b>095-035-10 KI3</b>     | 9.5            | 10     | 89  | 35 | 45  | 40 | 4.6 | ●      |
| <b>100-035-10 KI3</b>     | 10.0           | 10     | 89  | 35 | 45  | 40 | 4.8 | ●      |
| <b>103-040-12 KI3</b>     | 10.3           | 12     | 102 | 40 | 53  | 45 | 4.9 | ●      |
| <b>105-040-12 KI3</b>     | 10.5           | 12     | 102 | 40 | 53  | 45 | 5.0 | ●      |
| <b>110-040-12 KI3</b>     | 11.0           | 12     | 102 | 40 | 53  | 45 | 5.3 | ●      |
| <b>115-040-12 KI3</b>     | 11.5           | 12     | 102 | 40 | 53  | 45 | 5.5 | ●      |
| <b>120-040-12 KI3</b>     | 12.0           | 12     | 102 | 40 | 53  | 45 | 5.8 | ●      |
|                           |                |        |     |    |     |    |     |        |
|                           |                |        |     |    |     |    |     |        |
|                           |                |        |     |    |     |    |     |        |

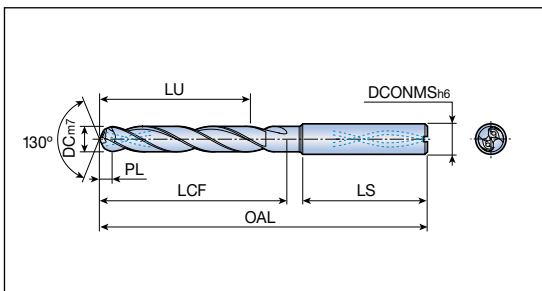


- : Standard items

## Solid carbide drills with oil holes for cast iron machining



- Drilling depth: 5x diameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade  |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | TT9030 |
| <b>NHD 030-023-06 KI5</b> | 3.0            | 6      | 66  | 23 | 27  | 34 | 1.4 | ●      |
| <b>033-023-06 KI5</b>     | 3.3            | 6      | 66  | 23 | 27  | 34 | 1.6 | ●      |
| <b>035-023-06 KI5</b>     | 3.5            | 6      | 66  | 23 | 27  | 34 | 1.7 | ●      |
| <b>040-029-06 KI5</b>     | 4.0            | 6      | 74  | 29 | 34  | 35 | 1.9 | ●      |
| <b>042-029-06 KI5</b>     | 4.2            | 6      | 74  | 29 | 34  | 35 | 2.0 | ●      |
| <b>045-029-06 KI5</b>     | 4.5            | 6      | 74  | 29 | 35  | 35 | 2.2 | ●      |
| <b>046-029-06 KI5</b>     | 4.6            | 6      | 74  | 29 | 35  | 35 | 2.2 | ●      |
| <b>050-035-06 KI5</b>     | 5.0            | 6      | 82  | 35 | 43  | 36 | 2.4 | ●      |
| <b>052-035-06 KI5</b>     | 5.2            | 6      | 82  | 35 | 43  | 36 | 2.5 | ●      |
| <b>055-035-06 KI5</b>     | 5.5            | 6      | 82  | 35 | 43  | 36 | 2.6 | ●      |
| <b>060-035-06 KI5</b>     | 6.0            | 6      | 82  | 35 | 43  | 36 | 2.9 | ●      |
| <b>065-043-08 KI5</b>     | 6.5            | 8      | 91  | 43 | 52  | 36 | 3.1 | ●      |
| <b>067-043-08 KI5</b>     | 6.7            | 8      | 91  | 43 | 52  | 36 | 3.2 | ●      |
| <b>068-043-08 KI5</b>     | 6.8            | 8      | 91  | 43 | 52  | 36 | 3.3 | ●      |
| <b>070-043-08 KI5</b>     | 7.0            | 8      | 91  | 43 | 52  | 36 | 3.4 | ●      |
| <b>075-043-08 KI5</b>     | 7.5            | 8      | 91  | 43 | 52  | 36 | 3.6 | ●      |
| <b>080-043-08 KI5</b>     | 8.0            | 8      | 91  | 43 | 52  | 36 | 3.8 | ●      |
| <b>081-049-10 KI5</b>     | 8.1            | 10     | 103 | 49 | 59  | 40 | 3.9 | ●      |
| <b>085-049-10 KI5</b>     | 8.5            | 10     | 103 | 49 | 59  | 40 | 4.1 | ●      |
| <b>087-049-10 KI5</b>     | 8.7            | 10     | 103 | 49 | 59  | 40 | 4.2 | ●      |
| <b>089-049-10 KI5</b>     | 8.9            | 10     | 103 | 49 | 59  | 40 | 4.3 | ●      |
| <b>090-049-10 KI5</b>     | 9.0            | 10     | 103 | 49 | 59  | 40 | 4.3 | ●      |
| <b>095-049-10 KI5</b>     | 9.5            | 10     | 103 | 49 | 59  | 40 | 4.6 | ●      |
| <b>100-049-10 KI5</b>     | 10.0           | 10     | 103 | 49 | 59  | 40 | 4.8 | ●      |
| <b>103-056-12 KI5</b>     | 10.3           | 12     | 118 | 56 | 69  | 45 | 4.9 | ●      |
| <b>105-056-12 KI5</b>     | 10.5           | 12     | 118 | 56 | 69  | 45 | 5.0 | ●      |
| <b>110-056-12 KI5</b>     | 11.0           | 12     | 118 | 56 | 69  | 45 | 5.3 | ●      |
| <b>115-056-12 KI5</b>     | 11.5           | 12     | 118 | 56 | 69  | 45 | 5.5 | ●      |
| <b>120-056-12 KI5</b>     | 12.0           | 12     | 118 | 56 | 69  | 45 | 5.8 | ●      |
|                           |                |        |     |    |     |    |     |        |
|                           |                |        |     |    |     |    |     |        |
|                           |                |        |     |    |     |    |     |        |
|                           |                |        |     |    |     |    |     |        |
|                           |                |        |     |    |     |    |     |        |
|                           |                |        |     |    |     |    |     |        |
|                           |                |        |     |    |     |    |     |        |

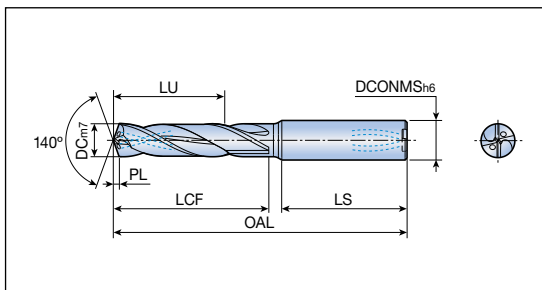
- Standard items



## Solid carbide drills with oil holes for aluminum machining



- Drilling depth: 3xdiameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | UF10  |
| <b>NHD 030-014-06 NI3</b> | 3.0            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●     |
| <b>031-014-06 NI3</b>     | 3.1            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●     |
| <b>032-014-06 NI3</b>     | 3.2            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●     |
| <b>033-014-06 NI3</b>     | 3.3            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●     |
| <b>034-014-06 NI3</b>     | 3.4            | 6      | 62  | 14 | 21  | 34 | 0.5 | ●     |
| <b>035-014-06 NI3</b>     | 3.5            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●     |
| <b>036-014-06 NI3</b>     | 3.6            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●     |
| <b>037-014-06 NI3</b>     | 3.7            | 6      | 62  | 14 | 21  | 34 | 0.6 | ●     |
| <b>038-017-06 NI3</b>     | 3.8            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●     |
| <b>039-017-06 NI3</b>     | 3.9            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●     |
| <b>040-017-06 NI3</b>     | 4.0            | 6      | 66  | 17 | 25  | 35 | 0.6 | ●     |
| <b>041-017-06 NI3</b>     | 4.1            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●     |
| <b>042-017-06 NI3</b>     | 4.2            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●     |
| <b>043-017-06 NI3</b>     | 4.3            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●     |
| <b>044-017-06 NI3</b>     | 4.4            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●     |
| <b>045-017-06 NI3</b>     | 4.5            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●     |
| <b>046-017-06 NI3</b>     | 4.6            | 6      | 66  | 17 | 25  | 35 | 0.7 | ●     |
| <b>047-017-06 NI3</b>     | 4.7            | 6      | 66  | 17 | 25  | 35 | 0.8 | ●     |
| <b>048-020-06 NI3</b>     | 4.8            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●     |
| <b>049-020-06 NI3</b>     | 4.9            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●     |
| <b>050-020-06 NI3</b>     | 5.0            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●     |
| <b>051-020-06 NI3</b>     | 5.1            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●     |
| <b>052-020-06 NI3</b>     | 5.2            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●     |
| <b>053-020-06 NI3</b>     | 5.3            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●     |
| <b>054-020-06 NI3</b>     | 5.4            | 6      | 66  | 20 | 29  | 36 | 0.8 | ●     |
| <b>055-020-06 NI3</b>     | 5.5            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●     |
| <b>056-020-06 NI3</b>     | 5.6            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●     |
| <b>057-020-06 NI3</b>     | 5.7            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●     |
| <b>058-020-06 NI3</b>     | 5.8            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●     |
| <b>059-020-06 NI3</b>     | 5.9            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●     |
| <b>060-020-06 NI3</b>     | 6.0            | 6      | 66  | 20 | 29  | 36 | 0.9 | ●     |
| <b>061-024-08 NI3</b>     | 6.1            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●     |
| <b>062-024-08 NI3</b>     | 6.2            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●     |
| <b>063-024-08 NI3</b>     | 6.3            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●     |
| <b>064-024-08 NI3</b>     | 6.4            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●     |

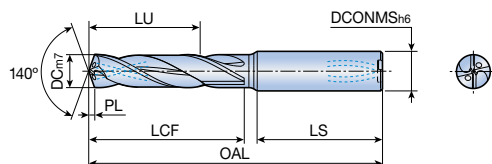
●: Standard items



## Solid carbide drills with oil holes for aluminum machining



- Drilling depth: 3x diameter



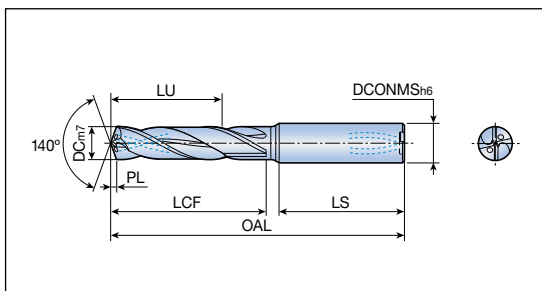
| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | UF10  |
| <b>NHD 065-024-08 NI3</b> | 6.5            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●     |
| <b>066-024-08 NI3</b>     | 6.6            | 8      | 79  | 24 | 35  | 36 | 1.0 | ●     |
| <b>067-024-08 NI3</b>     | 6.7            | 8      | 79  | 24 | 35  | 36 | 1.1 | ●     |
| <b>068-024-08 NI3</b>     | 6.8            | 8      | 79  | 24 | 35  | 36 | 1.1 | ●     |
| <b>069-024-08 NI3</b>     | 6.9            | 8      | 79  | 24 | 35  | 36 | 1.1 | ●     |
| <b>070-024-08 NI3</b>     | 7.0            | 8      | 79  | 24 | 35  | 36 | 1.1 | ●     |
| <b>071-029-08 NI3</b>     | 7.1            | 8      | 79  | 29 | 42  | 36 | 1.1 | ●     |
| <b>072-029-08 NI3</b>     | 7.2            | 8      | 79  | 29 | 42  | 36 | 1.1 | ●     |
| <b>073-029-08 NI3</b>     | 7.3            | 8      | 79  | 29 | 42  | 36 | 1.1 | ●     |
| <b>074-029-08 NI3</b>     | 7.4            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●     |
| <b>075-029-08 NI3</b>     | 7.5            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●     |
| <b>076-029-08 NI3</b>     | 7.6            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●     |
| <b>077-029-08 NI3</b>     | 7.7            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●     |
| <b>078-029-08 NI3</b>     | 7.8            | 8      | 79  | 29 | 42  | 36 | 1.2 | ●     |
| <b>079-029-08 NI3</b>     | 7.9            | 8      | 79  | 29 | 42  | 36 | 1.3 | ●     |
| <b>080-029-08 NI3</b>     | 8.0            | 8      | 79  | 29 | 42  | 36 | 1.3 | ●     |
| <b>081-035-10 NI3</b>     | 8.1            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●     |
| <b>082-035-10 NI3</b>     | 8.2            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●     |
| <b>083-035-10 NI3</b>     | 8.3            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●     |
| <b>084-035-10 NI3</b>     | 8.4            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●     |
| <b>085-035-10 NI3</b>     | 8.5            | 10     | 89  | 35 | 48  | 40 | 1.3 | ●     |
| <b>086-035-10 NI3</b>     | 8.6            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●     |
| <b>087-035-10 NI3</b>     | 8.7            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●     |
| <b>088-035-10 NI3</b>     | 8.8            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●     |
| <b>089-035-10 NI3</b>     | 8.9            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●     |
| <b>090-035-10 NI3</b>     | 9.0            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●     |
| <b>091-035-10 NI3</b>     | 9.1            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●     |
| <b>092-035-10 NI3</b>     | 9.2            | 10     | 89  | 35 | 48  | 40 | 1.4 | ●     |
| <b>093-035-10 NI3</b>     | 9.3            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●     |
| <b>094-035-10 NI3</b>     | 9.4            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●     |
| <b>095-035-10 NI3</b>     | 9.5            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●     |
| <b>096-035-10 NI3</b>     | 9.6            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●     |
| <b>097-035-10 NI3</b>     | 9.7            | 10     | 89  | 35 | 48  | 40 | 1.5 | ●     |
| <b>098-035-10 NI3</b>     | 9.8            | 10     | 89  | 35 | 48  | 40 | 1.6 | ●     |
| <b>099-035-10 NI3</b>     | 9.9            | 10     | 89  | 35 | 48  | 40 | 1.6 | ●     |

- Standard items



## HD RILL

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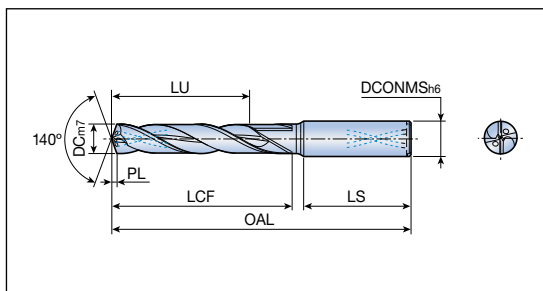
[illegible]

●: Standard items

## Solid carbide drills with oil holes for aluminum machining



- Drilling depth: 5x diameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | UF10  |
| <b>NHD 030-023-06 NI5</b> | 3.0            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●     |
| <b>031-023-06 NI5</b>     | 3.1            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●     |
| <b>032-023-06 NI5</b>     | 3.2            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●     |
| <b>033-023-06 NI5</b>     | 3.3            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●     |
| <b>034-023-06 NI5</b>     | 3.4            | 6      | 66  | 23 | 29  | 34 | 0.5 | ●     |
| <b>035-023-06 NI5</b>     | 3.5            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●     |
| <b>036-023-06 NI5</b>     | 3.6            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●     |
| <b>037-023-06 NI5</b>     | 3.7            | 6      | 66  | 23 | 29  | 34 | 0.6 | ●     |
| <b>038-029-06 NI5</b>     | 3.8            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●     |
| <b>039-029-06 NI5</b>     | 3.9            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●     |
| <b>040-029-06 NI5</b>     | 4.0            | 6      | 74  | 29 | 37  | 35 | 0.6 | ●     |
| <b>041-029-06 NI5</b>     | 4.1            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●     |
| <b>042-029-06 NI5</b>     | 4.2            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●     |
| <b>043-029-06 NI5</b>     | 4.3            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●     |
| <b>044-029-06 NI5</b>     | 4.4            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●     |
| <b>045-029-06 NI5</b>     | 4.5            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●     |
| <b>046-029-06 NI5</b>     | 4.6            | 6      | 74  | 29 | 37  | 35 | 0.7 | ●     |
| <b>047-029-06 NI5</b>     | 4.7            | 6      | 74  | 29 | 37  | 35 | 0.8 | ●     |
| <b>048-035-06 NI5</b>     | 4.8            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●     |
| <b>049-035-06 NI5</b>     | 4.9            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●     |
| <b>050-035-06 NI5</b>     | 5.0            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●     |
| <b>051-035-06 NI5</b>     | 5.1            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●     |
| <b>052-035-06 NI5</b>     | 5.2            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●     |
| <b>053-035-06 NI5</b>     | 5.3            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●     |
| <b>054-035-06 NI5</b>     | 5.4            | 6      | 82  | 35 | 45  | 36 | 0.8 | ●     |
| <b>055-035-06 NI5</b>     | 5.5            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●     |
| <b>056-035-06 NI5</b>     | 5.6            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●     |
| <b>057-035-06 NI5</b>     | 5.7            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●     |
| <b>058-035-06 NI5</b>     | 5.8            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●     |
| <b>059-035-06 NI5</b>     | 5.9            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●     |
| <b>060-035-06 NI5</b>     | 6.0            | 6      | 82  | 35 | 45  | 36 | 0.9 | ●     |
| <b>061-043-08 NI5</b>     | 6.1            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●     |
| <b>062-043-08 NI5</b>     | 6.2            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●     |
| <b>063-043-08 NI5</b>     | 6.3            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●     |
| <b>064-043-08 NI5</b>     | 6.4            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●     |

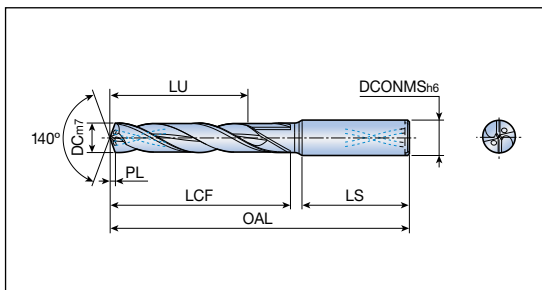
- Standard items



## Solid carbide drills with oil holes for aluminum machining



- Drilling depth: 5xdiameter



| Designation               | Dimension (mm) |        |     |    |     |    |     | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-------|
|                           | DC             | DCONMS | OAL | LU | LCF | LS | PL  | UF10  |
| <b>NHD 065-043-08 NI5</b> | 6.5            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●     |
| <b>066-043-08 NI5</b>     | 6.6            | 8      | 91  | 43 | 54  | 36 | 1.0 | ●     |
| <b>067-043-08 NI5</b>     | 6.7            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●     |
| <b>068-043-08 NI5</b>     | 6.8            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●     |
| <b>069-043-08 NI5</b>     | 6.9            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●     |
| <b>070-043-08 NI5</b>     | 7.0            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●     |
| <b>071-043-08 NI5</b>     | 7.1            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●     |
| <b>072-043-08 NI5</b>     | 7.2            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●     |
| <b>073-043-08 NI5</b>     | 7.3            | 8      | 91  | 43 | 54  | 36 | 1.1 | ●     |
| <b>074-043-08 NI5</b>     | 7.4            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●     |
| <b>075-043-08 NI5</b>     | 7.5            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●     |
| <b>076-043-08 NI5</b>     | 7.6            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●     |
| <b>077-043-08 NI5</b>     | 7.7            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●     |
| <b>078-043-08 NI5</b>     | 7.8            | 8      | 91  | 43 | 54  | 36 | 1.2 | ●     |
| <b>079-043-08 NI5</b>     | 7.9            | 8      | 91  | 43 | 54  | 36 | 1.3 | ●     |
| <b>080-043-08 NI5</b>     | 8.0            | 8      | 91  | 43 | 54  | 36 | 1.3 | ●     |
| <b>081-049-10 NI5</b>     | 8.1            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●     |
| <b>082-049-10 NI5</b>     | 8.2            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●     |
| <b>083-049-10 NI5</b>     | 8.3            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●     |
| <b>084-049-10 NI5</b>     | 8.4            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●     |
| <b>085-049-10 NI5</b>     | 8.5            | 10     | 103 | 49 | 62  | 40 | 1.3 | ●     |
| <b>086-049-10 NI5</b>     | 8.6            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●     |
| <b>087-049-10 NI5</b>     | 8.7            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●     |
| <b>088-049-10 NI5</b>     | 8.8            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●     |
| <b>089-049-10 NI5</b>     | 8.9            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●     |
| <b>090-049-10 NI5</b>     | 9.0            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●     |
| <b>091-049-10 NI5</b>     | 9.1            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●     |
| <b>092-049-10 NI5</b>     | 9.2            | 10     | 103 | 49 | 62  | 40 | 1.4 | ●     |
| <b>093-049-10 NI5</b>     | 9.3            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●     |
| <b>094-049-10 NI5</b>     | 9.4            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●     |
| <b>095-049-10 NI5</b>     | 9.5            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●     |
| <b>096-049-10 NI5</b>     | 9.6            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●     |
| <b>097-049-10 NI5</b>     | 9.7            | 10     | 103 | 49 | 62  | 40 | 1.5 | ●     |
| <b>098-049-10 NI5</b>     | 9.8            | 10     | 103 | 49 | 62  | 40 | 1.6 | ●     |
| <b>099-049-10 NI5</b>     | 9.9            | 10     | 103 | 49 | 62  | 40 | 1.6 | ●     |

●: Standard items





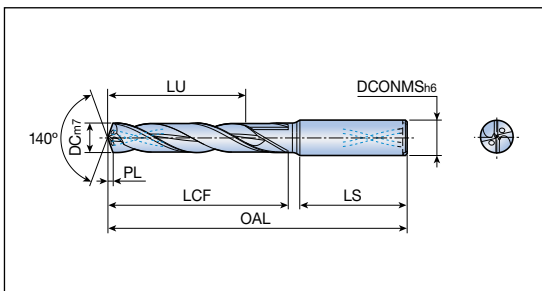
**NHD...NI5**



## Solid carbide drills with oil holes for aluminum machining



- Drilling depth: 5xdiameter

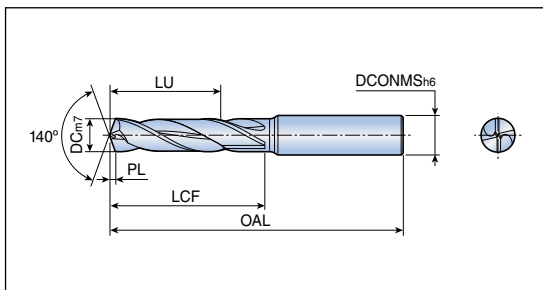
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●: Standard items

## Solid carbide drills without oil holes



- Drilling depth: 3xdiameter



| Designation       | Dimension (mm) |        |     |    |     |     | Grade<br>TT5130 |
|-------------------|----------------|--------|-----|----|-----|-----|-----------------|
|                   | DC             | DCONMS | OAL | LU | LCF | PL  |                 |
| <b>TED S030-4</b> | 3.0            | 4      | 62  | 11 | 18  | 0.5 | ●               |
| <b>S031-4</b>     | 3.1            | 4      | 62  | 11 | 18  | 0.5 | ●               |
| <b>S032-4</b>     | 3.2            | 4      | 62  | 11 | 18  | 0.5 | ●               |
| <b>S033-4</b>     | 3.3            | 4      | 62  | 11 | 18  | 0.5 | ●               |
| <b>S034-4</b>     | 3.4            | 4      | 62  | 11 | 18  | 0.5 | ●               |
| <b>S035-4</b>     | 3.5            | 4      | 62  | 11 | 18  | 0.6 | ●               |
| <b>S036-4</b>     | 3.6            | 4      | 62  | 11 | 18  | 0.6 | ●               |
| <b>S037-4</b>     | 3.7            | 4      | 62  | 11 | 18  | 0.6 | ●               |
| <b>S038-4</b>     | 3.8            | 4      | 66  | 12 | 18  | 0.6 | ●               |
| <b>S039-4</b>     | 3.9            | 4      | 66  | 12 | 18  | 0.6 | ●               |
| <b>S040-4</b>     | 4.0            | 4      | 66  | 12 | 18  | 0.6 | ●               |
| <b>S041-5</b>     | 4.1            | 5      | 66  | 19 | 27  | 0.7 | ●               |
| <b>S042-5</b>     | 4.2            | 5      | 66  | 19 | 27  | 0.7 | ●               |
| <b>S043-5</b>     | 4.3            | 5      | 66  | 19 | 27  | 0.7 | ●               |
| <b>S044-5</b>     | 4.4            | 5      | 66  | 19 | 27  | 0.7 | ●               |
| <b>S045-5</b>     | 4.5            | 5      | 66  | 19 | 27  | 0.7 | ●               |
| <b>S046-5</b>     | 4.6            | 5      | 66  | 19 | 27  | 0.8 | ●               |
| <b>S047-5</b>     | 4.7            | 5      | 66  | 19 | 27  | 0.8 | ●               |
| <b>S048-5</b>     | 4.8            | 5      | 66  | 19 | 27  | 0.8 | ●               |
| <b>S049-5</b>     | 4.9            | 5      | 66  | 19 | 27  | 0.8 | ●               |
| <b>S050-5</b>     | 5.0            | 5      | 66  | 19 | 27  | 0.8 | ●               |
| <b>S051-6</b>     | 5.1            | 6      | 66  | 22 | 31  | 0.8 | ●               |
| <b>S052-6</b>     | 5.2            | 6      | 66  | 22 | 31  | 0.8 | ●               |
| <b>S053-6</b>     | 5.3            | 6      | 66  | 22 | 31  | 0.8 | ●               |
| <b>S054-6</b>     | 5.4            | 6      | 66  | 22 | 31  | 0.8 | ●               |
| <b>S055-6</b>     | 5.5            | 6      | 66  | 22 | 31  | 0.9 | ●               |
| <b>S056-6</b>     | 5.6            | 6      | 66  | 22 | 31  | 0.9 | ●               |
| <b>S057-6</b>     | 5.7            | 6      | 66  | 22 | 31  | 0.9 | ●               |
| <b>S058-6</b>     | 5.8            | 6      | 66  | 22 | 31  | 0.9 | ●               |
| <b>S059-6</b>     | 5.9            | 6      | 66  | 22 | 31  | 0.9 | ●               |
| <b>S060-6</b>     | 6.0            | 6      | 66  | 22 | 31  | 0.9 | ●               |
| <b>S061-7</b>     | 6.1            | 7      | 79  | 26 | 37  | 1   | ●               |
| <b>S062-7</b>     | 6.2            | 7      | 79  | 26 | 37  | 1   | ●               |
| <b>S063-7</b>     | 6.3            | 7      | 79  | 26 | 37  | 1   | ●               |
| <b>S064-7</b>     | 6.4            | 7      | 79  | 26 | 37  | 1   | ●               |

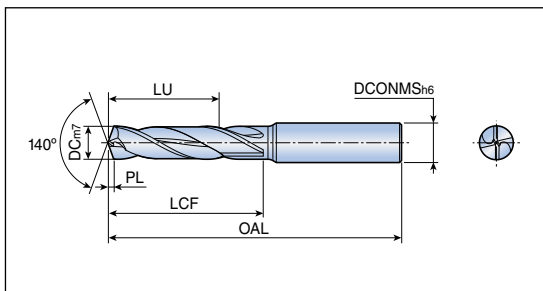
●: Standard items



## Solid carbide drills without oil holes



- Drilling depth: 3x diameter



| Designation       | Dimension (mm) |        |     |    |     |     | Grade  |
|-------------------|----------------|--------|-----|----|-----|-----|--------|
|                   | DC             | DCONMS | OAL | LU | LCF | PL  | TT5130 |
| <b>TED S065-7</b> | 6.5            | 7      | 79  | 26 | 37  | 1   | ●      |
| <b>S066-7</b>     | 6.6            | 7      | 79  | 26 | 37  | 1   | ●      |
| <b>S067-7</b>     | 6.7            | 7      | 79  | 26 | 37  | 1.1 | ●      |
| <b>S068-7</b>     | 6.8            | 7      | 79  | 26 | 37  | 1.1 | ●      |
| <b>S069-7</b>     | 6.9            | 7      | 79  | 26 | 37  | 1.1 | ●      |
| <b>S070-7</b>     | 7.0            | 7      | 79  | 26 | 37  | 1.1 | ●      |
| <b>S071-8</b>     | 7.1            | 8      | 79  | 28 | 41  | 1.1 | ●      |
| <b>S072-8</b>     | 7.2            | 8      | 79  | 28 | 41  | 1.1 | ●      |
| <b>S073-8</b>     | 7.3            | 8      | 79  | 28 | 41  | 1.1 | ●      |
| <b>S074-8</b>     | 7.4            | 8      | 79  | 28 | 41  | 1.2 | ●      |
| <b>S075-8</b>     | 7.5            | 8      | 79  | 28 | 41  | 1.2 | ●      |
| <b>S076-8</b>     | 7.6            | 8      | 79  | 28 | 41  | 1.2 | ●      |
| <b>S077-8</b>     | 7.7            | 8      | 79  | 28 | 41  | 1.2 | ●      |
| <b>S078-8</b>     | 7.8            | 8      | 79  | 28 | 41  | 1.2 | ●      |
| <b>S079-8</b>     | 7.9            | 8      | 79  | 28 | 41  | 1.3 | ●      |
| <b>S080-8</b>     | 8.0            | 8      | 79  | 28 | 41  | 1.3 | ●      |
| <b>S081-9</b>     | 8.1            | 9      | 89  | 32 | 45  | 1.3 | ●      |
| <b>S082-9</b>     | 8.2            | 9      | 89  | 32 | 45  | 1.3 | ●      |
| <b>S083-9</b>     | 8.3            | 9      | 89  | 32 | 45  | 1.3 | ●      |
| <b>S084-9</b>     | 8.4            | 9      | 89  | 32 | 45  | 1.3 | ●      |
| <b>S085-9</b>     | 8.5            | 9      | 89  | 32 | 45  | 1.3 | ●      |
| <b>S086-9</b>     | 8.6            | 9      | 89  | 32 | 45  | 1.4 | ●      |
| <b>S087-9</b>     | 8.7            | 9      | 89  | 32 | 45  | 1.4 | ●      |
| <b>S088-9</b>     | 8.8            | 9      | 89  | 32 | 45  | 1.4 | ●      |
| <b>S089-9</b>     | 8.9            | 9      | 89  | 32 | 45  | 1.4 | ●      |
| <b>S090-9</b>     | 9.0            | 9      | 89  | 32 | 45  | 1.4 | ●      |
| <b>S091-10</b>    | 9.1            | 10     | 89  | 35 | 48  | 1.4 | ●      |
| <b>S092-10</b>    | 9.2            | 10     | 89  | 35 | 48  | 1.4 | ●      |
| <b>S093-10</b>    | 9.3            | 10     | 89  | 35 | 48  | 1.5 | ●      |
| <b>S094-10</b>    | 9.4            | 10     | 89  | 35 | 48  | 1.5 | ●      |
| <b>S095-10</b>    | 9.5            | 10     | 89  | 35 | 48  | 1.5 | ●      |
| <b>S096-10</b>    | 9.6            | 10     | 89  | 35 | 48  | 1.5 | ●      |
| <b>S097-10</b>    | 9.7            | 10     | 89  | 35 | 48  | 1.5 | ●      |
| <b>S098-10</b>    | 9.8            | 10     | 89  | 35 | 48  | 1.6 | ●      |
| <b>S099-10</b>    | 9.9            | 10     | 89  | 35 | 48  | 1.6 | ●      |

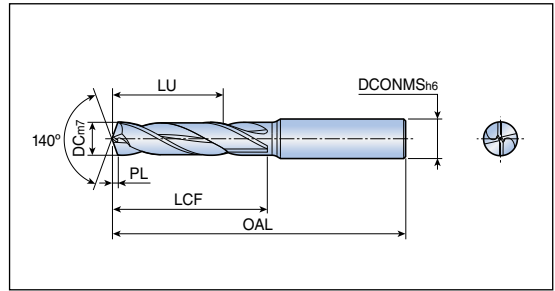
●: Standard items



## Solid carbide drills without oil holes



- Drilling depth:  $3 \times \text{diameter}$

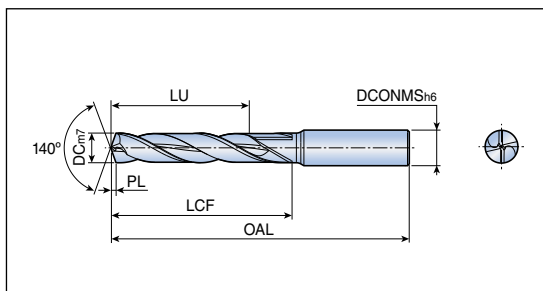
[illegible]

●: Standard items

## Solid carbide drills without oil holes



- Drilling depth: 5x diameter



| Designation       | Dimension (mm) |        |     |    |     |     | Grade  |
|-------------------|----------------|--------|-----|----|-----|-----|--------|
|                   | DC             | DCONMS | OAL | LU | LCF | PL  | TT5130 |
| <b>TED R030-4</b> | 3.0            | 4      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R031-4</b>     | 3.1            | 4      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R032-4</b>     | 3.2            | 4      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R033-4</b>     | 3.3            | 4      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R034-4</b>     | 3.4            | 4      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R035-4</b>     | 3.5            | 4      | 66  | 24 | 30  | 0.6 | ●      |
| <b>R036-4</b>     | 3.6            | 4      | 66  | 24 | 30  | 0.6 | ●      |
| <b>R037-4</b>     | 3.7            | 4      | 66  | 24 | 30  | 0.6 | ●      |
| <b>R038-4</b>     | 3.8            | 4      | 74  | 24 | 30  | 0.6 | ●      |
| <b>R039-4</b>     | 3.9            | 4      | 74  | 24 | 30  | 0.6 | ●      |
| <b>R040-4</b>     | 4.0            | 4      | 74  | 24 | 30  | 0.6 | ●      |
| <b>R041-5</b>     | 4.1            | 5      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R042-5</b>     | 4.2            | 5      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R043-5</b>     | 4.3            | 5      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R044-5</b>     | 4.4            | 5      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R045-5</b>     | 4.5            | 5      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R046-5</b>     | 4.6            | 5      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R047-5</b>     | 4.7            | 5      | 74  | 32 | 40  | 0.8 | ●      |
| <b>R048-5</b>     | 4.8            | 5      | 82  | 32 | 40  | 0.8 | ●      |
| <b>R049-5</b>     | 4.9            | 5      | 82  | 32 | 40  | 0.8 | ●      |
| <b>R050-5</b>     | 5.0            | 5      | 82  | 32 | 40  | 0.8 | ●      |
| <b>R051-6</b>     | 5.1            | 6      | 82  | 35 | 45  | 0.8 | ●      |
| <b>R052-6</b>     | 5.2            | 6      | 82  | 35 | 45  | 0.8 | ●      |
| <b>R053-6</b>     | 5.3            | 6      | 82  | 35 | 45  | 0.8 | ●      |
| <b>R054-6</b>     | 5.4            | 6      | 82  | 35 | 45  | 0.8 | ●      |
| <b>R055-6</b>     | 5.5            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R056-6</b>     | 5.6            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R057-6</b>     | 5.7            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R058-6</b>     | 5.8            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R059-6</b>     | 5.9            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R060-6</b>     | 6.0            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R061-7</b>     | 6.1            | 7      | 91  | 37 | 48  | 1   | ●      |
| <b>R062-7</b>     | 6.2            | 7      | 91  | 37 | 48  | 1   | ●      |
| <b>R063-7</b>     | 6.3            | 7      | 91  | 37 | 48  | 1   | ●      |
| <b>R064-7</b>     | 6.4            | 7      | 91  | 37 | 48  | 1   | ●      |

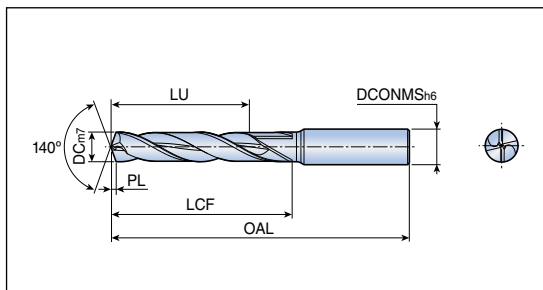
●: Standard items



## Solid carbide drills without oil holes



- Drilling depth: 5xdiameter

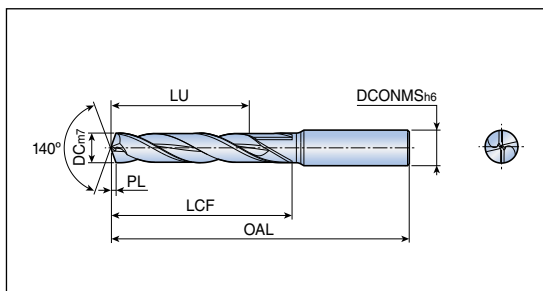


| Designation       | Dimension (mm) |        |     |    |     |     | Grade |
|-------------------|----------------|--------|-----|----|-----|-----|-------|
|                   | DC             | DCONMS | OAL | LU | LCF | PL  |       |
| <b>TED R065-7</b> | 6.5            | 7      | 91  | 37 | 48  | 1   | ●     |
| <b>R066-7</b>     | 6.6            | 7      | 91  | 37 | 48  | 1   | ●     |
| <b>R067-7</b>     | 6.7            | 7      | 91  | 37 | 48  | 1.1 | ●     |
| <b>R068-7</b>     | 6.8            | 7      | 91  | 37 | 48  | 1.1 | ●     |
| <b>R069-7</b>     | 6.9            | 7      | 91  | 37 | 48  | 1.1 | ●     |
| <b>R070-7</b>     | 7.0            | 7      | 91  | 37 | 48  | 1.1 | ●     |
| <b>R071-8</b>     | 7.1            | 8      | 91  | 42 | 53  | 1.1 | ●     |
| <b>R072-8</b>     | 7.2            | 8      | 91  | 42 | 53  | 1.1 | ●     |
| <b>R073-8</b>     | 7.3            | 8      | 91  | 42 | 53  | 1.1 | ●     |
| <b>R074-8</b>     | 7.4            | 8      | 91  | 42 | 53  | 1.2 | ●     |
| <b>R075-8</b>     | 7.5            | 8      | 91  | 42 | 53  | 1.2 | ●     |
| <b>R076-8</b>     | 7.6            | 8      | 91  | 42 | 53  | 1.2 | ●     |
| <b>R077-8</b>     | 7.7            | 8      | 91  | 42 | 53  | 1.2 | ●     |
| <b>R078-8</b>     | 7.8            | 8      | 91  | 42 | 53  | 1.2 | ●     |
| <b>R079-8</b>     | 7.9            | 8      | 91  | 42 | 53  | 1.3 | ●     |
| <b>R080-8</b>     | 8.0            | 8      | 91  | 42 | 53  | 1.3 | ●     |
| <b>R081-9</b>     | 8.1            | 9      | 103 | 46 | 59  | 1.3 | ●     |
| <b>R082-9</b>     | 8.2            | 9      | 103 | 46 | 59  | 1.3 | ●     |
| <b>R083-9</b>     | 8.3            | 9      | 103 | 46 | 59  | 1.3 | ●     |
| <b>R084-9</b>     | 8.4            | 9      | 103 | 46 | 59  | 1.3 | ●     |
| <b>R085-9</b>     | 8.5            | 9      | 103 | 46 | 59  | 1.3 | ●     |
| <b>R086-9</b>     | 8.6            | 9      | 103 | 46 | 59  | 1.4 | ●     |
| <b>R087-9</b>     | 8.7            | 9      | 103 | 46 | 59  | 1.4 | ●     |
| <b>R088-9</b>     | 8.8            | 9      | 103 | 46 | 59  | 1.4 | ●     |
| <b>R089-9</b>     | 8.9            | 9      | 103 | 46 | 59  | 1.4 | ●     |
| <b>R090-9</b>     | 9.0            | 9      | 103 | 46 | 59  | 1.4 | ●     |
| <b>R091-10</b>    | 9.1            | 10     | 103 | 50 | 63  | 1.4 | ●     |
| <b>R092-10</b>    | 9.2            | 10     | 103 | 50 | 63  | 1.4 | ●     |
| <b>R093-10</b>    | 9.3            | 10     | 103 | 50 | 63  | 1.5 | ●     |
| <b>R094-10</b>    | 9.4            | 10     | 103 | 50 | 63  | 1.5 | ●     |
| <b>R095-10</b>    | 9.5            | 10     | 103 | 50 | 63  | 1.5 | ●     |
| <b>R096-10</b>    | 9.6            | 10     | 103 | 50 | 63  | 1.5 | ●     |
| <b>R097-10</b>    | 9.7            | 10     | 103 | 50 | 63  | 1.5 | ●     |
| <b>R098-10</b>    | 9.8            | 10     | 103 | 50 | 63  | 1.6 | ●     |
| <b>R099-10</b>    | 9.9            | 10     | 103 | 50 | 63  | 1.6 | ●     |



- : Standard items

- 

[illegible]

**Cutting Condition**

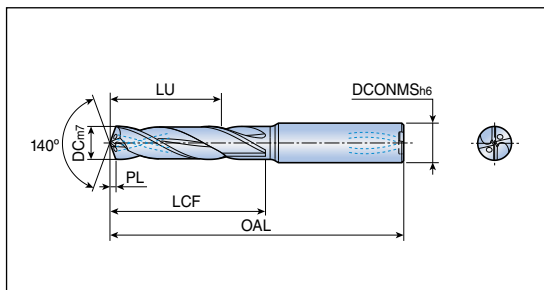


**D266**

## Solid carbide drills with oil holes



- Drilling depth: 3xdiameter



| Designation       | Dimension (mm) |        |     |    |     |     | Grade |
|-------------------|----------------|--------|-----|----|-----|-----|-------|
|                   | DC             | DCONMS | OAL | LU | LCF | PL  |       |
| <b>TEO S030-6</b> | 3.0            | 6      | 62  | 11 | 18  | 0.5 | ●     |
| <b>S031-6</b>     | 3.1            | 6      | 62  | 11 | 18  | 0.5 | ●     |
| <b>S032-6</b>     | 3.2            | 6      | 62  | 11 | 18  | 0.5 | ●     |
| <b>S033-6</b>     | 3.3            | 6      | 62  | 11 | 18  | 0.5 | ●     |
| <b>S034-6</b>     | 3.4            | 6      | 62  | 11 | 18  | 0.5 | ●     |
| <b>S035-6</b>     | 3.5            | 6      | 62  | 11 | 18  | 0.6 | ●     |
| <b>S036-6</b>     | 3.6            | 6      | 62  | 11 | 18  | 0.6 | ●     |
| <b>S037-6</b>     | 3.7            | 6      | 62  | 11 | 18  | 0.6 | ●     |
| <b>S038-6</b>     | 3.8            | 6      | 66  | 12 | 18  | 0.6 | ●     |
| <b>S039-6</b>     | 3.9            | 6      | 66  | 12 | 18  | 0.6 | ●     |
| <b>S040-6</b>     | 4.0            | 6      | 66  | 12 | 18  | 0.6 | ●     |
| <b>S041-6</b>     | 4.1            | 6      | 66  | 19 | 27  | 0.7 | ●     |
| <b>S042-6</b>     | 4.2            | 6      | 66  | 19 | 27  | 0.7 | ●     |
| <b>S043-6</b>     | 4.3            | 6      | 66  | 19 | 27  | 0.7 | ●     |
| <b>S044-6</b>     | 4.4            | 6      | 66  | 19 | 27  | 0.7 | ●     |
| <b>S045-6</b>     | 4.5            | 6      | 66  | 19 | 27  | 0.7 | ●     |
| <b>S046-6</b>     | 4.6            | 6      | 66  | 19 | 27  | 0.8 | ●     |
| <b>S047-6</b>     | 4.7            | 6      | 66  | 19 | 27  | 0.8 | ●     |
| <b>S048-6</b>     | 4.8            | 6      | 66  | 19 | 27  | 0.8 | ●     |
| <b>S049-6</b>     | 4.9            | 6      | 66  | 19 | 27  | 0.8 | ●     |
| <b>S050-6</b>     | 5.0            | 6      | 66  | 19 | 27  | 0.8 | ●     |
| <b>S051-6</b>     | 5.1            | 6      | 66  | 22 | 31  | 0.8 | ●     |
| <b>S052-6</b>     | 5.2            | 6      | 66  | 22 | 31  | 0.8 | ●     |
| <b>S053-6</b>     | 5.3            | 6      | 66  | 22 | 31  | 0.8 | ●     |
| <b>S054-6</b>     | 5.4            | 6      | 66  | 22 | 31  | 0.8 | ●     |
| <b>S055-6</b>     | 5.5            | 6      | 66  | 22 | 31  | 0.9 | ●     |
| <b>S056-6</b>     | 5.6            | 6      | 66  | 22 | 31  | 0.9 | ●     |
| <b>S057-6</b>     | 5.7            | 6      | 66  | 22 | 31  | 0.9 | ●     |
| <b>S058-6</b>     | 5.8            | 6      | 66  | 22 | 31  | 0.9 | ●     |
| <b>S059-6</b>     | 5.9            | 6      | 66  | 22 | 31  | 0.9 | ●     |
| <b>S060-6</b>     | 6.0            | 6      | 66  | 22 | 31  | 0.9 | ●     |
| <b>S061-7</b>     | 6.1            | 7      | 79  | 26 | 37  | 1   | ●     |
| <b>S062-7</b>     | 6.2            | 7      | 79  | 26 | 37  | 1   | ●     |
| <b>S063-7</b>     | 6.3            | 7      | 79  | 26 | 37  | 1   | ●     |
| <b>S064-7</b>     | 6.4            | 7      | 79  | 26 | 37  | 1   | ●     |



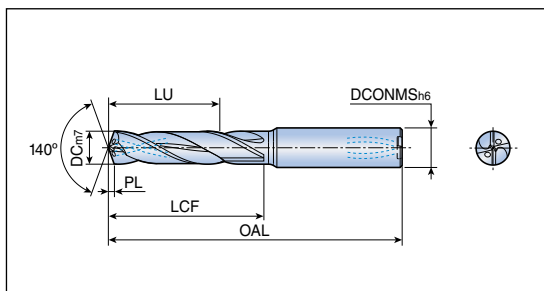
- : Standard items



## Solid carbide drills with oil holes



- Drilling depth: 3x diameter



| Designation       | Dimension (mm) |        |     |    |     |     | Grade<br>TT5130 |
|-------------------|----------------|--------|-----|----|-----|-----|-----------------|
|                   | DC             | DCONMS | OAL | LU | LCF | PL  |                 |
| <b>TEO S065-7</b> | 6.5            | 7      | 79  | 26 | 37  | 1   | ●               |
| <b>S066-7</b>     | 6.6            | 7      | 79  | 26 | 37  | 1   | ●               |
| <b>S067-7</b>     | 6.7            | 7      | 79  | 26 | 37  | 1.1 | ●               |
| <b>S068-7</b>     | 6.8            | 7      | 79  | 26 | 37  | 1.1 | ●               |
| <b>S069-7</b>     | 6.9            | 7      | 79  | 26 | 37  | 1.1 | ●               |
| <b>S070-7</b>     | 7.0            | 7      | 79  | 26 | 37  | 1.1 | ●               |
| <b>S071-8</b>     | 7.1            | 8      | 79  | 28 | 41  | 1.1 | ●               |
| <b>S072-8</b>     | 7.2            | 8      | 79  | 28 | 41  | 1.1 | ●               |
| <b>S073-8</b>     | 7.3            | 8      | 79  | 28 | 41  | 1.1 | ●               |
| <b>S074-8</b>     | 7.4            | 8      | 79  | 28 | 41  | 1.2 | ●               |
| <b>S075-8</b>     | 7.5            | 8      | 79  | 28 | 41  | 1.2 | ●               |
| <b>S076-8</b>     | 7.6            | 8      | 79  | 28 | 41  | 1.2 | ●               |
| <b>S077-8</b>     | 7.7            | 8      | 79  | 28 | 41  | 1.2 | ●               |
| <b>S078-8</b>     | 7.8            | 8      | 79  | 28 | 41  | 1.2 | ●               |
| <b>S079-8</b>     | 7.9            | 8      | 79  | 28 | 41  | 1.3 | ●               |
| <b>S080-8</b>     | 8.0            | 8      | 79  | 28 | 41  | 1.3 | ●               |
| <b>S081-9</b>     | 8.1            | 9      | 89  | 32 | 45  | 1.3 | ●               |
| <b>S082-9</b>     | 8.2            | 9      | 89  | 32 | 45  | 1.3 | ●               |
| <b>S083-9</b>     | 8.3            | 9      | 89  | 32 | 45  | 1.3 | ●               |
| <b>S084-9</b>     | 8.4            | 9      | 89  | 32 | 45  | 1.3 | ●               |
| <b>S085-9</b>     | 8.5            | 9      | 89  | 32 | 45  | 1.3 | ●               |
| <b>S086-9</b>     | 8.6            | 9      | 89  | 32 | 45  | 1.4 | ●               |
| <b>S087-9</b>     | 8.7            | 9      | 89  | 32 | 45  | 1.4 | ●               |
| <b>S088-9</b>     | 8.8            | 9      | 89  | 32 | 45  | 1.4 | ●               |
| <b>S089-9</b>     | 8.9            | 9      | 89  | 32 | 45  | 1.4 | ●               |
| <b>S090-9</b>     | 9.0            | 9      | 89  | 32 | 45  | 1.4 | ●               |
| <b>S091-10</b>    | 9.1            | 10     | 89  | 35 | 48  | 1.4 | ●               |
| <b>S092-10</b>    | 9.2            | 10     | 89  | 35 | 48  | 1.4 | ●               |
| <b>S093-10</b>    | 9.3            | 10     | 89  | 35 | 48  | 1.5 | ●               |
| <b>S094-10</b>    | 9.4            | 10     | 89  | 35 | 48  | 1.5 | ●               |
| <b>S095-10</b>    | 9.5            | 10     | 89  | 35 | 48  | 1.5 | ●               |
| <b>S096-10</b>    | 9.6            | 10     | 89  | 35 | 48  | 1.5 | ●               |
| <b>S097-10</b>    | 9.7            | 10     | 89  | 35 | 48  | 1.5 | ●               |
| <b>S098-10</b>    | 9.8            | 10     | 89  | 35 | 48  | 1.6 | ●               |
| <b>S099-10</b>    | 9.9            | 10     | 89  | 35 | 48  | 1.6 | ●               |

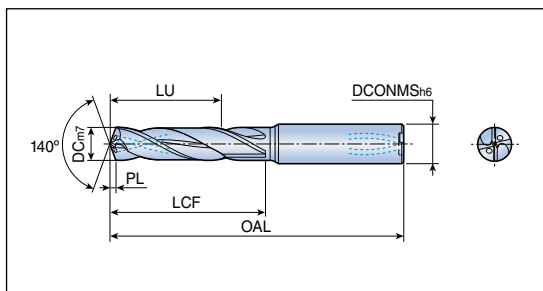
●: Standard items



## Solid carbide drills with oil holes



- Drilling depth:  $3 \times \text{diameter}$

[illegible]

●: Standard items

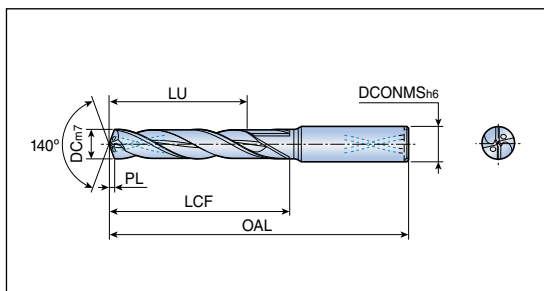
## TEO R



### Solid carbide drills with oil holes



- Drilling depth: 5xdiameter



| Designation       | Dimension (mm) |        |     |    |     |     | Grade  |
|-------------------|----------------|--------|-----|----|-----|-----|--------|
|                   | DC             | DCONMS | OAL | LU | LCF | PL  | TT5130 |
| <b>TE0 R030-6</b> | 3.0            | 6      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R031-6</b>     | 3.1            | 6      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R032-6</b>     | 3.2            | 6      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R033-6</b>     | 3.3            | 6      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R034-6</b>     | 3.4            | 6      | 66  | 24 | 30  | 0.5 | ●      |
| <b>R035-6</b>     | 3.5            | 6      | 66  | 24 | 30  | 0.6 | ●      |
| <b>R036-6</b>     | 3.6            | 6      | 66  | 24 | 30  | 0.6 | ●      |
| <b>R037-6</b>     | 3.7            | 6      | 66  | 24 | 30  | 0.6 | ●      |
| <b>R038-6</b>     | 3.8            | 6      | 74  | 24 | 30  | 0.6 | ●      |
| <b>R039-6</b>     | 3.9            | 6      | 74  | 24 | 30  | 0.6 | ●      |
| <b>R040-6</b>     | 4.0            | 6      | 74  | 24 | 30  | 0.6 | ●      |
| <b>R041-6</b>     | 4.1            | 6      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R042-6</b>     | 4.2            | 6      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R043-6</b>     | 4.3            | 6      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R044-6</b>     | 4.4            | 6      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R045-6</b>     | 4.5            | 6      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R046-6</b>     | 4.6            | 6      | 74  | 32 | 40  | 0.7 | ●      |
| <b>R047-6</b>     | 4.7            | 6      | 74  | 32 | 40  | 0.8 | ●      |
| <b>R048-6</b>     | 4.8            | 6      | 82  | 32 | 40  | 0.8 | ●      |
| <b>R049-6</b>     | 4.9            | 6      | 82  | 32 | 40  | 0.8 | ●      |
| <b>R050-6</b>     | 5.0            | 6      | 82  | 32 | 40  | 0.8 | ●      |
| <b>R051-6</b>     | 5.1            | 6      | 82  | 35 | 45  | 0.8 | ●      |
| <b>R052-6</b>     | 5.2            | 6      | 82  | 35 | 45  | 0.8 | ●      |
| <b>R053-6</b>     | 5.3            | 6      | 82  | 35 | 45  | 0.8 | ●      |
| <b>R054-6</b>     | 5.4            | 6      | 82  | 35 | 45  | 0.8 | ●      |
| <b>R055-6</b>     | 5.5            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R056-6</b>     | 5.6            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R057-6</b>     | 5.7            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R058-6</b>     | 5.8            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R059-6</b>     | 5.9            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R060-6</b>     | 6.0            | 6      | 82  | 35 | 45  | 0.9 | ●      |
| <b>R061-7</b>     | 6.1            | 7      | 91  | 37 | 48  | 1   | ●      |
| <b>R062-7</b>     | 6.2            | 7      | 91  | 37 | 48  | 1   | ●      |
| <b>R063-7</b>     | 6.3            | 7      | 91  | 37 | 48  | 1   | ●      |
| <b>R064-7</b>     | 6.4            | 7      | 91  | 37 | 48  | 1   | ●      |

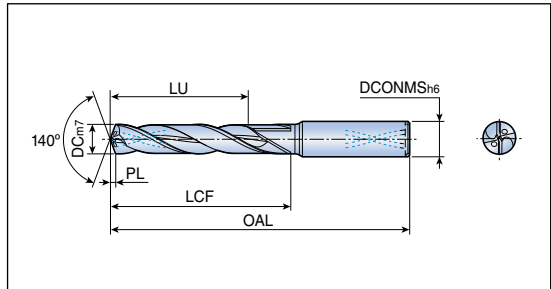
- : Standard items



## Solid carbide drills with oil holes



- Drilling depth: 5xdiameter



| Designation       | Dimension (mm) |        |     |    |     |     | Grade<br>TT5130 |
|-------------------|----------------|--------|-----|----|-----|-----|-----------------|
|                   | DC             | DCONMS | OAL | LU | LCF | PL  |                 |
| <b>TEO R065-7</b> | 6.5            | 7      | 91  | 37 | 48  | 1   | ●               |
| <b>R066-7</b>     | 6.6            | 7      | 91  | 37 | 48  | 1   | ●               |
| <b>R067-7</b>     | 6.7            | 7      | 91  | 37 | 48  | 1.1 | ●               |
| <b>R068-7</b>     | 6.8            | 7      | 91  | 37 | 48  | 1.1 | ●               |
| <b>R069-7</b>     | 6.9            | 7      | 91  | 37 | 48  | 1.1 | ●               |
| <b>R070-7</b>     | 7.0            | 7      | 91  | 37 | 48  | 1.1 | ●               |
| <b>R071-8</b>     | 7.1            | 8      | 91  | 42 | 53  | 1.1 | ●               |
| <b>R072-8</b>     | 7.2            | 8      | 91  | 42 | 53  | 1.1 | ●               |
| <b>R073-8</b>     | 7.3            | 8      | 91  | 42 | 53  | 1.1 | ●               |
| <b>R074-8</b>     | 7.4            | 8      | 91  | 42 | 53  | 1.2 | ●               |
| <b>R075-8</b>     | 7.5            | 8      | 91  | 42 | 53  | 1.2 | ●               |
| <b>R076-8</b>     | 7.6            | 8      | 91  | 42 | 53  | 1.2 | ●               |
| <b>R077-8</b>     | 7.7            | 8      | 91  | 42 | 53  | 1.2 | ●               |
| <b>R078-8</b>     | 7.8            | 8      | 91  | 42 | 53  | 1.2 | ●               |
| <b>R079-8</b>     | 7.9            | 8      | 91  | 42 | 53  | 1.3 | ●               |
| <b>R080-8</b>     | 8.0            | 8      | 91  | 42 | 53  | 1.3 | ●               |
| <b>R081-9</b>     | 8.1            | 9      | 103 | 46 | 59  | 1.3 | ●               |
| <b>R082-9</b>     | 8.2            | 9      | 103 | 46 | 59  | 1.3 | ●               |
| <b>R083-9</b>     | 8.3            | 9      | 103 | 46 | 59  | 1.3 | ●               |
| <b>R084-9</b>     | 8.4            | 9      | 103 | 46 | 59  | 1.3 | ●               |
| <b>R085-9</b>     | 8.5            | 9      | 103 | 46 | 59  | 1.3 | ●               |
| <b>R086-9</b>     | 8.6            | 9      | 103 | 46 | 59  | 1.4 | ●               |
| <b>R087-9</b>     | 8.7            | 9      | 103 | 46 | 59  | 1.4 | ●               |
| <b>R088-9</b>     | 8.8            | 9      | 103 | 46 | 59  | 1.4 | ●               |
| <b>R089-9</b>     | 8.9            | 9      | 103 | 46 | 59  | 1.4 | ●               |
| <b>R090-9</b>     | 9.0            | 9      | 103 | 46 | 59  | 1.4 | ●               |
| <b>R091-10</b>    | 9.1            | 10     | 103 | 50 | 63  | 1.4 | ●               |
| <b>R092-10</b>    | 9.2            | 10     | 103 | 50 | 63  | 1.4 | ●               |
| <b>R093-10</b>    | 9.3            | 10     | 103 | 50 | 63  | 1.5 | ●               |
| <b>R094-10</b>    | 9.4            | 10     | 103 | 50 | 63  | 1.5 | ●               |
| <b>R095-10</b>    | 9.5            | 10     | 103 | 50 | 63  | 1.5 | ●               |
| <b>R096-10</b>    | 9.6            | 10     | 103 | 50 | 63  | 1.5 | ●               |
| <b>R097-10</b>    | 9.7            | 10     | 103 | 50 | 63  | 1.5 | ●               |
| <b>R098-10</b>    | 9.8            | 10     | 103 | 50 | 63  | 1.6 | ●               |
| <b>R099-10</b>    | 9.9            | 10     | 103 | 50 | 63  | 1.6 | ●               |



- : Standard items

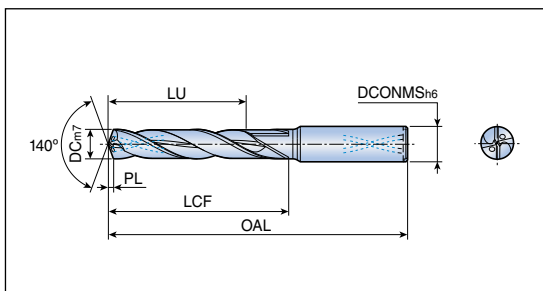
## TEO R



### Solid carbide drills with oil holes



- Drilling depth:  $5 \times \text{diameter}$

[illegible]

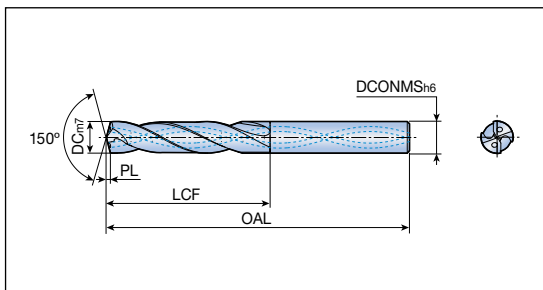
- : Standard items



## Solid pilot drills for solid long drill



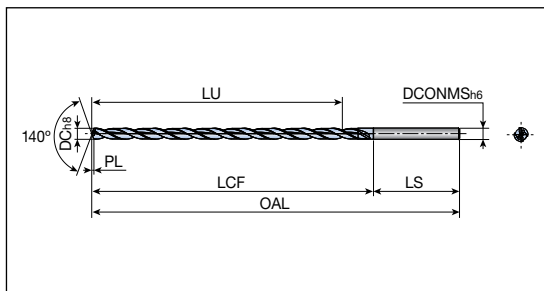
- M.Q.L drilling is available



●: Standard items



- 
- A schematic diagram of a water pump. It features a vertical shaft with a propeller at the bottom, enclosed within a pump housing. A discharge pipe extends upwards from the top of the housing. The pump is shown partially submerged in a body of water.



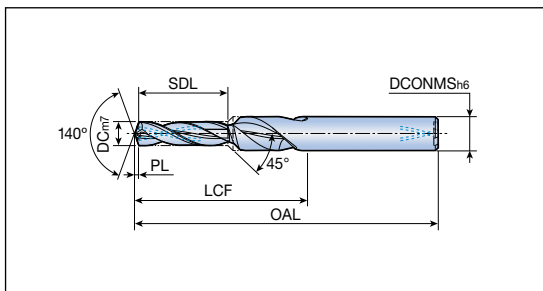
**Cutting Condition**



**D266**

D  
122

### Solid carbide drills for pre-thread holes



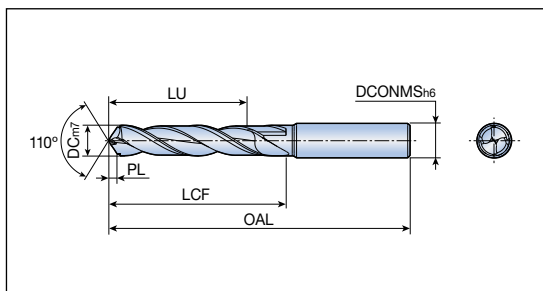
Cutting Condition



D266

●: Standard items



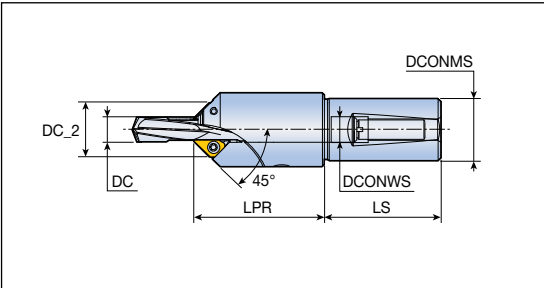
[illegible]

●: Standard items

# T-CHAMFER...T1



Chamfering tools with solid carbide drill



| Designation                  | DC        | Dimension (mm) |      |        |      |    | Insert         |
|------------------------------|-----------|----------------|------|--------|------|----|----------------|
|                              |           | DCONWS         | DC_2 | DCONMS | LPR  | LS |                |
| <b>T-CHAMFER 080-20T1-06</b> | 7.1-8.0   | 8              | 18.8 | 20     | 47.4 | 50 | XCGT 06....C.. |
| <b>090-20T1-06</b>           | 8.1-9.0   | 9              | 19.8 | 20     | 47.4 | 50 | D224           |
| <b>100-32T1-09</b>           | 9.1-10.0  | 10             | 24.9 | 32     | 67.3 | 60 | XCGT 09....C.. |
| <b>110-32T1-09</b>           | 10.1-11.0 | 11             | 25.9 | 32     | 67.3 | 60 | D224           |
| <b>120-32T1-09</b>           | 11.1-12.0 | 12             | 26.9 | 32     | 67.3 | 60 |                |
| <b>130-32T1-09</b>           | 12.1-13.0 | 13             | 27.9 | 32     | 67.3 | 60 |                |
| <b>140-32T1-09</b>           | 13.1-14.0 | 14             | 28.4 | 32     | 67.3 | 60 |                |
| <b>150-32T1-09</b>           | 14.1-15.0 | 15             | 29.4 | 32     | 67.3 | 60 |                |
| <b>160-32T1-09</b>           | 15.1-16.0 | 16             | 30.4 | 32     | 67.3 | 60 |                |
| <b>170-32T1-09</b>           | 16.1-17.0 | 17             | 31.4 | 32     | 67.3 | 60 |                |
| <b>180-32T1-09</b>           | 17.1-18.0 | 18             | 32.4 | 32     | 67.3 | 60 |                |
| <b>190-32T1-09</b>           | 18.1-19.0 | 19             | 33.4 | 32     | 75.0 | 60 |                |
| <b>200-32T1-09</b>           | 19.1-20.0 | 20             | 34.4 | 32     | 75.0 | 60 |                |
|                              |           |                |      |        |      |    |                |
|                              |           |                |      |        |      |    |                |
|                              |           |                |      |        |      |    |                |
|                              |           |                |      |        |      |    |                |
|                              |           |                |      |        |      |    |                |
|                              |           |                |      |        |      |    |                |
|                              |           |                |      |        |      |    |                |
|                              |           |                |      |        |      |    |                |
|                              |           |                |      |        |      |    |                |

## Spare parts

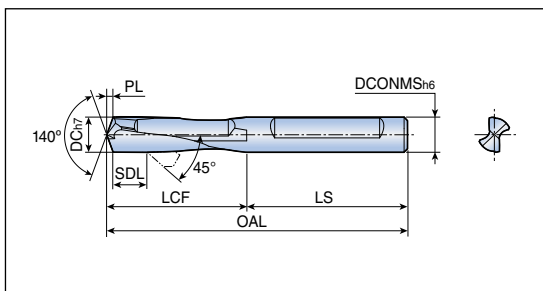
| Designation                | Side screw    | Back screw | L-wrench | Insert screw | Wrench |
|----------------------------|---------------|------------|----------|--------------|--------|
|                            |               |            |          |              |        |
| <b>T-CHAMFER 080 - 090</b> | SS M6x1x6     | M6x1-SP    | L-W 3    | TS 25064I    | TD 8   |
| <b>T-CHAMFER 100 - 200</b> | SS M10x1.5x10 | M10x1.5-SP | L-W 5    | TS 40093I    | TD 15  |
|                            |               |            |          |              |        |
|                            |               |            |          |              |        |
|                            |               |            |          |              |        |

Assembly

D126

## Solid carbide drills for T-CHAMFER

# TCAMPER



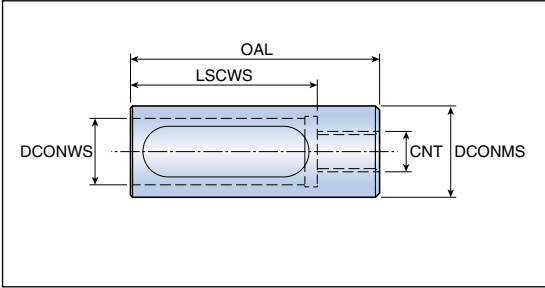
- 'SDL' is factored with a 45° insert positioned in insert pocket
- Solid carbide drill with internal coolant holes is available on request

●: Standard items

► The maximum chamfer size is obtained when using the smallest drill diameter in the drilling range

# TSL-NC

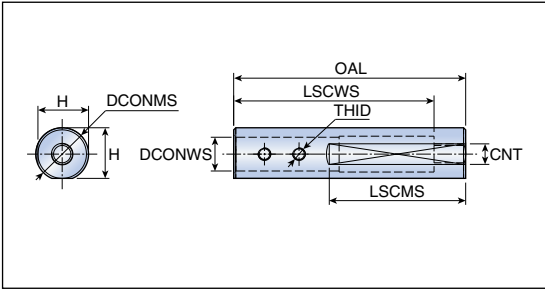
Drill sleeves for Swiss type automatic lathes (Fixed type, internal coolant)



| Designation            | Dimension (mm) |        |       |     |        |
|------------------------|----------------|--------|-------|-----|--------|
|                        | DCONMS         | DCONWS | LSCWS | OAL | CNT    |
| <b>TSL-NC 19.05-12</b> | 19.05          | 12.0   | 45    | 60  | Rc 1/8 |
| <b>19.05-16</b>        | 19.05          | 16.0   | 45    | 60  | Rc 1/8 |
| <b>20-12</b>           | 20.0           | 12.0   | 45    | 60  | Rc 1/8 |
| <b>20-16</b>           | 20.0           | 16.0   | 45    | 60  | Rc 1/8 |
| <b>22-16</b>           | 22.0           | 16.0   | 45    | 60  | Rc 1/8 |
| <b>25-20</b>           | 25.0           | 20.0   | 45    | 60  | Rc 1/8 |
| <b>25.4-20</b>         | 25.4           | 20.0   | 45    | 60  | Rc 1/8 |
| <b>32-25</b>           | 32.0           | 25.0   | 45    | 60  | Rc 1/8 |

# TSL-SW

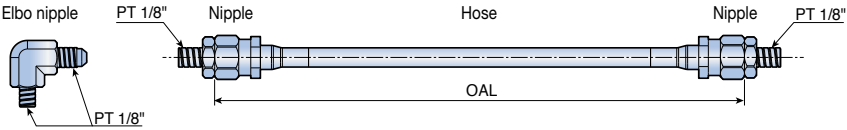
Drill sleeves for Swiss type automatic lathes (Adjustable type, internal coolant)



| Designation         | Dimension (mm) |        |       |       |     |      |      |        |
|---------------------|----------------|--------|-------|-------|-----|------|------|--------|
|                     | DCONMS         | DCONWS | LSCWS | LSCMS | OAL | H    | THID | CNT    |
| <b>TSL-SW 22-12</b> | 22.0           | 12.0   | 95    | 65    | 110 | 21.0 | M6   | Rc 1/8 |
| <b>25-12</b>        | 25.0           | 12.0   | 95    | 65    | 110 | 24.0 | M8   | Rc 1/8 |
| <b>25-16</b>        | 25.0           | 16.0   | 95    | 65    | 110 | 24.0 | M6   | Rc 1/8 |
| <b>25.4-12</b>      | 25.4           | 12.0   | 95    | 65    | 110 | 24.4 | M8   | Rc 1/8 |
| <b>25.4-16</b>      | 25.4           | 16.0   | 95    | 65    | 110 | 24.4 | M6   | Rc 1/8 |
| <b>32-12</b>        | 32.0           | 12.0   | 95    | 65    | 110 | 31.0 | M8   | Rc 1/8 |
| <b>32-16</b>        | 32.0           | 16.0   | 95    | 65    | 110 | 31.0 | M8   | Rc 1/8 |
| <b>32-20</b>        | 32.0           | 20.0   | 95    | 65    | 110 | 31.0 | M8   | Rc 1/8 |

# Accessories

## Hose set



\* Hose set components: 1 hose, 2 nipples, 1 elbo nipple

| Designation                | Dimension (mm) |                     |
|----------------------------|----------------|---------------------|
|                            | OAL (mm)       | Max. pressure (bar) |
| <b>S-TSL HOSE R1/8-220</b> | 220            | 100                 |
| <b>R1/8-350</b>            | 350            | 100                 |
|                            |                |                     |
|                            |                |                     |
|                            |                |                     |
|                            |                |                     |

► Hose set is ordered separately

## Spare parts

| Designation           | Mounting screw                                                                      | Wrench                                                                              |  |  |
|-----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                       |  |  |  |  |
| <b>TSL-SW 22-12</b>   | SS M6X1X5                                                                           | L-W 3                                                                               |  |  |
| <b>TSL-SW 25-12</b>   | SS M8X1.25X6                                                                        | L-W 4                                                                               |  |  |
| <b>TSL-SW 25-16</b>   | SS M6X1X5                                                                           | L-W 3                                                                               |  |  |
| <b>TSL-SW 25.4-12</b> | SS M8X1.25X6                                                                        | L-W 4                                                                               |  |  |
| <b>TSL-SW 25.4-16</b> | SS M6X1X5                                                                           | L-W 3                                                                               |  |  |
| <b>TSL-SW 32-12</b>   | SS M8X1.25X6                                                                        | L-W 4                                                                               |  |  |
| <b>TSL-SW 32-16</b>   | SS M8X1.25X6                                                                        | L-W 4                                                                               |  |  |
| <b>TSL-SW 32-20</b>   | SS M8X1.25X6                                                                        | L-W 4                                                                               |  |  |
|                       |                                                                                     |                                                                                     |  |  |

# Reaming Tools



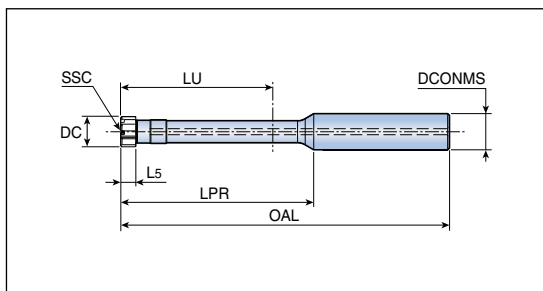
# XR...-3B/5B-S0



Head changeable reamer holders for small diameter blind hole



- Cylindrical shank



| Designation           | DC            | SSC | Dimension (mm) |     |       |      |      | Overhang |
|-----------------------|---------------|-----|----------------|-----|-------|------|------|----------|
|                       |               |     | DCONMS         | L5  | OAL   | LU   | LPR  |          |
| <b>XR-D08-3B-10S0</b> | 8.000-8.999   | 8   | 10             | 4.0 | 81.0  | 28.0 | 36.0 | 3XD      |
| <b>D09-3B-10S0</b>    | 9.000-9.999   | 9   | 10             | 4.5 | 85.5  | 31.5 | 40.5 |          |
| <b>D10-3B-12S0</b>    | 10.000-10.999 | 10  | 12             | 5.0 | 89.0  | 35.0 | 44.0 |          |
| <b>D11-3B-12S0</b>    | 11.000-11.999 | 11  | 12             | 5.5 | 92.5  | 38.5 | 47.5 |          |
| <b>D12-3B-12S0</b>    | 12.000-12.999 | 12  | 12             | 6.0 | 96.0  | 42.0 | 51.0 |          |
| <b>XR-D08-5B-10S0</b> | 8.000-8.999   | 8   | 10             | 4.0 | 97.0  | 44.0 | 52.0 | 5XD      |
| <b>D09-5B-10S0</b>    | 9.000-9.999   | 9   | 10             | 4.5 | 103.5 | 49.5 | 58.5 |          |
| <b>D10-5B-12S0</b>    | 10.000-10.999 | 10  | 12             | 5.0 | 109.0 | 55.0 | 64.0 |          |
| <b>D11-5B-12S0</b>    | 11.000-11.999 | 11  | 12             | 5.5 | 114.5 | 60.5 | 69.5 |          |
| <b>D12-5B-12S0</b>    | 12.000-12.999 | 12  | 12             | 6.0 | 120.0 | 66.0 | 75.0 |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |

- SSC: Seat size code
- Matched with XR...-AS reamer heads
- Reamer head is sold separately from reamer holder

## Spare parts

| Designation   | Clamping key | Key handle |
|---------------|--------------|------------|
|               |              |            |
| <b>XR-D08</b> | W XR D08-KEY | SW6-T-SH   |
| <b>XR-D09</b> | W XR D08-KEY | SW6-T-SH   |
| <b>XR-D10</b> | W XR D10-KEY | SW6-T-SH   |
| <b>XR-D11</b> | W XR D10-KEY | SW6-T-SH   |
| <b>XR-D12</b> | W XR D12-KEY | SW6-T-SH   |



- Clamping key & clamping screw are included

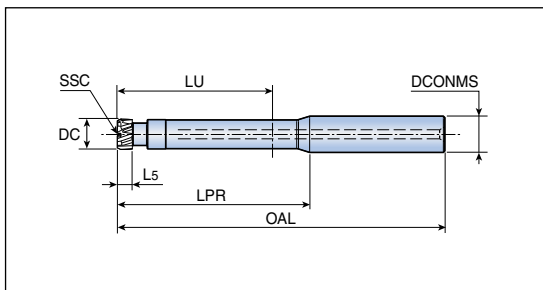
# XR...-3T/5T-S0



Head changeable reamer holders for small diameter through hole



• Cylindrical shank



| Designation           | DC            | SSC | Dimension (mm) |     |       |      |      | Overhang |
|-----------------------|---------------|-----|----------------|-----|-------|------|------|----------|
|                       |               |     | DCONMS         | L5  | OAL   | LU   | LPR  |          |
| <b>XR-D08-3T-10S0</b> | 8.000-8.999   | 8   | 10             | 4.0 | 81.0  | 28.0 | 36.0 | 3XD      |
| <b>D09-3T-10S0</b>    | 9.000-9.999   | 9   | 10             | 4.5 | 85.5  | 31.5 | 40.5 |          |
| <b>D10-3T-12S0</b>    | 10.000-10.999 | 10  | 12             | 5.0 | 89.0  | 35.0 | 44.0 |          |
| <b>D11-3T-12S0</b>    | 11.000-11.999 | 11  | 12             | 5.5 | 92.5  | 38.5 | 47.5 |          |
| <b>D12-3T-12S0</b>    | 12.000-12.999 | 12  | 12             | 6.0 | 95.0  | 42.0 | 50.0 |          |
| <b>XR-D08-5T-10S0</b> | 8.000-8.999   | 8   | 10             | 4.0 | 97.0  | 44.0 | 52.0 | 5XD      |
| <b>D09-5T-10S0</b>    | 9.000-9.999   | 9   | 10             | 4.5 | 103.5 | 49.5 | 58.5 |          |
| <b>D10-5T-12S0</b>    | 10.000-10.999 | 10  | 12             | 5.0 | 109.0 | 55.0 | 64.0 |          |
| <b>D11-5T-12S0</b>    | 11.000-11.999 | 11  | 12             | 5.5 | 114.5 | 60.5 | 69.5 |          |
| <b>D12-5T-12S0</b>    | 12.000-12.999 | 12  | 12             | 6.0 | 119.0 | 66.0 | 74.0 |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |
|                       |               |     |                |     |       |      |      |          |

- ▶ SSC: Seat size code
- ▶ Matched with XR...-BL reamer heads
- ▶ Reamer head is sold separately from reamer holder

## Spare parts

| Designation   | Clamping key | Key handle |
|---------------|--------------|------------|
|               |              |            |
| <b>XR-D08</b> | W XR D08-KEY | SW6-T-SH   |
| <b>XR-D09</b> | W XR D08-KEY | SW6-T-SH   |
| <b>XR-D10</b> | W XR D10-KEY | SW6-T-SH   |
| <b>XR-D11</b> | W XR D10-KEY | SW6-T-SH   |
| <b>XR-D12</b> | W XR D12-KEY | SW6-T-SH   |



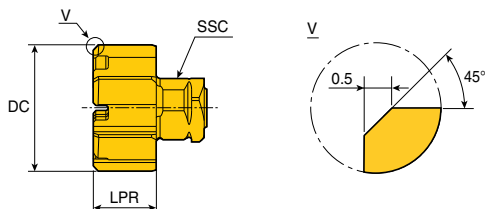
▶ Clamping key & clamping screw are included



# XR...-AS



## Head changeable reamer head



- Straight flute for blind hole
- For H7 hole tolerance

| Head | Designation         | Dimension (mm) |     | NOF | SSC | Flute type | Edge type | Grade TT9030 |
|------|---------------------|----------------|-----|-----|-----|------------|-----------|--------------|
|      |                     | DC             | LPR |     |     |            |           |              |
|      | <b>XR-08.000-AS</b> | 8.000          | 4.0 | 6   | 8   | S          | A         | ●            |
|      | <b>09.000-AS</b>    | 9.000          | 4.5 | 6   | 9   | S          | A         | ●            |
|      | <b>10.000-AS</b>    | 10.000         | 5.0 | 6   | 10  | S          | A         | ●            |
|      | <b>11.000-AS</b>    | 11.000         | 5.5 | 6   | 11  | S          | A         | ●            |
|      | <b>12.000-AS</b>    | 12.000         | 6.0 | 6   | 12  | S          | A         | ●            |



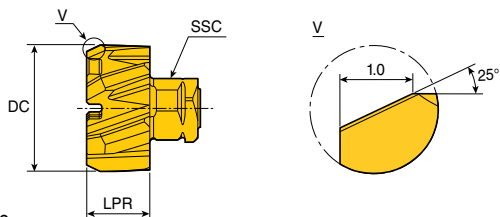
- NOF: Number of flutes
- SSC: Seat size code

●: Standard items

# XR...-BL



## Head changeable reamer head



- Helical flute for through hole
- For H7 hole tolerance

| Head | Designation         | Dimension (mm) |     | NOF | SSC | Flute type | Edge type | Grade TT9030 |
|------|---------------------|----------------|-----|-----|-----|------------|-----------|--------------|
|      |                     | DC             | LPR |     |     |            |           |              |
|      | <b>XR-08.000-BL</b> | 8.000          | 4.0 | 6   | 8   | L          | B         | ●            |
|      | <b>09.000-BL</b>    | 9.000          | 4.5 | 6   | 9   | L          | B         | ●            |
|      | <b>10.000-BL</b>    | 10.000         | 5.0 | 6   | 10  | L          | B         | ●            |
|      | <b>11.000-BL</b>    | 11.000         | 5.5 | 6   | 11  | L          | B         | ●            |
|      | <b>12.000-BL</b>    | 12.000         | 6.0 | 6   | 12  | L          | B         | ●            |



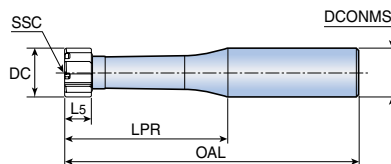
- NOF: Number of flutes
- SSC: Seat size code

●: Standard items

## Head changeable reamer holders



- Cylindrical shank



| Designation          | DC            | SSC | Dimension (mm) |      |       |       | Overhang |
|----------------------|---------------|-----|----------------|------|-------|-------|----------|
|                      |               |     | DCONMS         | L5   | OAL   | LPR   |          |
| <b>TM - 3B5-16T0</b> | 11.501-13.500 | B5  | 16             | 9.3  | 97.8  | 49.8  | 3XD      |
| <b>3B6-16T0</b>      | 13.501-16.000 | B6  | 16             | 9.4  | 105.4 | 57.4  |          |
| <b>3B7-20T0</b>      | 16.000-20.000 | B7  | 20             | 10.6 | 120.6 | 70.6  |          |
| <b>3B8-20T0</b>      | 20.001-25.400 | B8  | 20             | 12.8 | 137.8 | 87.8  |          |
| <b>3B9-32T0</b>      | 25.401-32.000 | B9  | 32             | 12.8 | 167.1 | 107.1 |          |
| <b>5B5-16T0</b>      | 11.501-13.500 | B5  | 16             | 9.3  | 125.0 | 77.0  | 5XD      |
| <b>5B6-16T0</b>      | 13.501-16.000 | B6  | 16             | 9.4  | 137.4 | 89.4  |          |
| <b>5B7-20T0</b>      | 16.000-20.000 | B7  | 20             | 10.6 | 160.6 | 110.6 |          |
| <b>5B8-20T0</b>      | 20.001-25.400 | B8  | 20             | 12.8 | 187.8 | 137.8 |          |
| <b>5B9-32T0</b>      | 25.401-32.000 | B9  | 32             | 12.8 | 231.1 | 171.1 |          |
| <b>8B5-16T0</b>      | 11.501-13.500 | B5  | 16             | 9.3  | 165.5 | 117.5 | 8XD      |
| <b>8B6-16T0</b>      | 13.501-16.000 | B6  | 16             | 9.4  | 185.4 | 137.4 |          |
| <b>8B7-20T0</b>      | 16.000-20.000 | B7  | 20             | 10.6 | 220.6 | 170.6 |          |
| <b>8B8-20T0</b>      | 20.001-25.400 | B8  | 20             | 12.8 | 262.8 | 212.8 |          |
| <b>8B9-32T0</b>      | 25.401-32.000 | B9  | 32             | 12.8 | 327.1 | 267.1 |          |
|                      |               |     |                |      |       |       |          |
|                      |               |     |                |      |       |       |          |
|                      |               |     |                |      |       |       |          |
|                      |               |     |                |      |       |       |          |

- SSC: Seat size code
- Reamer head is sold separately from reamer holder

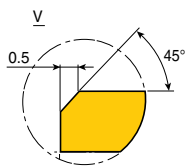
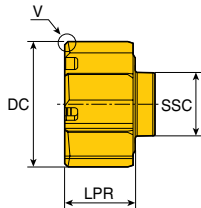
## Spare parts

| Designation         | Clamping screw                                                                      | Clamping key                                                                        |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |  |  |
| <b>TM...B5-16T0</b> | TM-B5-SCR                                                                           | TM-B5-KEY                                                                           |
| <b>TM...B6-16T0</b> | TM-B6-SCR                                                                           | TM-B6-KEY                                                                           |
| <b>TM...B7-20T0</b> | TM-B7-SCR                                                                           | TM-B7-KEY                                                                           |
| <b>TM...B8-20T0</b> | TM-B8-SCR                                                                           | TM-B8-KEY                                                                           |
| <b>TM...B9-32T0</b> | TM-B9-SCR                                                                           | TM-B9-KEY                                                                           |



- Clamping key & clamping screw are included

Head changeable reamer heads



- Straight flute for blind hole
- For H7 hole tolerance

| Head                                                                              | Designation              | Dimension (mm) |      | NOF | SSC | Flute type | Edge type | Grade TT9030 |
|-----------------------------------------------------------------------------------|--------------------------|----------------|------|-----|-----|------------|-----------|--------------|
|                                                                                   |                          | DC             | LPR  |     |     |            |           |              |
|  | <b>TM - 11.501-AS-B5</b> | 11.501         | 9.5  | 6   | B5  | S          | A         | ●            |
|                                                                                   | <b>12.000-AS-B5</b>      | 12.000         | 9.5  | 6   | B5  | S          | A         | ●            |
|                                                                                   | <b>13.000-AS-B5</b>      | 13.000         | 9.5  | 6   | B5  | S          | A         | ●            |
|                                                                                   | <b>13.500-AS-B5</b>      | 13.500         | 9.5  | 6   | B5  | S          | A         | ●            |
|                                                                                   | <b>13.501-AS-B6</b>      | 13.501         | 9.5  | 6   | B6  | S          | A         | ●            |
|                                                                                   | <b>14.000-AS-B6</b>      | 14.000         | 9.5  | 6   | B6  | S          | A         | ●            |
|                                                                                   | <b>15.000-AS-B6</b>      | 15.000         | 9.5  | 6   | B6  | S          | A         | ●            |
|                                                                                   | <b>16.000-AS-B6</b>      | 16.000         | 9.5  | 6   | B6  | S          | A         | ●            |
|                                                                                   | <b>16.001-AS-B7</b>      | 16.001         | 10.7 | 6   | B7  | S          | A         | ●            |
|                                                                                   | <b>17.000-AS-B7</b>      | 17.000         | 10.7 | 6   | B7  | S          | A         | ●            |
|                                                                                   | <b>18.000-AS-B7</b>      | 18.000         | 10.7 | 6   | B7  | S          | A         | ●            |
|                                                                                   | <b>19.000-AS-B7</b>      | 19.000         | 10.7 | 6   | B7  | S          | A         | ●            |
|                                                                                   | <b>20.000-AS-B7</b>      | 20.000         | 10.7 | 6   | B7  | S          | A         | ●            |
|                                                                                   | <b>20.001-AS-B8</b>      | 20.001         | 12.9 | 8   | B8  | S          | A         | ●            |
|                                                                                   | <b>21.000-AS-B8</b>      | 21.000         | 12.9 | 8   | B8  | S          | A         | ●            |
|                                                                                   | <b>22.000-AS-B8</b>      | 22.000         | 12.9 | 8   | B8  | S          | A         | ●            |
|                                                                                   | <b>23.000-AS-B8</b>      | 23.000         | 12.9 | 8   | B8  | S          | A         | ●            |
|                                                                                   | <b>24.000-AS-B8</b>      | 24.000         | 12.9 | 8   | B8  | S          | A         | ●            |
|                                                                                   | <b>25.000-AS-B8</b>      | 25.000         | 12.9 | 8   | B8  | S          | A         | ●            |
|                                                                                   | <b>26.000-AS-B9</b>      | 26.000         | 12.9 | 8   | B9  | S          | A         | ●            |
|                                                                                   | <b>27.000-AS-B9</b>      | 27.000         | 12.9 | 8   | B9  | S          | A         | ●            |
|                                                                                   | <b>28.000-AS-B9</b>      | 28.000         | 12.9 | 8   | B9  | S          | A         | ●            |
|                                                                                   | <b>29.000-AS-B9</b>      | 29.000         | 12.9 | 8   | B9  | S          | A         | ●            |
|                                                                                   | <b>30.000-AS-B9</b>      | 30.000         | 12.9 | 8   | B9  | S          | A         | ●            |
|                                                                                   | <b>31.000-AS-B9</b>      | 31.000         | 12.9 | 8   | B9  | S          | A         | ●            |
|                                                                                   | <b>32.000-AS-B9</b>      | 32.000         | 12.9 | 8   | B9  | S          | A         | ●            |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |
|                                                                                   |                          |                |      |     |     |            |           |              |



- NOF: Number of flutes
- SSC: Seat size code

●: Standard items

Technical drawing of a reamer showing side and end views with dimensions:

- Side View:** Shows the reamer with dimensions  $DC$  (total diameter),  $SSC$  (flute length),  $LPR$  (total length), and a  $20^\circ$  angle.
- End View:** Shows the reamer with dimensions  $1.07$  (radius) and a  $25^\circ$  angle.

• Helical flute for through hole  
• For H7 hole tolerance

[illegible]

- ▶ NOF: Number of flutes
- ▶ SSC: Seat size code

●: Standard items

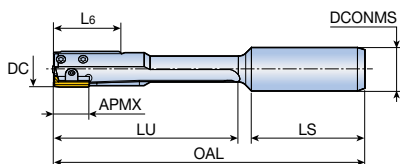


|                                                                                    |                                                                                    |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |
| D139                                                                               | D284                                                                               |

## Indexable reamer holders



- 



|                                                                                   |                                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|  |  Cutting Condition |
| D139                                                                              | D284                                                                                                |

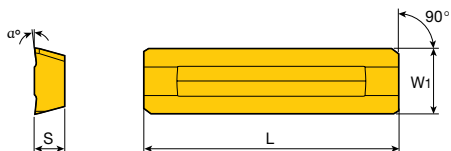
► Available upon request

**TDR**

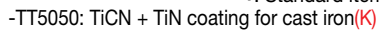
## Spare parts

► SSC: Seat size code

## Indexable blades



- [illegible]

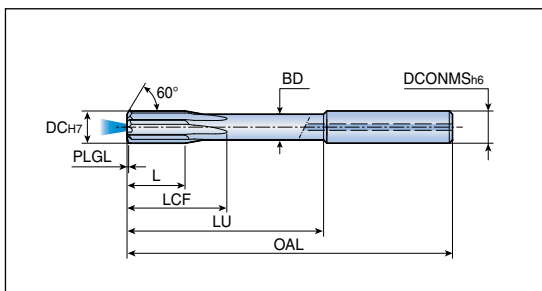




### Solid reamers for blind hole



- Straight flute - DIN1420

[illegible]

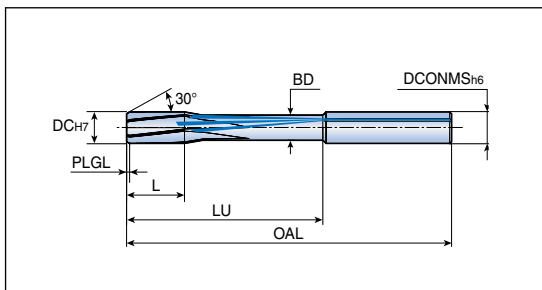
- ▶ Special diameters are available on request
- ▶ NOF: Number of flutes
- ▶ \*: Ø3 reamer does not include a coolant hole

●: Standard items

### Solid reamers for through hole



- Left flute - DIN1420

[illegible]

- ▶ Special diameters are available on request
- ▶ NOF: Number of flutes
- ▶ \*: Ø3 reamer does not include a coolant hole

●: Standard items

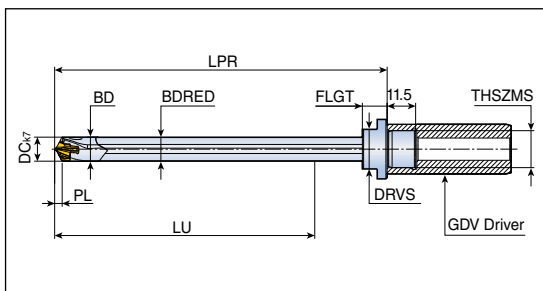
# Deep Drilling Tools



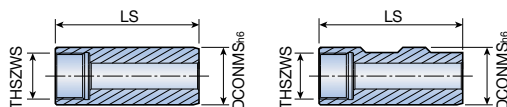
## DRILL-RUSH head-changeable and modular shank gundrill holders



- Drilling depth: 16-20x diameter

[illegible]

- ▶ OAL: LPR+11.5
- ▶ Driver is sold separately from drill holder
- ▶ SSC: Seat size code



### Cylindrical (C) Type

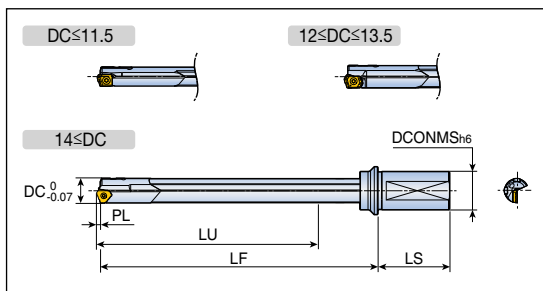
Weldon (W) Type

[illegible]

## Standard gundrill holders



- Drilling depth: 10-45x diameter



| Designation              | Dimension (mm) |       |       |    |        |     |     |
|--------------------------|----------------|-------|-------|----|--------|-----|-----|
|                          | DC             | LU    | LF    | LS | DCONMS | PL  | L/D |
| <b>TRGD 16.00xM25-10</b> | 16.0           | 172   | 209   | 56 | 25     | 2.2 | 10  |
| <b>16.50xM25-10</b>      | 16.5           | 172   | 209   | 56 | 25     | 2.2 | 10  |
| <b>17.00xM25-10</b>      | 17.0           | 182   | 220   | 56 | 25     | 2.2 | 10  |
| <b>18.00xM25-10</b>      | 18.0           | 193   | 232   | 56 | 25     | 3.0 | 10  |
| <b>19.00xM25-10</b>      | 19.0           | 203   | 243   | 56 | 25     | 3.0 | 10  |
| <b>20.00xM32-10</b>      | 20.0           | 213   | 255   | 60 | 32     | 3.2 | 10  |
| <b>29.00xM40-10</b>      | 29.0           | 294.6 | 360   | 69 | 40     | 4.6 | 10  |
| <b>30.00xM40-10</b>      | 30.0           | 314.6 | 383   | 69 | 40     | 4.6 | 10  |
| <b>31.00xM40-10</b>      | 31.0           | 314.6 | 383   | 69 | 40     | 4.6 | 10  |
| <b>32.00xM40-10</b>      | 32.0           | 324.6 | 395   | 69 | 40     | 4.6 | 10  |
| <b>10.00xM20-15</b>      | 10.0           | 159.2 | 184.5 | 50 | 20     | 1.8 | 15  |
| <b>10.50xM20-15</b>      | 10.5           | 166.7 | 193   | 50 | 20     | 1.8 | 15  |
| <b>11.00xM20-15</b>      | 11.0           | 181.7 | 209   | 50 | 20     | 1.8 | 15  |
| <b>11.50xM20-15</b>      | 11.5           | 181.7 | 209   | 50 | 20     | 1.8 | 15  |
| <b>12.00xM20-15</b>      | 12.0           | 196.8 | 225   | 50 | 20     | 1.8 | 15  |
| <b>12.50xM20-15</b>      | 12.5           | 196.8 | 226   | 50 | 20     | 1.8 | 15  |
| <b>13.00xM25-15</b>      | 13.0           | 211.8 | 245   | 56 | 25     | 1.8 | 15  |
| <b>13.50xM25-15</b>      | 13.5           | 211.8 | 245   | 56 | 25     | 1.8 | 15  |
| <b>14.00xM25-15</b>      | 14.0           | 227   | 261   | 56 | 25     | 2.0 | 15  |
| <b>14.50xM25-15</b>      | 14.5           | 227   | 262   | 56 | 25     | 2.0 | 15  |
| <b>15.00xM25-15</b>      | 15.0           | 242   | 278   | 56 | 25     | 2.0 | 15  |
| <b>16.00xM25-15</b>      | 16.0           | 257   | 294   | 56 | 25     | 2.2 | 15  |
| <b>16.50xM25-15</b>      | 16.5           | 257   | 294   | 56 | 25     | 2.2 | 15  |
| <b>17.00xM25-15</b>      | 17.0           | 272   | 310   | 56 | 25     | 2.2 | 15  |
| <b>17.50xM25-15</b>      | 17.5           | 272   | 310   | 56 | 25     | 2.2 | 15  |
| <b>18.00xM25-15</b>      | 18.0           | 288   | 327   | 56 | 25     | 3.0 | 15  |
| <b>18.50xM25-15</b>      | 18.5           | 288   | 327   | 56 | 25     | 3.0 | 15  |
| <b>19.00xM25-15</b>      | 19.0           | 303   | 343   | 56 | 25     | 3.0 | 15  |
| <b>19.50xM25-15</b>      | 19.5           | 303   | 343   | 56 | 25     | 3.0 | 15  |
| <b>20.00xM32-15</b>      | 20.0           | 318   | 360   | 60 | 32     | 3.2 | 15  |
| <b>21.00xM32-15</b>      | 21.0           | 333   | 376   | 60 | 32     | 3.2 | 15  |
| <b>22.00xM32-15</b>      | 22.0           | 348   | 393   | 60 | 32     | 3.4 | 15  |
| <b>23.00xM32-15</b>      | 23.0           | 363   | 409   | 60 | 32     | 3.4 | 15  |
| <b>24.00xM32-15</b>      | 24.0           | 378   | 426   | 60 | 32     | 3.4 | 15  |
| <b>25.00xM32-15</b>      | 25.0           | 394   | 442   | 60 | 32     | 3.7 | 15  |



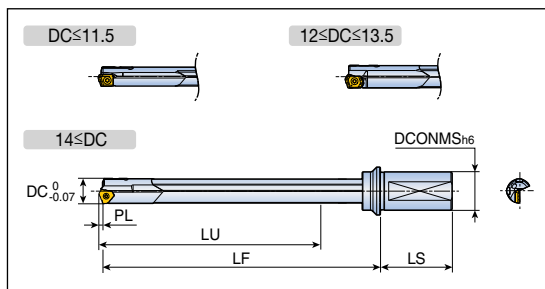
► Guide pad is sold separately from drill body

► Available upon request

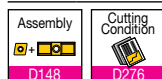
## Standard gundrill holders



- Drilling depth: 10-45x diameter

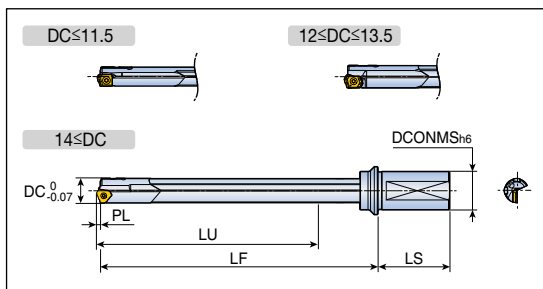
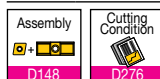


| Designation              | Dimension (mm) |       |       |    |        |     |     |
|--------------------------|----------------|-------|-------|----|--------|-----|-----|
|                          | DC             | LU    | LF    | LS | DCONMS | PL  | L/D |
| <b>TRGD 26.00xM40-15</b> | 26.0           | 409   | 449   | 70 | 40     | 3.7 | 15  |
| <b>27.00xM40-15</b>      | 27.0           | 424   | 465   | 70 | 40     | 3.7 | 15  |
| <b>28.00xM40-15</b>      | 28.0           | 424   | 467   | 70 | 40     | 3.7 | 15  |
| <b>8.00xM20-20</b>       | 8.0            | 169.2 | 192   | 50 | 20     | 1.2 | 20  |
| <b>10.00xM20-20</b>      | 10.0           | 211.7 | 237   | 50 | 20     | 1.8 | 20  |
| <b>10.50xM20-20</b>      | 10.5           | 221.7 | 248   | 50 | 20     | 1.8 | 20  |
| <b>11.00xM20-20</b>      | 11.0           | 241.7 | 269   | 50 | 20     | 1.8 | 20  |
| <b>11.50xM20-20</b>      | 11.5           | 211.7 | 269   | 50 | 20     | 1.8 | 20  |
| <b>12.00xM20-20</b>      | 12.0           | 261.8 | 290   | 50 | 20     | 1.8 | 20  |
| <b>12.50xM20-20</b>      | 12.5           | 261.8 | 291   | 50 | 20     | 1.8 | 20  |
| <b>13.00xM25-20</b>      | 13.0           | 281.8 | 315   | 56 | 25     | 1.8 | 20  |
| <b>13.50xM25-20</b>      | 13.5           | 281.8 | 315   | 56 | 25     | 1.8 | 20  |
| <b>14.00xM25-20</b>      | 14.0           | 302   | 336   | 56 | 25     | 2.0 | 20  |
| <b>14.50xM25-20</b>      | 14.5           | 302   | 337   | 56 | 25     | 2.0 | 20  |
| <b>15.00xM25-20</b>      | 15.0           | 322   | 358   | 56 | 25     | 2.0 | 20  |
| <b>29.00xM40-20</b>      | 29.0           | 584.6 | 650   | 69 | 40     | 4.6 | 20  |
| <b>30.00xM40-20</b>      | 30.0           | 624.6 | 693   | 69 | 40     | 4.6 | 20  |
| <b>31.00xM40-20</b>      | 31.0           | 624.6 | 693   | 69 | 40     | 4.6 | 20  |
| <b>32.00xM40-20</b>      | 32.0           | 644.6 | 715   | 69 | 40     | 4.6 | 20  |
| <b>8.00xM20-25</b>       | 8.0            | 211.2 | 234   | 50 | 20     | 1.2 | 25  |
| <b>8.50xM20-25</b>       | 8.5            | 218.7 | 242.5 | 50 | 20     | 1.2 | 25  |
| <b>9.00xM20-25</b>       | 9.0            | 236.1 | 261   | 50 | 20     | 1.1 | 25  |
| <b>10.00xM20-25</b>      | 10.0           | 264.5 | 289.5 | 50 | 20     | 1.8 | 25  |
| <b>11.00xM20-25</b>      | 11.0           | 301.7 | 329   | 50 | 20     | 1.8 | 25  |
| <b>11.50xM20-25</b>      | 11.5           | 301.7 | 329   | 50 | 20     | 1.8 | 25  |
| <b>12.00xM20-25</b>      | 12.0           | 326.8 | 355   | 50 | 20     | 1.8 | 25  |
| <b>12.50xM20-25</b>      | 12.5           | 326.8 | 356   | 50 | 20     | 1.8 | 25  |
| <b>13.00xM25-25</b>      | 13.0           | 351.8 | 385   | 56 | 25     | 1.8 | 25  |
| <b>13.50xM25-25</b>      | 13.5           | 351.8 | 385   | 56 | 25     | 1.8 | 25  |
| <b>14.00xM25-25</b>      | 14.0           | 377   | 411   | 56 | 25     | 2.0 | 25  |
| <b>14.50xM25-25</b>      | 14.5           | 377   | 412   | 56 | 25     | 2.0 | 25  |
| <b>15.00xM25-25</b>      | 15.0           | 402   | 438   | 56 | 25     | 2.0 | 25  |
| <b>16.00xM25-25</b>      | 16.0           | 427   | 464   | 56 | 25     | 2.2 | 25  |
| <b>16.50xM25-25</b>      | 16.5           | 427   | 464   | 56 | 25     | 2.2 | 25  |
| <b>17.00xM25-25</b>      | 17.0           | 452   | 490   | 56 | 25     | 2.2 | 25  |



► Guide pad is sold separately from drill body

► Available upon request

[illegible]

► Available upon request



## Insert & guide pad

| Tool dia.<br>(mm) | Insert         |                  |        | Guide pad                                      |                |        |
|-------------------|----------------|------------------|--------|------------------------------------------------|----------------|--------|
|                   | Insert         | Screw            | Wrench | Guide pad                                      | Screw          | Wrench |
| 7.94-8.49         | ZSGT 040104 RS | CSPB-2FL3.1      | T-6P   | PAD-SGP03-12-035-DC-SB                         | CSPB-2FL2.7-LH | T-6P   |
| 8.50-8.99         | ZSGT 040104 RS | CSPB-2FL3.1      | T-6P   | PAD-SGP03-12-040-DC-SB                         | CSPB-2FL3.1    |        |
| 9.00-9.99         | ZSGT 050104 RS |                  |        |                                                |                |        |
| 10.00-10.99       | ZSGT 060204 RS | SR-M2.5X0.35L3.8 | T-7F   | PAD-GP04-16-045-DC-SB                          | CSTB-2         | T-6    |
| 11.00-11.80       | ZSGT 060204 RS | SR-M2.5X0.35L3.8 | T-7F   | PAD-GP04-16-050-DC-SB                          | CSTB-2         | T-6    |
| 11.81-11.99       | LOGT 060204 RS | SR10503833L040   | T-7F   |                                                |                |        |
| 12.00-13.99       | LOGT 060204 RS | SR10503833L040   | T-7F   | PAD-GP04-16-055-DC-SB<br>PAD-GP04-16-055-DC-SC | TS 20043I/HG-P | T-6P   |
| 14.00-15.99       | TOGT 070304 RS | SR14-560/S       | T-8F   | PAD-GP05-18-060-DC-SB<br>PAD-GP05-18-060-DC-SC | SR34-508       | T-7F   |
| 16.00-18.00       | TOGT 080305 RS | SR14-560/S       | T-8F   | PAD-GP05-18-075-DC-SB<br>PAD-GP05-18-075-DC-SC | SR34-508       | T-7F   |
| 18.01-20.00       | TOGT 090305 RS | SR14-560/S       | T-8F   | PAD-GP06-20-085-DC-SB<br>PAD-GP06-20-085-DC-SC | SR34-508       | T-7F   |
| 20.01-21.00       | TOGT 100305 RS | SR34-506         | T-9F   |                                                |                |        |
| 21.01-21.99       | TOGT 100305 RS | SR34-506         | T-9F   | PAD-GP06-20-100-DC-SB<br>PAD-GP06-20-100-DC-SC | SR34-508       | T-7F   |
| 22.00-25.00       | TOGT 110405 RS | SR14-571/S       | T-10/5 |                                                |                |        |
| 25.01-28.00       | TOGT 120405 RS | SR14-560         | T-15F  | PAD-GP06-20-120-DC-SB<br>PAD-GP06-20-120-DC-SC | SR34-508       | T-7F   |
| 28.01-29.99       | TOGT 130408 RS | SR16-212/L10     | T-20/5 | PAD-GP06-20-120-DC-SB<br>PAD-GP06-20-120-DC-SC | SR34-508       | T-7F   |
| 30.00-32.00       | TOGT 130408 RS | SR16-212/L10     | T-20/5 | PAD-GP07-20-120-DC-SB<br>PAD-GP07-20-120-DC-SC | CSTB-3S        | T-9F   |



D231-D232



D236



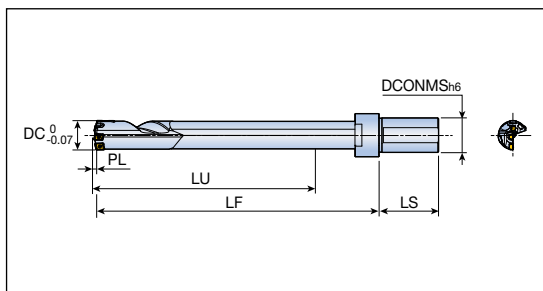
D276

- ▶ SB: First choice for general purpose
- ▶ SC: First choice when using water-soluble coolant
- ▶ Inserts and guide pads must be ordered separately

## Standard gundrill holders



- Drilling depth: 10-15x diameter



| Designation                | Dimension (mm) |     |     |    |        |     |     |
|----------------------------|----------------|-----|-----|----|--------|-----|-----|
|                            | DC             | LU  | LF  | LS | DCONMS | PL  | L/D |
| <b>TRGD3 29.00xFM40-10</b> | 29.0           | 293 | 360 | 69 | 40     | 2.6 | 10  |
| <b>30.00xFM40-10</b>       | 30.0           | 313 | 383 | 69 | 40     | 2.9 | 10  |
| <b>31.00xFM40-10</b>       | 31.0           | 313 | 383 | 69 | 40     | 2.9 | 10  |
| <b>32.00xFM40-10</b>       | 32.0           | 323 | 395 | 69 | 40     | 3.0 | 10  |
| <b>33.00xFM40-10</b>       | 33.0           | 333 | 406 | 69 | 40     | 3.1 | 10  |
| <b>34.00xFM40-10</b>       | 34.0           | 343 | 418 | 69 | 40     | 3.0 | 10  |
| <b>35.00xFM40-10</b>       | 35.0           | 353 | 428 | 69 | 40     | 3.1 | 10  |
| <b>36.00xFM40-10</b>       | 36.0           | 363 | 441 | 69 | 40     | 3.1 | 10  |
| <b>29.00xFM40-15</b>       | 29.0           | 438 | 505 | 69 | 40     | 2.6 | 15  |
| <b>30.00xFM40-15</b>       | 30.0           | 468 | 538 | 69 | 40     | 2.9 | 15  |
| <b>31.00xFM40-15</b>       | 31.0           | 468 | 538 | 69 | 40     | 2.9 | 15  |
| <b>32.00xFM40-15</b>       | 32.0           | 483 | 555 | 69 | 40     | 3.0 | 15  |
| <b>33.00xFM40-15</b>       | 33.0           | 498 | 571 | 69 | 40     | 3.1 | 15  |
| <b>34.00xFM40-15</b>       | 34.0           | 513 | 588 | 69 | 40     | 3.0 | 15  |
| <b>35.00xFM40-15</b>       | 35.0           | 528 | 603 | 69 | 40     | 3.1 | 15  |
| <b>36.00xFM40-15</b>       | 36.0           | 543 | 621 | 69 | 40     | 3.1 | 15  |

- Guide pad is sold separately from drill body.
- Supply up to 42.5 mm drill diameter

► Available upon request

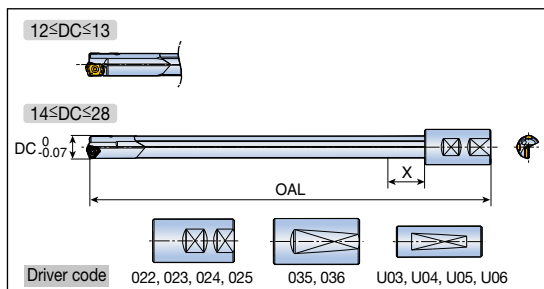
## Insert & guide pad

| Parts  | Diameter (mm)       |                       |                       |                       |
|--------|---------------------|-----------------------|-----------------------|-----------------------|
|        | 28.01-29.99         | 30.00-33.00           | 33.01-35.00           | 35.01-38.00           |
| Insert | Peripheral insert   | NPHT 0603...-P        | NPHT 0804...-P        | NPHT 0804...-P        |
|        | Screw               | CSTB-2.2              | CSTB-2.5              | CSTB-2.5              |
|        | Wrench              | T-7F                  | T-8F                  | T-8F                  |
|        | Intermediate insert | NPMT 060304R...-I     | NPMT 070404R...-I     | NPMT 070404R...-I     |
|        | Screw               | CSTB-2.2              | CSTB-2.5              | CSTB-2.5              |
|        | Wrench              | T-7F                  | T-8F                  | T-8F                  |
|        | Central insert      | NPMT 070408L...-C     | NPMT 070408L...-C     | NPMT 080408L...-C     |
|        | Screw               | CSTB-2.5              | CSTB-2.5              | CSTB-2.5              |
|        | Wrench              | T-8F                  | T-8F                  | T-8F                  |
| Pad    | Guide pad           | PAD-GP06-20-120-DC-SB | PAD-GP06-20-120-DC-SB | PAD-GP07-20-120-DC-SB |
|        |                     | PAD-GP06-20-120-DC-SC | PAD-GP06-20-120-DC-SC | PAD-GP07-20-120-DC-SC |
|        | Screw               | SR34-508              | SR34-508              | CSTB-3S               |
|        | Wrench              | T-7F                  | T-7F                  | T-9F                  |

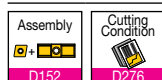


- Inserts and guide pads must be ordered separately

## Standard gundrill holders



| Designation                | Driver code       | Dimension (mm) |        |    |
|----------------------------|-------------------|----------------|--------|----|
|                            |                   | DC             | OAL    | X  |
| <b>TRGDL 12.00x800-xxx</b> | U03<br>022        | 12             | 801.8  | 18 |
| <b>12.00x800-xxx</b>       |                   | 12             | 801.8  | 18 |
| <b>12.00x1000-xxx</b>      |                   | 12             | 1001.8 | 18 |
| <b>12.00x1000-xxx</b>      |                   | 12             | 1001.8 | 18 |
| <b>12.00x1650-xxx</b>      |                   | 12             | 1651.8 | 18 |
| <b>12.00x1650-xxx</b>      |                   | 12             | 1651.8 | 18 |
| <b>12.70x1219-xxx</b>      | U04               | 12.7           | 1220.8 | 19 |
| <b>12.70x1524-xxx</b>      |                   | 12.7           | 1525.8 | 19 |
| <b>13.00x800-xxx</b>       | U04<br>023        | 13             | 801.8  | 20 |
| <b>13.00x800-xxx</b>       |                   | 13             | 801.8  | 20 |
| <b>13.00x1000-xxx</b>      |                   | 13             | 1001.8 | 20 |
| <b>13.00x1000-xxx</b>      |                   | 13             | 1001.8 | 20 |
| <b>13.00x1650-xxx</b>      |                   | 13             | 1651.8 | 20 |
| <b>13.00x1650-xxx</b>      |                   | 13             | 1651.8 | 20 |
| <b>13.49x1219-xxx</b>      | U04               | 13.49          | 1220.8 | 20 |
| <b>13.49x1527-xxx</b>      |                   | 13.49          | 1528.8 | 20 |
| <b>14.00x800-xxx</b>       | U04<br>023        | 14             | 800    | 21 |
| <b>14.00x1000-xxx</b>      |                   | 14             | 1000   | 21 |
| <b>14.00x1650-xxx</b>      |                   | 14             | 1650   | 21 |
| <b>14.50x800-xxx</b>       |                   | 14.5           | 800    | 22 |
| <b>14.50x1000-xxx</b>      |                   | 14.5           | 1000   | 22 |
| <b>14.50x1650-xxx</b>      |                   | 14.5           | 1650   | 22 |
| <b>15.00x800-xxx</b>       | U04<br>023        | 15             | 800    | 23 |
| <b>15.00x1000-xxx</b>      |                   | 15             | 1000   | 23 |
| <b>15.00x1650-xxx</b>      |                   | 15             | 1650   | 23 |
| <b>16.00x800-xxx</b>       | U04<br>023<br>035 | 16             | 800    | 24 |
| <b>16.00x1000-xxx</b>      |                   | 16             | 1000   | 24 |
| <b>16.00x1500-xxx</b>      |                   | 16             | 1500   | 24 |
| <b>17.00x1000-xxx</b>      |                   | 17             | 1000   | 25 |
| <b>17.00x1500-xxx</b>      |                   | 17             | 1500   | 25 |
| <b>18.00x800-xxx</b>       |                   | 18             | 800    | 27 |
| <b>18.00x1000-xxx</b>      |                   | 18             | 1000   | 27 |
| <b>18.00x1500-xxx</b>      |                   | 18             | 1500   | 27 |
| <b>19.00x800-xxx</b>       |                   | 19             | 800    | 28 |
| <b>19.00x1000-xxx</b>      |                   | 19             | 1000   | 28 |
| <b>19.00x1500-xxx</b>      |                   | 19             | 1500   | 28 |



► Guide pad is sold separately from drill body

► Available upon request  
► Select "xxx" driver code



## Insert & guide pad

| Tool dia.<br>(mm) | Insert         |                |        | Guide pad                                      |                |        |
|-------------------|----------------|----------------|--------|------------------------------------------------|----------------|--------|
|                   | Insert         | Screw          | Wrench | Guide pad                                      | Screw          | Wrench |
| 12.00-13.99       | LOGT 060204 RS | SR10503833L040 | T-7F   | PAD-GP04-16-055-DC-SB<br>PAD-GP04-16-055-DC-SC | TS 20043I/HG-P | T-7F   |
| 14.00-15.99       | TOGT 070304 RS | SR14-560/S     | T-8F   | PAD-GP05-18-060-DC-SB<br>PAD-GP05-18-060-DC-SC | SR34-508       | T-7F   |
| 16.00-18.00       | TOGT 080305 RS | SR14-560/S     | T-8F   | PAD-GP05-18-075-DC-SB<br>PAD-GP05-18-075-DC-SC | SR34-508       | T-7F   |
| 18.01-20.00       | TOGT 090305 RS | SR14-560/S     | T-8F   | PAD-GP06-20-085-DC-SB<br>PAD-GP06-20-085-DC-SC | SR34-508       | T-7F   |
| 20.01-21.00       | TOGT 100305 RS | SR34-506       | T-9F   |                                                |                |        |
| 21.01-21.99       | TOGT 100305 RS | SR34-506       | T-9F   | PAD-GP06-20-100-DC-SB<br>PAD-GP06-20-100-DC-SC | SR34-508       | T-7F   |
| 22.00-25.00       | TOGT 110405 RS | SR14-571/S     | T-10/5 |                                                |                |        |
| 25.01-28.00       | TOGT 120405 RS | SR14-560       | T-15F  | PAD-GP06-20-120-DC-SB<br>PAD-GP06-20-120-DC-SC | SR34-508       | T-7F   |



- ▶ SB: First choice for general purpose
- ▶ SC: First choice when using water-soluble coolant
- ▶ Inserts and guide pads must be ordered separately

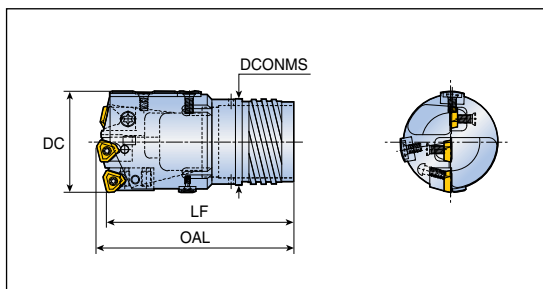
## Driver for TRGDL Type

| Driver | Driver code | Dimension (mm) |        |
|--------|-------------|----------------|--------|
|        |             | LS             | DCONMS |
|        | 022         | 50             | 20.00  |
|        | 023         | 56             | 25.00  |
|        | 024         | 60             | 32.00  |
|        | 025         | 70             | 40.00  |
|        | 026         | 80             | 50.00  |
|        | 035         | 56             | 25.00  |
|        | 036         | 60             | 32.00  |
|        | U03         | 70             | 19.05  |
|        | U04         | 70             | 25.40  |
|        | U05         | 70             | 31.75  |
|        | U06         | 70             | 38.10  |

### Single tube system



- Outer four start thread

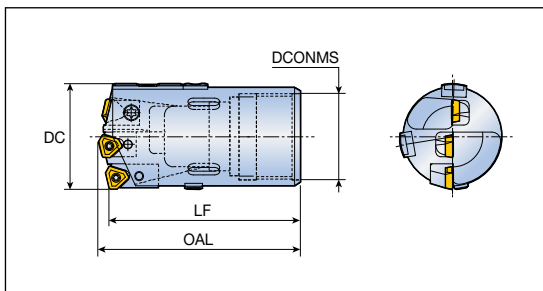
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| Assembly                                                                                                                                                               | Tube                                                                                | Cutting Condition                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  +  |  |  |
| D159                                                                                                                                                                   | D185-D186                                                                           | D268                                                                                |

### Single tube system

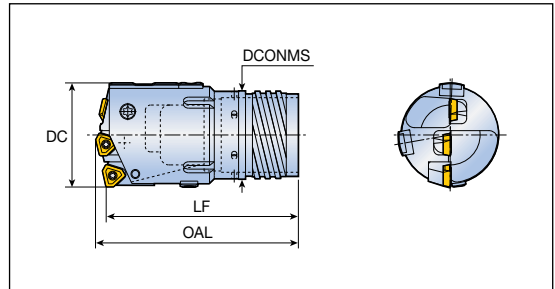


- Inner single start thread

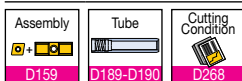


|                                                                                                                |                                                                                                                  |                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <p>Assembly</p>  <p>D159</p> | <p>Tube</p>  <p>D187-D188</p> | <p>Cutting Condition</p>  <p>D268</p> |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|

### Double tube system



- [illegible]





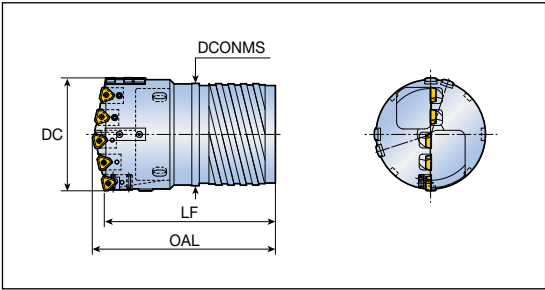
# TBTA5...SE4



## Single tube system



- Outer four start thread



| Designation                 | DC            | Dimension (mm) |     |        | Tube     |               |
|-----------------------------|---------------|----------------|-----|--------|----------|---------------|
|                             |               | LF             | OAL | DCONMS | Part     | Diameter (mm) |
| <b>TBTA5- xxx.xxSE4-094</b> | 107.00-111.99 | 180            | 197 | 89     | BTSl 094 | 94            |
| <b>xxx.xxSE4-106</b>        | 112.00-123.99 | 205            | 221 | 101    | BTSl 106 | 106           |
| <b>xxx.xxSE4-118</b>        | 124.00-135.99 | 205            | 222 | 113    | BTSl 118 | 118           |
| <b>xxx.xxSE4-130</b>        | 136.00-147.99 | 205            | 223 | 125    | BTSl 130 | 130           |
| <b>xxx.xxSE4-142</b>        | 148.00-159.99 | 225            | 245 | 137    | BTSl 142 | 142           |
| <b>xxx.xxSE4-154</b>        | 160.00-168.99 | 225            | 246 | 149    | BTSl 154 | 154           |

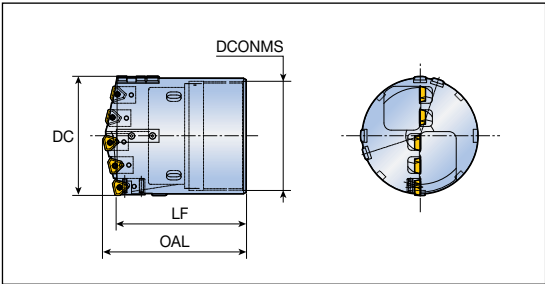
# TBTA5...SI1



## Single tube system



- Inner single start thread



| Designation                 | DC            | Dimension (mm) |     |        | Tube     |               |
|-----------------------------|---------------|----------------|-----|--------|----------|---------------|
|                             |               | LF             | OAL | DCONMS | Part     | Diameter (mm) |
| <b>TBTA5- xxx.xxSI1-094</b> | 107.00-110.99 | 150            | 164 | 90     | BTSE 094 | 94            |
| <b>xxx.xxSI1-106</b>        | 111.00-122.99 | 150            | 165 | 102    | BTSE 106 | 106           |
| <b>xxx.xxSI1-118</b>        | 123.00-134.99 | 150            | 167 | 114    | BTSE 118 | 118           |
| <b>xxx.xxSI1-130</b>        | 135.00-148.99 | 150            | 168 | 126    | BTSE 130 | 130           |
| <b>xxx.xxSI1-142</b>        | 149.00-161.99 | 150            | 170 | 139    | BTSE 142 | 142           |
| <b>xxx.xxSI1-154</b>        | 162.00-168.99 | 190            | 211 | 151    | BTSE 154 | 154           |

|          |            |                   |
|----------|------------|-------------------|
| Assembly | Tube       | Cutting Condition |
|          |            |                   |
| D160     | D186, D188 | D268              |

### Double tube system



- 
- Technical drawing of the DCONMS connector. The side view on the left shows the connector's profile with dimensions: DC (height), LF (length of the main body), and OAL (overall length). The end view on the right shows the circular face of the connector with four pins.

| Assembly                                                                                       | Tube                                                                                            | Cutting Condition                                                                               |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
|  <b>D160</b> |  <b>D189</b> |  <b>D268</b> |

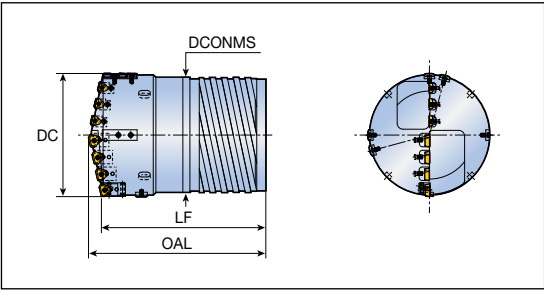
# TBTA7...SE4



## Single tube system



- Outer four start thread
- Double tube system also available on request



| Designation                 | DC            | Dimension (mm) |     |        | Tube     |               |
|-----------------------------|---------------|----------------|-----|--------|----------|---------------|
|                             |               | LF             | OAL | DCONMS | Part     | Diameter (mm) |
| <b>TBTA7- xxx.xxSE4-154</b> | 169.00-171.99 | 225            | 246 | 149    | BTSi 154 | 154           |
| <b>xxx.xxSE4-166</b>        | 172.00-183.99 | 225            | 247 | 161    | BTSi 166 | 166           |
| <b>xxx.xxSE4-178</b>        | 184.00-195.99 | 245            | 267 | 173    | BTSi 178 | 178           |
| <b>xxx.xxSE4-190</b>        | 196.00-207.99 | 245            | 270 | 185    | BTSi 190 | 190           |
| <b>xxx.xxSE4-202</b>        | 208.00-219.99 | 245            | 271 | 197    | BTSi 202 | 202           |
| <b>xxx.xxSE4-214</b>        | 220.00-231.99 | 265            | 293 | 208    | BTSi 214 | 214           |
| <b>xxx.xxSE4-226</b>        | 232.00-232.99 | 265            | 293 | 220    | BTSi 226 | 226           |

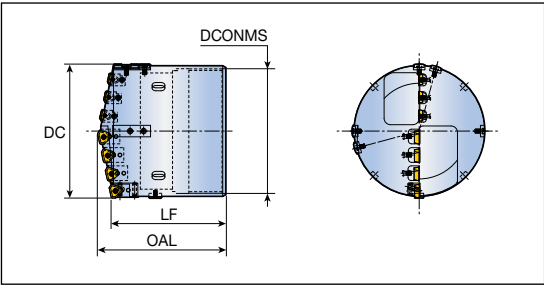
# TBTA7...SI1



## Single tube system



- Inner single start thread



| Designation                 | DC            | Dimension (mm) |     |        | Tube     |               |
|-----------------------------|---------------|----------------|-----|--------|----------|---------------|
|                             |               | LF             | OAL | DCONMS | Part     | Diameter (mm) |
| <b>TBTA7- xxx.xxSI1-154</b> | 169.00-173.99 | 190            | 211 | 151    | BTSE 154 | 154           |
| <b>xxx.xxSI1-166</b>        | 174.00-185.99 | 190            | 213 | 163    | BTSE 166 | 166           |
| <b>xxx.xxSI1-178</b>        | 186.00-197.99 | 190            | 212 | 175    | BTSE 178 | 178           |
| <b>xxx.xxSI1-190</b>        | 198.00-209.99 | 190            | 215 | 187    | BTSE 190 | 190           |
| <b>xxx.xxSI1-202</b>        | 210.00-221.99 | 190            | 217 | 199    | BTSE 202 | 202           |
| <b>xxx.xxSI1-214</b>        | 222.00-232.99 | 190            | 218 | 211    | BTSE 214 | 214           |

Assembly

D161

Tube

D186.D188

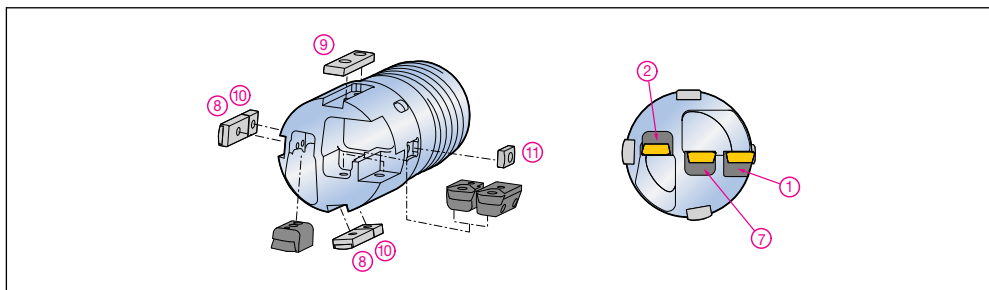
Cutting Condition

D268

# TBTA3 Series



## Assembly of TBTA3 series



### Cartridge (1,2,7)

| DCN - DCX   | Peripheral                                                                          | Intermediate                                                                        | Central                                                                             |
|-------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|             |  ① |  ② |  ⑦ |
| 38 - 39.99  | PERC 05R                                                                            | CENC 05R                                                                            | CENC 05R                                                                            |
| 40 - 44.99  | PERC 402 - 04                                                                       | CENC 05R                                                                            | CENC 05R                                                                            |
| 45 - 47.99  | PERC 402 - 04                                                                       | CENC 05R                                                                            | CENC 402 - 04                                                                       |
| 48 - 51.99  | PERC 402 - 04                                                                       | CENC 402 - 04                                                                       | CENC 402 - 04                                                                       |
| 52 - 54.99  | PERC 402 - 32                                                                       | CENC 402 - 04                                                                       | CENC 402 - 04                                                                       |
| 55 - 57.99  | PERC 402 - 32                                                                       | CENC 402 - 04                                                                       | CENC 402 - 32                                                                       |
| 58 - 59.99  | PERC 402 - 32                                                                       | CENC 402 - 32                                                                       | CENC 402 - 32                                                                       |
| 60 - 63.99  | PERC 402 - 32                                                                       | CENC 402 - 32                                                                       | CENC 402 - 32                                                                       |
| 64 - 67.99  | PERC 402 - 43                                                                       | CENC 402 - 32                                                                       | CENC 402 - 32                                                                       |
| 68 - 77.99  | PERC 402 - 32                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                       |
| 78 - 84.99  | PERC 402 - 43                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                       |
| 85 - 91.99  | PERC 402 - 63                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                       |
| 92 - 98.99  | PERC 402 - 43                                                                       | CENC 402 - 63                                                                       | CENC 402 - 63                                                                       |
| 99 - 106.99 | PERC 402 - 63                                                                       | CENC 402 - 63                                                                       | CENC 402 - 63                                                                       |

### Cartridge & Insert (1,2,7)

| Peripheral ①                                                                        |                                                                                     | Intermediate & Central ② ⑦                                                          |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Cartridge                                                                           | Insert                                                                              | Cartridge                                                                           | Insert                                                                              |
|  |  |  |  |
| PERC 05R                                                                            | NPMX 080308R-G                                                                      | CENC 05R                                                                            | NPMX 080308R-G                                                                      |
| PERC 402 - 04                                                                       | TPMX 140308R-G                                                                      | CENC 402 - 04                                                                       | TPMX 140308R-G                                                                      |
| PERC 402 - 32                                                                       | TPMX 170408R-G                                                                      | CENC 402 - 32                                                                       | TPMX 170408R-G                                                                      |
| PERC 402 - 43                                                                       | TPMX 240512R-G                                                                      | CENC 402 - 43                                                                       | TPMX 240512R-G                                                                      |
| PERC 402 - 63                                                                       | TPMX 280716R-G                                                                      | CENC 402 - 63                                                                       | TPMX 280716R-G                                                                      |

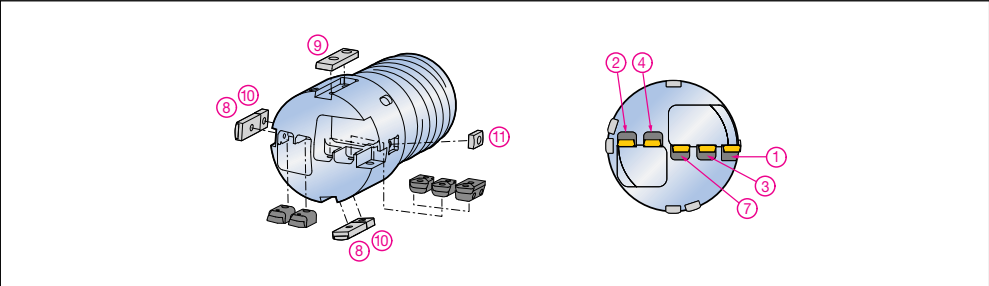
### Guide Pad (8,9,10,11)

| DCN - DCX   | Guide Pad ⑧                                                                         |     | Filler ⑨                                                                            |     | Protector ⑩                                                                         |     | Sub guide pad ⑪                                                                     |     |
|-------------|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|
|             |  | QTY |  | QTY |  | QTY |  | QTY |
| 38 - 44.99  | PAD-GP08-25-155-DC-SB                                                               | 2   | FILLER08                                                                            | 1   | PAD-P08                                                                             | 2   | PAD-S08                                                                             | 1   |
| 45 - 59.99  | PAD-GP10-35-200-DC-SB                                                               | 2   | FILLER10                                                                            | 1   | PAD-P10                                                                             | 2   | PAD-S08                                                                             | 1   |
| 60 - 63.99  | PAD-GP14-40-250-DC-SB                                                               | 2   | FILLER14                                                                            | 1   | PAD-P14                                                                             | 2   | PAD-S08                                                                             | 1   |
| 64 - 98.99  | PAD-GP14-40-250-DC-SB                                                               | 2   | FILLER14                                                                            | 1   | PAD-P14                                                                             | 2   | PAD-S10                                                                             | 1   |
| 99 - 106.99 | PAD-GP18-40-300-DC-SB                                                               | 2   | FILLER18                                                                            | 1   | PAD-P18                                                                             | 2   | PAD-S14                                                                             | 1   |



► Insert and guide pad are sold separately from drill body.

Assembly of TBTA5 series



Cartridge (1,2,3, 4,7)

| DCN - DCX    | Peripheral                                                                          | Intermediate                                                                        |                                                                                     |                                                                                     |                                                                                      | Central       |
|--------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------|
|              |  ① |  ② |  ③ |  ④ |  ⑦ |               |
| 107 - 117.99 | PERC 402 - 43                                                                       | CENC 402 - 32                                                                       | CENC 402 - 32                                                                       | CENC 402 - 32                                                                       | CENC 402 - 32                                                                        | CENC 402 - 43 |
| 118 - 135.99 | PERC 402 - 43                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                        | CENC 402 - 43 |
| 136 - 144.99 | PERC 402 - 43                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                        | CENC 402 - 63 |
| 145 - 150.99 | PERC 402 - 43                                                                       | CENC 402 - 43                                                                       | CENC 402 - 63                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                        | CENC 402 - 63 |
| 151 - 156.99 | PERC 402 - 63                                                                       | CENC 402 - 43                                                                       | CENC 402 - 63                                                                       | CENC 402 - 43                                                                       | CENC 402 - 43                                                                        | CENC 402 - 63 |
| 157 - 162.99 | PERC 402 - 63                                                                       | CENC 402 - 43                                                                       | CENC 402 - 63                                                                       | CENC 402 - 63                                                                       | CENC 402 - 63                                                                        | CENC 402 - 63 |
| 163 - 168.99 | PERC 402 - 63                                                                       | CENC 402 - 63                                                                       | CENC 402 - 63                                                                       | CENC 402 - 63                                                                       | CENC 402 - 63                                                                        | CENC 402 - 63 |

Cartridge & Insert (1,2,3, 4,7)

| Peripheral ①                                                                      |                                                                                   | Intermediate & Central ②③④⑦                                                       |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Cartridge                                                                         | Insert                                                                            | Cartridge                                                                         | Insert                                                                            |
|  |  |  |  |
| -                                                                                 | -                                                                                 | CENC 402 - 32                                                                     | TPMX 170408R-G                                                                    |
| PERC 402 - 43                                                                     | TPMX 240512R-G                                                                    | CENC 402 - 43                                                                     | TPMX 240512R-G                                                                    |
| PERC 402 - 63                                                                     | TPMX 280716R-G                                                                    | CENC 402 - 63                                                                     | TPMX 280716R-G                                                                    |

Guide Pad (8,9,10,11)

| DCN - DCX    | Guide Pad ⑧                                                                         |     | Filler ⑨                                                                            |     | Protector ⑩                                                                         |     | Sub guide pad ⑪                                                                     |     |
|--------------|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|
|              |  | QTY |  | QTY |  | QTY |  | QTY |
| 107 - 135.99 | PAD-GP18-40-300-DC-SB                                                               | 2   | FILLER18                                                                            | 1   | PAD-P18                                                                             | 2   | PAD-S14                                                                             | 1   |
| 136 - 168.99 | PAD-GP18-40-300-DC-SB                                                               | 4   | FILLER18                                                                            | 1   | PAD-P18                                                                             | 4   | PAD-S14                                                                             | 1   |

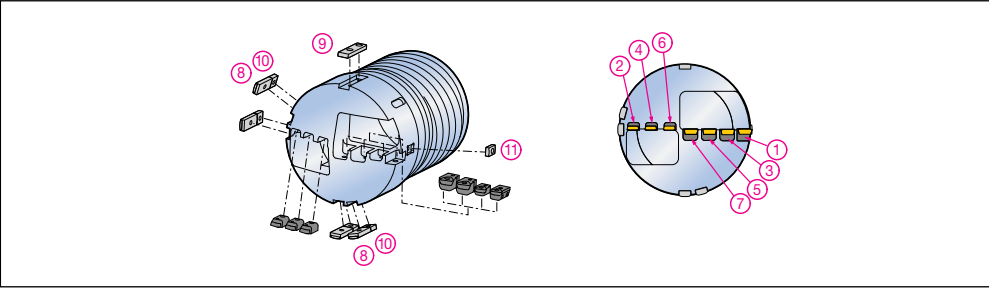


► Insert and guide pad are sold separately from drill body.

# TBTA7 Series



## Assembly of TBTA7 series



### Cartridge (1,2,3,4,5,6,7)

| DCN - DCX    | Peripheral                                                                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | Intermediate                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | Central                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|--------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 169 - 188.99 | PERC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      |
| 189 - 196.99 | PERC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                      |
| 197 - 202.99 | PERC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                      |
| 203 - 208.99 | PERC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                      |
| 209 - 214.99 | PERC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                      |
| 215 - 220.99 | PERC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                      |
| 221 - 226.99 | PERC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                      | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 43                                                                     | CENC 402 - 63                                                                      |
| 227 - 232.99 | PERC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                      | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                      | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                     | CENC 402 - 63                                                                      |

### Cartridge & Insert (1,2,3,4,5,6,7)

| Peripheral ①                                                                      |                                                                                   | Intermediate & Central ②③④⑤⑥⑦                                                     |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Cartridge                                                                         | Insert                                                                            | Cartridge                                                                         | Insert                                                                            |
|  |  |  |  |
| PERC 402 - 43                                                                     | TPMX 240512R-G                                                                    | CENC 402 - 43                                                                     | TPMX 240512R-G                                                                    |
| PERC 402 - 63                                                                     | TPMX 280716R-G                                                                    | CENC 402 - 63                                                                     | TPMX 280716R-G                                                                    |

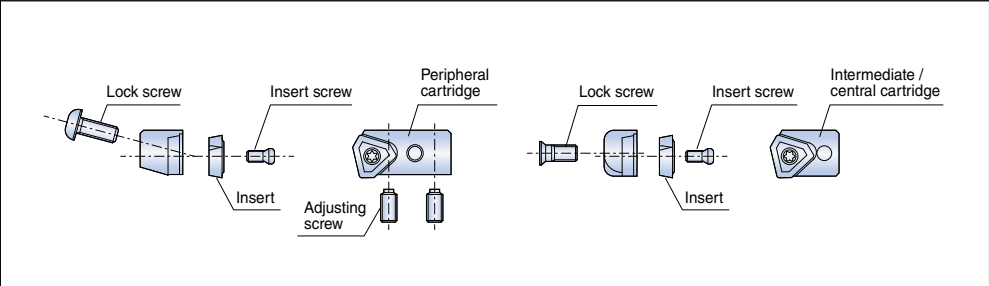
### Guide Pad (8,9,10,11)

| DCN - DCX    | Guide Pad ⑧                                                                         |     | Filler ⑨                                                                            |     | Protector ⑩                                                                         |     | Sub guide pad ⑪                                                                     |     |
|--------------|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|-----|
|              |  | QTY |  | QTY |  | QTY |  | QTY |
| 165 - 232.99 | PAD-GP18-40-300-DC-SB                                                               | 4   | FILLER18                                                                            | 1   | PAD-P18                                                                             | 4   | PAD-S14                                                                             | 1   |



► Insert and guide pad are sold separately from drill body.

Accessories of TBTA series



Peripheral inserts and accessories

| Cartridge   | Insert         | Adjusting screw | Wrench | Lock screw | Wrench |
|-------------|----------------|-----------------|--------|------------|--------|
|             |                |                 |        |            |        |
| PERC 05R    | NPMX 080308R-G | AS0003-5        | H1.5   | LS1803RH   | H2     |
| PERC 402-04 | TPMX 140308R-G | AS0004-8        | H2     | LS1803.5RH | H2.5   |
| PERC 402-32 | TPMX 170408R-G | AS0005-10       | H2.5   | LS1805RH   | H3     |
| PERC 402-43 | TPMX 240512R-G | AS0005-15       | H2.5   | LS1806RH   | H4     |
| PERC 402-63 | TPMX 280716R-G | AS0006-15       | H3     | LS1806RH   | H4     |

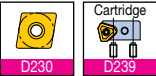
Central and intermediate inserts and accessories

| Cartridge   | Insert         | Lock screw   |                                      | Wrench    |            |
|-------------|----------------|--------------|--------------------------------------|-----------|------------|
|             |                | Inter. Cart. | Cen. Cart.                           | < ø151.00 | ø151.00 =< |
|             |                |              |                                      |           |            |
| CENC 05R    | NPMX 080308R-G |              | CSTB-3                               |           | T-9D       |
| CENC 402-04 | TPMX 140308R-G |              | CSTB-3.5                             |           | T-15D      |
| CENC 402-32 | TPMX 170408R-G |              | CSTA-5                               |           | T-15D      |
| CENC 402-43 | TPMX 240512R-G |              | LS1206                               | H3        | H3L        |
| CENC 402-63 | TPMX 280716R-G | LS1206       | LS1206S (CICT3)<br>LS1206 (CICT5, 7) | H3        | H3L        |

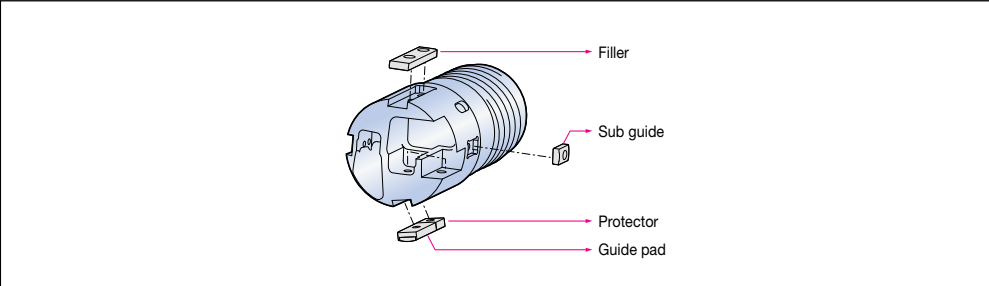
Spare part for Inserts

| Insert         | Insert screw | Wrench   |
|----------------|--------------|----------|
|                |              |          |
| NPMX 080308R-G | CSTB-2.2     | T-7LB-L  |
| TPMX 140308R-G | CSTB-2.5     | T-8LB-L  |
| TPMX 170408R-G | CSTB-3.5D    | T-9LB-L  |
| TPMX 240512R-G | CSTB-4M      | T-15LB-L |
| TPMX 280716R-G | CSTB-5       | T-20LB-L |

- ▶ Peripheral cartridges are supplied with the adjusting screws and insert screw (inserts, lock screw and wrenches are not included)
- ▶ Central and intermediate cartridges are supplied with insert screw (inserts, lock screw and wrenches are not included)



Assembly of TBTA series



Guide pads, protectors, fillers and accessories

| Guide pad                                                                         | Protector                                                                         | Filler                                                                            | Lock screw                                                                        | Wrench                                                                             |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |  |  |  |
| PAD-GP08-25-155-DC-SB                                                             | PAD-P08                                                                           | FILLER08                                                                          | CSTB-3S                                                                           | T-9D                                                                               |
| PAD-GP10-35-200-DC-SB                                                             | PAD-P10                                                                           | FILLER10                                                                          | CSTB-4S                                                                           | T-15D                                                                              |
| PAD-GP14-40-250-DC-SB                                                             | PAD-P14                                                                           | FILLER14                                                                          | CSTA-5S                                                                           | T-15D                                                                              |
| PAD-GP18-40-300-DC-SB                                                             | PAD-P18                                                                           | FILLER18                                                                          | LS1206S / LS1206SS                                                                | H3                                                                                 |

Sub guide pad and accessories

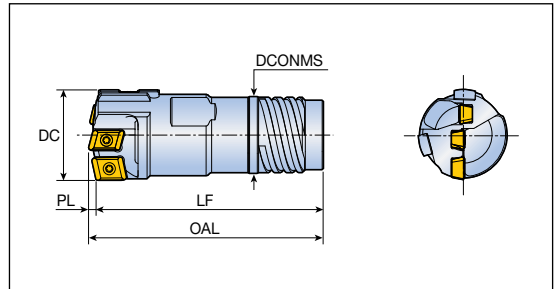
| Guide pad                                                                         | Lock screw                                                                        | Wrench                                                                            |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |  |
| PAD-GP08-25-155-DC-SB                                                             | PAD-P08                                                                           | T-9D                                                                              |
| PAD-GP10-35-200-DC-SB                                                             | PAD-P10                                                                           | T-15D                                                                             |
| PAD-GP14-40-250-DC-SB                                                             | PAD-P14                                                                           | T-15D                                                                             |
| PAD-GP18-40-300-DC-SB                                                             | PAD-P18                                                                           | H3                                                                                |



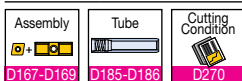
► Insert and guide pad are sold separately from drill body.



### Single tube system

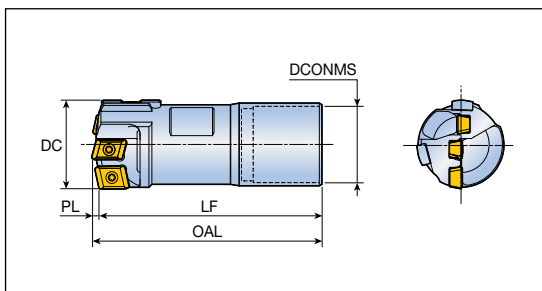


- Outer four start thread

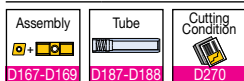
[illegible]

► Insert and guide pad are sold separately from drill body

### Single tube system

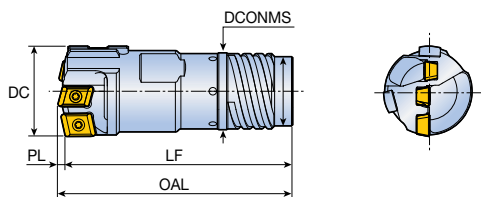


- [illegible]



► Insert and guide pad are sold separately from drill body

### Double tube system



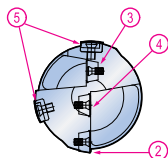
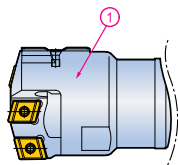
- [illegible]

| Assembly                                                                                                                                                                 | Tube                                                                                | Cutting Condition                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  +  |  |  |
| D167-D169                                                                                                                                                                | D189                                                                                | D270                                                                                |

# TBTA-FB Series



## Assembly of TBTA-FB series



1. Head shank
2. Peripheral insert
3. Intermediate insert
4. Central insert
5. Guide pad

| Parts  |              | Diameter (mm)         |                       |                       |                       |
|--------|--------------|-----------------------|-----------------------|-----------------------|-----------------------|
|        |              | 25.00-28.00           | 28.01-29.99           | 30.00-35.00           | 35.01-38.00           |
| Insert | Peripheral   | NPHT 060304R-G-P      | NPHT 060304R-G-P      | NPHT 080404R-G-P      | NPHT 080404R-G-P      |
|        | Screw        | CSTB-2.2              | CSTB-2.2              | SR14-560-HG           | SR14-560-HG           |
|        | Wrench       | T-7F                  | T-7F                  | T-8F                  | T-8F                  |
|        | Intermediate | NPMT 060304R-G-I      | NPMT 060304R-G-I      | NPMT 070404R-G-I      | NPMT 070404R-G-I      |
|        | Screw        | CSTB-2.2              | CSTB-2.2              | SR14-560-HG           | SR14-560-HG           |
|        | Wrench       | T-7F                  | T-7F                  | T-8F                  | T-8F                  |
|        | Central      | NPMT 060308L-G-C      | NPMT 070408L-G-C      | NPMT 070408L-G-C      | NPMT 080480L-G-C      |
|        | Screw        | CSTB-2.2              | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
| Pad    | Wrench       | T-7F                  | T-8F                  | T-8F                  | T-8F                  |
|        | PAD          | PAD-GP06-20-120-DC-SB | PAD-GP06-20-120-DC-SB | PAD-GP07-20-120-DC-SB | PAD-GP07-20-120-DC-SB |
|        |              | PAD-GP06-20-120-DC-SC | PAD-GP06-20-120-DC-SC | PAD-GP07-20-120-DC-SC | PAD-GP07-20-120-DC-SC |
|        | Screw        | CSTB-2.2S             | CSTB-2.2S             | CSTB-3S               | CSTB-3S               |
|        | Wrench       | T-7F                  | T-7F                  | T-9F                  | T-9F                  |
|        |              |                       |                       |                       |                       |
|        |              |                       |                       |                       |                       |
|        |              |                       |                       |                       |                       |

| Parts  |              | Diameter (mm)         |                       |                       |                       |
|--------|--------------|-----------------------|-----------------------|-----------------------|-----------------------|
|        |              | 38.01-39.00           | 39.01-41.00           | 41.01-44.00           | 44.01-45.00           |
| Insert | Peripheral   | NPHT 090404R-G-P      | NPHT 090404R-G-P      | NPHT 090404R-G-P      | NPHT 090404R-G-P      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench       | T-8F                  | T-8F                  | T-8F                  | T-8F                  |
|        | Intermediate | NPMT 070404R-G-I      | NPMT 070404R-G-I      | NPMT 080404R-G-I      | NPMT 080404R-G-I      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench       | T-8F                  | T-8F                  | T-8F                  | T-8F                  |
|        | Central      | NPMT 080408L-G-C      | NPMT 080408L-G-C      | NPMT 080408L-G-C      | NPMT 100408L-G-C      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
| Pad    | Wrench       | T-8F                  | T-8F                  | T-8F                  | T-8F                  |
|        | PAD          | PAD-GP07-20-120-DC-SB | PAD-GP08-25-155-DC-SB | PAD-GP08-25-155-DC-SB | PAD-GP08-25-155-DC-SB |
|        |              | PAD-GP07-20-120-DC-SC | PAD-GP08-25-155-DC-SC | PAD-GP08-25-155-DC-SC | PAD-GP08-25-155-DC-SC |
|        | Screw        | CSTB-3S               | CSTB-3S               | CSTB-3S               | CSTB-3S               |
|        | Wrench       | T-9F                  | T-9F                  | T-9F                  | T-9F                  |
|        |              |                       |                       |                       |                       |
|        |              |                       |                       |                       |                       |
|        |              |                       |                       |                       |                       |

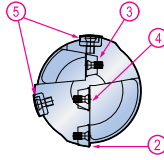
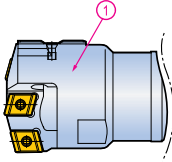


► Insert and guide pad are sold separately from drill body

# TBTA-FB Series



## Assembly of TBTA-FB series



1. Head shank
2. Peripheral insert
3. Intermediate insert
4. Central insert
5. Guide pad

| Parts  |              | Diameter (mm)         |                       |                       |                       |
|--------|--------------|-----------------------|-----------------------|-----------------------|-----------------------|
|        |              | 45.01-47.00           | 47.01-51.00           | 51.01-54.00           | 54.01-57.00           |
| Insert | Peripheral   | NPHT 090404R-G-P      | NPHT 110404R-G-P      | NPHT 110404R-G-P      | NPHT 110404R-G-P      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench       | T-8F                  | T-8F                  | T-8F                  | T-8F                  |
|        | Intermediate | NPMT 080404R-G-I      | NPMT 080404R-G-I      | NPMT 100404R-G-I      | NPMT 100404R-G-I      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench       | T-8F                  | T-8F                  | T-8F                  | T-8F                  |
|        | Central      | NPMT 100408L-G-C      | NPMT 100408L-G-C      | NPMT 100408L-G-C      | NPMT 130408L-G-C      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
| Pad    | Wrench       | T-8F                  | T-8F                  | T-8F                  | T-8F                  |
|        | PAD          | PAD-GP10-30-200-DC-SB | PAD-GP10-30-200-DC-SB | PAD-GP10-30-200-DC-SB | PAD-GP10-30-200-DC-SB |
|        |              | PAD-GP10-30-200-DC-SC | PAD-GP10-30-200-DC-SC | PAD-GP10-30-200-DC-SC | PAD-GP10-30-200-DC-SC |
|        | Screw        | CSTB-3.5              | CSTB-3.5              | CSTB-3.5              | CSTB-3.5              |
|        | Wrench       | T-15F                 | T-15F                 | T-15F                 | T-15F                 |
|        |              |                       |                       |                       |                       |
|        |              |                       |                       |                       |                       |
|        |              |                       |                       |                       |                       |

| Parts  |              | Diameter (mm)         |                       |                       |
|--------|--------------|-----------------------|-----------------------|-----------------------|
|        |              | 57.01-60.00           | 60.01-64.00           | 64.01-65.00           |
| Insert | Peripheral   | NPHT 110404R-G-P      | NPHT 130404R-G-P      | NPHT 130404R-G-P      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench       | T-8F                  | T-8F                  | T-8F                  |
|        | Intermediate | NPMT 100404R-G-I      | NPMT 100404R-G-I      | NPMT 130404R-G-I      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench       | T-8F                  | T-8F                  | T-8F                  |
|        | Central      | NPMT 130408L-G-C      | NPMT 130408L-G-C      | NPMT 130408L-G-C      |
|        | Screw        | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
| Pad    | Wrench       | T-8F                  | T-8F                  | T-8F                  |
|        | PAD          | PAD-GP12-35-250-DC-SB | PAD-GP12-35-250-DC-SB | PAD-GP12-35-250-DC-SB |
|        |              | PAD-GP12-35-250-DC-SC | PAD-GP12-35-250-DC-SC | PAD-GP12-35-250-DC-SC |
|        | Screw        | CSTB-3.5              | CSTB-3.5              | CSTB-3.5              |
|        | Wrench       | T-15F                 | T-15F                 | T-15F                 |
|        |              |                       |                       |                       |
|        |              |                       |                       |                       |
|        |              |                       |                       |                       |



Guide Pad



D227-D223

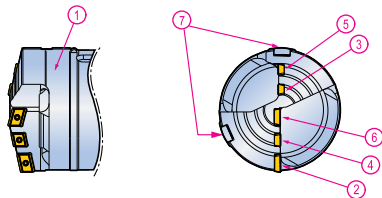
D235

► Insert and guide pad are sold separately from drill body

# TBTA-FB Series



## Assembly of TBTA-FB series



1. Head shank

2. Peripheral insert

3. Intermediate insert 1

4. Intermediate insert 2
5. Intermediate insert3

6. Central insert

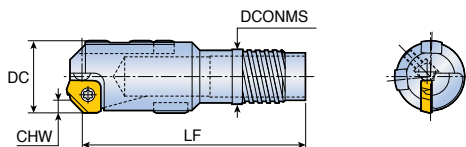
7. Guide pad

| Parts  |               | Diameter (mm)         |                       |                       |
|--------|---------------|-----------------------|-----------------------|-----------------------|
|        |               | 65.01-71.00           | 71.01-83.00           | 83.01-89.00           |
| Insert | Peripheral    | NPHT 110404R-G-P      | NPHT 130404R-G-P      | NPHT 130404R-G-P      |
|        | Screw         | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench        | T-8F                  | T-8F                  | T-8F                  |
|        | Intermediate1 | NPMT 080404R-G-I      | NPMT 080404R-G-I      | NPMT 080404R-G-I      |
|        | Screw         | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench        | T-8F                  | T-8F                  | T-8F                  |
|        | Intermediate2 | NPMT 080404R-G-I      | NPMT 080404R-G-I      | NPMT 100404R-G-I      |
|        | Screw         | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench        | T-8F                  | T-8F                  | T-8F                  |
|        | Intermediate3 | NPMT 070404R-G-I      | NPMT 080404R-G-I      | NPMT 080404R-G-I      |
|        | Screw         | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench        | T-8F                  | T-8F                  | T-8F                  |
|        | Central       | NPMT 100408L-G-C      | NPMT 100408L-G-C      | NPMT 130408L-G-C      |
|        | Screw         | SR14-560-HG           | SR14-560-HG           | SR14-560-HG           |
|        | Wrench        | T-8F                  | T-8F                  | T-8F                  |
| Pad    | PAD           | PAD-GP12-35-250-DC-SB | PAD-GP12-35-250-DC-SB | PAD-GP12-35-250-DC-SB |
|        |               | PAD-GP12-35-250-DC-SC | PAD-GP12-35-250-DC-SC | PAD-GP12-35-250-DC-SC |
|        | Screw         | CSTB-3.5              | CSTB-3.5              | CSTB-3.5              |
|        | Wrench        | T-15F                 | T-15F                 | T-15F                 |
|        |               |                       |                       |                       |
|        |               |                       |                       |                       |
|        |               |                       |                       |                       |
|        |               |                       |                       |                       |
|        |               |                       |                       |                       |
|        |               |                       |                       |                       |
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|        |               |                       |                       |                       |
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|        |               |                       |                       |                       |

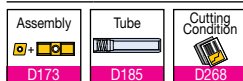


► Insert and guide pad are sold separately from drill body

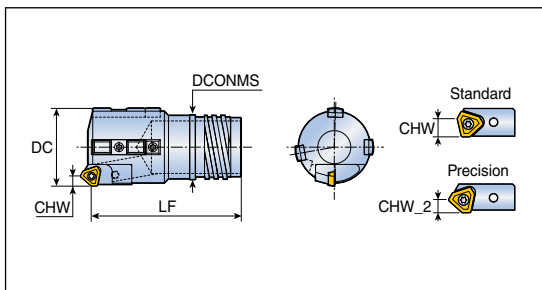
### Single tube system



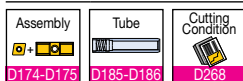
- [illegible]



### Single tube system



- [illegible]





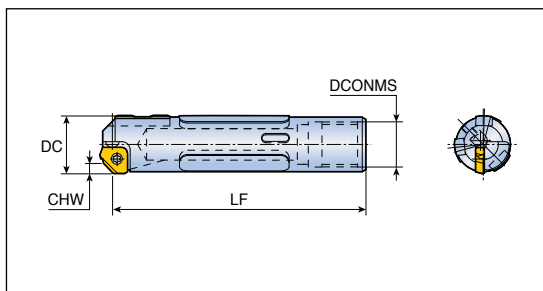
# TBTA-R...SI1



## Single tube system



- Inner single start thread



| Designation                 | DC          | CHW (mm) | Dimension (mm) |        | Tube     |               |
|-----------------------------|-------------|----------|----------------|--------|----------|---------------|
|                             |             |          | LF             | DCONMS | Part     | Diameter (mm) |
| <b>TBTA-R- xxx.xxSI1-22</b> | 25.00-26.99 | 2.8      | 110.5          | 20     | BTSE 022 | 22            |
| <b>xxx.xxSI1-24</b>         | 27.00-29.99 | 2.8      | 110.5          | 22     | BTSE 024 | 24            |
| <b>xxx.xxSI1-26</b>         | 30.00-31.99 | 2.8      | 110.5          | 24     | BTSE 026 | 26            |
| <b>xxx.xxSI1-28</b>         | 32.00-33.99 | 2.8      | 110.5          | 26     | BTSE 028 | 28            |
| <b>xxx.xxSI1-30</b>         | 34.00-36.99 | 2.8      | 135.5          | 27     | BTSE 030 | 30            |
| <b>xxx.xxSI1-33</b>         | 37.00-39.99 | 2.8      | 135.5          | 30     | BTSE 033 | 33            |

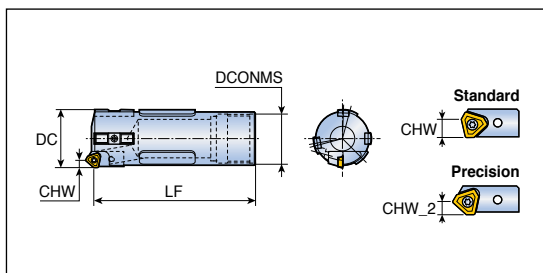
# TBTA-R...SI1



## Single tube system



- Inner single start thread

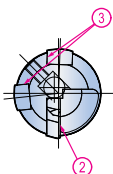


| Designation                 | DC           | CHW (mm) |           | Dimension (mm) |        | Tube     |               |
|-----------------------------|--------------|----------|-----------|----------------|--------|----------|---------------|
|                             |              | Standard | Precision | LF             | DCONMS | Part     | Diameter (mm) |
| <b>TBTA-R- xxx.xxSI1-36</b> | 40.00-43.99  | 6.4      | 4         | 135            | 33     | BTSE 036 | 36            |
| <b>xxx.xxSI1-39</b>         | 44.00-46.99  | 6.4      | 4         | 135            | 37     | BTSE 039 | 39            |
| <b>xxx.xxSI1-43</b>         | 47.00-51.99  | 6.4      | 4         | 145            | 41     | BTSE 043 | 43            |
| <b>xxx.xxSI1-47</b>         | 52.00-56.99  | 7.2      | 4.8       | 145            | 44     | BTSE 047 | 47            |
| <b>xxx.xxSI1-51</b>         | 57.00-60.99  | 7.2      | 4.8       | 170            | 49     | BTSE 051 | 51            |
| <b>xxx.xxSI1-56</b>         | 61.00-67.99  | 7.2/10.4 | 4.8/6.4   | 170            | 53     | BTSE 056 | 56            |
| <b>xxx.xxSI1-62</b>         | 68.00-74.99  | 10.4     | 6.4       | 170            | 59     | BTSE 062 | 62            |
| <b>xxx.xxSI1-68</b>         | 75.00-80.99  | 10.4     | 6.4       | 205            | 65     | BTSE 068 | 68            |
| <b>xxx.xxSI1-75</b>         | 81.00-90.99  | 10.4     | 6.4       | 215            | 71     | BTSE 075 | 75            |
| <b>xxx.xxSI1-82</b>         | 91.00-98.99  | 10.4     | 6.4       | 225            | 79     | BTSE 082 | 82            |
| <b>xxx.xxSI1-94</b>         | 99.00-110.99 | 10.4     | 6.4       | 235            | 90     | BTSE 094 | 94            |

| Assembly  | Tube      | Cutting Condition |
|-----------|-----------|-------------------|
| D173-D175 | D187-D188 | D268              |

**TDEEP**

A diagram of a 3D printer nozzle assembly. Callout 1 points to the nozzle body, and callout 4 points to the nozzle tip.

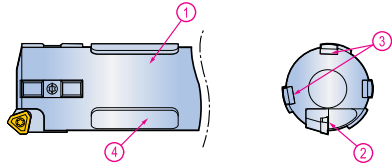


1. Head shank
2. Insert
3. Guide pad
4. Guide pad protector

[illegible]

- ▶ A+B is for outer four start thread connection type
- ▶ A+C is for inner single start thread connection type

## Assembly of TBTA-R series

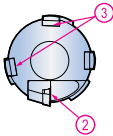
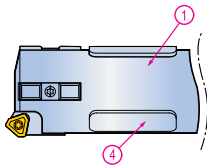


- 1. Head shank
- 2. Cartridge & lock screw
- 3. Guide pad
- 4. Resin guide pad & lock screw

| Parts            |                         | Diameter (mm)                                  |                                                |                                                |                                                |
|------------------|-------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|
|                  |                         | 40.00-45.99                                    | 46.00-51.99                                    | 52.00-56.99                                    | 57.00-59.99                                    |
| Close tolerance  | Peripheral              | PERC P04R                                      | PERC P04R                                      | PERC P32R                                      | PERC P32R                                      |
|                  | Adjust screw            | AS0004-8                                       | AS0004-8                                       | AS0005-10                                      | AS0005-10                                      |
|                  | Wrench                  | H2                                             | H2                                             | H2.5                                           | H2.5                                           |
|                  | Screw                   | LS1803.5RH                                     | LS1803.5RH                                     | LS1805RH                                       | LS1805RH                                       |
|                  | Wrench                  | H2.5                                           | H2.5                                           | H3                                             | H3                                             |
|                  | Insert                  | TPMX 1403LG                                    | TPMX 1403LG                                    | TPMX 1704LG                                    | TPMX 1704LG                                    |
|                  | Screw                   | CSTB-2.5                                       | CSTB-2.5                                       | CSTB-3.5D                                      | CSTB-3.5D                                      |
| Normal tolerance | Wrench                  | T-8D                                           | T-8D                                           | T-8D                                           | T-8D                                           |
|                  | Peripheral              | PERC 402-04                                    | PERC 402-04                                    | PERC 402-32                                    | PERC 402-32                                    |
|                  | Adjust screw            | AS0004-8                                       | AS0004-8                                       | AS0005-10                                      | AS0005-10                                      |
|                  | Wrench                  | H2                                             | H2                                             | H2.5                                           | H2.5                                           |
|                  | Screw                   | LS1803.5RH                                     | LS1803.5RH                                     | LS1805RH                                       | LS1805RH                                       |
|                  | Wrench                  | H2.5                                           | H2.5                                           | H3                                             | H3                                             |
|                  | Insert                  | TPMX 140308R-G                                 | TPMX 140308R-G                                 | TPMX 170408R-G                                 | TPMX 170408R-G                                 |
| Pad              | Screw                   | CSTB-2.5                                       | CSTB-2.5                                       | CSTB-3.5D                                      | CSTB-3.5D                                      |
|                  | Wrench                  | T-8D                                           | T-8D                                           | T-8D                                           | T-8D                                           |
|                  | Guide pad (A)           | PAD-GP08-25-155-DC-SB<br>PAD-GP08-25-155-DC-SC | PAD-GP10-35-200-DC-SB<br>PAD-GP10-35-200-DC-SC | PAD-GP10-35-200-DC-SB<br>PAD-GP10-35-200-DC-SC | PAD-GP10-35-200-DC-SB<br>PAD-GP10-35-200-DC-SC |
|                  | Screw                   | CSTB-3S                                        | CSTB-4S                                        | CSTB-4S                                        | CSTB-4S                                        |
|                  | Wrench                  | T-9D                                           | T-15D                                          | T-15D                                          | T-15D                                          |
|                  | Guide pad protector (B) | PAD-P08                                        | PAD-P10                                        | PAD-P10                                        | PAD-P14                                        |
|                  | Screw                   | CSTB-3S                                        | CSTB-4S                                        | CSTB-4S                                        | CSTB-4S                                        |
|                  | Wrench                  | T-9D                                           | T-15D                                          | T-15D                                          | T-15D                                          |
|                  | Resin guide pad (C)     | PAD-R15                                        | PAD-R15                                        | PAD-R15                                        | PAD-R20                                        |
|                  | Screw                   | LS0904-10                                      | LS0904-10                                      | LS0904-10                                      | LS0905-12                                      |
|                  | Wrench                  | H2.5                                           | H2.5                                           | H2.5                                           | H3                                             |
|                  |                         |                                                |                                                |                                                |                                                |
|                  |                         |                                                |                                                |                                                |                                                |
|                  |                         |                                                |                                                |                                                |                                                |



- ▶ A+B is for outer four start thread connection type
- ▶ A+C is for inner single start thread connection type



- 1. Head shank
- 2. Cartridge & lock screw
- 3. Guide pad
- 4. Resin guide pad & lock screw

| Parts            |           |                         | Diameter (mm)                                  |                                                |                                                |
|------------------|-----------|-------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|
|                  |           |                         | 60.00-66.99                                    | 67.00-99.99                                    | 100.00-122.99                                  |
| Close tolerance  | Cartridge | Peripheral              | PERC P32R                                      | PERC P43R                                      | PERC P43R                                      |
|                  |           | Adjust screw            | AS0005-10                                      | AS0005-15                                      | AS0005-15                                      |
|                  |           | Wrench                  | H2.5                                           | H2.5                                           | H2.5                                           |
|                  |           | Screw                   | LS1805RH                                       | LS1806RH                                       | LS1806RH                                       |
|                  | Insert    | Wrench                  | H3                                             | H4                                             | H4                                             |
|                  |           | Insert                  | TPMX 1704LG                                    | TPMX 2405LG                                    | TPMX 2405LG                                    |
|                  |           | Screw                   | CSTB-3.5D                                      | CSTB-4M                                        | CSTB-4M                                        |
| Normal tolerance | Cartridge | Wrench                  | T-8D                                           | T-15D                                          | T-15D                                          |
|                  |           | Peripheral              | PERC 402-32                                    | PERC 402-43                                    | PERC 402-43                                    |
|                  |           | Adjust screw            | AS0005-10                                      | AS0005-15                                      | AS0005-15                                      |
|                  |           | Wrench                  | H2.5                                           | H2.5                                           | H2.5                                           |
|                  | Insert    | Screw                   | LS1805RH                                       | LS1806RH                                       | LS1806RH                                       |
|                  |           | Wrench                  | H3                                             | H4                                             | H4                                             |
|                  |           | Insert                  | TPMX 170408R-G                                 | TPMX 240512R-G                                 | TPMX 240512R-G                                 |
| Pad              |           | Screw                   | CSTB-3.5D                                      | CSTB-4M                                        | CSTB-4M                                        |
|                  |           | Wrench                  | T-8D                                           | T-15D                                          | T-15D                                          |
|                  |           | Guide pad (A)           | PAD-GP14-40-250-DC-SB<br>PAD-GP14-40-250-DC-SC | PAD-GP14-40-250-DC-SB<br>PAD-GP14-40-250-DC-SC | PAD-GP18-40-300-DC-SB<br>PAD-GP18-40-300-DC-SC |
|                  |           | Screw                   | CSTA-5S                                        | CSTA-5S                                        | LS1206S                                        |
|                  |           | Wrench                  | T-15D                                          | T-15D                                          | H3                                             |
|                  |           | Guide pad protector (B) | PAD-P14                                        | PAD-P14                                        | PAD-P18                                        |
|                  |           | Screw                   | CSTA-5S                                        | CSTA-5S                                        | LS1206S                                        |
|                  |           | Wrench                  | T-15D                                          | T-15D                                          | H3                                             |
|                  |           | Resin guide pad (C)     | PAD-R20                                        | PAD-R35                                        | PAD-R35                                        |
|                  |           | Screw                   | LS0905-12                                      | LS0906-15                                      | LS0906-15                                      |
|                  |           | Wrench                  | H3                                             | H4                                             | H4                                             |
|                  |           |                         |                                                |                                                |                                                |
|                  |           |                         |                                                |                                                |                                                |

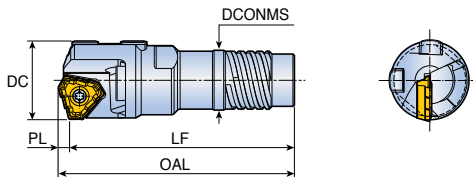


- ▶ A+B is for outer four start thread connection type
- ▶ A+C is for inner single start thread connection type

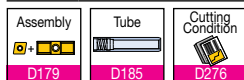
# TBTA-TR...SE4



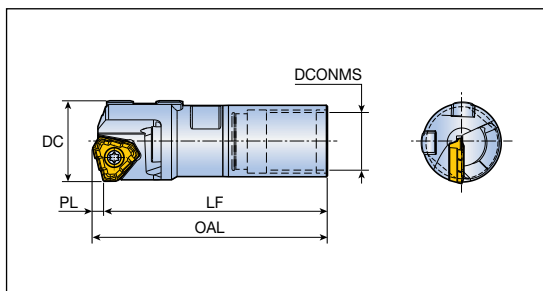
### Single tube system



- Outer four start thread

[illegible]

► Insert and guide pad are sold separately from drill body

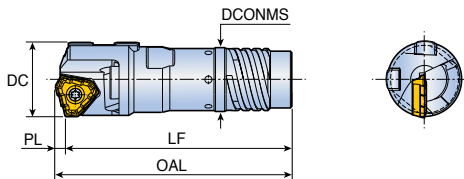


| Assembly                                                                                                                                                               | Tube                                                                                | Cutting Condition                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  +  |  |  |
| D179                                                                                                                                                                   | D186                                                                                | D276                                                                                |

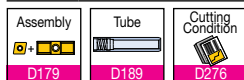
# TBTA-TR...DE4



### Double tube system



- Outer four start thread

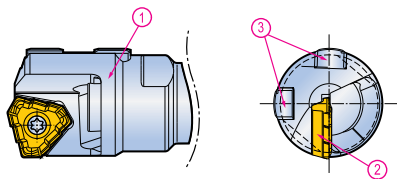
[illegible]

► Insert and guide pad are sold separately from drill body.

# TBTA-TR Series



## Assembly of TBTA-TR series



1. Head shank
2. Insert
3. Guide pad

| Parts     |           | Diameter (mm)         |                       |                       |                       |
|-----------|-----------|-----------------------|-----------------------|-----------------------|-----------------------|
|           |           | 14.00-15.99           | 16.00-18.00           | 18.01-20.00           | 20.01-21.00           |
| Insert    | Insert    | TOGT 070304 RS        | TOGT 080305 RS        | TOGT 090305 RS        | TOGT 100305 RS        |
|           | Screw     | SR14-560/S            | SR14-560/S            | SR14-560/S            | SR34-506              |
|           | Wrench    | T-8F                  | T-8F                  | T-8F                  | T-9F                  |
| Guide Pad | Guide Pad | PAD-GP05-18-060-DC-SB | PAD-GP05-18-075-DC-SB | PAD-GP06-20-085-DC-SB | PAD-GP06-20-085-DC-SB |
|           |           | PAD-GP05-18-060-DC-SC | PAD-GP05-18-075-DC-SC | PAD-GP06-20-085-DC-SC | PAD-GP06-20-085-DC-SC |
|           | Screw     | SR34-508              | SR34-508              | SR34-508              | SR34-508              |
|           | Wrench    | T-7F                  | T-7F                  | T-7F                  | T-7F                  |

| Parts     |           | Diameter (mm)         |                       |                       |
|-----------|-----------|-----------------------|-----------------------|-----------------------|
|           |           | 21.01-21.99           | 22.00-25.00           | 25.01-28.00           |
| Insert    | Insert    | TOGT 100305 RS        | TOGT 110405 RS        | TOGT 120405 RS        |
|           | Screw     | SR34-506              | SR14-571/S            | SR14-506              |
|           | Wrench    | T-9F                  | T-10/5                | T-15F                 |
| Guide Pad | Guide Pad | PAD-GP06-20-100-DC-SB | PAD-GP06-20-100-DC-SB | PAD-GP06-20-120-DC-SB |
|           |           | PAD-GP06-20-100-DC-SC | PAD-GP06-20-100-DC-SC | PAD-GP06-20-120-DC-SC |
|           | Screw     | SR34-508              | SR34-508              | SR34-508              |
|           | Wrench    | T-7F                  | T-7F                  | T-7F                  |

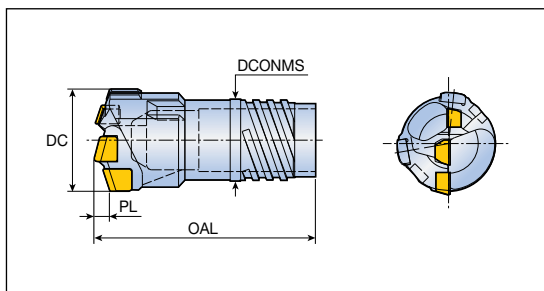
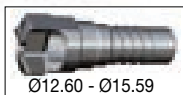
| Parts     |           | Diameter (mm)         |                       |                       |                       |
|-----------|-----------|-----------------------|-----------------------|-----------------------|-----------------------|
|           |           | 28.01-29.99           | 30.00-32.00           | 32.01-39.00           | 39.01-40.00           |
| Insert    | Insert    | TOGT 130408 RS        | TOGT 130408 RS        | TOGT 140510 RS        | TOGT 140510 RS        |
|           | Screw     | SR16-212/L10          | SR16-212/L10          | SR16-212/L10          | SR16-212/L10          |
|           | Wrench    | T-20/5                | T-20/5                | T-20/5                | T-20/5                |
| Guide Pad | Guide Pad | PAD-GP06-20-120-DC-SB | PAD-GP07-20-120-DC-SB | PAD-GP07-20-120-DC-SB | PAD-GP08-25-155-DC-SB |
|           |           | PAD-GP06-20-120-DC-SC | PAD-GP07-20-120-DC-SC | PAD-GP07-20-120-DC-SC | PAD-GP08-25-155-DC-SC |
|           | Screw     | CSTB-2.2              | CSTB-3S               | CSTB-3S               | CSTB-3S               |
|           | Wrench    | T-7F                  | T-9F                  | T-9F                  | T-9F                  |
|           |           |                       |                       |                       |                       |



► Insert and guide pad are sold separately from drill body.



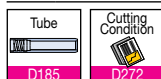
## Single tube system



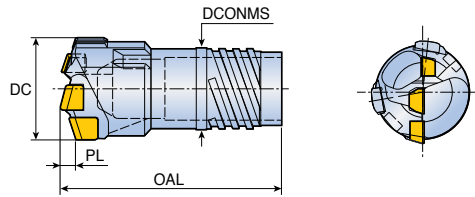
- Outer four start thread

| Designation               | DC          | Dimension (mm) |     |        | Tube     |               |
|---------------------------|-------------|----------------|-----|--------|----------|---------------|
|                           |             | OAL            | PL  | DCONMS | Part     | Diameter (mm) |
| <b>BTA xxx.xx SE2-11*</b> | 12.60-13.10 | 43.0           | 1.1 | 9.6    | BTSI 011 | 11            |
| <b>xxx.xx SE2-11*</b>     | 13.11-13.60 | 43.0           | 1.1 | 9.6    | BTSI 011 | 11            |
| <b>xxx.xx SE2-12*</b>     | 13.61-14.10 | 43.0           | 1.2 | 10.6   | BTSI 012 | 12            |
| <b>xxx.xx SE2-12*</b>     | 14.11-14.60 | 43.0           | 1.2 | 10.6   | BTSI 012 | 12            |
| <b>xxx.xx SE2-13*</b>     | 14.61-15.10 | 43.0           | 1.3 | 11.6   | BTSI 013 | 13            |
| <b>xxx.xx SE2-13*</b>     | 15.11-15.59 | 43.0           | 1.3 | 11.6   | BTSI 013 | 13            |
| <b>xxx.xx SE4-14</b>      | 15.60-16.20 | 43.0           | 2.7 | 12.6   | BTSI 014 | 14            |
| <b>xxx.xx SE4-14</b>      | 16.21-16.70 | 43.0           | 2.7 | 12.6   | BTSI 014 | 14            |
| <b>xxx.xx SE4-15</b>      | 16.71-17.20 | 43.0           | 2.7 | 13.6   | BTSI 015 | 15            |
| <b>xxx.xx SE4-15</b>      | 17.21-17.70 | 43.0           | 2.7 | 13.6   | BTSI 015 | 15            |
| <b>xxx.xx SE4-16</b>      | 17.71-18.40 | 47.0           | 2.8 | 14.5   | BTSI 016 | 16            |
| <b>xxx.xx SE4-16</b>      | 18.41-18.90 | 47.0           | 2.9 | 14.5   | BTSI 016 | 16            |
| <b>xxx.xx SE4-17</b>      | 18.91-19.20 | 47.0           | 2.9 | 15.5   | BTSI 017 | 17            |
| <b>xxx.xx SE4-17</b>      | 19.21-20.00 | 47.0           | 2.9 | 15.5   | BTSI 017 | 17            |
| <b>xxx.xx SE4-18</b>      | 20.01-20.90 | 52.5           | 3.2 | 16.0   | BTSI 018 | 18            |
| <b>xxx.xx SE4-18</b>      | 20.91-21.80 | 52.5           | 3.2 | 16.0   | BTSI 018 | 18            |
| <b>xxx.xx SE4-20</b>      | 21.81-22.90 | 56.0           | 3.2 | 18.0   | BTSI 020 | 20            |
| <b>xxx.xx SE4-20</b>      | 22.91-24.10 | 56.0           | 3.2 | 18.0   | BTSI 020 | 20            |
| <b>xxx.xx SE4-22</b>      | 24.11-25.20 | 57.5           | 3.5 | 19.5   | BTSI 022 | 22            |
| <b>xxx.xx SE4-22</b>      | 25.21-26.40 | 57.5           | 3.5 | 19.5   | BTSI 022 | 22            |
| <b>xxx.xx SE4-24</b>      | 26.41-27.50 | 57.5           | 3.7 | 21.0   | BTSI 024 | 24            |
| <b>xxx.xx SE4-24</b>      | 27.51-28.70 | 57.5           | 3.7 | 21.0   | BTSI 024 | 24            |
| <b>xxx.xx SE4-26</b>      | 28.71-29.80 | 63.5           | 4.0 | 23.5   | BTSI 026 | 26            |
| <b>xxx.xx SE4-26</b>      | 29.81-31.00 | 63.5           | 4.0 | 23.5   | BTSI 026 | 26            |
| <b>xxx.xx SE4-28</b>      | 31.01-32.10 | 63.5           | 4.3 | 25.5   | BTSI 028 | 28            |
| <b>xxx.xx SE4-28</b>      | 32.11-33.30 | 63.5           | 4.3 | 25.5   | BTSI 028 | 28            |
| <b>xxx.xx SE4-30</b>      | 33.31-34.80 | 63.5           | 4.5 | 28.0   | BTSI 030 | 30            |
| <b>xxx.xx SE4-30</b>      | 34.81-36.20 | 63.5           | 4.5 | 28.0   | BTSI 030 | 30            |
| <b>xxx.xx SE4-33</b>      | 36.21-37.30 | 73.5           | 4.8 | 30.0   | BTSI 033 | 33            |
| <b>xxx.xx SE4-33</b>      | 37.31-38.40 | 73.5           | 4.8 | 30.0   | BTSI 033 | 33            |
| <b>xxx.xx SE4-33</b>      | 38.41-39.60 | 73.5           | 4.8 | 30.0   | BTSI 033 | 33            |
| <b>xxx.xx SE4-36</b>      | 39.61-40.60 | 73.5           | 5.6 | 33.0   | BTSI 036 | 36            |
| <b>xxx.xx SE4-36</b>      | 40.61-41.80 | 73.5           | 5.6 | 33.0   | BTSI 036 | 36            |
| <b>xxx.xx SE4-36</b>      | 41.81-43.00 | 73.5           | 5.6 | 33.0   | BTSI 036 | 36            |
| <b>xxx.xx SE4-39</b>      | 43.01-44.30 | 75.0           | 5.4 | 36.0   | BTSI 039 | 39            |

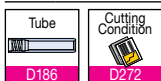
► \*: 2 cutting edge head, 2 start thread



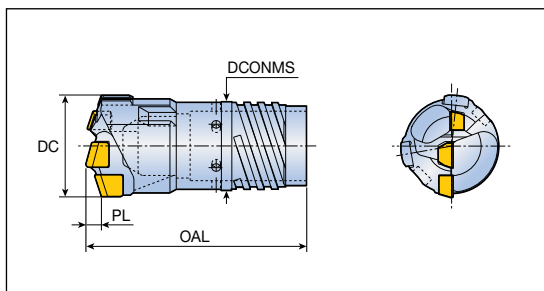
### Single tube system



- [illegible]

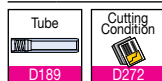


## Double tube system



- Outer four start thread

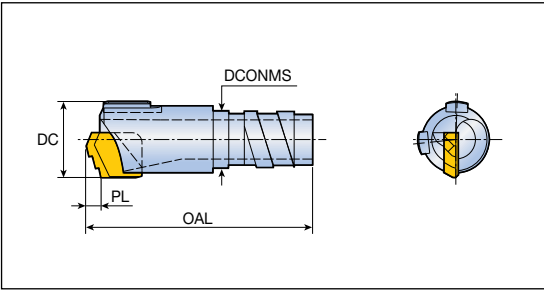
| Designation              | DC          | Dimension (mm) |     |        | Tube       |            |               |
|--------------------------|-------------|----------------|-----|--------|------------|------------|---------------|
|                          |             | OAL            | PL  | DCONMS | Outer tube | Inner tube | Diameter (mm) |
| <b>BTA xxx.xx DE4-18</b> | 18.41-19.20 | 50.0           | 2.9 | 16.0   | BTDO 018   | BTDI 012   | 18.0          |
| <b>xxx.xx DE4-18</b>     | 19.21-20.00 | 50.0           | 2.9 | 16.0   | BTDO 018   | BTDI 012   | 18.0          |
| <b>xxx.xx DE4-19.5</b>   | 20.01-20.90 | 56.0           | 3.2 | 18.0   | BTDO 019.5 | BTDI 014   | 19.5          |
| <b>xxx.xx DE4-19.5</b>   | 20.91-21.80 | 56.0           | 3.2 | 18.0   | BTDO 019.5 | BTDI 014   | 19.5          |
| <b>xxx.xx DE4-21.5</b>   | 21.81-22.90 | 56.0           | 3.2 | 19.5   | BTDO 021.5 | BTDI 015   | 21.5          |
| <b>xxx.xx DE4-21.5</b>   | 22.91-24.10 | 56.0           | 3.2 | 19.5   | BTDO 021.5 | BTDI 015   | 21.5          |
| <b>xxx.xx DE4-23.5</b>   | 24.11-25.20 | 57.5           | 3.5 | 21.0   | BTDO 023.5 | BTDI 016   | 23.5          |
| <b>xxx.xx DE4-23.5</b>   | 25.21-26.40 | 57.5           | 3.5 | 21.0   | BTDO 023.5 | BTDI 016   | 23.5          |
| <b>xxx.xx DE4-26</b>     | 26.41-27.50 | 60.5           | 3.7 | 23.5   | BTDO 026   | BTDI 018   | 26.0          |
| <b>xxx.xx DE4-26</b>     | 27.51-28.70 | 60.5           | 3.7 | 23.5   | BTDO 026   | BTDI 018   | 26.0          |
| <b>xxx.xx DE4-28</b>     | 28.71-29.80 | 63.5           | 4.0 | 25.5   | BTDO 028   | BTDI 020   | 28.0          |
| <b>xxx.xx DE4-28</b>     | 29.81-31.00 | 63.5           | 4.0 | 25.5   | BTDO 028   | BTDI 020   | 28.0          |
| <b>xxx.xx DE4-30.5</b>   | 31.01-32.10 | 63.5           | 4.1 | 28.0   | BTDO 030.5 | BTDI 022   | 30.5          |
| <b>xxx.xx DE4-30.5</b>   | 32.11-33.30 | 63.5           | 4.1 | 28.0   | BTDO 030.5 | BTDI 022   | 30.5          |
| <b>xxx.xx DE4-33</b>     | 33.31-34.80 | 70.5           | 4.5 | 30.0   | BTDO 033.0 | BTDI 024   | 33.0          |
| <b>xxx.xx DE4-33</b>     | 34.81-36.20 | 70.5           | 4.5 | 30.0   | BTDO 033.0 | BTDI 024   | 33.0          |
| <b>xxx.xx DE4-35.5</b>   | 36.21-37.30 | 73.5           | 4.8 | 33.0   | BTDO 035.5 | BTDI 026   | 35.5          |
| <b>xxx.xx DE4-35.5</b>   | 37.31-38.40 | 73.5           | 4.8 | 33.0   | BTDO 035.5 | BTDI 026   | 35.5          |
| <b>xxx.xx DE4-35.5</b>   | 38.41-39.60 | 73.5           | 4.8 | 33.0   | BTDO 035.5 | BTDI 026   | 35.5          |
| <b>xxx.xx DE4-39</b>     | 39.61-40.60 | 73.5           | 5.3 | 36.0   | BTDO 039   | BTDI 029   | 39.0          |
| <b>xxx.xx DE4-39</b>     | 40.61-41.80 | 73.5           | 5.3 | 36.0   | BTDO 039   | BTDI 029   | 39.0          |
| <b>xxx.xx DE4-39</b>     | 41.81-43.00 | 73.5           | 5.3 | 36.0   | BTDO 039   | BTDI 029   | 39.0          |
| <b>xxx.xx DE4-42.5</b>   | 43.01-44.30 | 75.0           | 5.5 | 39.0   | BTDO 042.5 | BTDI 032   | 42.5          |
| <b>xxx.xx DE4-42.5</b>   | 44.31-45.60 | 75.0           | 5.5 | 39.0   | BTDO 042.5 | BTDI 032   | 42.5          |
| <b>xxx.xx DE4-42.5</b>   | 45.61-47.00 | 75.0           | 5.5 | 39.0   | BTDO 042.5 | BTDI 032   | 42.5          |
| <b>xxx.xx DE4-46.5</b>   | 47.01-48.50 | 79.0           | 6.1 | 43.0   | BTDO 046.5 | BTDI 035   | 46.5          |
| <b>xxx.xx DE4-46.5</b>   | 48.51-50.10 | 79.0           | 6.1 | 43.0   | BTDO 046.5 | BTDI 035   | 46.5          |
| <b>xxx.xx DE4-46.5</b>   | 50.11-51.70 | 79.0           | 6.1 | 43.0   | BTDO 046.5 | BTDI 035   | 46.5          |
| <b>xxx.xx DE4-51</b>     | 51.71-53.20 | 82.0           | 6.5 | 47.0   | BTDO 051   | BTDI 039   | 51.0          |
| <b>xxx.xx DE4-51</b>     | 53.21-54.70 | 82.0           | 6.5 | 47.0   | BTDO 051   | BTDI 039   | 51.0          |
| <b>xxx.xx DE4-51</b>     | 54.71-56.20 | 82.0           | 6.5 | 47.0   | BTDO 051   | BTDI 039   | 51.0          |
| <b>xxx.xx DE4-55.5</b>   | 56.21-58.40 | 84.0           | 6.6 | 51.0   | BTDO 055.5 | BTDI 043A  | 55.5          |
| <b>xxx.xx DE4-55.5</b>   | 58.41-60.60 | 84.0           | 6.6 | 51.0   | BTDO 055.5 | BTDI 043A  | 55.5          |
| <b>xxx.xx DE4-55.5</b>   | 60.61-62.80 | 84.0           | 6.6 | 51.0   | BTDO 055.5 | BTDI 043A  | 55.5          |
| <b>xxx.xx DE4-55.5</b>   | 62.81-65.00 | 84.0           | 6.6 | 51.0   | BTDO 055.5 | BTDI 043A  | 55.5          |



# BTS...SE1

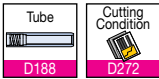


## Single tube system



- Outer single start thread

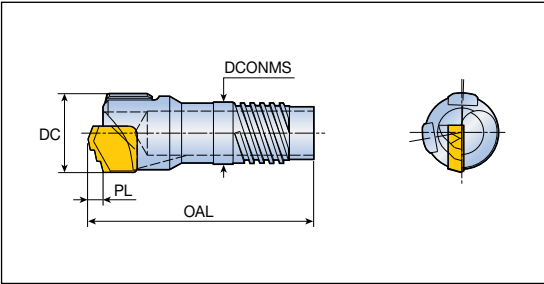
| Designation               | DC          | Dimension (mm) |     |        | Tube     |               |
|---------------------------|-------------|----------------|-----|--------|----------|---------------|
|                           |             | OAL            | PL  | DCONMS | Part     | Diameter (mm) |
| <b>BTS xxx.xx SE1-7.1</b> | 8.00-8.99   | 34             | 2.0 | 6.0    | BTSO 071 | 7.1           |
| <b>xxx.xx SE1-8.3</b>     | 9.00-9.99   | 34             | 2.0 | 7.2    | BTSO 083 | 8.3           |
| <b>xxx.xx SE1-9</b>       | 10.00-10.99 | 34             | 2.2 | 7.6    | BTSO 090 | 9.0           |
| <b>xxx.xx SE1-10</b>      | 11.00-11.99 | 34             | 2.2 | 8.6    | BTSO 100 | 10.0          |
| <b>xxx.xx SE1-11</b>      | 12.00-13.49 | 34             | 2.3 | 9.1    | BTSO 110 | 11.0          |
| <b>xxx.xx SE1-12</b>      | 13.50-14.79 | 34             | 2.4 | 10.8   | BTSO 120 | 12.0          |



# BTS...SE2/SE4

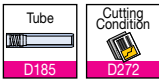


## Single tube system



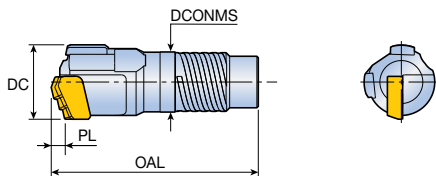
- Outer four start thread

| Designation               | DC          | Dimension (mm) |     |        | Tube     |               |
|---------------------------|-------------|----------------|-----|--------|----------|---------------|
|                           |             | OAL            | PL  | DCONMS | Part     | Diameter (mm) |
| <b>BTS xxx.xx SE2-11*</b> | 12.60-13.60 | 40             | 2.3 | 9.6    | BTSI 011 | 11            |
| <b>xxx.xx SE2-12*</b>     | 13.61-14.60 | 40             | 2.4 | 10.6   | BTSI 012 | 12            |
| <b>xxx.xx SE2-13*</b>     | 14.61-15.59 | 40             | 3.0 | 11.6   | BTSI 013 | 13            |
| <b>xxx.xx SE4-14</b>      | 15.60-16.70 | 40             | 2.4 | 12.6   | BTSI 014 | 14            |
| <b>xxx.xx SE4-15</b>      | 16.71-17.70 | 40             | 3.0 | 13.6   | BTSI 015 | 15            |
| <b>xxx.xx SE4-16</b>      | 17.71-18.90 | 40             | 3.3 | 14.5   | BTSI 016 | 16            |
| <b>xxx.xx SE4-17</b>      | 18.91-20.00 | 40             | 3.3 | 15.5   | BTSI 017 | 17            |

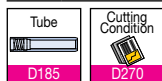


► \*: Designates outer two start thread

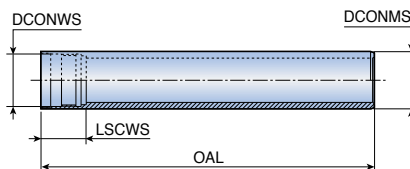
### Single tube system



- [illegible]



- Inner four start thread

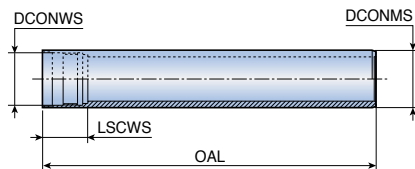
[illegible]

► Please indicate overall length (OAL) when ordering

► \*: Indicates parts are inner two start thread



- Inner four start thread

[illegible]

► Please indicate overall length (OAL) when ordering

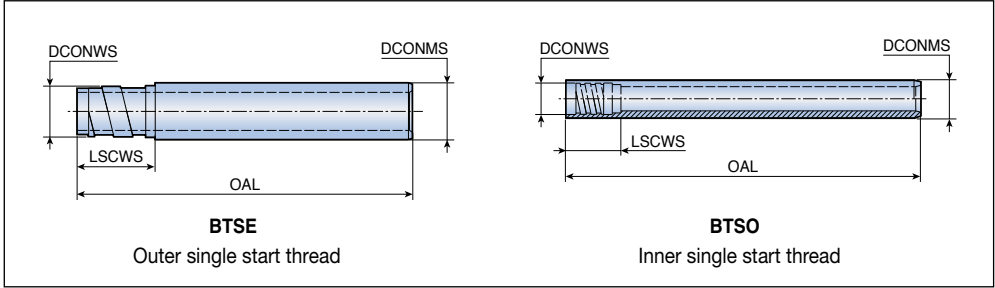
- 
- Technical drawing of a shaft with the following dimensions:
- DCONWS**: Diameter at the left end of the shaft.
  - DCONMS**: Diameter at the right end of the shaft.
  - LSCWS**: Length of the section at the left end of the shaft.
  - OAL**: Overall length of the shaft.



**TaeguTec**  
Member IMC Group



## Single tube



| Designation     | DC            | Dimension (mm) |        |       |      |
|-----------------|---------------|----------------|--------|-------|------|
|                 |               | DCONMS         | DCONWS | LSCWS |      |
| <b>BTSE 047</b> | 52.00-56.99   | 47.0           | 44     | -     | 41   |
| <b>051</b>      | 57.00-60.99   | 51.0           | 49     | -     | 41   |
| <b>056</b>      | 61.00-67.99   | 56.0           | 53     | -     | 41   |
| <b>062</b>      | 68.00-74.99   | 62.0           | 59     | -     | 41   |
| <b>068</b>      | 75.00-80.99   | 68.0           | 65     | -     | 71   |
| <b>075</b>      | 81.00-90.99   | 75.0           | 71     | -     | 71   |
| <b>082</b>      | 91.00-98.99   | 82.0           | 79     | -     | 71   |
| <b>094</b>      | 99.00-110.99  | 94.0           | 90     | -     | 71   |
| <b>106</b>      | 111.00-122.99 | 106.0          | 102    | -     | 71   |
| <b>118</b>      | 123.00-134.99 | 118.0          | 114    | -     | 71   |
| <b>130</b>      | 135.00-148.99 | 130.0          | 126    | -     | 71   |
| <b>142</b>      | 149.00-161.99 | 142.0          | 139    | -     | 71   |
| <b>154</b>      | 162.00-173.99 | 154.0          | 151    | -     | 86   |
| <b>166</b>      | 174.00-185.99 | 166.0          | 163    | -     | 86   |
| <b>178</b>      | 186.00-197.99 | 178.0          | 175    | -     | 86   |
| <b>190</b>      | 198.00-209.99 | 190.0          | 187    | -     | 86   |
| <b>202</b>      | 210.00-221.99 | 202.0          | 199    | -     | 86   |
| <b>214</b>      | 222.00-233.99 | 214.0          | 211    | -     | 86   |
| <b>226</b>      | 234.00-245.99 | 226.0          | 223    | -     | 86   |
| <b>238</b>      | 246.00-257.99 | 238.0          | 235    | -     | 86   |
| <b>250</b>      | 258.00-269.99 | 250.0          | 247    | -     | 121  |
| <b>262</b>      | 270.00-281.99 | 262.0          | 259    | -     | 121  |
| <b>274</b>      | 282.00-293.99 | 274.0          | 271    | -     | 121  |
| <b>BTSO 071</b> | 8.00-8.99     | 7.1            | -      | 6.0   | 13.5 |
| <b>083</b>      | 9.00-9.99     | 8.3            | -      | 7.2   | 13.5 |
| <b>090</b>      | 10.00-10.99   | 9.0            | -      | 7.6   | 13.5 |
| <b>100</b>      | 11.00-11.99   | 10.0           | -      | 8.6   | 13.5 |
| <b>110</b>      | 12.00-13.49   | 11.0           | -      | 9.1   | 13.5 |
| <b>120</b>      | 13.50-14.79   | 12.0           | -      | 10.8  | 13.5 |
|                 |               |                |        |       |      |
|                 |               |                |        |       |      |
|                 |               |                |        |       |      |
|                 |               |                |        |       |      |
|                 |               |                |        |       |      |
|                 |               |                |        |       |      |
|                 |               |                |        |       |      |

► Please indicate overall length (OAL) when ordering

Technical drawings of the Outer tube and Inner tube components.

**Outer tube:**

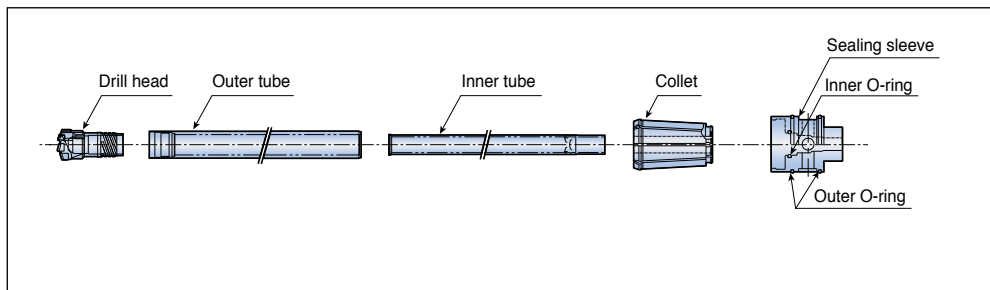
- Ø18.40:** Dimensions include DCONWS (outer diameter), DHUB (hub diameter), LSCWS (length of sleeve), and OAL (overall length).
- Ø65.01:** Dimensions include DCONWS (outer diameter), DHUB (hub diameter), LSCWS (length of sleeve), and LSCMS (length of sleeve).

**Inner tube:**

- Ø18.40:** Dimensions include DCONMS (outer diameter), OAL (overall length), and DC\_3 (dimension).

[illegible]

# Assembly of Double Tube System



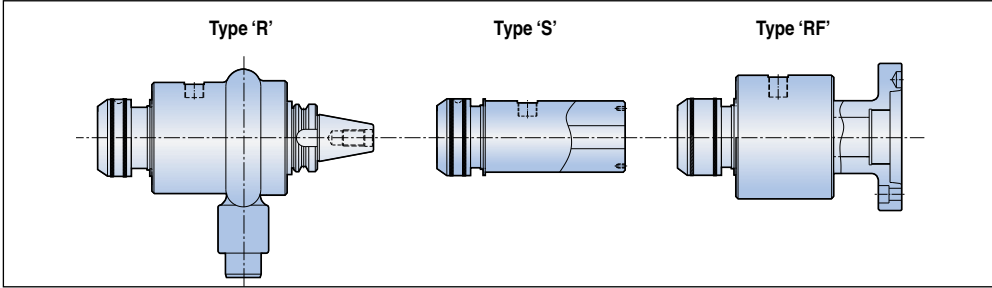
| Designation     |                 | DC          | Collet        |
|-----------------|-----------------|-------------|---------------|
| <b>BTDO 018</b> | <b>BTDI 012</b> | 18.40-19.20 | COLLET 4-18   |
| <b>018</b>      | <b>012</b>      | 19.21-20.00 | COLLET 4-18   |
| <b>019.5</b>    | <b>014</b>      | 20.01-20.90 | COLLET 4-19.5 |
| <b>019.5</b>    | <b>014</b>      | 20.91-21.80 | COLLET 4-19.5 |
| <b>021.5</b>    | <b>015</b>      | 21.81-22.90 | COLLET 4-21.5 |
| <b>021.5</b>    | <b>015</b>      | 22.91-24.10 | COLLET 4-21.5 |
| <b>023.5</b>    | <b>016</b>      | 24.11-25.20 | COLLET 4-23.5 |
| <b>023.5</b>    | <b>016</b>      | 25.21-26.40 | COLLET 4-23.5 |
| <b>026</b>      | <b>018</b>      | 26.41-27.50 | COLLET 4-26   |
| <b>026</b>      | <b>018</b>      | 27.51-28.70 | COLLET 4-26   |
| <b>028</b>      | <b>020</b>      | 28.71-29.80 | COLLET 4-28   |
| <b>028</b>      | <b>020</b>      | 29.81-31.00 | COLLET 4-28   |
| <b>030.5</b>    | <b>022</b>      | 31.01-32.10 | COLLET 4-30.5 |
| <b>030.5</b>    | <b>022</b>      | 32.11-33.30 | COLLET 4-30.5 |
| <b>033</b>      | <b>024</b>      | 33.31-34.80 | COLLET 4-33   |
| <b>033</b>      | <b>024</b>      | 34.81-36.20 | COLLET 4-33   |
| <b>035.5</b>    | <b>026</b>      | 36.21-37.30 | COLLET 4-35.5 |
| <b>035.5</b>    | <b>026</b>      | 37.31-38.40 | COLLET 4-35.5 |
| <b>035.5</b>    | <b>026</b>      | 38.41-39.60 | COLLET 4-35.5 |
| <b>039</b>      | <b>029</b>      | 39.61-40.60 | COLLET 4-39   |
| <b>039</b>      | <b>029</b>      | 40.61-41.80 | COLLET 4-39   |
| <b>039</b>      | <b>029</b>      | 41.81-43.00 | COLLET 4-39   |
| <b>042.5</b>    | <b>032</b>      | 43.01-44.30 | COLLET 4-42.5 |
| <b>042.5</b>    | <b>032</b>      | 44.31-45.60 | COLLET 4-42.5 |
| <b>042.5</b>    | <b>032</b>      | 45.61-47.00 | COLLET 4-42.5 |
| <b>046.5</b>    | <b>035</b>      | 47.01-48.50 | COLLET 4-46.5 |
| <b>046.5</b>    | <b>035</b>      | 48.51-50.10 | COLLET 4-46.5 |
| <b>046.5</b>    | <b>035</b>      | 50.11-51.70 | COLLET 4-46.5 |
| <b>051</b>      | <b>039</b>      | 51.71-53.20 | COLLET 4-51   |
| <b>051</b>      | <b>039</b>      | 53.21-54.70 | COLLET 4-51   |
| <b>051</b>      | <b>039</b>      | 54.71-56.20 | COLLET 4-51   |
| <b>055.5</b>    | <b>043A</b>     | 56.21-58.40 | COLLET 4-55.5 |
| <b>055.5</b>    | <b>043A</b>     | 58.41-60.60 | COLLET 4-55.5 |
| <b>055.5</b>    | <b>043A</b>     | 60.61-62.80 | COLLET 4-55.5 |
| <b>055.5</b>    | <b>043A</b>     | 62.81-65.00 | COLLET 4-55.5 |

► Inner tube should be longer than outer tube. Please refer to page D189 for details

# Assembly of Double Tube System

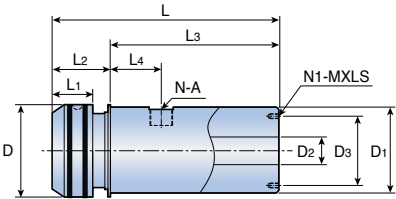


## Connector



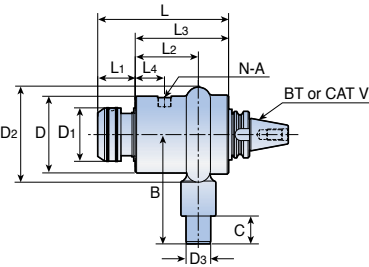
| Sealing sleeve         | Outer O-ring | Inner O-ring | Connector     |
|------------------------|--------------|--------------|---------------|
| SEALING SLEEVE 4R-18   | OOR-25.24    | IOR-18       | DTC-4S/4R/4RF |
| SEALING SLEEVE 4R-18   |              | IOR-18       |               |
| SEALING SLEEVE 4R-19.5 |              | IOR-19.5     |               |
| SEALING SLEEVE 4R-19.5 |              | IOR-19.5     |               |
| SEALING SLEEVE 4R-21.5 |              | IOR-21.5     |               |
| SEALING SLEEVE 4R-21.5 |              | IOR-21.5     |               |
| SEALING SLEEVE 4R-23.5 |              | IOR-23.5     |               |
| SEALING SLEEVE 4R-23.5 |              | IOR-23.5     |               |
| SEALING SLEEVE 4R-26   |              | IOR-26       |               |
| SEALING SLEEVE 4R-26   |              | IOR-26       |               |
| SEALING SLEEVE 4R-28   |              | IOR-28       |               |
| SEALING SLEEVE 4R-28   |              | IOR-28       |               |
| SEALING SLEEVE 4R-30.5 |              | IOR-30.5     |               |
| SEALING SLEEVE 4R-30.5 |              | IOR-30.5     |               |
| SEALING SLEEVE 4R-33   |              | IOR-33       |               |
| SEALING SLEEVE 4R-33   |              | IOR-33       |               |
| SEALING SLEEVE 4R-35.5 | OOR-65       | IOR-35.5     |               |
| SEALING SLEEVE 4R-35.5 |              | IOR-35.5     |               |
| SEALING SLEEVE 4R-35.5 |              | IOR-35.5     |               |
| SEALING SLEEVE 4R-39   |              | IOR-39       |               |
| SEALING SLEEVE 4R-39   |              | IOR-39       |               |
| SEALING SLEEVE 4R-39   |              | IOR-39       |               |
| SEALING SLEEVE 4R-42.5 |              | IOR-42.5     |               |
| SEALING SLEEVE 4R-42.5 |              | IOR-42.5     |               |
| SEALING SLEEVE 4R-42.5 |              | IOR-42.5     |               |
| SEALING SLEEVE 4R-46.5 |              | IOR-46.5     |               |
| SEALING SLEEVE 4R-46.5 |              | IOR-46.5     |               |
| SEALING SLEEVE 4R-46.5 |              | IOR-46.5     |               |
| SEALING SLEEVE 4R-51   |              | IOR-51       |               |
| SEALING SLEEVE 4R-51   |              | IOR-51       |               |
| SEALING SLEEVE 4R-51   |              | IOR-51       |               |
| SEALING SLEEVE 4R-55.5 |              | IOR-55.5     |               |
| SEALING SLEEVE 4R-55.5 |              | IOR-55.5     |               |
| SEALING SLEEVE 4R-55.5 |              | IOR-55.5     |               |
| SEALING SLEEVE 4R-55.5 |              | IOR-55.5     |               |

'S' type connector



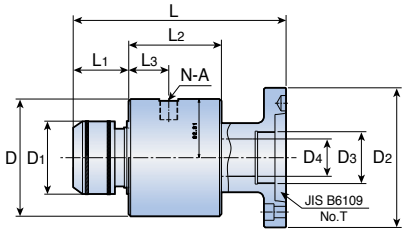
| Designation | DC         | D   | D1  | D2 | D3  | L   | L1 | L2  | L3  | L4 | N-A      | N1-MXLS |
|-------------|------------|-----|-----|----|-----|-----|----|-----|-----|----|----------|---------|
| DTC 4S      | 18.4-65.0  | 115 | 100 | 45 | 80  | 310 | 50 | 60  | 250 | 68 | 2-PT3/4" | 4-M8x15 |
| 5S          | 65.0-123.9 | 164 | 140 | 81 | 120 | 415 | 47 | 115 | 300 |    | 2-PT1"   | 6-M8x20 |
|             |            |     |     |    |     |     |    |     |     |    |          |         |
|             |            |     |     |    |     |     |    |     |     |    |          |         |
|             |            |     |     |    |     |     |    |     |     |    |          |         |
|             |            |     |     |    |     |     |    |     |     |    |          |         |

'R' type connector



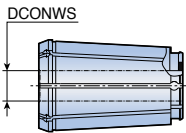
| Designation | DC          | D   | D1  | D2  | D3    | B     | C   | L     | L1   | L2  | L3  | L4  | N-A        |
|-------------|-------------|-----|-----|-----|-------|-------|-----|-------|------|-----|-----|-----|------------|
| DTC 4R      | 18.4-65.0   | 165 | 115 | 206 | 53    | 186.5 | 60  | 319.7 | 59.2 | 152 | 228 | 75  | 2-PT1"     |
| 5R          | 65.0-123.9  | 225 | 164 | 312 | 100   | 310   | 100 | 382   | 62   | 201 | 320 | 95  | 2-PT1 1/4" |
| 6R          | 124.0-183.9 | 350 | 244 | 445 | 152.4 | 412   | 120 | 487   | 75   | 250 | 412 | 118 | 4-PT1-1/4" |
|             |             |     |     |     |       |       |     |       |      |     |     |     |            |
|             |             |     |     |     |       |       |     |       |      |     |     |     |            |
|             |             |     |     |     |       |       |     |       |      |     |     |     |            |
|             |             |     |     |     |       |       |     |       |      |     |     |     |            |

'RF' type connector

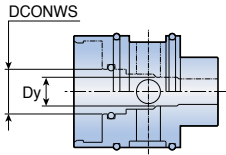


| Designation | DC        | D   | D1  | D2  | D3    | D4 | L     | L1   | L2  | L3 | N-A    |
|-------------|-----------|-----|-----|-----|-------|----|-------|------|-----|----|--------|
| DTC 4RF     | 18.4-65.0 | 160 | 115 | 210 | M62x2 | 46 | 291.5 | 64.5 | 150 | 75 | 2-PT1" |

Collet / Sealing Sleeve



Collet



Sealing sleeve

| Designation        | DC          | DCONWS | Designation                | DC          | DCONWS | Dy | Outer O-ring | Inner O-ring |
|--------------------|-------------|--------|----------------------------|-------------|--------|----|--------------|--------------|
| <b>COLLET 4-18</b> | 18.40-20.00 | 18.0   | <b>SEALING SLEEVE 4-18</b> | 18.40-20.00 | 18.0   | 10 | OOR-65       | IOR 18       |
| <b>4-19.5</b>      | 20.01-21.80 | 19.5   | <b>4-19.5</b>              | 20.01-21.80 | 19.5   | 12 |              | IOR 19.5     |
| <b>4-21.5</b>      | 21.81-24.10 | 21.5   | <b>4-21.5</b>              | 21.81-24.10 | 21.5   | 13 |              | IOR 21.5     |
| <b>4-23.5</b>      | 24.11-26.40 | 23.5   | <b>4-23.5</b>              | 24.11-26.40 | 23.5   | 14 |              | IOR 23.5     |
| <b>4-26</b>        | 26.41-28.70 | 26.0   | <b>4-26</b>                | 26.41-28.70 | 26.0   | 16 |              | IOR 26       |
| <b>4-28</b>        | 28.71-31.00 | 28.0   | <b>4-28</b>                | 28.71-31.00 | 28.0   | 18 |              | IOR 28       |
| <b>4-30.5</b>      | 31.01-33.30 | 30.5   | <b>4-30.5</b>              | 31.01-33.30 | 30.5   | 20 |              | IOR 30.5     |
| <b>4-33</b>        | 33.31-36.20 | 33.0   | <b>4-33</b>                | 33.31-36.20 | 33.0   | 22 |              | IOR 33       |
| <b>4-35.5</b>      | 36.21-39.60 | 35.5   | <b>4-35.5</b>              | 36.21-39.60 | 35.5   | 24 |              | IOR 35.5     |
| <b>4-39</b>        | 39.61-43.00 | 39.0   | <b>4-39</b>                | 39.61-43.00 | 39.0   | 27 |              | IOR 39       |
| <b>4-42.5</b>      | 43.01-47.00 | 42.5   | <b>4-42.5</b>              | 43.01-47.00 | 42.5   | 30 |              | IOR 42.5     |
| <b>4-46.5</b>      | 47.01-51.70 | 46.5   | <b>4-46.5</b>              | 47.01-51.70 | 46.5   | 32 |              | IOR 46.5     |
| <b>4-51</b>        | 51.71-56.20 | 51.0   | <b>4-51</b>                | 51.71-56.20 | 51.0   | 36 |              | IOR 51       |
| <b>4-55.5</b>      | 56.21-65.00 | 55.5   | <b>4-55.5</b>              | 56.21-65.00 | 55.5   | 40 |              | IOR 55.5     |

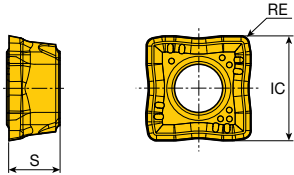
# Drilling Heads & Inserts



# SOMT...DP



## Inserts for general purpose



| Size | Dimension (mm) |      |     |
|------|----------------|------|-----|
|      | IC             | S    | RE  |
| 04   | 4.4            | 2.38 | 0.4 |
| 05   | 4.9            | 2.38 | 0.4 |
| 06   | 5.7            | 2.38 | 0.4 |
| 07   | 6.8            | 2.80 | 0.6 |
| 08   | 7.9            | 3.97 | 0.6 |
| 09   | 9.2            | 3.97 | 0.8 |
| 11   | 11.0           | 3.97 | 0.8 |
| 13   | 12.8           | 4.40 | 0.8 |
| 15   | 15.0           | 4.80 | 1.0 |

| Insert | Designation    | Coated |        |        |        |        |        | Uncoated |  |
|--------|----------------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT7400 | K10      |  |
|        | SOMT 040204 DP | ●      | ●      | ●      |        |        |        |          |  |
|        | 050204 DP      | ●      | ●      | ●      |        |        |        |          |  |
|        | 060204 DP      | ●      | ●      | ●      |        |        |        |          |  |
|        | 070306 DP      | ●      | ●      | ●      |        |        |        |          |  |
|        | 08T306 DP      | ●      | ●      | ●      |        |        |        |          |  |
|        | 09T308 DP      | ●      | ●      | ●      |        |        |        |          |  |
|        | 11T308 DP      | ●      | ●      | ●      |        |        |        |          |  |
|        | 130408 DP      | ●      | ●      | ●      |        |        |        |          |  |
|        | 150510 DP      | ●      | ●      | ●      |        |        |        |          |  |



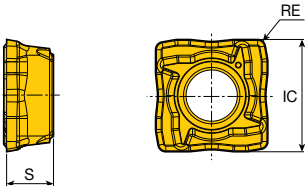
- ▶ TT9080: First choice for general purpose
- ▶ TT8020: For unstable condition
- ▶ TT9300: For high speed machining on a steel application (Peripheral **ONLY**)

●: Standard items

# SOMT...DL



## Inserts for low carbon steel



| Size | Dimension (mm) |      |     |
|------|----------------|------|-----|
|      | IC             | S    | RE  |
| 05   | 4.9            | 2.38 | 0.4 |
| 06   | 5.7            | 2.38 | 0.4 |
| 07   | 6.8            | 2.80 | 0.6 |
| 08   | 7.9            | 3.97 | 0.6 |
| 09   | 9.2            | 3.97 | 0.8 |
| 11   | 11.0           | 3.97 | 0.8 |
| 13   | 12.8           | 4.40 | 0.8 |
| 15   | 15.0           | 4.80 | 1.0 |

| Insert | Designation    | Coated |        |        |        |        |        | Uncoated |  |
|--------|----------------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | K10      |  |
|        | SOMT 050204 DL | ●      |        |        |        |        |        |          |  |
|        | 060204 DL      | ●      |        |        |        |        |        |          |  |
|        | 070306 DL      | ●      |        |        |        |        |        |          |  |
|        | 08T306 DL      | ●      |        |        |        |        |        |          |  |
|        | 09T308 DL      | ●      |        |        |        |        |        |          |  |
|        | 11T308 DL      | ●      |        |        |        |        |        |          |  |
|        | 130408 DL      | ●      |        |        |        |        |        |          |  |
|        | 150510 DL      | ●      |        |        |        |        |        |          |  |



- ▶ TT9080: First choice for general purpose

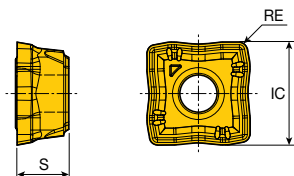
●: Standard items



# SOMT...DK



Inserts for cast iron



| Size      | Dimension (mm) |      |     |
|-----------|----------------|------|-----|
|           | IC             | S    | RE  |
| <b>05</b> | 4.9            | 2.38 | 0.4 |
| <b>06</b> | 5.7            | 2.38 | 0.4 |
| <b>07</b> | 6.8            | 2.80 | 0.6 |
| <b>08</b> | 7.9            | 3.97 | 0.6 |
| <b>09</b> | 9.2            | 3.97 | 0.8 |
| <b>11</b> | 11.0           | 3.97 | 0.8 |
| <b>13</b> | 12.8           | 4.40 | 0.8 |
| <b>15</b> | 15.0           | 4.80 | 1.0 |

| Insert | Designation           | Coated |        |        |        |        |        |        | Uncoated |  |  |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|--------|----------|--|--|
|        |                       | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT6080 | TT7400 | K10      |  |  |
|        | <b>SOMT 050204 DK</b> |        |        |        |        | ●      |        |        |          |  |  |
|        | <b>060204 DK</b>      |        |        |        |        | ●      |        |        |          |  |  |
|        | <b>070306 DK</b>      |        |        |        |        | ●      |        |        |          |  |  |
|        | <b>08T306 DK</b>      |        |        |        |        | ●      |        |        |          |  |  |
|        | <b>09T308 DK</b>      |        |        |        |        | ●      |        |        |          |  |  |
|        | <b>11T308 DK</b>      |        |        |        |        | ●      |        |        |          |  |  |
|        | <b>130408 DK</b>      |        |        |        |        | ●      |        |        |          |  |  |
|        | <b>150510 DK</b>      |        |        |        |        | ●      |        |        |          |  |  |

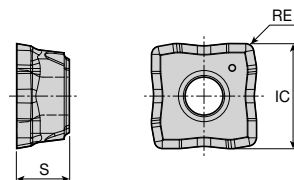


●: Standard items

# SOMT...DA



Inserts for aluminum alloy



| Size      | Dimension (mm) |      |     |
|-----------|----------------|------|-----|
|           | IC             | S    | RE  |
| <b>05</b> | 4.9            | 2.38 | 0.4 |
| <b>06</b> | 5.7            | 2.38 | 0.4 |
| <b>07</b> | 6.8            | 2.80 | 0.6 |
| <b>08</b> | 7.9            | 3.97 | 0.6 |
| <b>09</b> | 9.2            | 3.97 | 0.8 |
| <b>11</b> | 11.0           | 3.97 | 0.8 |
| <b>13</b> | 12.8           | 4.40 | 0.8 |
| <b>15</b> | 15.0           | 4.80 | 1.0 |

| Insert | Designation           | Coated |        |        |        |        |        |        | Uncoated |  |  |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|--------|----------|--|--|
|        |                       | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT6080 | TT7400 | K10      |  |  |
|        | <b>SOMT 050204 DA</b> |        |        |        |        |        |        |        | ●        |  |  |
|        | <b>060204 DA</b>      |        |        |        |        |        |        |        | ●        |  |  |
|        | <b>070306 DA</b>      |        |        |        |        |        |        |        | ●        |  |  |
|        | <b>08T306 DA</b>      |        |        |        |        |        |        |        | ●        |  |  |
|        | <b>09T308 DA</b>      |        |        |        |        |        |        |        | ●        |  |  |
|        | <b>11T308 DA</b>      |        |        |        |        |        |        |        | ●        |  |  |
|        | <b>130408 DA</b>      |        |        |        |        |        |        |        | ●        |  |  |
|        | <b>150510 DA</b>      |        |        |        |        |        |        |        | ●        |  |  |

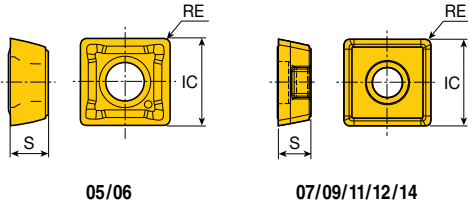


●: Standard items

SPMG...DG



Inserts for general purpose



| Size | Dimension (mm) |      |     |
|------|----------------|------|-----|
|      | IC             | S    | RE  |
| 05   | 5.00           | 2.38 | 0.4 |
| 06   | 6.00           | 2.38 | 0.4 |
| 07   | 7.94           | 3.97 | 0.8 |
| 09   | 9.80           | 4.30 | 0.8 |
| 11   | 11.50          | 4.80 | 0.8 |
| 12   | 12.70          | 4.76 | 0.8 |
| 14   | 14.30          | 5.20 | 1.2 |
|      |                |      |     |

| Insert | Designation    | Coated |        |        |        |        |        | Uncoated |  |
|--------|----------------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | K10      |  |
|        | SPMG 050204 DG |        | •      | •      |        |        | •      |          |  |
|        | 060204 DG      |        | •      | •      |        |        | •      |          |  |
|        | 07T308 DG      |        | •      | •      |        |        | •      |          |  |
|        | 090408 DG      |        | •      | •      |        |        | •      |          |  |
|        | 110408 DG      |        | •      | •      |        |        | •      |          |  |
|        | 120408 DG      |        | •      |        |        |        |        |          |  |
|        | 140512 DG      |        | •      | •      |        |        | •      |          |  |



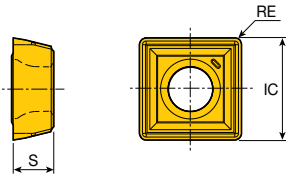
- ▶ TT9030: First choice for general purpose
- ▶ TT8020: For unstable condition
- ▶ TT7400: For high speed machining on a steel application (Peripheral **ONLY**)

•: Standard items

SPMG...DK



Inserts for cast iron



| Size | Dimension (mm) |      |     |
|------|----------------|------|-----|
|      | IC             | S    | RE  |
| 05   | 5.00           | 2.38 | 0.4 |
| 06   | 6.00           | 2.38 | 0.4 |
| 07   | 7.94           | 3.97 | 0.8 |
| 09   | 9.80           | 4.30 | 0.8 |
| 11   | 11.50          | 4.80 | 0.8 |
| 14   | 14.30          | 5.20 | 1.2 |
|      |                |      |     |

| Insert | Designation    | Coated |        |        |        |        |        | Uncoated |  |
|--------|----------------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | K10      |  |
|        | SPMG 050204 DK |        |        |        | •      |        |        |          |  |
|        | 060204 DK      |        |        |        | •      |        |        |          |  |
|        | 07T308 DK      |        |        |        | •      |        |        |          |  |
|        | 090408 DK      |        |        |        | •      |        |        |          |  |
|        | 110408 DK      |        |        |        | •      |        |        |          |  |
|        | 140512 DK      |        |        |        | •      |        |        |          |  |

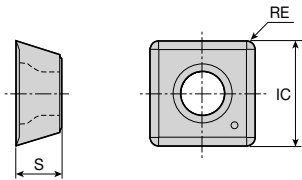


•: Standard items

SPGG...DA



Inserts for aluminum alloy



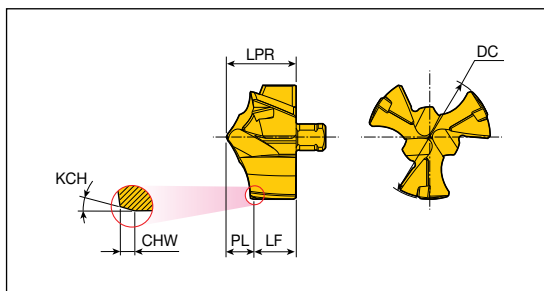
| Size | Dimension (mm) |      |     |
|------|----------------|------|-----|
|      | IC             | S    | RE  |
| 05   | 5.00           | 2.38 | 0.4 |
| 06   | 6.00           | 2.38 | 0.4 |
| 07   | 7.94           | 3.97 | 0.8 |
| 09   | 9.80           | 4.30 | 0.8 |
| 11   | 11.50          | 4.80 | 0.8 |
| 14   | 14.30          | 5.20 | 1.2 |
|      |                |      |     |
|      |                |      |     |

| Insert                                                                            | Designation    | Coated |        |        |        |        |        | Uncoated |  |
|-----------------------------------------------------------------------------------|----------------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                   |                | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | K10      |  |
|  | SPGG 050204 DA |        |        |        |        |        |        | ●        |  |
|                                                                                   | 060204 DA      |        |        |        |        |        |        | ●        |  |
|                                                                                   | 07T308 DA      |        |        |        |        |        |        | ●        |  |
|                                                                                   | 090408 DA      |        |        |        |        |        |        | ●        |  |
|                                                                                   | 110408 DA      |        |        |        |        |        |        | ●        |  |
|                                                                                   | 140512 DA      |        |        |        |        |        |        | ●        |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |
|                                                                                   |                |        |        |        |        |        |        |          |  |

●: Standard items



## 3 flute drill heads



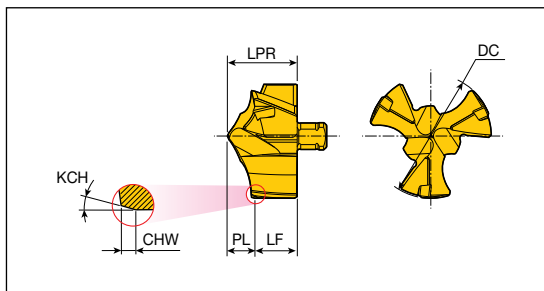
| Designation        | Dimension (mm) |     |      |      |     |     |     | Grade  |
|--------------------|----------------|-----|------|------|-----|-----|-----|--------|
|                    | DC             | LPR | PL   | LF   | CHW | KCH | SSC | TT5130 |
| <b>3ED- 120-P+</b> | 12.0           | 6.7 | 2.74 | 3.96 | 0.4 | 15  | 12  | ●      |
| <b>121-P+</b>      | 12.1           | 6.7 | 2.74 | 3.96 | 0.4 | 15  | 12  | ●      |
| <b>122-P+</b>      | 12.2           | 6.7 | 2.74 | 3.96 | 0.4 | 15  | 12  | ●      |
| <b>123-P+</b>      | 12.3           | 6.7 | 2.74 | 3.96 | 0.4 | 15  | 12  | ●      |
| <b>124-P+</b>      | 12.4           | 6.7 | 2.74 | 3.96 | 0.4 | 15  | 12  | ●      |
| <b>125-P+</b>      | 12.5           | 6.7 | 2.76 | 3.94 | 0.4 | 15  | 12  | ●      |
| <b>126-P+</b>      | 12.6           | 6.7 | 2.76 | 3.94 | 0.4 | 15  | 12  | ●      |
| <b>127-P+</b>      | 12.7           | 6.7 | 2.76 | 3.94 | 0.4 | 15  | 12  | ●      |
| <b>128-P+</b>      | 12.8           | 6.7 | 2.76 | 3.94 | 0.4 | 15  | 12  | ●      |
| <b>129-P+</b>      | 12.9           | 6.7 | 2.76 | 3.94 | 0.4 | 15  | 12  | ●      |
| <b>130-P+</b>      | 13.0           | 7.3 | 2.91 | 4.39 | 0.4 | 15  | 13  | ●      |
| <b>131-P+</b>      | 13.1           | 7.3 | 2.91 | 4.39 | 0.4 | 15  | 13  | ●      |
| <b>132-P+</b>      | 13.2           | 7.3 | 2.91 | 4.39 | 0.4 | 15  | 13  | ●      |
| <b>133-P+</b>      | 13.3           | 7.3 | 2.91 | 4.39 | 0.4 | 15  | 13  | ●      |
| <b>134-P+</b>      | 13.4           | 7.3 | 2.91 | 4.39 | 0.4 | 15  | 13  | ●      |
| <b>135-P+</b>      | 13.5           | 7.3 | 2.93 | 4.37 | 0.4 | 15  | 13  | ●      |
| <b>136-P+</b>      | 13.6           | 7.3 | 2.93 | 4.37 | 0.4 | 15  | 13  | ●      |
| <b>137-P+</b>      | 13.7           | 7.3 | 2.93 | 4.37 | 0.4 | 15  | 13  | ●      |
| <b>138-P+</b>      | 13.8           | 7.3 | 2.93 | 4.37 | 0.4 | 15  | 13  | ●      |
| <b>139-P+</b>      | 13.9           | 7.3 | 2.93 | 4.37 | 0.4 | 15  | 13  | ●      |
| <b>140-P+</b>      | 14.0           | 7.9 | 3.17 | 4.73 | 0.4 | 15  | 14  | ●      |
| <b>141-P+</b>      | 14.1           | 7.9 | 3.17 | 4.73 | 0.4 | 15  | 14  | ●      |
| <b>142-P+</b>      | 14.2           | 7.9 | 3.17 | 4.73 | 0.4 | 15  | 14  | ●      |
| <b>143-P+</b>      | 14.3           | 7.9 | 3.17 | 4.73 | 0.4 | 15  | 14  | ●      |
| <b>144-P+</b>      | 14.4           | 7.9 | 3.17 | 4.73 | 0.4 | 15  | 14  | ●      |
| <b>145-P+</b>      | 14.5           | 7.9 | 3.19 | 4.71 | 0.4 | 15  | 14  | ●      |
| <b>146-P+</b>      | 14.6           | 7.9 | 3.19 | 4.71 | 0.4 | 15  | 14  | ●      |
| <b>147-P+</b>      | 14.7           | 7.9 | 3.19 | 4.71 | 0.4 | 15  | 14  | ●      |
| <b>148-P+</b>      | 14.8           | 7.9 | 3.19 | 4.71 | 0.4 | 15  | 14  | ●      |
| <b>149-P+</b>      | 14.9           | 7.9 | 3.19 | 4.71 | 0.4 | 15  | 14  | ●      |
| <b>150-P+</b>      | 15.0           | 8.4 | 3.31 | 5.09 | 0.5 | 30  | 15  | ●      |
| <b>151-P+</b>      | 15.1           | 8.4 | 3.31 | 5.09 | 0.5 | 30  | 15  | ●      |
| <b>152-P+</b>      | 15.2           | 8.4 | 3.31 | 5.09 | 0.5 | 30  | 15  | ●      |
| <b>153-P+</b>      | 15.3           | 8.4 | 3.31 | 5.09 | 0.5 | 30  | 15  | ●      |
| <b>154-P+</b>      | 15.4           | 8.4 | 3.31 | 5.09 | 0.5 | 30  | 15  | ●      |



► SSC: Seat size code

●: Standard items

## 3 flute drill heads



| Designation        | Dimension (mm) |      |      |      |     |     |     | Grade  |
|--------------------|----------------|------|------|------|-----|-----|-----|--------|
|                    | DC             | LPR  | PL   | LF   | CHW | KCH | SSC | TT5130 |
| <b>3ED- 155-P+</b> | 15.5           | 8.4  | 3.32 | 5.08 | 0.5 | 30  | 15  | ●      |
| <b>156-P+</b>      | 15.6           | 8.4  | 3.32 | 5.08 | 0.5 | 30  | 15  | ●      |
| <b>157-P+</b>      | 15.7           | 8.4  | 3.32 | 5.08 | 0.5 | 30  | 15  | ●      |
| <b>158-P+</b>      | 15.8           | 8.4  | 3.32 | 5.08 | 0.5 | 30  | 15  | ●      |
| <b>159-P+</b>      | 15.9           | 8.4  | 3.32 | 5.08 | 0.5 | 30  | 15  | ●      |
| <b>160-P+</b>      | 16.0           | 9.0  | 3.70 | 5.30 | 0.7 | 30  | 16  | ●      |
| <b>161-P+</b>      | 16.1           | 9.0  | 3.70 | 5.30 | 0.7 | 30  | 16  | ●      |
| <b>162-P+</b>      | 16.2           | 9.0  | 3.70 | 5.30 | 0.7 | 30  | 16  | ●      |
| <b>163-P+</b>      | 16.3           | 9.0  | 3.70 | 5.30 | 0.7 | 30  | 16  | ●      |
| <b>164-P+</b>      | 16.4           | 9.0  | 3.70 | 5.30 | 0.7 | 30  | 16  | ●      |
| <b>165-P+</b>      | 16.5           | 9.0  | 3.71 | 5.29 | 0.7 | 30  | 16  | ●      |
| <b>166-P+</b>      | 16.6           | 9.0  | 3.71 | 5.29 | 0.7 | 30  | 16  | ●      |
| <b>167-P+</b>      | 16.7           | 9.0  | 3.71 | 5.29 | 0.7 | 30  | 16  | ●      |
| <b>168-P+</b>      | 16.8           | 9.0  | 3.71 | 5.29 | 0.7 | 30  | 16  | ●      |
| <b>169-P+</b>      | 16.9           | 9.0  | 3.71 | 5.29 | 0.7 | 30  | 16  | ●      |
| <b>170-P+</b>      | 17.0           | 9.5  | 3.88 | 5.62 | 0.7 | 30  | 17  | ●      |
| <b>171-P+</b>      | 17.1           | 9.5  | 3.88 | 5.62 | 0.7 | 30  | 17  | ●      |
| <b>172-P+</b>      | 17.2           | 9.5  | 3.88 | 5.62 | 0.7 | 30  | 17  | ●      |
| <b>173-P+</b>      | 17.3           | 9.5  | 3.88 | 5.62 | 0.7 | 30  | 17  | ●      |
| <b>174-P+</b>      | 17.4           | 9.5  | 3.88 | 5.62 | 0.7 | 30  | 17  | ●      |
| <b>175-P+</b>      | 17.5           | 9.5  | 3.89 | 5.61 | 0.7 | 30  | 17  | ●      |
| <b>176-P+</b>      | 17.6           | 9.5  | 3.89 | 5.61 | 0.7 | 30  | 17  | ●      |
| <b>177-P+</b>      | 17.7           | 9.5  | 3.89 | 5.61 | 0.7 | 30  | 17  | ●      |
| <b>178-P+</b>      | 17.8           | 9.5  | 3.89 | 5.61 | 0.7 | 30  | 17  | ●      |
| <b>179-P+</b>      | 17.9           | 9.5  | 3.89 | 5.61 | 0.7 | 30  | 17  | ●      |
| <b>180-P+</b>      | 18.0           | 10.1 | 4.07 | 6.03 | 0.7 | 30  | 18  | ●      |
| <b>181-P+</b>      | 18.1           | 10.1 | 4.07 | 6.03 | 0.7 | 30  | 18  | ●      |
| <b>182-P+</b>      | 18.2           | 10.1 | 4.07 | 6.03 | 0.7 | 30  | 18  | ●      |
| <b>183-P+</b>      | 18.3           | 10.1 | 4.07 | 6.03 | 0.7 | 30  | 18  | ●      |
| <b>184-P+</b>      | 18.4           | 10.1 | 4.07 | 6.03 | 0.7 | 30  | 18  | ●      |
| <b>185-P+</b>      | 18.5           | 10.1 | 4.08 | 6.02 | 0.7 | 30  | 18  | ●      |
| <b>186-P+</b>      | 18.6           | 10.1 | 4.08 | 6.02 | 0.7 | 30  | 18  | ●      |
| <b>187-P+</b>      | 18.7           | 10.1 | 4.08 | 6.02 | 0.7 | 30  | 18  | ●      |
| <b>188-P+</b>      | 18.8           | 10.1 | 4.08 | 6.02 | 0.7 | 30  | 18  | ●      |
| <b>189-P+</b>      | 18.9           | 10.1 | 4.08 | 6.02 | 0.7 | 30  | 18  | ●      |

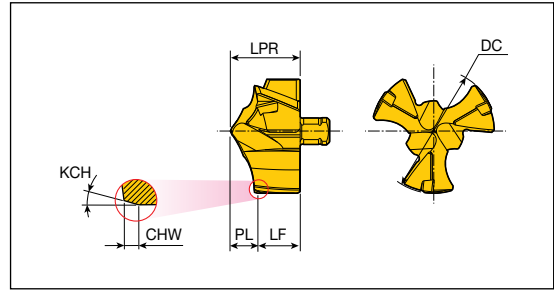


► SSC: Seat size code

●: Standard items

# 3ED...-P+

## 3 flute drill heads



| Designation        | Dimension (mm) |      |      |      |     |     |     | Grade  |
|--------------------|----------------|------|------|------|-----|-----|-----|--------|
|                    | DC             | LPR  | PL   | LF   | CHW | KCH | SSC | TT5130 |
| <b>3ED- 190-P+</b> | 19.0           | 10.7 | 4.26 | 6.44 | 0.7 | 30  | 19  | ●      |
| <b>191-P+</b>      | 19.1           | 10.7 | 4.26 | 6.44 | 0.7 | 30  | 19  | ●      |
| <b>192-P+</b>      | 19.2           | 10.7 | 4.26 | 6.44 | 0.7 | 30  | 19  | ●      |
| <b>193-P+</b>      | 19.3           | 10.7 | 4.26 | 6.44 | 0.7 | 30  | 19  | ●      |
| <b>194-P+</b>      | 19.4           | 10.7 | 4.26 | 6.44 | 0.7 | 30  | 19  | ●      |
| <b>195-P+</b>      | 19.5           | 10.7 | 4.27 | 6.43 | 0.7 | 30  | 19  | ●      |
| <b>196-P+</b>      | 19.6           | 10.7 | 4.27 | 6.43 | 0.7 | 30  | 19  | ●      |
| <b>197-P+</b>      | 19.7           | 10.7 | 4.27 | 6.43 | 0.7 | 30  | 19  | ●      |
| <b>198-P+</b>      | 19.8           | 10.7 | 4.27 | 6.43 | 0.7 | 30  | 19  | ●      |
| <b>199-P+</b>      | 19.9           | 10.7 | 4.27 | 6.43 | 0.7 | 30  | 19  | ●      |
| <b>200-P+</b>      | 20.0           | 11.3 | 4.44 | 6.86 | 0.7 | 30  | 20  | ●      |
| <b>201-P+</b>      | 20.1           | 11.3 | 4.44 | 6.86 | 0.7 | 30  | 20  | ●      |
| <b>202-P+</b>      | 20.2           | 11.3 | 4.44 | 6.86 | 0.7 | 30  | 20  | ●      |
| <b>203-P+</b>      | 20.3           | 11.3 | 4.44 | 6.86 | 0.7 | 30  | 20  | ●      |
| <b>204-P+</b>      | 20.4           | 11.3 | 4.44 | 6.86 | 0.7 | 30  | 20  | ●      |
| <b>205-P+</b>      | 20.5           | 11.3 | 4.45 | 6.85 | 0.7 | 30  | 20  | ●      |
| <b>206-P+</b>      | 20.6           | 11.3 | 4.45 | 6.85 | 0.7 | 30  | 20  | ●      |
| <b>207-P+</b>      | 20.7           | 11.3 | 4.45 | 6.85 | 0.7 | 30  | 20  | ●      |
| <b>208-P+</b>      | 20.8           | 11.3 | 4.45 | 6.85 | 0.7 | 30  | 20  | ●      |
| <b>209-P+</b>      | 20.9           | 11.3 | 4.45 | 6.85 | 0.7 | 30  | 20  | ●      |
| <b>210-P+</b>      | 21.0           | 11.8 | 4.62 | 7.18 | 0.4 | 15  | 21  | ●      |
| <b>215-P+</b>      | 21.5           | 11.8 | 4.64 | 7.16 | 0.4 | 15  | 21  | ●      |
| <b>220-P+</b>      | 22.0           | 12.4 | 4.78 | 7.62 | 0.4 | 15  | 22  | ●      |
| <b>225-P+</b>      | 22.5           | 12.4 | 4.80 | 7.60 | 0.4 | 15  | 22  | ●      |
| <b>230-P+</b>      | 23.0           | 12.8 | 5.02 | 7.78 | 0.4 | 15  | 23  | ●      |
| <b>235-P+</b>      | 23.5           | 12.8 | 5.04 | 7.76 | 0.4 | 15  | 23  | ●      |
| <b>240-P+</b>      | 24.0           | 13.4 | 5.18 | 8.22 | 0.4 | 15  | 24  | ●      |
| <b>245-P+</b>      | 24.5           | 13.4 | 5.20 | 8.20 | 0.4 | 15  | 24  | ●      |
| <b>250-P+</b>      | 25.0           | 14.0 | 5.29 | 8.71 | 0.4 | 15  | 25  | ●      |
| <b>255-P+</b>      | 25.5           | 14.0 | 5.31 | 8.69 | 0.4 | 15  | 25  | ●      |
|                    |                |      |      |      |     |     |     |        |
|                    |                |      |      |      |     |     |     |        |
|                    |                |      |      |      |     |     |     |        |
|                    |                |      |      |      |     |     |     |        |



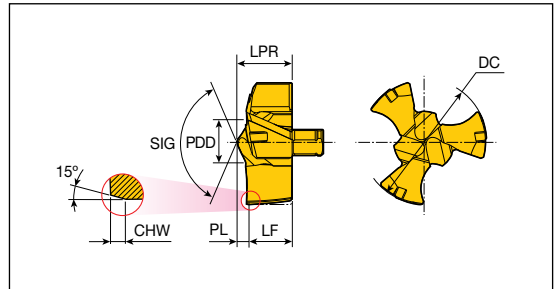
► SSC: Seat size code

●: Standard items

# 3ED...-F



## 3 flute drill heads for flat bottom hole

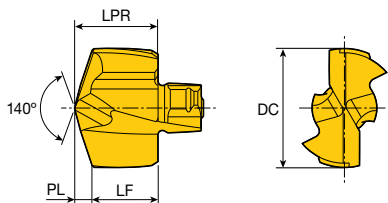


| Designation       | Dimension (mm) |       |      |      |      |     |     |     | Grade  |
|-------------------|----------------|-------|------|------|------|-----|-----|-----|--------|
|                   | DC             | LPR   | PL   | LF   | PDD  | SIG | CHW | SSC | TT5130 |
| <b>3ED- 120-F</b> | 12.0           | 5.14  | 1.18 | 3.96 | 3.38 | 133 | 0.4 | 12  | ●      |
| <b>125-F</b>      | 12.5           | 5.14  | 1.20 | 3.94 | 3.38 | 133 | 0.4 | 12  | ●      |
| <b>130-F</b>      | 13.0           | 5.61  | 1.22 | 4.39 | 3.58 | 132 | 0.4 | 13  | ●      |
| <b>135-F</b>      | 13.5           | 5.61  | 1.24 | 4.37 | 3.58 | 132 | 0.4 | 13  | ●      |
| <b>140-F</b>      | 14.0           | 6.01  | 1.28 | 4.73 | 4.01 | 133 | 0.4 | 14  | ●      |
| <b>145-F</b>      | 14.5           | 6.01  | 1.30 | 4.71 | 4.01 | 133 | 0.4 | 14  | ●      |
| <b>150-F</b>      | 15.0           | 6.38  | 1.32 | 5.06 | 4.16 | 133 | 0.4 | 15  | ●      |
| <b>155-F</b>      | 15.5           | 6.38  | 1.34 | 5.04 | 4.16 | 133 | 0.4 | 15  | ●      |
| <b>160-F</b>      | 16.0           | 6.86  | 1.38 | 5.48 | 4.52 | 134 | 0.4 | 16  | ●      |
| <b>165-F</b>      | 16.5           | 6.86  | 1.40 | 5.46 | 4.52 | 134 | 0.4 | 16  | ●      |
| <b>170-F</b>      | 17.0           | 7.22  | 1.45 | 5.77 | 4.79 | 134 | 0.4 | 17  | ●      |
| <b>175-F</b>      | 17.5           | 7.22  | 1.47 | 5.75 | 4.79 | 134 | 0.4 | 17  | ●      |
| <b>180-F</b>      | 18.0           | 7.93  | 1.75 | 6.18 | 5.96 | 133 | 0.4 | 18  | ●      |
| <b>185-F</b>      | 18.5           | 7.93  | 1.77 | 6.16 | 5.96 | 133 | 0.4 | 18  | ●      |
| <b>190-F</b>      | 19.0           | 8.41  | 1.83 | 6.58 | 6.32 | 133 | 0.4 | 19  | ●      |
| <b>195-F</b>      | 19.5           | 8.41  | 1.85 | 6.56 | 6.32 | 133 | 0.4 | 19  | ●      |
| <b>200-F</b>      | 20.0           | 8.89  | 1.90 | 6.99 | 6.61 | 133 | 0.4 | 20  | ●      |
| <b>205-F</b>      | 20.5           | 8.89  | 1.92 | 6.97 | 6.61 | 133 | 0.4 | 20  | ●      |
| <b>210-F</b>      | 21.0           | 9.17  | 1.99 | 7.18 | 7.01 | 133 | 0.4 | 21  | ●      |
| <b>215-F</b>      | 21.5           | 9.17  | 2.01 | 7.16 | 7.01 | 133 | 0.4 | 21  | ●      |
| <b>220-F</b>      | 22.0           | 9.72  | 2.10 | 7.62 | 7.30 | 133 | 0.4 | 22  | ●      |
| <b>225-F</b>      | 22.5           | 9.72  | 2.12 | 7.60 | 7.30 | 133 | 0.4 | 22  | ●      |
| <b>230-F</b>      | 23.0           | 9.96  | 2.18 | 7.78 | 7.49 | 132 | 0.4 | 23  | ●      |
| <b>235-F</b>      | 23.5           | 9.96  | 2.20 | 7.76 | 7.49 | 132 | 0.4 | 23  | ●      |
| <b>240-F</b>      | 24.0           | 10.46 | 2.24 | 8.22 | 7.81 | 132 | 0.4 | 24  | ●      |
| <b>245-F</b>      | 24.5           | 10.46 | 2.26 | 8.20 | 7.81 | 132 | 0.4 | 24  | ●      |
| <b>250-F</b>      | 25.0           | 11.03 | 2.31 | 8.72 | 8.16 | 132 | 0.4 | 25  | ●      |
| <b>255-F</b>      | 25.5           | 11.03 | 2.33 | 8.70 | 8.16 | 132 | 0.4 | 25  | ●      |
|                   |                |       |      |      |      |     |     |     |        |
|                   |                |       |      |      |      |     |     |     |        |
|                   |                |       |      |      |      |     |     |     |        |
|                   |                |       |      |      |      |     |     |     |        |
|                   |                |       |      |      |      |     |     |     |        |
|                   |                |       |      |      |      |     |     |     |        |
|                   |                |       |      |      |      |     |     |     |        |
|                   |                |       |      |      |      |     |     |     |        |



► SSC: Seat size code

●: Standard items

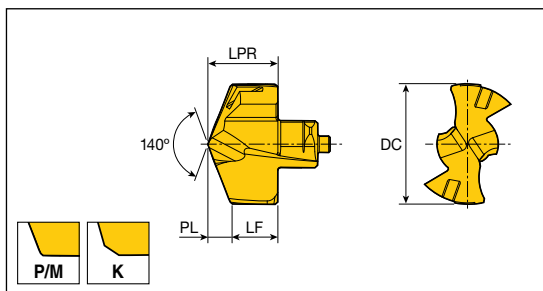


D58

 Steel



## Drill heads



| Designation            | Dimension (mm) |     |      |      |     | Grade |
|------------------------|----------------|-----|------|------|-----|-------|
|                        | DC             | LPR | PL   | LF   | SSC |       |
| <b>TCD - 060-P/M/K</b> | 6.0            | 4.0 | 0.96 | 3.04 | 6   | ●     |
| <b>061-P/M/K</b>       | 6.1            | 4.0 | 0.98 | 3.02 | 6   | ●     |
| <b>062-P/M/K</b>       | 6.2            | 4.0 | 1.00 | 3.00 | 6   | ●     |
| <b>063-P/M/K</b>       | 6.3            | 4.0 | 1.01 | 2.99 | 6   | ●     |
| <b>064-P/M/K</b>       | 6.4            | 4.0 | 1.03 | 2.97 | 6   | ●     |
| <b>065-P/M/K</b>       | 6.5            | 4.3 | 1.18 | 3.12 | 6.5 | ●     |
| <b>066-P/M/K</b>       | 6.6            | 4.3 | 1.20 | 3.10 | 6.5 | ●     |
| <b>067-P/M/K</b>       | 6.7            | 4.3 | 1.22 | 3.08 | 6.5 | ●     |
| <b>068-P/M/K</b>       | 6.8            | 4.3 | 1.23 | 3.07 | 6.5 | ●     |
| <b>069-P/M/K</b>       | 6.9            | 4.3 | 1.25 | 3.05 | 6.5 | ●     |
| <b>070-P/M/K</b>       | 7.0            | 4.6 | 1.01 | 3.59 | 7   | ●     |
| <b>071-P/M/K</b>       | 7.1            | 4.6 | 1.03 | 3.57 | 7   | ●     |
| <b>072-P/M/K</b>       | 7.2            | 4.6 | 1.05 | 3.55 | 7   | ●     |
| <b>073-P/M/K</b>       | 7.3            | 4.6 | 1.06 | 3.54 | 7   | ●     |
| <b>074-P/M/K</b>       | 7.4            | 4.6 | 1.08 | 3.52 | 7   | ●     |
| <b>075-P/M/K</b>       | 7.5            | 4.6 | 1.10 | 3.50 | 7   | ●     |
| <b>076-P/M/K</b>       | 7.6            | 4.6 | 1.12 | 3.48 | 7   | ●     |
| <b>077-P/M/K</b>       | 7.7            | 4.6 | 1.14 | 3.46 | 7   | ●     |
| <b>078-P/M/K</b>       | 7.8            | 4.6 | 1.16 | 3.44 | 7   | ●     |
| <b>079-P/M/K</b>       | 7.9            | 4.6 | 1.17 | 3.43 | 7   | ●     |
| <b>080-P/M/K</b>       | 8.0            | 5.4 | 1.20 | 4.20 | 8   | ●     |
| <b>081-P/M/K</b>       | 8.1            | 5.4 | 1.22 | 4.18 | 8   | ●     |
| <b>082-P/M/K</b>       | 8.2            | 5.4 | 1.24 | 4.16 | 8   | ●     |
| <b>083-P/M/K</b>       | 8.3            | 5.4 | 1.25 | 4.15 | 8   | ●     |
| <b>084-P/M/K</b>       | 8.4            | 5.4 | 1.27 | 4.13 | 8   | ●     |
| <b>085-P/M/K</b>       | 8.5            | 5.4 | 1.29 | 4.11 | 8   | ●     |
| <b>086-P/M/K</b>       | 8.6            | 5.4 | 1.31 | 4.09 | 8   | ●     |
| <b>087-P/M/K</b>       | 8.7            | 5.4 | 1.33 | 4.07 | 8   | ●     |
| <b>088-P/M/K</b>       | 8.8            | 5.4 | 1.35 | 4.05 | 8   | ●     |
| <b>089-P/M/K</b>       | 8.9            | 5.4 | 1.36 | 4.04 | 8   | ●     |
| <b>090-P/M/K</b>       | 9.0            | 5.8 | 1.35 | 4.45 | 9   | ●     |
| <b>091-P/M/K</b>       | 9.1            | 5.8 | 1.37 | 4.43 | 9   | ●     |
| <b>092-P/M/K</b>       | 9.2            | 5.8 | 1.39 | 4.41 | 9   | ●     |
| <b>093-P/M/K</b>       | 9.3            | 5.8 | 1.40 | 4.40 | 9   | ●     |
| <b>094-P/M/K</b>       | 9.4            | 5.8 | 1.42 | 4.38 | 9   | ●     |



► Drill head can be ordered by an application  
**Order example**) Diameter 10.0mm drill head for  
 ISO P application: TCD-100-P TT9080

●: Standard items



Steel

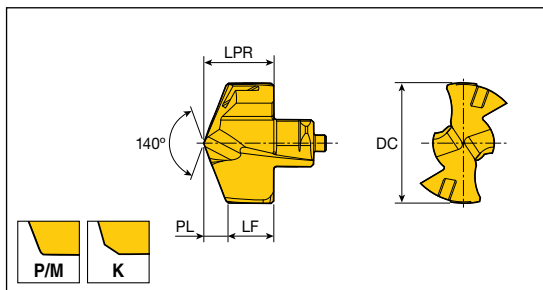


Stainless steel



Cast iron

## Drill heads



| Designation            | Dimension (mm) |     |      |      |     | Grade  |
|------------------------|----------------|-----|------|------|-----|--------|
|                        | DC             | LPR | PL   | LF   | SSC | TT9080 |
| <b>TCD - 095-P/M/K</b> | 9.5            | 5.8 | 1.44 | 4.36 | 9   | ●      |
| <b>096-P/M/K</b>       | 9.6            | 5.8 | 1.46 | 4.34 | 9   | ●      |
| <b>097-P/M/K</b>       | 9.7            | 5.8 | 1.48 | 4.32 | 9   | ●      |
| <b>098-P/M/K</b>       | 9.8            | 5.8 | 1.50 | 4.30 | 9   | ●      |
| <b>099-P/M/K</b>       | 9.9            | 5.8 | 1.51 | 4.29 | 9   | ●      |
| <b>100-P/M/K</b>       | 10.0           | 6.2 | 1.50 | 4.70 | 10  | ●      |
| <b>101-P/M/K</b>       | 10.1           | 6.2 | 1.52 | 4.68 | 10  | ●      |
| <b>102-P/M/K</b>       | 10.2           | 6.2 | 1.54 | 4.66 | 10  | ●      |
| <b>103-P/M/K</b>       | 10.3           | 6.2 | 1.55 | 4.65 | 10  | ●      |
| <b>104-P/M/K</b>       | 10.4           | 6.2 | 1.57 | 4.63 | 10  | ●      |
| <b>105-P/M/K</b>       | 10.5           | 6.2 | 1.59 | 4.61 | 10  | ●      |
| <b>106-P/M/K</b>       | 10.6           | 6.2 | 1.61 | 4.59 | 10  | ●      |
| <b>107-P/M/K</b>       | 10.7           | 6.2 | 1.63 | 4.57 | 10  | ●      |
| <b>108-P/M/K</b>       | 10.8           | 6.2 | 1.65 | 4.55 | 10  | ●      |
| <b>109-P/M/K</b>       | 10.9           | 6.2 | 1.66 | 4.54 | 10  | ●      |
| <b>110-P/M/K</b>       | 11.0           | 6.6 | 1.67 | 4.93 | 11  | ●      |
| <b>111-P/M/K</b>       | 11.1           | 6.6 | 1.69 | 4.91 | 11  | ●      |
| <b>112-P/M/K</b>       | 11.2           | 6.6 | 1.71 | 4.89 | 11  | ●      |
| <b>113-P/M/K</b>       | 11.3           | 6.6 | 1.72 | 4.88 | 11  | ●      |
| <b>114-P/M/K</b>       | 11.4           | 6.6 | 1.74 | 4.86 | 11  | ●      |
| <b>115-P/M/K</b>       | 11.5           | 6.6 | 1.76 | 4.84 | 11  | ●      |
| <b>116-P/M/K</b>       | 11.6           | 6.6 | 1.78 | 4.82 | 11  | ●      |
| <b>117-P/M/K</b>       | 11.7           | 6.6 | 1.80 | 4.80 | 11  | ●      |
| <b>118-P/M/K</b>       | 11.8           | 6.6 | 1.82 | 4.78 | 11  | ●      |
| <b>119-P/M/K</b>       | 11.9           | 6.6 | 1.83 | 4.77 | 11  | ●      |
| <b>120-P/M/K</b>       | 12.0           | 7.0 | 1.82 | 5.18 | 12  | ●      |
| <b>121-P/M/K</b>       | 12.1           | 7.0 | 1.84 | 5.16 | 12  | ●      |
| <b>122-P/M/K</b>       | 12.2           | 7.0 | 1.86 | 5.14 | 12  | ●      |
| <b>123-P/M/K</b>       | 12.3           | 7.0 | 1.87 | 5.13 | 12  | ●      |
| <b>124-P/M/K</b>       | 12.4           | 7.0 | 1.89 | 5.11 | 12  | ●      |
| <b>125-P/M/K</b>       | 12.5           | 7.0 | 1.91 | 5.09 | 12  | ●      |
| <b>126-P/M/K</b>       | 12.6           | 7.0 | 1.93 | 5.07 | 12  | ●      |
| <b>127-P/M/K</b>       | 12.7           | 7.0 | 1.95 | 5.05 | 12  | ●      |
| <b>128-P/M/K</b>       | 12.8           | 7.0 | 1.97 | 5.03 | 12  | ●      |
| <b>129-P/M/K</b>       | 12.9           | 7.0 | 1.98 | 5.02 | 12  | ●      |



D59-D74



D143

► Drill head can be ordered by an application  
**Order example**) Diameter 10.0mm drill head for  
 ISO P application: TCD-100-P TT9080



Steel

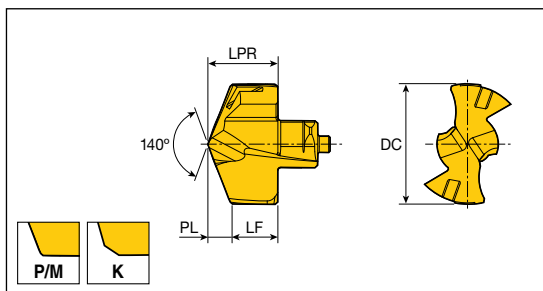


Stainless steel



Cast iron

## Drill heads



| Designation            | Dimension (mm) |     |      |      |     | Grade  |
|------------------------|----------------|-----|------|------|-----|--------|
|                        | DC             | LPR | PL   | LF   | SSC | TT9080 |
| <b>TCD - 130-P/M/K</b> | 13.0           | 7.6 | 1.96 | 5.64 | 13  | ●      |
| <b>131-P/M/K</b>       | 13.1           | 7.6 | 1.98 | 5.62 | 13  | ●      |
| <b>132-P/M/K</b>       | 13.2           | 7.6 | 2.00 | 5.60 | 13  | ●      |
| <b>133-P/M/K</b>       | 13.3           | 7.6 | 2.01 | 5.59 | 13  | ●      |
| <b>134-P/M/K</b>       | 13.4           | 7.6 | 2.03 | 5.57 | 13  | ●      |
| <b>135-P/M/K</b>       | 13.5           | 7.6 | 2.05 | 5.55 | 13  | ●      |
| <b>136-P/M/K</b>       | 13.6           | 7.6 | 2.07 | 5.53 | 13  | ●      |
| <b>137-P/M/K</b>       | 13.7           | 7.6 | 2.09 | 5.51 | 13  | ●      |
| <b>138-P/M/K</b>       | 13.8           | 7.6 | 2.11 | 5.49 | 13  | ●      |
| <b>139-P/M/K</b>       | 13.9           | 7.6 | 2.12 | 5.48 | 13  | ●      |
| <b>140-P/M/K</b>       | 14.0           | 8.1 | 2.12 | 5.98 | 14  | ●      |
| <b>141-P/M/K</b>       | 14.1           | 8.1 | 2.14 | 5.96 | 14  | ●      |
| <b>142-P/M/K</b>       | 14.2           | 8.1 | 2.16 | 5.94 | 14  | ●      |
| <b>143-P/M/K</b>       | 14.3           | 8.1 | 2.17 | 5.93 | 14  | ●      |
| <b>144-P/M/K</b>       | 14.4           | 8.1 | 2.19 | 5.91 | 14  | ●      |
| <b>145-P/M/K</b>       | 14.5           | 8.1 | 2.21 | 5.89 | 14  | ●      |
| <b>146-P/M/K</b>       | 14.6           | 8.1 | 2.23 | 5.87 | 14  | ●      |
| <b>147-P/M/K</b>       | 14.7           | 8.1 | 2.25 | 5.85 | 14  | ●      |
| <b>148-P/M/K</b>       | 14.8           | 8.1 | 2.27 | 5.83 | 14  | ●      |
| <b>149-P/M/K</b>       | 14.9           | 8.1 | 2.28 | 5.82 | 14  | ●      |
| <b>150-P/M/K</b>       | 15.0           | 8.7 | 2.27 | 6.43 | 15  | ●      |
| <b>151-P/M/K</b>       | 15.1           | 8.7 | 2.29 | 6.41 | 15  | ●      |
| <b>152-P/M/K</b>       | 15.2           | 8.7 | 2.31 | 6.39 | 15  | ●      |
| <b>153-P/M/K</b>       | 15.3           | 8.7 | 2.32 | 6.38 | 15  | ●      |
| <b>154-P/M/K</b>       | 15.4           | 8.7 | 2.34 | 6.36 | 15  | ●      |
| <b>155-P/M/K</b>       | 15.5           | 8.7 | 2.36 | 6.34 | 15  | ●      |
| <b>156-P/M/K</b>       | 15.6           | 8.7 | 2.38 | 6.32 | 15  | ●      |
| <b>157-P/M/K</b>       | 15.7           | 8.7 | 2.40 | 6.30 | 15  | ●      |
| <b>158-P/M/K</b>       | 15.8           | 8.7 | 2.42 | 6.28 | 15  | ●      |
| <b>159-P/M/K</b>       | 15.9           | 8.7 | 2.43 | 6.27 | 15  | ●      |
| <b>160-P/M/K</b>       | 16.0           | 9.3 | 2.42 | 6.88 | 16  | ●      |
| <b>161-P/M/K</b>       | 16.1           | 9.3 | 2.44 | 6.86 | 16  | ●      |
| <b>162-P/M/K</b>       | 16.2           | 9.3 | 2.46 | 6.84 | 16  | ●      |
| <b>163-P/M/K</b>       | 16.3           | 9.3 | 2.47 | 6.83 | 16  | ●      |
| <b>164-P/M/K</b>       | 16.4           | 9.3 | 2.49 | 6.81 | 16  | ●      |



► Drill head can be ordered by an application  
 Order example) Diameter 10.0mm drill head for  
 ISO P application: TCD-100-P TT9080

●: Standard items



Steel

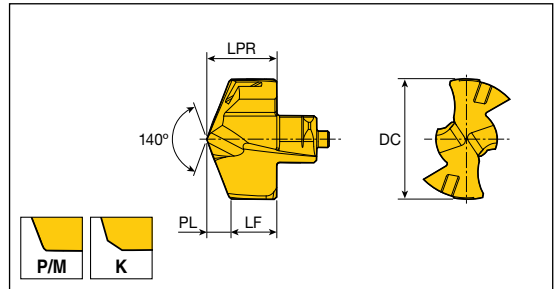


Stainless steel



Cast iron

## Drill heads



| Designation            | Dimension (mm) |      |      |      |     | Grade  |
|------------------------|----------------|------|------|------|-----|--------|
|                        | DC             | LPR  | PL   | LF   | SSC | TT9080 |
| <b>TCD - 165-P/M/K</b> | 16.5           | 9.3  | 2.51 | 6.79 | 16  | ●      |
| <b>166-P/M/K</b>       | 16.6           | 9.3  | 2.53 | 6.77 | 16  | ●      |
| <b>167-P/M/K</b>       | 16.7           | 9.3  | 2.55 | 6.75 | 16  | ●      |
| <b>168-P/M/K</b>       | 16.8           | 9.3  | 2.57 | 6.73 | 16  | ●      |
| <b>169-P/M/K</b>       | 16.9           | 9.3  | 2.58 | 6.72 | 16  | ●      |
| <b>170-P/M/K</b>       | 17.0           | 9.9  | 2.59 | 7.31 | 17  | ●      |
| <b>171-P/M/K</b>       | 17.1           | 9.9  | 2.61 | 7.29 | 17  | ●      |
| <b>172-P/M/K</b>       | 17.2           | 9.9  | 2.63 | 7.27 | 17  | ●      |
| <b>173-P/M/K</b>       | 17.3           | 9.9  | 2.64 | 7.26 | 17  | ●      |
| <b>174-P/M/K</b>       | 17.4           | 9.9  | 2.66 | 7.24 | 17  | ●      |
| <b>175-P/M/K</b>       | 17.5           | 9.9  | 2.68 | 7.22 | 17  | ●      |
| <b>176-P/M/K</b>       | 17.6           | 9.9  | 2.70 | 7.20 | 17  | ●      |
| <b>177-P/M/K</b>       | 17.7           | 9.9  | 2.72 | 7.18 | 17  | ●      |
| <b>178-P/M/K</b>       | 17.8           | 9.9  | 2.74 | 7.16 | 17  | ●      |
| <b>179-P/M/K</b>       | 17.9           | 9.9  | 2.75 | 7.15 | 17  | ●      |
| <b>180-P/M/K</b>       | 18.0           | 10.5 | 2.73 | 7.77 | 18  | ●      |
| <b>181-P/M/K</b>       | 18.1           | 10.5 | 2.75 | 7.75 | 18  | ●      |
| <b>182-P/M/K</b>       | 18.2           | 10.5 | 2.77 | 7.73 | 18  | ●      |
| <b>183-P/M/K</b>       | 18.3           | 10.5 | 2.78 | 7.72 | 18  | ●      |
| <b>184-P/M/K</b>       | 18.4           | 10.5 | 2.80 | 7.70 | 18  | ●      |
| <b>185-P/M/K</b>       | 18.5           | 10.5 | 2.82 | 7.68 | 18  | ●      |
| <b>186-P/M/K</b>       | 18.6           | 10.5 | 2.84 | 7.66 | 18  | ●      |
| <b>187-P/M/K</b>       | 18.7           | 10.5 | 2.86 | 7.64 | 18  | ●      |
| <b>188-P/M/K</b>       | 18.8           | 10.5 | 2.88 | 7.62 | 18  | ●      |
| <b>189-P/M/K</b>       | 18.9           | 10.5 | 2.89 | 7.61 | 18  | ●      |
| <b>190-P/M/K</b>       | 19.0           | 11.0 | 2.88 | 8.12 | 19  | ●      |
| <b>191-P/M/K</b>       | 19.1           | 11.0 | 2.90 | 8.10 | 19  | ●      |
| <b>192-P/M/K</b>       | 19.2           | 11.0 | 2.92 | 8.08 | 19  | ●      |
| <b>193-P/M/K</b>       | 19.3           | 11.0 | 2.93 | 8.07 | 19  | ●      |
| <b>194-P/M/K</b>       | 19.4           | 11.0 | 2.95 | 8.05 | 19  | ●      |
| <b>195-P/M/K</b>       | 19.5           | 11.0 | 2.97 | 8.03 | 19  | ●      |
| <b>196-P/M/K</b>       | 19.6           | 11.0 | 2.99 | 8.01 | 19  | ●      |
| <b>197-P/M/K</b>       | 19.7           | 11.0 | 3.01 | 7.99 | 19  | ●      |
| <b>198-P/M/K</b>       | 19.8           | 11.0 | 3.03 | 7.97 | 19  | ●      |
| <b>199-P/M/K</b>       | 19.9           | 11.0 | 3.04 | 7.96 | 19  | ●      |



D59-D74



D143

► Drill head can be ordered by an application  
**Order example**) Diameter 10.0mm drill head for  
 ISO P application: TCD-100-P TT9080



Steel

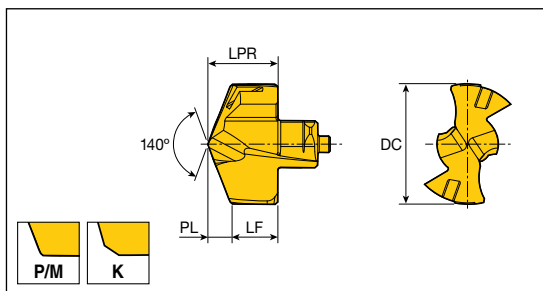


Stainless steel



Cast iron

## Drill heads



| Designation            | Dimension (mm) |      |      |      |     | Grade  |
|------------------------|----------------|------|------|------|-----|--------|
|                        | DC             | LPR  | PL   | LF   | SSC | TT9080 |
| <b>TCD - 200-P/M/K</b> | 20.0           | 11.6 | 3.02 | 8.58 | 20  | ●      |
| <b>201-P/M/K</b>       | 20.1           | 11.6 | 3.04 | 8.56 | 20  | ●      |
| <b>202-P/M/K</b>       | 20.2           | 11.6 | 3.06 | 8.54 | 20  | ●      |
| <b>203-P/M/K</b>       | 20.3           | 11.6 | 3.07 | 8.53 | 20  | ●      |
| <b>204-P/M/K</b>       | 20.4           | 11.6 | 3.09 | 8.51 | 20  | ●      |
| <b>205-P/M/K</b>       | 20.5           | 11.6 | 3.11 | 8.49 | 20  | ●      |
| <b>206-P/M/K</b>       | 20.6           | 11.6 | 3.13 | 8.47 | 20  | ●      |
| <b>207-P/M/K</b>       | 20.7           | 11.6 | 3.15 | 8.45 | 20  | ●      |
| <b>208-P/M/K</b>       | 20.8           | 11.6 | 3.17 | 8.43 | 20  | ●      |
| <b>209-P/M/K</b>       | 20.9           | 11.6 | 3.18 | 8.42 | 20  | ●      |
| <b>210-P/M/K</b>       | 21.0           | 12.1 | 3.18 | 8.92 | 21  | ●      |
| <b>211-P/M/K</b>       | 21.1           | 12.1 | 3.20 | 8.90 | 21  | ●      |
| <b>212-P/M/K</b>       | 21.2           | 12.1 | 3.22 | 8.88 | 21  | ●      |
| <b>213-P/M/K</b>       | 21.3           | 12.1 | 3.23 | 8.87 | 21  | ●      |
| <b>214-P/M/K</b>       | 21.4           | 12.1 | 3.25 | 8.85 | 21  | ●      |
| <b>215-P/M/K</b>       | 21.5           | 12.1 | 3.27 | 8.83 | 21  | ●      |
| <b>216-P/M/K</b>       | 21.6           | 12.1 | 3.29 | 8.81 | 21  | ●      |
| <b>217-P/M/K</b>       | 21.7           | 12.1 | 3.31 | 8.79 | 21  | ●      |
| <b>218-P/M/K</b>       | 21.8           | 12.1 | 3.33 | 8.77 | 21  | ●      |
| <b>219-P/M/K</b>       | 21.9           | 12.1 | 3.34 | 8.76 | 21  | ●      |
| <b>220-P/M/K</b>       | 22.0           | 12.7 | 3.24 | 9.46 | 22  | ●      |
| <b>221-P/M/K</b>       | 22.1           | 12.7 | 3.26 | 9.44 | 22  | ●      |
| <b>222-P/M/K</b>       | 22.2           | 12.7 | 3.28 | 9.42 | 22  | ●      |
| <b>223-P/M/K</b>       | 22.3           | 12.7 | 3.29 | 9.41 | 22  | ●      |
| <b>224-P/M/K</b>       | 22.4           | 12.7 | 3.31 | 9.39 | 22  | ●      |
| <b>225-P/M/K</b>       | 22.5           | 12.7 | 3.33 | 9.37 | 22  | ●      |
| <b>226-P/M/K</b>       | 22.6           | 12.7 | 3.35 | 9.35 | 22  | ●      |
| <b>227-P/M/K</b>       | 22.7           | 12.7 | 3.37 | 9.33 | 22  | ●      |
| <b>228-P/M/K</b>       | 22.8           | 12.7 | 3.39 | 9.31 | 22  | ●      |
| <b>229-P/M/K</b>       | 22.9           | 12.7 | 3.40 | 9.30 | 22  | ●      |
| <b>230-P/M/K</b>       | 23.0           | 13.3 | 3.46 | 9.84 | 23  | ●      |
| <b>231-P/M/K</b>       | 23.1           | 13.3 | 3.48 | 9.82 | 23  | ●      |
| <b>232-P/M/K</b>       | 23.2           | 13.3 | 3.50 | 9.80 | 23  | ●      |
| <b>233-P/M/K</b>       | 23.3           | 13.3 | 3.51 | 9.79 | 23  | ●      |
| <b>234-P/M/K</b>       | 23.4           | 13.3 | 3.53 | 9.77 | 23  | ●      |



► Drill head can be ordered by an application  
**Order example)** Diameter 10.0mm drill head for  
 ISO P application: TCD-100-P TT9080

●: Standard items



Steel



Stainless steel

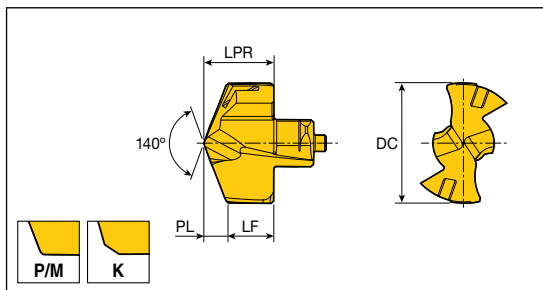


Cast iron

**TCD...P/M/K**



## Drill heads

[illegible]

- ▶ Drill head can be ordered by an application  
Order example) Diameter 10.0mm drill head for  
ISO P application: TCD-100-P TT9080

●: Standard items

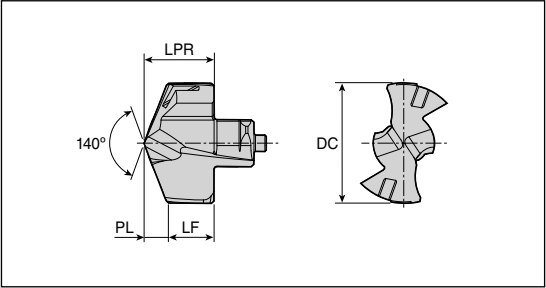
 Stainless steel

**TaeguTec**  
Member IMC Group

# TCD...N



Drill heads for aluminum alloy

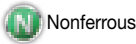


| Designation | Dimension (mm) |       |      |      |     | Grade |
|-------------|----------------|-------|------|------|-----|-------|
|             | DC             | LPR   | PL   | LF   | SSC | UF10  |
| TCD - 060-N | 6.0            | 4.00  | 0.96 | 3.04 | 6   | ●     |
| 065-N       | 6.5            | 4.30  | 1.18 | 3.12 | 6.5 | ●     |
| 070-N       | 7.0            | 4.60  | 1.01 | 3.59 | 7   | ●     |
| 075-N       | 7.5            | 4.60  | 1.10 | 3.50 | 7   | ●     |
| 080-N       | 8.0            | 5.40  | 1.20 | 4.20 | 8   | ●     |
| 085-N       | 8.5            | 5.40  | 1.29 | 4.11 | 8   | ●     |
| 090-N       | 9.0            | 5.80  | 1.35 | 4.45 | 9   | ●     |
| 095-N       | 9.5            | 5.80  | 1.44 | 4.36 | 9   | ●     |
| 100-N       | 10.0           | 6.20  | 1.50 | 4.70 | 10  | ●     |
| 105-N       | 10.5           | 6.20  | 1.59 | 4.61 | 10  | ●     |
| 110-N       | 11.0           | 6.60  | 1.67 | 4.93 | 11  | ●     |
| 115-N       | 11.5           | 6.60  | 1.76 | 4.84 | 11  | ●     |
| 120-N       | 12.0           | 7.00  | 1.82 | 5.18 | 12  | ●     |
| 125-N       | 12.5           | 7.00  | 1.91 | 5.09 | 12  | ●     |
| 130-N       | 13.0           | 7.60  | 1.96 | 5.64 | 13  | ●     |
| 135-N       | 13.5           | 7.60  | 2.05 | 5.55 | 13  | ●     |
| 140-N       | 14.0           | 8.15  | 2.12 | 6.03 | 14  | ●     |
| 145-N       | 14.5           | 8.15  | 2.21 | 5.94 | 14  | ●     |
| 150-N       | 15.0           | 8.73  | 2.27 | 6.46 | 15  | ●     |
| 155-N       | 15.5           | 8.73  | 2.36 | 6.37 | 15  | ●     |
| 160-N       | 16.0           | 9.30  | 2.42 | 6.88 | 16  | ●     |
| 165-N       | 16.5           | 9.30  | 2.51 | 6.79 | 16  | ●     |
| 170-N       | 17.0           | 9.90  | 2.59 | 7.31 | 17  | ●     |
| 175-N       | 17.5           | 9.90  | 2.68 | 7.22 | 17  | ●     |
| 180-N       | 18.0           | 10.50 | 2.73 | 7.77 | 18  | ●     |
| 185-N       | 18.5           | 10.50 | 2.82 | 7.68 | 18  | ●     |
| 190-N       | 19.0           | 11.00 | 2.88 | 8.12 | 19  | ●     |
| 195-N       | 19.5           | 11.00 | 2.97 | 8.03 | 19  | ●     |
|             |                |       |      |      |     |       |
|             |                |       |      |      |     |       |
|             |                |       |      |      |     |       |
|             |                |       |      |      |     |       |
|             |                |       |      |      |     |       |
|             |                |       |      |      |     |       |
|             |                |       |      |      |     |       |
|             |                |       |      |      |     |       |
|             |                |       |      |      |     |       |



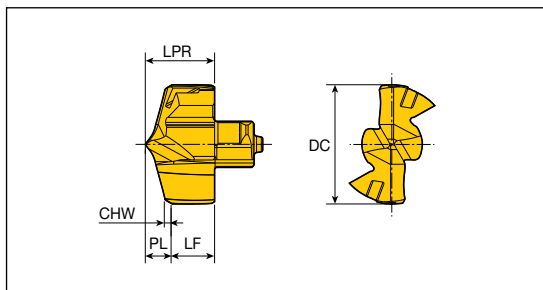
► SSC: Seat size code

●: Standard items



# TCD-P+

## Self-centering drill heads



| Designation       | Dimension (mm) |      |      |      |     |     | Grade  |
|-------------------|----------------|------|------|------|-----|-----|--------|
|                   | DC             | LPR  | PL   | LF   | CHW | SSC | TT9080 |
| <b>TCD-060-P+</b> | 6.0            | 4.00 | 1.46 | 2.54 | 0.5 | 6   | ●      |
| <b>065-P+</b>     | 6.5            | 4.30 | 1.55 | 2.75 | 0.5 | 6.5 | ●      |
| <b>068-P+</b>     | 6.8            | 4.30 | 1.59 | 2.71 | 0.5 | 6.5 | ●      |
| <b>070-P+</b>     | 7.0            | 4.60 | 1.64 | 2.96 | 0.5 | 7   | ●      |
| <b>072-P+</b>     | 7.2            | 4.60 | 1.67 | 2.93 | 0.5 | 7   | ●      |
| <b>075-P+</b>     | 7.5            | 4.60 | 1.71 | 2.89 | 0.5 | 7   | ●      |
| <b>080-P+</b>     | 8.0            | 5.40 | 1.81 | 3.59 | 0.5 | 8   | ●      |
| <b>081-P+</b>     | 8.1            | 5.40 | 1.82 | 3.58 | 0.5 | 8   | ●      |
| <b>082-P+</b>     | 8.2            | 5.40 | 1.84 | 3.56 | 0.5 | 8   | ●      |
| <b>083-P+</b>     | 8.3            | 5.40 | 1.85 | 3.55 | 0.5 | 8   | ●      |
| <b>085-P+</b>     | 8.5            | 5.40 | 1.88 | 3.52 | 0.5 | 8   | ●      |
| <b>086-P+</b>     | 8.6            | 5.40 | 1.89 | 3.51 | 0.5 | 8   | ●      |
| <b>087-P+</b>     | 8.7            | 5.40 | 1.90 | 3.50 | 0.5 | 8   | ●      |
| <b>088-P+</b>     | 8.8            | 5.40 | 1.92 | 3.48 | 0.5 | 8   | ●      |
| <b>089-P+</b>     | 8.9            | 5.40 | 1.93 | 3.47 | 0.5 | 8   | ●      |
| <b>090-P+</b>     | 9.0            | 5.80 | 1.98 | 3.82 | 0.5 | 9   | ●      |
| <b>093-P+</b>     | 9.3            | 5.80 | 2.02 | 3.78 | 0.5 | 9   | ●      |
| <b>095-P+</b>     | 9.5            | 5.80 | 2.05 | 3.75 | 0.5 | 9   | ●      |
| <b>096-P+</b>     | 9.6            | 5.80 | 2.06 | 3.74 | 0.5 | 9   | ●      |
| <b>097-P+</b>     | 9.7            | 5.80 | 2.07 | 3.73 | 0.5 | 9   | ●      |
| <b>098-P+</b>     | 9.8            | 5.80 | 2.09 | 3.71 | 0.5 | 9   | ●      |
| <b>099-P+</b>     | 9.9            | 5.80 | 2.10 | 3.70 | 0.5 | 9   | ●      |
| <b>100-P+</b>     | 10.0           | 6.20 | 2.33 | 3.87 | 0.7 | 10  | ●      |
| <b>101-P+</b>     | 10.1           | 6.20 | 2.34 | 3.86 | 0.7 | 10  | ●      |
| <b>102-P+</b>     | 10.2           | 6.20 | 2.36 | 3.84 | 0.7 | 10  | ●      |
| <b>103-P+</b>     | 10.3           | 6.20 | 2.37 | 3.83 | 0.7 | 10  | ●      |
| <b>105-P+</b>     | 10.5           | 6.20 | 2.40 | 3.80 | 0.7 | 10  | ●      |
| <b>106-P+</b>     | 10.6           | 6.20 | 2.41 | 3.79 | 0.7 | 10  | ●      |
| <b>107-P+</b>     | 10.7           | 6.20 | 2.42 | 3.78 | 0.7 | 10  | ●      |
| <b>108-P+</b>     | 10.8           | 6.20 | 2.44 | 3.76 | 0.7 | 10  | ●      |
| <b>109-P+</b>     | 10.9           | 6.20 | 2.45 | 3.75 | 0.7 | 10  | ●      |
| <b>110-P+</b>     | 11.0           | 6.60 | 2.50 | 4.10 | 0.7 | 11  | ●      |
| <b>111-P+</b>     | 11.1           | 6.60 | 2.51 | 4.09 | 0.7 | 11  | ●      |
| <b>112-P+</b>     | 11.2           | 6.60 | 2.53 | 4.07 | 0.7 | 11  | ●      |
| <b>113-P+</b>     | 11.3           | 6.60 | 2.54 | 4.06 | 0.7 | 11  | ●      |



D59-D74

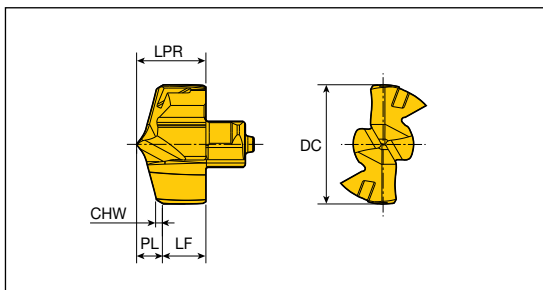


D143

► SSC: Seat size code

●: Standard items





| Designation        | Dimension (mm) |      |      |      |     |     | Grade |
|--------------------|----------------|------|------|------|-----|-----|-------|
|                    | DC             | LPR  | PL   | LF   | CHW | SSC |       |
| <b>TCD- 114-P+</b> | 11.4           | 6.60 | 2.55 | 4.05 | 0.7 | 11  | ●     |
| <b>115-P+</b>      | 11.5           | 6.60 | 2.57 | 4.03 | 0.7 | 11  | ●     |
| <b>116-P+</b>      | 11.6           | 6.60 | 2.58 | 4.02 | 0.7 | 11  | ●     |
| <b>117-P+</b>      | 11.7           | 6.60 | 2.59 | 4.01 | 0.7 | 11  | ●     |
| <b>118-P+</b>      | 11.8           | 6.60 | 2.61 | 3.99 | 0.7 | 11  | ●     |
| <b>119-P+</b>      | 11.9           | 6.60 | 2.62 | 3.98 | 0.7 | 11  | ●     |
| <b>120-P+</b>      | 12.0           | 7.00 | 2.67 | 4.33 | 0.7 | 12  | ●     |
| <b>121-P+</b>      | 12.1           | 7.00 | 2.68 | 4.32 | 0.7 | 12  | ●     |
| <b>122-P+</b>      | 12.2           | 7.00 | 2.70 | 4.30 | 0.7 | 12  | ●     |
| <b>123-P+</b>      | 12.3           | 7.00 | 2.71 | 4.29 | 0.7 | 12  | ●     |
| <b>124-P+</b>      | 12.4           | 7.00 | 2.72 | 4.28 | 0.7 | 12  | ●     |
| <b>125-P+</b>      | 12.5           | 7.00 | 2.74 | 4.26 | 0.7 | 12  | ●     |
| <b>126-P+</b>      | 12.6           | 7.00 | 2.75 | 4.25 | 0.7 | 12  | ●     |
| <b>127-P+</b>      | 12.7           | 7.00 | 2.76 | 4.24 | 0.7 | 12  | ●     |
| <b>128-P+</b>      | 12.8           | 7.00 | 2.78 | 4.22 | 0.7 | 12  | ●     |
| <b>130-P+</b>      | 13.0           | 7.60 | 2.85 | 4.75 | 0.7 | 13  | ●     |
| <b>131-P+</b>      | 13.1           | 7.60 | 2.86 | 4.74 | 0.7 | 13  | ●     |
| <b>132-P+</b>      | 13.2           | 7.60 | 2.88 | 4.72 | 0.7 | 13  | ●     |
| <b>133-P+</b>      | 13.3           | 7.60 | 2.89 | 4.71 | 0.7 | 13  | ●     |
| <b>134-P+</b>      | 13.4           | 7.60 | 2.90 | 4.70 | 0.7 | 13  | ●     |
| <b>135-P+</b>      | 13.5           | 7.60 | 2.92 | 4.68 | 0.7 | 13  | ●     |
| <b>136-P+</b>      | 13.6           | 7.60 | 2.93 | 4.67 | 0.7 | 13  | ●     |
| <b>137-P+</b>      | 13.7           | 7.60 | 2.94 | 4.66 | 0.7 | 13  | ●     |
| <b>138-P+</b>      | 13.8           | 7.60 | 2.96 | 4.64 | 0.7 | 13  | ●     |
| <b>139-P+</b>      | 13.9           | 7.60 | 2.97 | 4.63 | 0.7 | 13  | ●     |
| <b>140-P+</b>      | 14.0           | 8.15 | 3.02 | 5.13 | 0.7 | 14  | ●     |
| <b>141-P+</b>      | 14.1           | 8.15 | 3.03 | 5.12 | 0.7 | 14  | ●     |
| <b>142-P+</b>      | 14.2           | 8.15 | 3.05 | 5.10 | 0.7 | 14  | ●     |
| <b>143-P+</b>      | 14.3           | 8.15 | 3.06 | 5.09 | 0.7 | 14  | ●     |
| <b>144-P+</b>      | 14.4           | 8.15 | 3.07 | 5.08 | 0.7 | 14  | ●     |
| <b>145-P+</b>      | 14.5           | 8.15 | 3.09 | 5.06 | 0.7 | 14  | ●     |
| <b>146-P+</b>      | 14.6           | 8.15 | 3.10 | 5.05 | 0.7 | 14  | ●     |
| <b>147-P+</b>      | 14.7           | 8.15 | 3.11 | 5.04 | 0.7 | 14  | ●     |
| <b>148-P+</b>      | 14.8           | 8.15 | 3.13 | 5.02 | 0.7 | 14  | ●     |
| <b>150-P+</b>      | 15.0           | 8.73 | 3.19 | 5.54 | 0.7 | 15  | ●     |

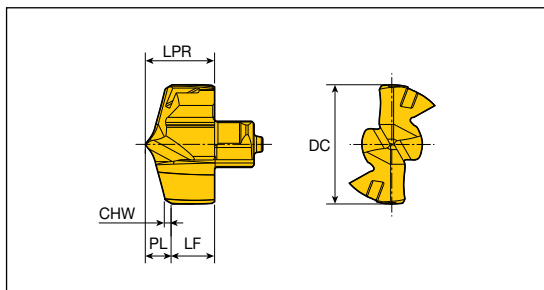


► SSC: Seat size code

●: Standard items

# TCD-P+

## Self-centering drill heads



| Designation       | Dimension (mm) |       |      |      |      |     | Grade  |
|-------------------|----------------|-------|------|------|------|-----|--------|
|                   | DC             | LPR   | PL   | LF   | CHW  | SSC | TT9080 |
| <b>TCD-151-P+</b> | 15.1           | 8.73  | 3.20 | 5.53 | 0.7  | 15  | ●      |
| <b>152-P+</b>     | 15.2           | 8.73  | 3.22 | 5.51 | 0.7  | 15  | ●      |
| <b>153-P+</b>     | 15.3           | 8.73  | 3.23 | 5.50 | 0.7  | 15  | ●      |
| <b>154-P+</b>     | 15.4           | 8.73  | 3.24 | 5.49 | 0.7  | 15  | ●      |
| <b>155-P+</b>     | 15.5           | 8.73  | 3.26 | 5.47 | 0.7  | 15  | ●      |
| <b>156-P+</b>     | 15.6           | 8.73  | 3.27 | 5.46 | 0.7  | 15  | ●      |
| <b>157-P+</b>     | 15.7           | 8.73  | 3.28 | 5.45 | 0.7  | 15  | ●      |
| <b>158-P+</b>     | 15.8           | 8.73  | 3.30 | 5.43 | 0.7  | 15  | ●      |
| <b>159-P+</b>     | 15.9           | 8.73  | 3.31 | 5.42 | 0.7  | 15  | ●      |
| <b>160-P+</b>     | 16.0           | 9.30  | 3.46 | 5.84 | 0.81 | 16  | ●      |
| <b>161-P+</b>     | 16.1           | 9.30  | 3.47 | 5.83 | 0.81 | 16  | ●      |
| <b>162-P+</b>     | 16.2           | 9.30  | 3.49 | 5.81 | 0.81 | 16  | ●      |
| <b>163-P+</b>     | 16.3           | 9.30  | 3.50 | 5.80 | 0.81 | 16  | ●      |
| <b>164-P+</b>     | 16.4           | 9.30  | 3.51 | 5.79 | 0.81 | 16  | ●      |
| <b>165-P+</b>     | 16.5           | 9.30  | 3.53 | 5.77 | 0.81 | 16  | ●      |
| <b>166-P+</b>     | 16.6           | 9.30  | 3.54 | 5.76 | 0.81 | 16  | ●      |
| <b>167-P+</b>     | 16.7           | 9.30  | 3.55 | 5.75 | 0.81 | 16  | ●      |
| <b>168-P+</b>     | 16.8           | 9.30  | 3.57 | 5.73 | 0.81 | 16  | ●      |
| <b>170-P+</b>     | 17.0           | 9.90  | 3.63 | 6.27 | 0.81 | 17  | ●      |
| <b>171-P+</b>     | 17.1           | 9.90  | 3.64 | 6.26 | 0.81 | 17  | ●      |
| <b>172-P+</b>     | 17.2           | 9.90  | 3.66 | 6.24 | 0.81 | 17  | ●      |
| <b>173-P+</b>     | 17.3           | 9.90  | 3.67 | 6.23 | 0.81 | 17  | ●      |
| <b>174-P+</b>     | 17.4           | 9.90  | 3.68 | 6.22 | 0.81 | 17  | ●      |
| <b>175-P+</b>     | 17.5           | 9.90  | 3.70 | 6.20 | 0.81 | 17  | ●      |
| <b>176-P+</b>     | 17.6           | 9.90  | 3.71 | 6.19 | 0.81 | 17  | ●      |
| <b>177-P+</b>     | 17.7           | 9.90  | 3.72 | 6.18 | 0.81 | 17  | ●      |
| <b>178-P+</b>     | 17.8           | 9.90  | 3.74 | 6.16 | 0.81 | 17  | ●      |
| <b>179-P+</b>     | 17.9           | 9.90  | 3.75 | 6.15 | 0.81 | 17  | ●      |
| <b>180-P+</b>     | 18.0           | 10.50 | 3.81 | 6.69 | 0.81 | 18  | ●      |
| <b>181-P+</b>     | 18.1           | 10.50 | 3.82 | 6.68 | 0.81 | 18  | ●      |
| <b>182-P+</b>     | 18.2           | 10.50 | 3.84 | 6.66 | 0.81 | 18  | ●      |
| <b>183-P+</b>     | 18.3           | 10.50 | 3.85 | 6.65 | 0.81 | 18  | ●      |
| <b>185-P+</b>     | 18.5           | 10.50 | 3.88 | 6.62 | 0.81 | 18  | ●      |
| <b>186-P+</b>     | 18.6           | 10.50 | 3.89 | 6.61 | 0.81 | 18  | ●      |
| <b>187-P+</b>     | 18.7           | 10.50 | 3.90 | 6.60 | 0.81 | 18  | ●      |
| <b>188-P+</b>     | 18.8           | 10.50 | 3.92 | 6.58 | 0.81 | 18  | ●      |



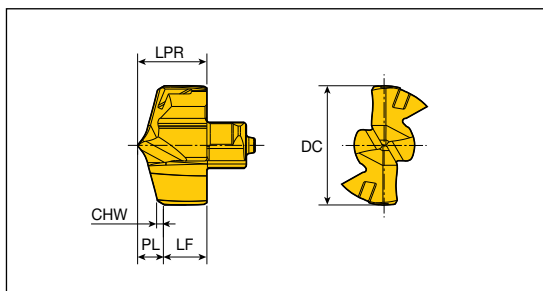
D59-D74



D143

► SSC: Seat size code

●: Standard items



| Designation        | Dimension (mm) |       |      |      |      |     | Grade |
|--------------------|----------------|-------|------|------|------|-----|-------|
|                    | DC             | LPR   | PL   | LF   | CHW  | SSC |       |
| <b>TCD- 190-P+</b> | 19.0           | 11.00 | 3.98 | 7.02 | 0.81 | 19  | ●     |
| <b>191-P+</b>      | 19.1           | 11.00 | 3.99 | 7.01 | 0.81 | 19  | ●     |
| <b>192-P+</b>      | 19.2           | 11.00 | 4.01 | 6.99 | 0.81 | 19  | ●     |
| <b>193-P+</b>      | 19.3           | 11.00 | 4.02 | 6.98 | 0.81 | 19  | ●     |
| <b>194-P+</b>      | 19.4           | 11.00 | 4.03 | 6.97 | 0.81 | 19  | ●     |
| <b>195-P+</b>      | 19.5           | 11.00 | 4.05 | 6.95 | 0.81 | 19  | ●     |
| <b>196-P+</b>      | 19.6           | 11.00 | 4.06 | 6.94 | 0.81 | 19  | ●     |
| <b>197-P+</b>      | 19.7           | 11.00 | 4.07 | 6.93 | 0.81 | 19  | ●     |
| <b>198-P+</b>      | 19.8           | 11.00 | 4.09 | 6.91 | 0.81 | 19  | ●     |
| <b>199-P+</b>      | 19.9           | 11.00 | 4.10 | 6.90 | 0.81 | 19  | ●     |
| <b>200-P+</b>      | 20.0           | 11.60 | 4.15 | 7.45 | 0.81 | 20  | ●     |
| <b>201-P+</b>      | 20.1           | 11.60 | 4.16 | 7.44 | 0.81 | 20  | ●     |
| <b>202-P+</b>      | 20.2           | 11.60 | 4.18 | 7.42 | 0.81 | 20  | ●     |
| <b>205-P+</b>      | 20.5           | 11.60 | 4.22 | 7.38 | 0.81 | 20  | ●     |
| <b>206-P+</b>      | 20.6           | 11.60 | 4.23 | 7.37 | 0.81 | 20  | ●     |
| <b>207-P+</b>      | 20.7           | 11.60 | 4.24 | 7.36 | 0.81 | 20  | ●     |
| <b>210-P+</b>      | 21.0           | 12.18 | 4.32 | 7.86 | 0.81 | 21  | ●     |
| <b>212-P+</b>      | 21.2           | 12.18 | 4.35 | 7.83 | 0.81 | 21  | ●     |
| <b>213-P+</b>      | 21.3           | 12.18 | 4.36 | 7.82 | 0.81 | 21  | ●     |
| <b>214-P+</b>      | 21.4           | 12.18 | 4.37 | 7.81 | 0.81 | 21  | ●     |
| <b>215-P+</b>      | 21.5           | 12.18 | 4.39 | 7.79 | 0.81 | 21  | ●     |
| <b>218-P+</b>      | 21.8           | 12.18 | 4.43 | 7.75 | 0.81 | 21  | ●     |
| <b>220-P+</b>      | 22.0           | 12.76 | 4.50 | 8.26 | 0.81 | 22  | ●     |
| <b>225-P+</b>      | 22.5           | 12.76 | 4.57 | 8.19 | 0.81 | 22  | ●     |
| <b>229-P+</b>      | 22.9           | 12.76 | 4.62 | 8.14 | 0.81 | 22  | ●     |
| <b>230-P+</b>      | 23.0           | 13.33 | 4.67 | 8.66 | 0.81 | 23  | ●     |
| <b>235-P+</b>      | 23.5           | 13.33 | 4.74 | 8.59 | 0.81 | 23  | ●     |
| <b>240-P+</b>      | 24.0           | 13.90 | 4.84 | 9.06 | 0.81 | 24  | ●     |
| <b>245-P+</b>      | 24.5           | 13.90 | 4.91 | 8.99 | 0.81 | 24  | ●     |
| <b>250-P+</b>      | 25.0           | 14.50 | 5.01 | 9.49 | 0.81 | 25  | ●     |
| <b>254-P+</b>      | 25.4           | 14.50 | 5.06 | 9.44 | 0.81 | 25  | ●     |
| <b>255-P+</b>      | 25.5           | 14.50 | 5.08 | 9.42 | 0.81 | 25  | ●     |
| <b>256-P+</b>      | 25.6           | 14.50 | 5.09 | 9.41 | 0.81 | 25  | ●     |
| <b>257-P+</b>      | 25.7           | 14.50 | 5.10 | 9.40 | 0.81 | 25  | ●     |
| <b>258-P+</b>      | 25.8           | 14.50 | 5.12 | 9.38 | 0.81 | 25  | ●     |
| <b>259-P+</b>      | 25.9           | 14.50 | 5.13 | 9.37 | 0.81 | 25  | ●     |

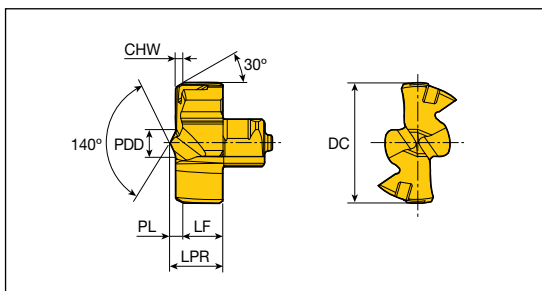


► SSC: Seat size code

●: Standard items

# TCD...F

## Drill heads for flat bottom hole



| Designation        | Dimension (mm) |      |      |      |      |     |     | Grade  |
|--------------------|----------------|------|------|------|------|-----|-----|--------|
|                    | DC             | PDD  | LPR  | PL   | LF   | CHW | SSC | TT9080 |
| <b>TCD - 080-F</b> | 8.0            | 2.33 | 4.4  | 1.09 | 3.3  | 0.7 | 8   | ●      |
| <b>085-F</b>       | 8.5            | 2.33 | 4.4  | 1.09 | 3.3  | 0.7 | 8   | ●      |
| <b>090-F</b>       | 9.0            | 2.29 | 4.6  | 1.11 | 3.5  | 0.7 | 9   | ●      |
| <b>095-F</b>       | 9.5            | 2.29 | 4.6  | 1.11 | 3.5  | 0.7 | 9   | ●      |
| <b>100-F</b>       | 10.0           | 2.44 | 4.9  | 1.17 | 3.7  | 0.7 | 10  | ●      |
| <b>105-F</b>       | 10.5           | 2.44 | 4.9  | 1.17 | 3.7  | 0.7 | 10  | ●      |
| <b>110-F</b>       | 11.0           | 3.09 | 5.1  | 1.25 | 3.8  | 0.7 | 11  | ●      |
| <b>115-F</b>       | 11.5           | 3.09 | 5.1  | 1.25 | 3.8  | 0.7 | 11  | ●      |
| <b>120-F</b>       | 12.0           | 2.95 | 5.4  | 1.26 | 4.1  | 0.7 | 12  | ●      |
| <b>125-F</b>       | 12.5           | 2.95 | 5.4  | 1.26 | 4.1  | 0.7 | 12  | ●      |
| <b>130-F</b>       | 13.0           | 3.04 | 5.7  | 1.30 | 4.4  | 0.7 | 13  | ●      |
| <b>135-F</b>       | 13.5           | 3.04 | 5.7  | 1.30 | 4.4  | 0.7 | 13  | ●      |
| <b>140-F</b>       | 14.0           | 3.30 | 6.1  | 1.31 | 4.8  | 0.7 | 14  | ●      |
| <b>145-F</b>       | 14.5           | 3.30 | 6.1  | 1.31 | 4.8  | 0.7 | 14  | ●      |
| <b>150-F</b>       | 15.0           | 3.54 | 6.6  | 1.35 | 5.23 | 0.7 | 15  | ●      |
| <b>155-F</b>       | 15.5           | 3.54 | 6.6  | 1.35 | 5.23 | 0.7 | 15  | ●      |
| <b>160-F</b>       | 16.0           | 3.74 | 7.0  | 1.39 | 5.6  | 0.7 | 16  | ●      |
| <b>165-F</b>       | 16.5           | 3.74 | 7.0  | 1.39 | 5.6  | 0.7 | 16  | ●      |
| <b>170-F</b>       | 17.0           | 3.75 | 7.3  | 1.40 | 5.9  | 0.7 | 17  | ●      |
| <b>175-F</b>       | 17.5           | 3.75 | 7.3  | 1.40 | 5.9  | 0.7 | 17  | ●      |
| <b>180-F</b>       | 18.0           | 3.85 | 7.6  | 1.42 | 6.18 | 0.7 | 18  | ●      |
| <b>185-F</b>       | 18.5           | 3.85 | 7.6  | 1.42 | 6.18 | 0.7 | 18  | ●      |
| <b>190-F</b>       | 19.0           | 3.86 | 7.9  | 1.44 | 6.5  | 0.7 | 19  | ●      |
| <b>195-F</b>       | 19.5           | 3.86 | 7.9  | 1.44 | 6.5  | 0.7 | 19  | ●      |
| <b>200-F</b>       | 20.0           | 6.76 | 9.3  | 1.77 | 7.5  | 0.7 | 20  | ●      |
| <b>205-F</b>       | 20.5           | 6.76 | 9.3  | 1.77 | 7.5  | 0.7 | 20  | ●      |
| <b>210-F</b>       | 21.0           | 6.98 | 9.7  | 1.79 | 7.9  | 0.7 | 21  | ●      |
| <b>215-F</b>       | 21.5           | 6.98 | 9.7  | 1.79 | 7.9  | 0.7 | 21  | ●      |
| <b>220-F</b>       | 22.0           | 7.42 | 10.0 | 1.81 | 8.2  | 0.7 | 22  | ●      |
| <b>225-F</b>       | 22.5           | 7.42 | 10.0 | 1.81 | 8.2  | 0.7 | 22  | ●      |
| <b>230-F</b>       | 23.0           | 7.60 | 10.4 | 1.83 | 8.6  | 0.7 | 23  | ●      |
| <b>235-F</b>       | 23.5           | 7.60 | 10.4 | 1.83 | 8.6  | 0.7 | 23  | ●      |
| <b>240-F</b>       | 24.0           | 8.13 | 10.9 | 1.86 | 9.0  | 0.7 | 24  | ●      |
| <b>245-F</b>       | 24.5           | 8.13 | 10.9 | 1.86 | 9.0  | 0.7 | 24  | ●      |
| <b>250-F</b>       | 25.0           | 8.16 | 11.3 | 1.89 | 9.4  | 0.7 | 25  | ●      |



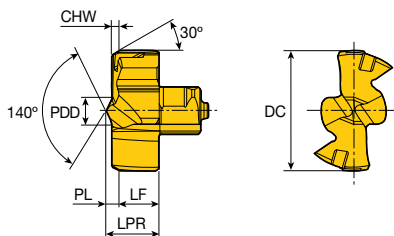
► SSC: Seat size code

●: Standard items

**TCD...F**



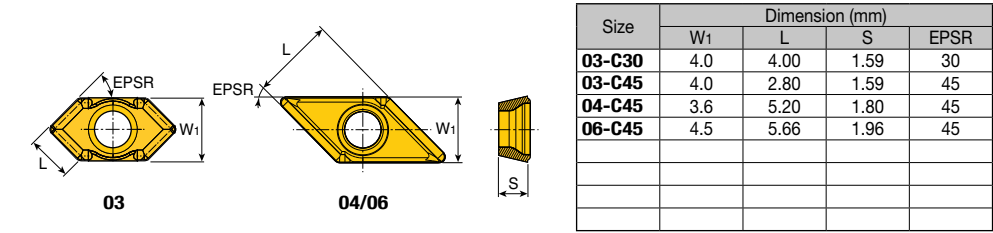
### Drill heads for flat bottom hole

[illegible]

► SSC: Seat size code

●: Standard items

Chamfering inserts for pre-thread hole



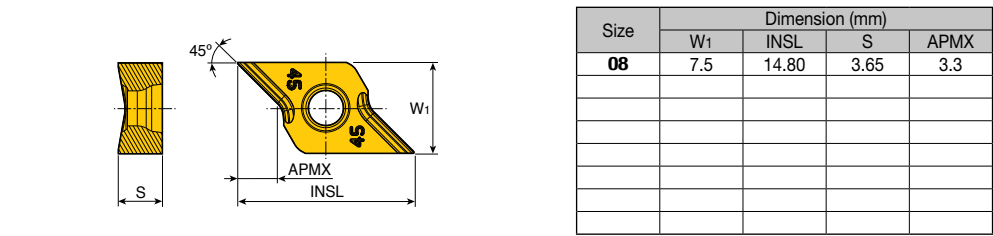
| Insert                                                                            | Designation     | Coated |        |        |        |        |        | Uncoated |  |
|-----------------------------------------------------------------------------------|-----------------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                   |                 | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | K10      |  |
|  | AOMT 030204-C30 | ●      |        |        |        |        |        |          |  |
|                                                                                   | 030204-C45      | ●      |        |        |        |        |        |          |  |
|                                                                                   |                 |        |        |        |        |        |        |          |  |
|   | AOMT 040204-C45 | ●      |        |        |        |        |        |          |  |
|                                                                                   | 060204-C45      | ●      |        |        |        |        |        |          |  |
|                                                                                   |                 |        |        |        |        |        |        |          |  |
|                                                                                   |                 |        |        |        |        |        |        |          |  |



●: Standard items

CRNG 0802-45CD

Chamfering inserts for chamfering ring



| Insert                                                                              | Designation    | Coated |        |        |        |        |        | Uncoated |  |
|-------------------------------------------------------------------------------------|----------------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                     |                | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | K10      |  |
|  | CRNG 0802-45CD | ●      |        |        |        |        |        |          |  |
|                                                                                     |                |        |        |        |        |        |        |          |  |
|                                                                                     |                |        |        |        |        |        |        |          |  |
|                                                                                     |                |        |        |        |        |        |        |          |  |

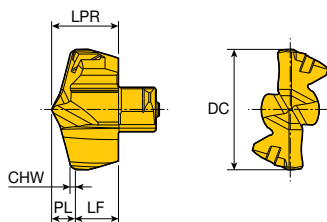


●: Standard items

# TCD...P-CO+



## Drill heads



| Designation           | Dimension (mm) |       |      |      |      |     | Grade  |
|-----------------------|----------------|-------|------|------|------|-----|--------|
|                       | DC             | LPR   | PL   | LF   | CHW  | SSC | TT9080 |
| <b>TCD- 159-P-CO+</b> | 15.9           | 8.73  | 3.17 | 5.56 | 0.7  | 15  | ●      |
| <b>169-P-CO+</b>      | 16.9           | 9.30  | 3.34 | 5.96 | 0.81 | 16  | ●      |
| <b>179-P-CO+</b>      | 17.9           | 9.90  | 3.50 | 6.40 | 0.81 | 17  | ●      |
| <b>189-P-CO+</b>      | 18.9           | 10.50 | 3.66 | 6.84 | 0.81 | 18  | ●      |
| <b>199-P-CO+</b>      | 19.9           | 11.00 | 3.82 | 7.18 | 0.81 | 19  | ●      |
| <b>209-P-CO+</b>      | 20.9           | 11.60 | 3.98 | 7.62 | 0.81 | 20  | ●      |
| <b>219-P-CO+</b>      | 21.9           | 12.18 | 4.15 | 8.03 | 0.81 | 21  | ●      |
| <b>229-P-CO+</b>      | 22.9           | 12.76 | 4.31 | 8.45 | 0.81 | 22  | ●      |
| <b>239-P-CO+</b>      | 23.9           | 13.33 | 4.48 | 8.85 | 0.81 | 23  | ●      |
| <b>249-P-CO+</b>      | 24.9           | 13.90 | 4.64 | 9.26 | 0.81 | 24  | ●      |
| <b>259-P-CO+</b>      | 25.9           | 14.50 | 4.81 | 9.69 | 0.81 | 25  | ●      |



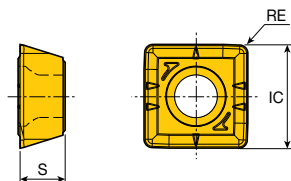
► SSC: Seat size code

●: Standard items

## SPGX...DW



## Inserts



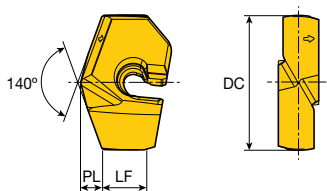
| Size      | Dimension (mm) |      |     |  |
|-----------|----------------|------|-----|--|
|           | IC             | S    | RE  |  |
| <b>06</b> | 6.07           | 2.38 | 0.4 |  |
| <b>07</b> | 8.02           | 3.97 | 0.8 |  |
| <b>09</b> | 9.91           | 4.30 | 0.8 |  |
| <b>11</b> | 11.62          | 4.80 | 0.8 |  |
| <b>14</b> | 14.41          | 5.20 | 1.2 |  |
|           |                |      |     |  |
|           |                |      |     |  |
|           |                |      |     |  |

| Insert | Designation           | Coated |        |        |        |        |        | Uncoated |  |  |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|----------|--|--|
|        |                       | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT7400 |          |  |  |
|        | <b>SPGX 060204 DW</b> | ●      |        |        |        |        |        |          |  |  |
|        | <b>07T308 DW</b>      | ●      |        |        |        |        |        |          |  |  |
|        | <b>090408 DW</b>      | ●      |        |        |        |        |        |          |  |  |
|        | <b>110408 DW</b>      | ●      |        |        |        |        |        |          |  |  |
|        | <b>140512 DW</b>      | ●      |        |        |        |        |        |          |  |  |



●: Standard items

## Drill heads



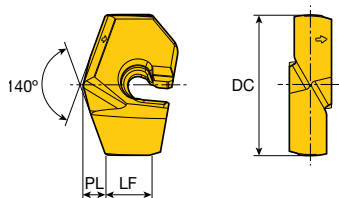
| Designation       | Dimension (mm) |      |       |     | Grade  |
|-------------------|----------------|------|-------|-----|--------|
|                   | DC             | PL   | LF    | SSC | TT9080 |
| <b>LCD- 200-P</b> | 20.0           | 3.11 | 6.54  | 20  | ●      |
| <b>205-P</b>      | 20.5           | 3.20 | 6.45  | 20  | ●      |
| <b>210-P</b>      | 21.0           | 3.29 | 6.36  | 21  | ●      |
| <b>215-P</b>      | 21.5           | 3.38 | 6.27  | 21  | ●      |
| <b>220-P</b>      | 22.0           | 3.42 | 7.12  | 22  | ●      |
| <b>225-P</b>      | 22.5           | 3.51 | 7.03  | 22  | ●      |
| <b>230-P</b>      | 23.0           | 3.60 | 6.94  | 23  | ●      |
| <b>235-P</b>      | 23.5           | 3.69 | 6.85  | 23  | ●      |
| <b>240-P</b>      | 24.0           | 3.73 | 7.03  | 24  | ●      |
| <b>245-P</b>      | 24.5           | 3.82 | 6.94  | 24  | ●      |
| <b>250-P</b>      | 25.0           | 3.91 | 6.85  | 25  | ●      |
| <b>255-P</b>      | 25.5           | 4.00 | 6.76  | 25  | ●      |
| <b>260-P</b>      | 26.0           | 4.04 | 7.51  | 26  | ●      |
| <b>265-P</b>      | 26.5           | 4.13 | 7.42  | 26  | ●      |
| <b>270-P</b>      | 27.0           | 4.22 | 7.33  | 27  | ●      |
| <b>275-P</b>      | 27.5           | 4.31 | 7.24  | 27  | ●      |
| <b>280-P</b>      | 28.0           | 4.35 | 7.39  | 28  | ●      |
| <b>285-P</b>      | 28.5           | 4.44 | 7.30  | 28  | ●      |
| <b>290-P</b>      | 29.0           | 4.53 | 7.21  | 29  | ●      |
| <b>295-P</b>      | 29.5           | 4.62 | 7.12  | 29  | ●      |
| <b>300-P</b>      | 30.0           | 4.67 | 9.47  | 30  | ●      |
| <b>305-P</b>      | 30.5           | 4.76 | 9.38  | 30  | ●      |
| <b>310-P</b>      | 31.0           | 4.85 | 9.29  | 31  | ●      |
| <b>315-P</b>      | 31.5           | 4.94 | 9.20  | 31  | ●      |
| <b>320-P</b>      | 32.0           | 4.98 | 9.55  | 32  | ●      |
| <b>325-P</b>      | 32.5           | 5.07 | 9.46  | 32  | ●      |
| <b>330-P</b>      | 33.0           | 5.16 | 9.37  | 33  | ●      |
| <b>335-P</b>      | 33.5           | 5.25 | 9.28  | 33  | ●      |
| <b>340-P</b>      | 34.0           | 5.34 | 9.19  | 34  | ●      |
| <b>345-P</b>      | 34.5           | 5.44 | 9.10  | 34  | ●      |
| <b>350-P</b>      | 35.0           | 5.44 | 11.12 | 35  | ●      |
| <b>355-P</b>      | 35.5           | 5.53 | 11.03 | 35  | ●      |
| <b>360-P</b>      | 36.0           | 5.62 | 10.94 | 36  | ●      |
| <b>365-P</b>      | 36.5           | 5.71 | 10.85 | 36  | ●      |
| <b>370-P</b>      | 37.0           | 5.80 | 10.76 | 37  | ●      |



► SSC: Seat size code

●: Standard items





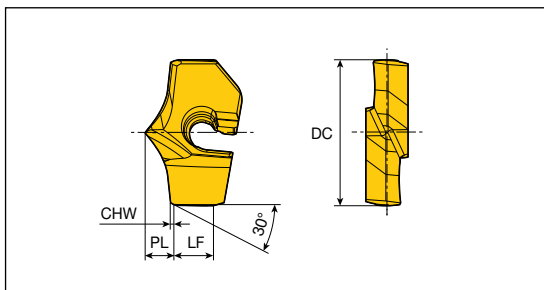
D80-D82

► SSC: Seat size code

●: Standard items

# LCD...-P+

## Self-centering drill head



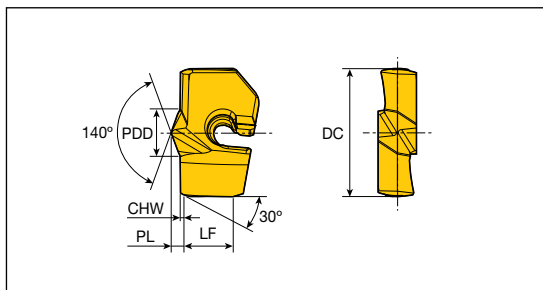
| Designation        | Dimension (mm) |      |      |      |     | Grade  |
|--------------------|----------------|------|------|------|-----|--------|
|                    | DC             | PL   | LF   | CHW  | SSC | TT9080 |
| <b>LCD- 200-P+</b> | 20.0           | 4.55 | 5.83 | 0.86 | 20  | ●      |
| <b>205-P+</b>      | 20.5           | 4.58 | 5.60 | 0.86 | 20  | ●      |
| <b>210-P+</b>      | 21.0           | 4.60 | 5.36 | 0.86 | 21  | ●      |
| <b>215-P+</b>      | 21.5           | 4.63 | 5.13 | 0.86 | 21  | ●      |
| <b>220-P+</b>      | 22.0           | 4.92 | 6.21 | 0.86 | 22  | ●      |
| <b>225-P+</b>      | 22.5           | 4.95 | 5.98 | 0.86 | 22  | ●      |
| <b>230-P+</b>      | 23.0           | 4.97 | 5.74 | 0.86 | 23  | ●      |
| <b>235-P+</b>      | 23.5           | 5.00 | 5.51 | 0.86 | 23  | ●      |
| <b>240-P+</b>      | 24.0           | 5.30 | 5.93 | 0.86 | 24  | ●      |
| <b>245-P+</b>      | 24.5           | 5.33 | 5.70 | 0.86 | 24  | ●      |
| <b>250-P+</b>      | 25.0           | 5.35 | 5.46 | 0.86 | 25  | ●      |
| <b>255-P+</b>      | 25.5           | 5.38 | 5.23 | 0.86 | 25  | ●      |
| <b>260-P+</b>      | 26.0           | 5.67 | 7.39 | 0.86 | 26  | ●      |
| <b>265-P+</b>      | 26.5           | 5.70 | 7.16 | 0.86 | 26  | ●      |
| <b>270-P+</b>      | 27.0           | 5.72 | 6.92 | 0.86 | 27  | ●      |
| <b>275-P+</b>      | 27.5           | 5.75 | 6.69 | 0.86 | 27  | ●      |
| <b>280-P+</b>      | 28.0           | 5.73 | 7.26 | 0.86 | 28  | ●      |
| <b>285-P+</b>      | 28.5           | 5.76 | 7.03 | 0.86 | 28  | ●      |
| <b>290-P+</b>      | 29.0           | 5.78 | 6.79 | 0.86 | 29  | ●      |
| <b>295-P+</b>      | 29.5           | 5.81 | 6.56 | 0.86 | 29  | ●      |
| <b>300-P+</b>      | 30.0           | 6.08 | 9.17 | 0.86 | 30  | ●      |
| <b>305-P+</b>      | 30.5           | 6.11 | 8.94 | 0.86 | 30  | ●      |
| <b>310-P+</b>      | 31.0           | 6.13 | 8.70 | 0.86 | 31  | ●      |
| <b>315-P+</b>      | 31.5           | 6.16 | 8.47 | 0.86 | 31  | ●      |
| <b>320-P+</b>      | 32.0           | 6.43 | 9.18 | 0.86 | 32  | ●      |
| <b>325-P+</b>      | 32.5           | 6.46 | 8.95 | 0.86 | 32  | ●      |
| <b>330-P+</b>      | 33.0           | 6.48 | 8.71 | 0.86 | 33  | ●      |
| <b>335-P+</b>      | 33.5           | 6.51 | 8.48 | 0.86 | 33  | ●      |
| <b>340-P+</b>      | 34.0           | 6.53 | 8.24 | 0.86 | 34  | ●      |
| <b>345-P+</b>      | 34.5           | 6.56 | 8.01 | 0.86 | 34  | ●      |
|                    |                |      |      |      |     |        |
|                    |                |      |      |      |     |        |
|                    |                |      |      |      |     |        |
|                    |                |      |      |      |     |        |



► SSC: Seat size code

●: Standard items

## Drill heads for flat bottom hole



| Designation        | Dimension (mm) |      |       |     |     |      | Grade  |
|--------------------|----------------|------|-------|-----|-----|------|--------|
|                    | DC             | PL   | LF    | CHW | SSC | PDD  | TT9080 |
| <b>LCD - 200-F</b> | 20.0           | 2.18 | 7.63  | 0.7 | 20  | 8.3  | ●      |
| <b>205-F</b>       | 20.5           | 2.18 | 7.63  | 0.7 | 20  | 8.3  | ●      |
| <b>210-F</b>       | 21.0           | 2.18 | 7.63  | 0.7 | 21  | 8.3  | ●      |
| <b>215-F</b>       | 21.5           | 2.18 | 7.63  | 0.7 | 21  | 8.3  | ●      |
| <b>220-F</b>       | 22.0           | 2.38 | 8.17  | 0.7 | 22  | 9.0  | ●      |
| <b>225-F</b>       | 22.5           | 2.38 | 8.17  | 0.7 | 22  | 9.0  | ●      |
| <b>230-F</b>       | 23.0           | 2.38 | 8.17  | 0.7 | 23  | 9.0  | ●      |
| <b>235-F</b>       | 23.5           | 2.38 | 8.17  | 0.7 | 23  | 9.0  | ●      |
| <b>240-F</b>       | 24.0           | 2.52 | 8.10  | 0.7 | 24  | 10.0 | ●      |
| <b>245-F</b>       | 24.5           | 2.52 | 8.10  | 0.7 | 24  | 10.0 | ●      |
| <b>250-F</b>       | 25.0           | 2.52 | 8.10  | 0.7 | 25  | 10.0 | ●      |
| <b>255-F</b>       | 25.5           | 2.52 | 8.10  | 0.7 | 25  | 10.0 | ●      |
| <b>260-F</b>       | 26.0           | 2.48 | 9.84  | 0.7 | 26  | 10.5 | ●      |
| <b>265-F</b>       | 26.5           | 2.48 | 9.84  | 0.7 | 26  | 10.5 | ●      |
| <b>270-F</b>       | 27.0           | 2.48 | 9.84  | 0.7 | 27  | 10.5 | ●      |
| <b>275-F</b>       | 27.5           | 2.48 | 9.84  | 0.7 | 27  | 10.5 | ●      |
| <b>280-F</b>       | 28.0           | 2.72 | 9.50  | 0.7 | 28  | 11.6 | ●      |
| <b>285-F</b>       | 28.5           | 2.72 | 9.50  | 0.7 | 28  | 11.6 | ●      |
| <b>290-F</b>       | 29.0           | 2.72 | 9.50  | 0.7 | 29  | 11.6 | ●      |
| <b>295-F</b>       | 29.5           | 2.72 | 9.50  | 0.7 | 29  | 11.6 | ●      |
| <b>300-F</b>       | 30.0           | 2.80 | 11.63 | 0.7 | 30  | 12.4 | ●      |
| <b>305-F</b>       | 30.5           | 2.80 | 11.63 | 0.7 | 30  | 12.4 | ●      |
| <b>310-F</b>       | 31.0           | 2.80 | 11.63 | 0.7 | 31  | 12.4 | ●      |
| <b>315-F</b>       | 31.5           | 2.80 | 11.63 | 0.7 | 31  | 12.4 | ●      |
| <b>320-F</b>       | 32.0           | 3.13 | 11.59 | 0.7 | 32  | 13.6 | ●      |
| <b>325-F</b>       | 32.5           | 3.13 | 11.59 | 0.7 | 32  | 13.6 | ●      |
| <b>330-F</b>       | 33.0           | 3.13 | 11.59 | 0.7 | 33  | 13.6 | ●      |
| <b>335-F</b>       | 33.5           | 3.13 | 11.59 | 0.7 | 33  | 13.6 | ●      |
| <b>340-F</b>       | 34.0           | 3.13 | 11.59 | 0.7 | 34  | 13.6 | ●      |
| <b>345-F</b>       | 34.5           | 3.13 | 11.59 | 0.7 | 34  | 13.6 | ●      |
| <b>350-F</b>       | 35.0           | 3.31 | 13.20 | 0.7 | 35  | 14.6 | ●      |
| <b>355-F</b>       | 35.5           | 3.31 | 13.20 | 0.7 | 35  | 14.6 | ●      |
| <b>360-F</b>       | 36.0           | 3.31 | 13.20 | 0.7 | 36  | 14.6 | ●      |
| <b>365-F</b>       | 36.5           | 3.31 | 13.20 | 0.7 | 36  | 14.6 | ●      |
| <b>370-F</b>       | 37.0           | 3.31 | 13.20 | 0.7 | 37  | 14.6 | ●      |



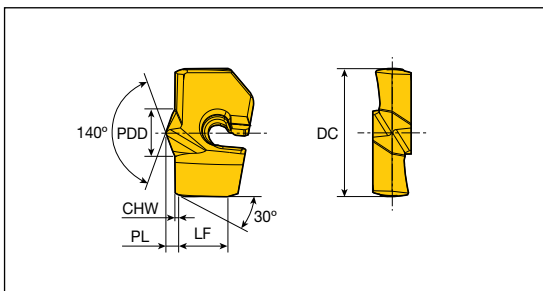
► SSC: Seat size code

●: Standard items

## LCD...-F



### Drill heads for flat bottom hole

[illegible]

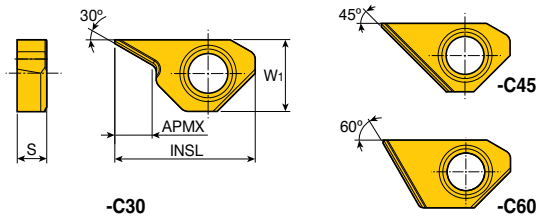
► SSC: Seat size code

●: Standard items

XCGT ...-C



Chamfering inserts for T-CHAMFER holder



| Size   | Dimension (mm) |      |     |      |
|--------|----------------|------|-----|------|
|        | W1             | INSL | S   | APMX |
| 06-C30 | 6.18           | 12.3 | 2.8 | 3.49 |
| 09-C30 | 8.50           | 16.0 | 3.3 | 4.43 |
| 06-C45 | 6.18           | 12.3 | 2.8 | 5.89 |
| 09-C45 | 8.50           | 16.0 | 3.3 | 8.07 |
| 06-C60 | 6.18           | 12.3 | 2.8 | 3.43 |
| 09-C60 | 8.50           | 16.0 | 3.3 | 4.78 |
|        |                |      |     |      |
|        |                |      |     |      |

| Insert | Designation   | Coated |        |        |        |        |        | Uncoated |  |
|--------|---------------|--------|--------|--------|--------|--------|--------|----------|--|
|        |               | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | K10      |  |
|        | XCGT 0603-C30 | •      |        |        |        |        |        |          |  |
|        | 0903-C30      | •      |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        | XCGT 0603-C45 | •      |        |        |        |        |        |          |  |
|        | 0903-C45      | •      |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        | XCGT 0603-C60 | •      |        |        |        |        |        |          |  |
|        | 0903-C60      | •      |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |
|        |               |        |        |        |        |        |        |          |  |

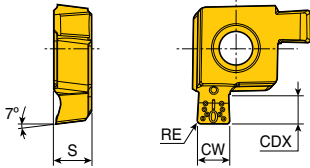
•: Standard items



# XCMT..R-GV



## Inserts



| Size | Dimension (mm) |     |      |     |
|------|----------------|-----|------|-----|
|      | CW             | CDX | S    | RE  |
| 05   | 2.0            | 1.8 | 2.27 | 0.2 |
| 06   | 2.0            | 2.0 | 2.62 | 0.2 |
| 07   | 2.5            | 2.0 | 3.42 | 0.2 |
| 08   | 2.5            | 2.5 | 3.50 | 0.2 |
| 10   | 3.0            | 3.0 | 4.37 | 0.3 |
| 13   | 3.5            | 3.5 | 5.24 | 0.3 |
| 17   | 4.0            | 4.0 | 6.06 | 0.4 |

- For grooving

| Insert | Designation              | Coated |        |        |        |        |        | Uncoated |  |
|--------|--------------------------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                          | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT7400 | K10      |  |
|        | <b>XCMT 05R-200020GV</b> | •      | •      |        |        |        |        |          |  |
|        | <b>06R-200020GV</b>      | •      | •      |        |        |        |        |          |  |
|        | <b>07R-250020GV</b>      | •      | •      |        |        |        |        |          |  |
|        | <b>08R-250020GV</b>      | •      | •      |        |        |        |        |          |  |
|        | <b>10R-300030GV</b>      | •      | •      |        |        |        |        |          |  |
|        | <b>13R-350030GV</b>      | •      | •      |        |        |        |        |          |  |
|        | <b>17R-400040GV</b>      | •      | •      |        |        |        |        |          |  |



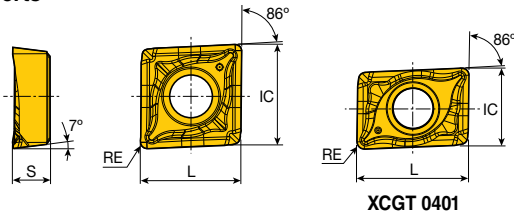
► Grooving insert is available only for right handed type

•: Standard items

# XCGT...TA



## Inserts



| Size | Dimension (mm) |      |      |     |
|------|----------------|------|------|-----|
|      | IC             | L    | S    | RE  |
| 04   | 4.4            | 6.4  | 1.70 | 0.4 |
| 05   | 5.6            | 5.6  | 2.10 | 0.4 |
| 06   | 6.4            | 6.4  | 2.38 | 0.4 |
| 07   | 7.5            | 7.5  | 3.18 | 0.4 |
| 08   | 8.4            | 8.4  | 3.18 | 0.4 |
| 10   | 10.5           | 10.5 | 3.97 | 0.4 |
| 13   | 13.4           | 13.4 | 4.76 | 0.4 |
| 17   | 17.5           | 17.5 | 5.56 | 0.8 |

- For aluminum alloy

| Insert                               | Designation            | Turning |               | Drilling      | Coated |        |        |        |        |        | Uncoated |  |
|--------------------------------------|------------------------|---------|---------------|---------------|--------|--------|--------|--------|--------|--------|----------|--|
|                                      |                        | ap (mm) | Feed (mm/rev) | Feed (mm/rev) | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT7400 | K10      |  |
| <br>Right-hand shown (XCGT 0401)<br> | <b>XCGT 040104R TA</b> | 0.2-1.8 | 0.02-0.15     | 0.02-0.09     |        |        |        |        |        |        | •        |  |
|                                      | <b>040104L TA</b>      | 0.2-1.8 | 0.02-0.15     | 0.02-0.09     |        |        |        |        |        |        | •        |  |
|                                      | <b>050204 TA</b>       | 0.2-2.2 | 0.03-0.18     | 0.02-0.11     |        |        |        |        |        |        | •        |  |
|                                      | <b>060204 TA</b>       | 0.3-2.5 | 0.03-0.20     | 0.03-0.12     |        |        |        |        |        |        | •        |  |
|                                      | <b>070304 TA</b>       | 0.4-2.8 | 0.05-0.22     | 0.03-0.13     |        |        |        |        |        |        | •        |  |
|                                      | <b>080304 TA</b>       | 0.4-3.2 | 0.06-0.25     | 0.03-0.13     |        |        |        |        |        |        | •        |  |
|                                      | <b>10T304 TA</b>       | 0.5-3.5 | 0.06-0.30     | 0.03-0.13     |        |        |        |        |        |        | •        |  |
|                                      | <b>130404 TA</b>       | 0.6-4.3 | 0.08-0.33     | 0.03-0.13     |        |        |        |        |        |        | •        |  |
|                                      | <b>170508 TA</b>       | 0.7-5.3 | 0.10-0.38     | 0.03-0.13     |        |        |        |        |        |        | •        |  |



•: Standard items





| Size      | Dimension (mm) |      |     |         |
|-----------|----------------|------|-----|---------|
|           | W <sub>1</sub> | INSL | S   | RE      |
| <b>06</b> | 6.0            | 8    | 3.0 | 0.4/0.8 |
| <b>08</b> | 7.5            | 10   | 4.0 | 0.4/0.8 |
| <b>09</b> | 9.0            | 10   | 4.0 | 0.4/0.8 |
| <b>11</b> | 11.0           | 10   | 4.0 | 0.4/0.8 |
| <b>13</b> | 13.0           | 10   | 4.0 | 0.4/0.8 |
|           |                |      |     |         |
|           |                |      |     |         |

[illegible]

- ▶ **\*\* -G -\*** : General chipbreaker type
- ▶ **\*\* -HF -\***: High feed chipbreaker type

●: Standard items





| Size      | Dimension (mm) |      |     |     |
|-----------|----------------|------|-----|-----|
|           | W <sub>1</sub> | INSL | S   | RE  |
| <b>06</b> | 5.5            | 8    | 3.0 | 0.8 |
| <b>07</b> | 6.5            | 10   | 4.0 | 0.8 |
| <b>08</b> | 8.0            | 10   | 4.0 | 0.8 |
| <b>10</b> | 10.0           | 10   | 4.0 | 0.8 |
| <b>13</b> | 12.5           | 10   | 4.0 | 0.8 |
|           |                |      |     |     |
|           |                |      |     |     |

[illegible]

- ▶ **\*\*G-\*** : General chipbreaker type
- ▶ **\*\*HF-\***: High feed chipbreaker type

●: Standard items



| Size      | Dimension (mm) |      |     |     |
|-----------|----------------|------|-----|-----|
|           | W <sub>1</sub> | INSL | S   | RE  |
| <b>06</b> | 5.5            | 8    | 3.0 | 0.4 |
| <b>07</b> | 6.5            | 10   | 4.0 | 0.4 |
| <b>08</b> | 8.0            | 10   | 4.0 | 0.4 |
| <b>10</b> | 10.0           | 10   | 4.0 | 0.4 |
| <b>13</b> | 12.5           | 10   | 4.0 | 0.4 |
|           |                |      |     |     |
|           |                |      |     |     |

[illegible]

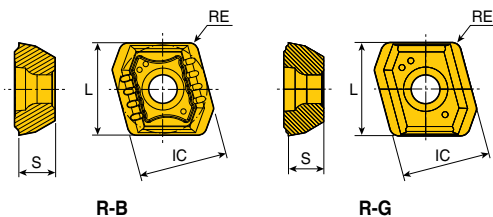
- ▶ **\*\*G-\*** : General chipbreaker type
- ▶ **\*\*HF-\***: High feed chipbreaker type

●: Standard items

# NPMX...R-B/R-G



Inserts for TBTA...3/5/7



| Size      | Dimension (mm) |      |      |     |
|-----------|----------------|------|------|-----|
|           | IC             | L    | S    | RE  |
| <b>08</b> | 8.0            | 8.36 | 3.18 | 0.8 |
|           |                |      |      |     |
|           |                |      |      |     |
|           |                |      |      |     |
|           |                |      |      |     |
|           |                |      |      |     |

| Insert                                                                            | Designation           | Pocket |       |       | Coated |        |        |        |        |        |        | Uncoated |  |
|-----------------------------------------------------------------------------------|-----------------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                   |                       | Center | Inner | Outer | TT9030 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030 | K10      |  |
|  | <b>NPMX 080308R-B</b> | ●      | ●     | ●     | ●      | ●      |        | ●      |        |        |        |          |  |
|                                                                                   | <b>080308R-G</b>      | ●      | ●     | ●     | ●      | ●      |        |        | ●      | ●      |        |          |  |
|                                                                                   |                       |        |       |       |        |        |        |        |        |        |        |          |  |



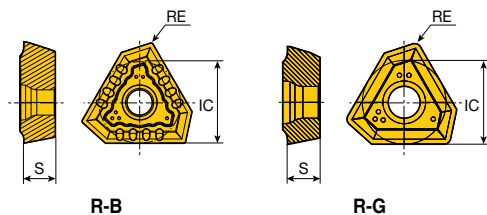
- ▶ G: General chipbreaker
- ▶ B: Good chip control for heat-resistant alloy

●: Standard items

# TPMX...R-B/R-G



Inserts for TBTA...3/5/7 & TBTA-R



| Size                  | Dimension (mm) |     |     |  |
|-----------------------|----------------|-----|-----|--|
|                       | IC             | S   | RE  |  |
| <b>140304 R-B</b>     | 8.45           | 3.5 | 0.4 |  |
| <b>140308 R-B/R-G</b> | 8.45           | 3.5 | 0.8 |  |
| <b>170404 R-B</b>     | 10.30          | 4.0 | 0.4 |  |
| <b>170408 R-B/R-G</b> | 10.30          | 4.0 | 0.8 |  |
| <b>240504 R-B</b>     | 14.20          | 5.5 | 0.4 |  |
| <b>240512 R-B/R-G</b> | 14.20          | 5.5 | 1.2 |  |
| <b>280708 R-B</b>     | 17.00          | 7.5 | 0.8 |  |
| <b>280716 R-B/R-G</b> | 17.00          | 7.5 | 1.6 |  |

| Insert                                                                              | Designation    | Pocket |       |       | Coated |        |        |        |        |        |        | Uncoated |     |  |
|-------------------------------------------------------------------------------------|----------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                     |                | Center | Inner | Outer | TT9030 | TT9130 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030   | K10 |  |
|  | TPMX 140304R-B | ●      | ●     | ●     | ●      |        | ●      |        | ●      |        |        | ●        |     |  |
|                                                                                     | 140308R-B      | ●      | ●     | ●     |        | ●      |        |        |        |        |        | ●        |     |  |
|                                                                                     | 140308R-G      | ●      | ●     | ●     | ●      | ●      | ●      | ●      |        | ●      | ●      | ●        |     |  |
|                                                                                     | 170404R-B      | ●      | ●     | ●     | ●      |        | ●      |        | ●      |        |        |          |     |  |
|                                                                                     | 170408R-B      | ●      | ●     | ●     |        | ●      |        |        |        |        |        | ●        |     |  |
|                                                                                     | 170408R-G      | ●      | ●     | ●     | ●      | ●      | ●      | ●      |        | ●      | ●      | ●        |     |  |
|                                                                                     | 240504R-B      | ●      | ●     | ●     | ●      |        | ●      |        | ●      |        |        |          |     |  |
|                                                                                     | 240512R-B      | ●      | ●     | ●     |        | ●      |        |        |        |        |        | ●        |     |  |
|                                                                                     | 240512R-G      | ●      | ●     | ●     | ●      | ●      | ●      | ●      |        | ●      | ●      | ●        |     |  |
|                                                                                     | 280708R-B      | ●      | ●     | ●     | ●      | ●      |        | ●      |        | ●      |        |          |     |  |
|                                                                                     | 280716R-B      | ●      | ●     | ●     |        | ●      |        |        |        |        |        | ●        |     |  |
|                                                                                     | 280716R-G      | ●      | ●     | ●     | ●      | ●      | ●      | ●      |        | ●      | ●      | ●        |     |  |



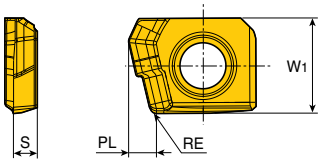
- ▶ G: General chipbreaker
- ▶ B: Good chip control for heat-resistant alloy

●: Standard items

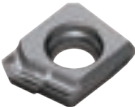
ZSGT



Inserts for TRGD



| Size | Dimension (mm) |     |     |     |
|------|----------------|-----|-----|-----|
|      | W1             | RE  | PL  | S   |
| 04   | 4.80           | 0.4 | 1.2 | 1.5 |
| 05   | 5.30           | 0.4 | 1.1 | 1.5 |
| 06   | 6.00           | 0.4 | 1.8 | 1.5 |
|      |                |     |     |     |
|      |                |     |     |     |
|      |                |     |     |     |
|      |                |     |     |     |

| Insert                                                                            | Designation    | Coated |        |        |        |        |        |        | Uncoated |     |
|-----------------------------------------------------------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                   |                | TT9030 | TT9130 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030   | K10 |
|  | ZSGT 040104 RS |        | ●      |        |        |        |        |        |          |     |
|                                                                                   | 050104 RS      |        | ●      |        |        |        |        |        |          |     |
|                                                                                   | 060204 RS      |        | ●      |        |        |        |        |        |          |     |
|                                                                                   |                |        |        |        |        |        |        |        |          |     |
|                                                                                   |                |        |        |        |        |        |        |        |          |     |

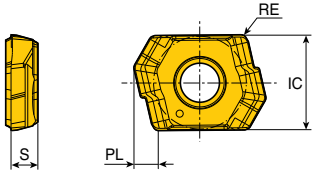


●: Standard items

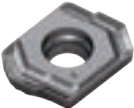
LOGT



Inserts for TRGD / TRGDL



| Size | Dimension (mm) |     |     |     |
|------|----------------|-----|-----|-----|
|      | IC             | RE  | PL  | S   |
| 06   | 7.00           | 0.4 | 1.8 | 2.0 |
|      |                |     |     |     |
|      |                |     |     |     |
|      |                |     |     |     |
|      |                |     |     |     |
|      |                |     |     |     |
|      |                |     |     |     |

| Insert                                                                              | Designation    | Coated |        |        |        |        |        |        | Uncoated |     |
|-------------------------------------------------------------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                     |                | TT9030 | TT9130 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030   | K10 |
|  | LOGT 060204 RS | ●      | ●      |        |        |        |        |        |          |     |
|                                                                                     |                |        |        |        |        |        |        |        |          |     |
|                                                                                     |                |        |        |        |        |        |        |        |          |     |
|                                                                                     |                |        |        |        |        |        |        |        |          |     |
|                                                                                     |                |        |        |        |        |        |        |        |          |     |



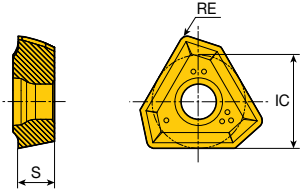
●: Standard items



TPMX...LG



Inserts for TBTA-R



| Size | Dimension (mm) |     |     |  |
|------|----------------|-----|-----|--|
|      | IC             | S   | RE  |  |
| 14   | 8.45           | 3.5 | 0.8 |  |
| 17   | 10.30          | 4.0 | 0.8 |  |
| 24   | 14.20          | 5.5 | 1.2 |  |
|      |                |     |     |  |
|      |                |     |     |  |
|      |                |     |     |  |
|      |                |     |     |  |

| Insert                                                                            | Designation    | Pocket |       |       | Coated |        |        |        |        |        |        | Uncoated |     |
|-----------------------------------------------------------------------------------|----------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                   |                | Center | Inner | Outer | TT9030 | TT9130 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030   | K10 |
|  | TPMX 140308 LG |        |       | ●     | ●      |        |        |        |        |        | ●      |          |     |
|                                                                                   | 170408 LG      |        |       | ●     | ●      | ●      |        |        |        | ●      | ●      |          |     |
|                                                                                   | 240512 LG      |        |       | ●     | ●      | ●      |        |        |        | ●      | ●      |          |     |
|                                                                                   |                |        |       |       |        |        |        |        |        |        |        |          |     |
|                                                                                   |                |        |       |       |        |        |        |        |        |        |        |          |     |

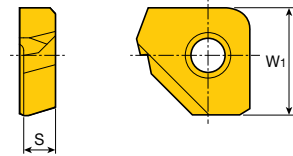


•: Standard items

XPMT...-45



Inserts for TBTA-R



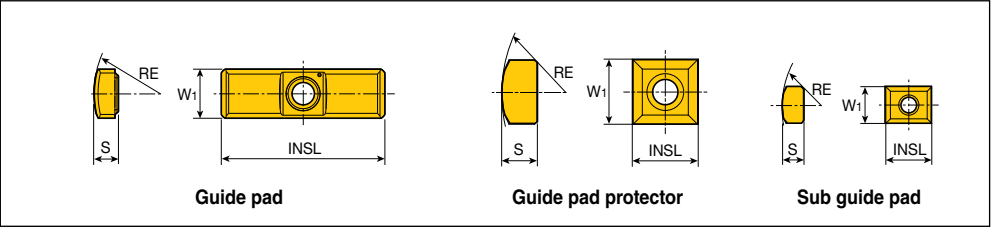
| Size | Dimension (mm) |      |  |  |
|------|----------------|------|--|--|
|      | W1             | S    |  |  |
| 16   | 9.5            | 2.70 |  |  |
|      |                |      |  |  |
|      |                |      |  |  |
|      |                |      |  |  |
|      |                |      |  |  |
|      |                |      |  |  |
|      |                |      |  |  |

| Insert | Designation   | Pocket |       |       | Coated |        |        |        |        |        |        | Uncoated |  |
|--------|---------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|        |               | Center | Inner | Outer | TT9030 | TT8125 | TT7100 | TT3500 | TT6020 | TT9300 | TT7400 | K10      |  |
|        | XPMT 16002-45 |        |       | •     | •      |        |        |        |        |        |        |          |  |
|        |               |        |       |       |        |        |        |        |        |        |        |          |  |
|        |               |        |       |       |        |        |        |        |        |        |        |          |  |
|        |               |        |       |       |        |        |        |        |        |        |        |          |  |
|        |               |        |       |       |        |        |        |        |        |        |        |          |  |



•: Standard items

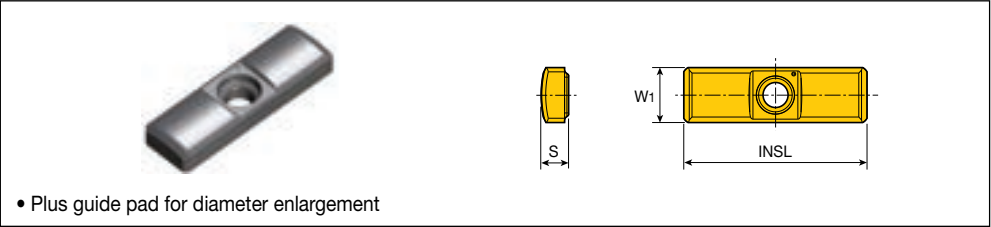
# Pad for TBTA 3.../5.../7...



| Designation         |                                | Dimension (mm) |     |      |      | Screw   |
|---------------------|--------------------------------|----------------|-----|------|------|---------|
|                     |                                | W1             | S   | INSL | RE   |         |
| Guide pad           | <b>PAD - GP08-25-155-DC-SB</b> | 8              | 4.5 | 25   | 15.5 | CSTB-3S |
|                     | <b>GP08-25-155-DC-SC</b>       | 8              | 4.5 | 25   | 15.5 | CSTB-3S |
|                     | <b>GP10-35-200-DC-SB</b>       | 10             | 6.0 | 35   | 20.0 | CSTB-4S |
|                     | <b>GP10-35-200-DC-SC</b>       | 10             | 6.0 | 35   | 20.0 | CSTB-4S |
|                     | <b>GP14-40-250-DC-SB/SC</b>    | 14             | 7.5 | 40   | 25.0 | CSTA-5S |
|                     | <b>GP18-40-300-DC-SB/SC</b>    | 18             | 9.0 | 40   | 30.0 | LS1206S |
| Guide pad protector | <b>PAD - P08</b>               | 8              | 4.5 | 8    | 17.5 | CSTB-3S |
|                     | <b>P10</b>                     | 10             | 6.0 | 10   | 20.0 | CSTB-4S |
|                     | <b>P14</b>                     | 14             | 7.5 | 14   | 25.0 | CSTA-5S |
|                     | <b>P18</b>                     | 18             | 9.0 | 18   | 30.0 | LS1206S |
| Sub guide pad       | <b>PAD - S08</b>               | 8              | 4.5 | 10   | 17.5 | CSTB-3S |
|                     | <b>S10</b>                     | 10             | 5.0 | 10   | 29.0 | CSTB-3S |
|                     | <b>S14</b>                     | 14             | 7.0 | 20   | 45.0 | CSTA-5S |



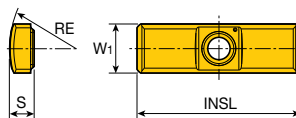
# Plus Guide Pad for TBTA 3.../5.../7...



- Plus guide pad for diameter enlargement

| Designation |               |     |               |     |               |      |               |      |
|-------------|---------------|-----|---------------|-----|---------------|------|---------------|------|
| DC          | PAD-GC08      | S   | PAD-GC10      | S   | PAD-GC14      | S    | PAD-GC18      | S    |
| DC+1mm      | PAD-GC08-DC+1 | 5.0 | PAD-GC10-DC+1 | 6.5 | PAD-GC14-DC+1 | 8.0  | PAD-GC18-DC+1 | 9.5  |
| DC+2mm      | PAD-GC08-DC+2 | 5.5 | PAD-GC10-DC+2 | 7.0 | PAD-GC14-DC+2 | 8.5  | PAD-GC18-DC+2 | 10.0 |
| DC+3mm      | PAD-GC08-DC+3 | 6.0 | PAD-GC10-DC+3 | 7.5 | PAD-GC14-DC+3 | 9.0  | PAD-GC18-DC+3 | 10.5 |
| DC+4mm      | -             | -   | PAD-GC10-DC+4 | 8.0 | PAD-GC14-DC+4 | 9.5  | PAD-GC18-DC+4 | 11.0 |
| DC+5mm      | -             | -   | -             | -   | PAD-GC14-DC+5 | 10.0 | PAD-GC18-DC+5 | 11.5 |





## Guide pad

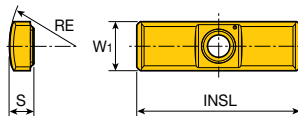


D164-D169



**TDEEP**

**Fig.1**



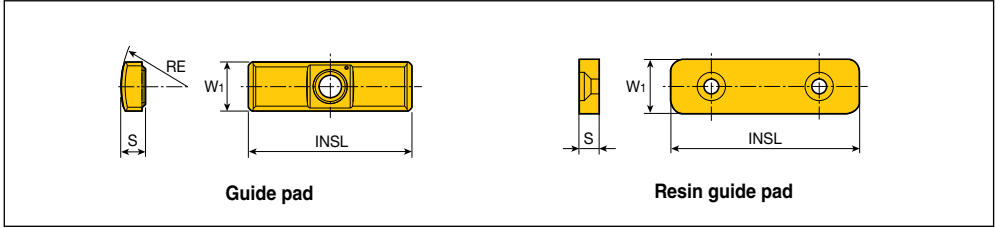
**Fig.2**

▶ SB: First choice for general purpose  
 ▶ SC: First choice when using water-soluble coolant

**ADVANCE e CUTTING**  
 Tooling

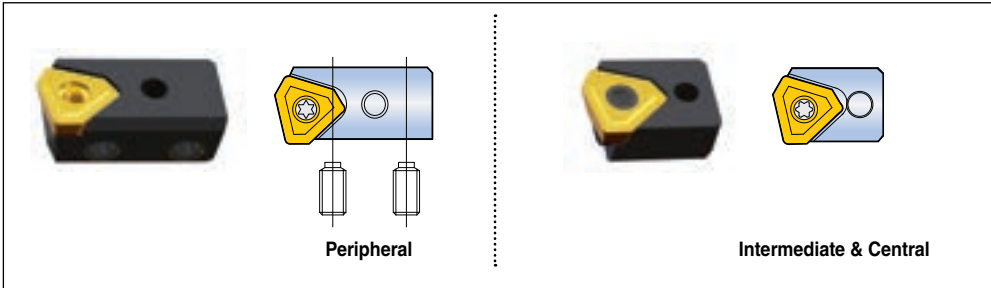
**TDEEP**

SHIMSET-GP06

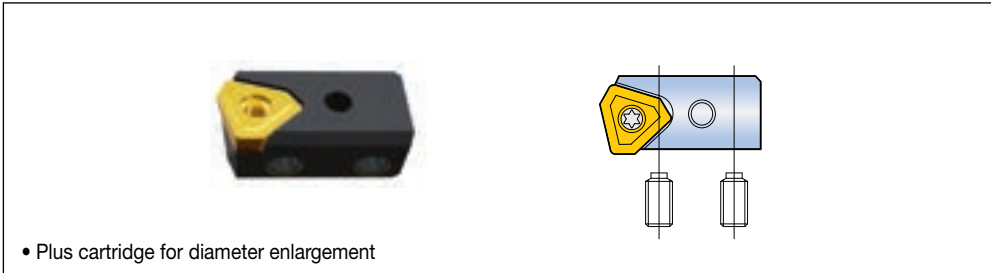


| Designation     |                                | Dimension (mm) |      |      |      | Screw      |
|-----------------|--------------------------------|----------------|------|------|------|------------|
|                 |                                | W1             | S    | INSL | RE   |            |
| Guide pad       | <b>PAD - GP08-25-155-DC-SB</b> | 8              | 4.5  | 25   | 15.5 | CSTB-3S    |
|                 | <b>GP08-25-155-DC-SC</b>       | 8              | 4.5  | 25   | 15.5 | CSTB-3S    |
|                 | <b>GP10-35-200-DC-SB</b>       | 10             | 6.0  | 35   | 20.0 | CSTB-4S    |
|                 | <b>GP10-35-200-DC-SC</b>       | 10             | 6.0  | 35   | 20.0 | CSTB-4S    |
|                 | <b>GP14-40-250-DC-SB</b>       | 14             | 7.5  | 40   | 25.0 | CSTA-5S    |
|                 | <b>GP14-40-250-DC-SC</b>       | 14             | 7.5  | 40   | 25.0 | CSTA-5S    |
|                 | <b>GP18-40-300-DC-SB</b>       | 18             | 9.0  | 40   | 30.0 | LS1206S    |
|                 | <b>GP18-40-300-DC-SC</b>       | 18             | 9.0  | 40   | 30.0 | LS1206S    |
| Resin guide pad | <b>PAD - R10</b>               | 10             | 4.0  | 40   | -    | LS0902.5-6 |
|                 | <b>R12</b>                     | 12             | 5.0  | 45   | -    | LS0903-8   |
|                 | <b>R15</b>                     | 15             | 5.8  | 50   | -    | LS0904-10  |
|                 | <b>R20</b>                     | 20             | 7.5  | 70   | -    | LS0905-12  |
|                 | <b>R30</b>                     | 30             | 12.5 | 80   | -    | LS0906-15  |
|                 | <b>R35</b>                     | 35             | 15.5 | 100  | -    | LS0906-15  |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |
|                 |                                |                |      |      |      |            |





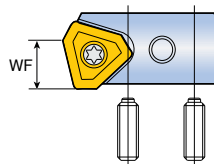
| Designation            |                 | Adjust screw | Wrench | Lock screw | Wrench | Insert     |
|------------------------|-----------------|--------------|--------|------------|--------|------------|
| Peripheral             | <b>PERC 05R</b> | AS0003-5     | H1.5   | LS1803RH   | H2     | NPMX0803.. |
|                        | <b>402-04</b>   | AS0004-8     | H2     | LS1803.5RH | H2.5   | TPMX1403.. |
|                        | <b>402-32</b>   | AS0005-10    | H2.5   | LS1805RH   | H3     | TPMX1704.. |
|                        | <b>402-43</b>   | AS0005-15    | H2.5   | LS1806RH   | H4     | TPMX2405.. |
|                        | <b>402-63</b>   | AS0006-15    | H3     | LS1806RH   | H4     | TPMX2807.. |
| Intermediate & central | <b>CENC 05R</b> | -            | -      | CSTB-3     | T9     | NPMX0803.. |
|                        | <b>402-04</b>   | -            | -      | CSTB-3.5   | T15    | TPMX1403.. |
|                        | <b>402-32</b>   | -            | -      | CSTA-5     | T15    | TPMX1704.. |
|                        | <b>402-43</b>   | -            | -      | LS1206     | H3     | TPMX2405.. |
|                        | <b>402-63</b>   | -            | -      | LS1206     | H3     | TPMX2807.. |



| Designation        |                      |                      |                      |                      |                      |
|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| DC                 | DC+1mm               | DC+2mm               | DC+3mm               | DC+4mm               | DC+5mm               |
| <b>PERC 05R</b>    | <b>PERC 05R+1</b>    | <b>PERC 05R+2</b>    | -                    | -                    | -                    |
| <b>PERC 402-04</b> | <b>PERC 402-04+1</b> | <b>PERC 402-04+2</b> | <b>PERC 402-04+3</b> | -                    | -                    |
| <b>PERC 402-32</b> | <b>PERC 402-32+1</b> | <b>PERC 402-32+2</b> | <b>PERC 402-32+3</b> | <b>PERC 402-32+4</b> | -                    |
| <b>PERC 402-43</b> | <b>PERC 402-43+1</b> | <b>PERC 402-43+2</b> | <b>PERC 402-43+3</b> | <b>PERC 402-43+4</b> | <b>PERC 402-43+5</b> |
| <b>PERC 402-63</b> | <b>PERC 402-63+1</b> | <b>PERC 402-63+2</b> | <b>PERC 402-63+3</b> | <b>PERC 402-63+4</b> | <b>PERC 402-63+5</b> |



**TDEEP**



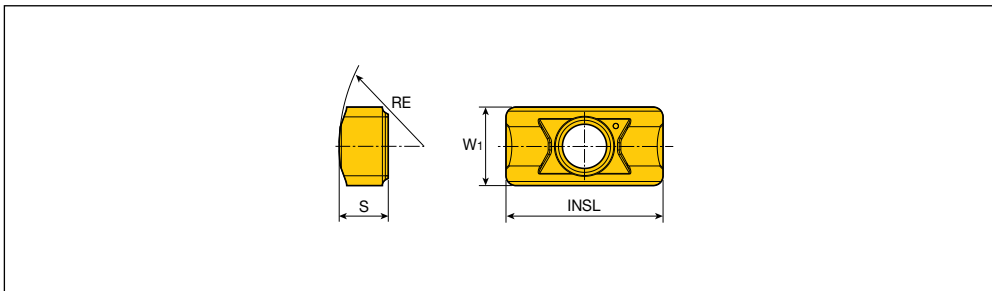
## Open tolerance applications



D170-D175

**ADVANCECUTTING**  
TaeguTec

**MODURDRILL**  
MODULAR RUSH




 ▶ Guide pad is sold separately from drill heads
 ●: Standard items



# Recommended Cutting Conditions



## Machining data for TOP-DRILL 2,3,4xD

| ISO         | Material                                                                    |                              | Condition             | Tensile strength<br>(N/mm²) | Hardness<br>HB | Material<br>No. | Cutting<br>speed<br>Vc (m/min) |
|-------------|-----------------------------------------------------------------------------|------------------------------|-----------------------|-----------------------------|----------------|-----------------|--------------------------------|
| P           | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C                      | Annealed              | 420                         | 125            | 1               | 220-350                        |
|             |                                                                             | >=0.25%C                     | Annealed              | 650                         | 190            | 2               | 180-280                        |
|             |                                                                             | <0.55%C                      | Quenched and tempered | 850                         | 250            | 3               | 140-240                        |
|             |                                                                             | >=0.55%C                     | Annealed              | 750                         | 220            | 4               | 140-240                        |
|             |                                                                             |                              | Quenched and tempered | 1000                        | 300            | 5               | 140-240                        |
|             | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                              | Annealed              | 600                         | 200            | 6               | 140-240                        |
|             |                                                                             |                              | Quenched and tempered | 930                         | 275            | 7               | 100-180                        |
|             |                                                                             |                              |                       | 1000                        | 300            | 8               | 100-180                        |
|             |                                                                             |                              |                       | 1200                        | 350            | 9               | 100-180                        |
|             | High alloy steel, cast steel<br>and tool steel                              |                              | Annealed              | 680                         | 200            | 10              | 140-200                        |
|             |                                                                             |                              | Quenched and tempered | 1100                        | 325            | 11              | 100-160                        |
| M           | Stainless steel<br>and cast steel                                           | Ferritic / martensitic       | 680                   | 200                         | 12             | 150-250         |                                |
|             |                                                                             | Martensitic                  | 820                   | 240                         | 13             | 150-250         |                                |
|             |                                                                             | Austenitic                   | 600                   | 180                         | 14             | 150-250         |                                |
| K           | Gray cast iron<br>(GG)                                                      | Ferritic                     |                       | 160                         | 15             | 160-260         |                                |
|             |                                                                             | Pearlitic                    |                       | 250                         | 16             | 160-260         |                                |
|             | Cast iron nodular<br>(GGG)                                                  | Ferritic                     |                       | 180                         | 17             | 160-260         |                                |
|             |                                                                             | Pearlitic                    |                       | 260                         | 18             | 160-260         |                                |
|             | Malleable cast iron                                                         | Ferritic                     |                       | 130                         | 19             | 120-220         |                                |
| Pearlitic   |                                                                             |                              | 230                   | 20                          | 120-220        |                 |                                |
| N           | Aluminum - Wrought alloy                                                    | Not cureable                 |                       | 60                          | 21             | 200-350         |                                |
|             |                                                                             | Cured                        |                       | 100                         | 22             | 200-350         |                                |
|             | Aluminum-<br>cast, alloyed                                                  | <=12% Si                     | Not cureable          |                             | 75             | 23              | 200-350                        |
|             |                                                                             |                              | Cured                 |                             | 90             | 24              | 200-350                        |
|             |                                                                             | >12% Si                      | High temp.            |                             | 130            | 25              | 200-350                        |
|             | Copper alloys                                                               | >1% Pb                       | Free cutting          |                             | 110            | 26              | 150-250                        |
|             |                                                                             |                              | Brass                 |                             | 90             | 27              | 150-250                        |
|             |                                                                             |                              | Electrolitic copper   |                             | 100            | 28              | 150-250                        |
|             | Non-metallic                                                                | Duroplastics, fiber plastics |                       | 70 Shore D                  | 29             | 150-250         |                                |
| Hard rubber |                                                                             |                              | 55 Shore D            | 30                          | 150-250        |                 |                                |
| S           | High temp.<br>alloys                                                        | Fe based                     | Annealed              |                             | 200            | 31              | 30-60                          |
|             |                                                                             |                              | Cured                 |                             | 280            | 32              | 30-60                          |
|             |                                                                             | Ni or<br>Co based            | Annealed              |                             | 250            | 33              | 30-60                          |
|             |                                                                             |                              | Cured                 |                             | 350            | 34              | 30-60                          |
|             |                                                                             |                              | Cast                  |                             | 320            | 35              | 30-60                          |
|             | Titanium,Ti alloys                                                          | Pure                         | Rm 400                | 190                         | 36             | 50-80           |                                |
|             |                                                                             | Alpha+beta alloys cured      | Rm 1050               | 310                         | 37             | 50-80           |                                |
| H           | Hardened steel                                                              | Hardened                     |                       | 55HRC                       | 38             | 30-60           |                                |
|             |                                                                             | Hardened                     |                       | 60HRC                       | 39             | 30-60           |                                |
|             | Chilled cast iron                                                           | Cast                         |                       | 400                         | 40             | 30-60           |                                |
|             | Cast iron nodular                                                           | Hardened                     |                       | 55HRC                       | 41             | 30-60           |                                |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



Machining data for TOP-DRILL 2,3,4xD

| Feed (mm/rev) vs. drill diameter<br>Drill length 2,3,4xD |                      |                      |                      |                      |                      |                      |                      |                      |
|----------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SOMT 04<br>Ø12 - Ø13.5                                   | SOMT 05<br>Ø14 - Ø16 | SOMT 06<br>Ø17 - Ø19 | SOMT 07<br>Ø20 - Ø22 | SOMT 08<br>Ø23 - Ø26 | SOMT 09<br>Ø27 - Ø31 | SOMT 11<br>Ø32 - Ø36 | SOMT 13<br>Ø37 - Ø43 | SOMT 15<br>Ø44 - Ø50 |
| 0.04-0.06                                                | 0.04-0.06            | 0.04-0.06            | 0.04-0.08            | 0.04-0.08            | 0.06-0.10            | 0.06-0.10            | 0.08-0.12            | 0.08-0.12            |
| 0.06-0.10                                                | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            | 0.08-0.14            | 0.08-0.14            | 0.08-0.16            | 0.10-0.16            |
| 0.08-0.12                                                | 0.08-0.12            | 0.08-0.12            | 0.08-0.16            | 0.08-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.18            | 0.10-0.18            |
| 0.08-0.12                                                | 0.08-0.12            | 0.08-0.12            | 0.08-0.16            | 0.08-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.18            | 0.10-0.18            |
| 0.08-0.12                                                | 0.08-0.12            | 0.08-0.12            | 0.08-0.16            | 0.08-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.16                                                | 0.06-0.16            | 0.06-0.16            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.10-0.22            | 0.10-0.22            | 0.10-0.24            |
| 0.06-0.16                                                | 0.06-0.16            | 0.06-0.16            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.22            | 0.10-0.22            | 0.10-0.22            |
| 0.06-0.16                                                | 0.06-0.16            | 0.06-0.16            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.22            | 0.10-0.22            | 0.10-0.22            |
| 0.06-0.16                                                | 0.06-0.16            | 0.06-0.16            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.22            | 0.10-0.22            | 0.10-0.22            |
| 0.06-0.12                                                | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.08-0.20            | 0.10-0.20            | 0.10-0.20            |
| 0.06-0.12                                                | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.08-0.20            | 0.10-0.20            | 0.10-0.20            |
| 0.06-0.12                                                | 0.06-0.12            | 0.06-0.12            | 0.06-0.16            | 0.06-0.16            | 0.08-0.18            | 0.08-0.20            | 0.10-0.20            | 0.10-0.20            |
| 0.06-0.12                                                | 0.06-0.12            | 0.06-0.12            | 0.06-0.16            | 0.06-0.16            | 0.08-0.18            | 0.08-0.20            | 0.10-0.20            | 0.10-0.20            |
| 0.06-0.12                                                | 0.06-0.12            | 0.06-0.12            | 0.06-0.16            | 0.06-0.16            | 0.08-0.18            | 0.08-0.20            | 0.10-0.20            | 0.10-0.20            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.10-0.20            | 0.10-0.20            | 0.10-0.20            | 0.10-0.20            | 0.10-0.22            | 0.10-0.22            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.10-0.20            | 0.10-0.20            | 0.10-0.20            | 0.10-0.20            | 0.10-0.22            | 0.10-0.22            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.10-0.20            | 0.10-0.20            | 0.10-0.20            | 0.10-0.20            | 0.10-0.22            | 0.10-0.22            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.10-0.20            | 0.10-0.20            | 0.10-0.20            | 0.10-0.20            | 0.10-0.22            | 0.10-0.22            |
| 0.08-0.14                                                | 0.08-0.14            | 0.08-0.14            | 0.10-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.08-0.14                                                | 0.08-0.14            | 0.08-0.14            | 0.10-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.08-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.08-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.08-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.08-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.08-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.08-0.17            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.08-0.17            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.08-0.17            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            | 0.10-0.18            | 0.10-0.18            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            |
| 0.06-0.09                                                | 0.06-0.09            | 0.06-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.09                                                | 0.06-0.09            | 0.06-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.09                                                | 0.05-0.09            | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.09                                                | 0.05-0.09            | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.09                                                | 0.05-0.09            | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |



# Recommended Cutting Conditions



## Machining data for TOP-DRILL 5xD

| ISO         | Material                                                           |                              | Condition             | Tensile strength (N/mm²) | Hardness HB | Material No. | Cutting speed Vc (m/min) |
|-------------|--------------------------------------------------------------------|------------------------------|-----------------------|--------------------------|-------------|--------------|--------------------------|
| P           | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                      | Annealed              | 420                      | 125         | 1            | 220-350                  |
|             |                                                                    | >=0.25%C                     | Annealed              | 650                      | 190         | 2            | 180-280                  |
|             |                                                                    | <0.55%C                      | Quenched and tempered | 850                      | 250         | 3            | 140-240                  |
|             |                                                                    | >=0.55%C                     | Annealed              | 750                      | 220         | 4            | 140-240                  |
|             |                                                                    |                              | Quenched and tempered | 1000                     | 300         | 5            | 140-240                  |
|             | Low alloy steel and cast steel (Less than 5% of alloying elements) |                              | Annealed              | 600                      | 200         | 6            | 140-240                  |
|             |                                                                    |                              | Quenched and tempered | 930                      | 275         | 7            | 100-180                  |
|             |                                                                    |                              |                       | 1000                     | 300         | 8            | 100-180                  |
|             |                                                                    |                              |                       | 1200                     | 350         | 9            | 100-180                  |
|             | High alloy steel, cast steel and tool steel                        |                              | Annealed              | 680                      | 200         | 10           | 140-200                  |
|             |                                                                    |                              | Quenched and tempered | 1100                     | 325         | 11           | 100-160                  |
| M           | Stainless steel and cast steel                                     | Ferritic / martensitic       | 680                   | 200                      | 12          | 150-250      |                          |
|             |                                                                    | Martensitic                  | 820                   | 240                      | 13          | 150-250      |                          |
|             |                                                                    | Austenitic                   | 600                   | 180                      | 14          | 150-250      |                          |
| K           | Gray cast iron (GG)                                                | Ferritic                     |                       | 160                      | 15          | 160-260      |                          |
|             |                                                                    | Pearlitic                    |                       | 250                      | 16          | 160-260      |                          |
|             | Cast iron nodular (GGG)                                            | Ferritic                     |                       | 180                      | 17          | 160-260      |                          |
|             |                                                                    | Pearlitic                    |                       | 260                      | 18          | 160-260      |                          |
|             | Malleable cast iron                                                | Ferritic                     |                       | 130                      | 19          | 120-220      |                          |
| Pearlitic   |                                                                    |                              | 230                   | 20                       | 120-220     |              |                          |
| N           | Aluminum - Wrought alloy                                           | Not cureable                 |                       | 60                       | 21          | 200-350      |                          |
|             |                                                                    | Cured                        |                       | 100                      | 22          | 200-350      |                          |
|             | Aluminum-cast, alloyed                                             | <=12% Si                     | Not cureable          |                          | 75          | 23           | 200-350                  |
|             |                                                                    |                              | Cured                 |                          | 90          | 24           | 200-350                  |
|             |                                                                    | >12% Si                      | High temp.            |                          | 130         | 25           | 200-350                  |
|             | Copper alloys                                                      | >1% Pb                       | Free cutting          |                          | 110         | 26           | 150-250                  |
|             |                                                                    |                              | Brass                 |                          | 90          | 27           | 150-250                  |
|             |                                                                    |                              | Electrolitic copper   |                          | 100         | 28           | 150-250                  |
|             | Non-metallic                                                       | Duroplastics, fiber plastics |                       | 70 Shore D               | 29          | 150-250      |                          |
| Hard rubber |                                                                    |                              | 55 Shore D            | 30                       | 150-250     |              |                          |
| S           | High temp. alloys                                                  | Fe based                     | Annealed              |                          | 200         | 31           | 30-60                    |
|             |                                                                    |                              | Cured                 |                          | 280         | 32           | 30-60                    |
|             |                                                                    | Ni or Co based               | Annealed              |                          | 250         | 33           | 30-60                    |
|             |                                                                    |                              | Cured                 |                          | 350         | 34           | 30-60                    |
|             |                                                                    |                              | Cast                  |                          | 320         | 35           | 30-60                    |
|             | Titanium, Ti alloys                                                | Pure                         | Rm 400                | 190                      | 36          | 50-80        |                          |
|             |                                                                    | Alpha+beta alloys cured      | Rm 1050               | 310                      | 37          | 50-80        |                          |
| H           | Hardened steel                                                     | Hardened                     |                       | 55HRC                    | 38          | 30-60        |                          |
|             |                                                                    | Hardened                     |                       | 60HRC                    | 39          | 30-60        |                          |
|             | Chilled cast iron                                                  | Cast                         |                       | 400                      | 40          | 30-60        |                          |
|             | Cast iron nodular                                                  | Hardened                     |                       | 55HRC                    | 41          | 30-60        |                          |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for TOP-DRILL 5xD

| Feed (mm/rev) vs. drill diameter<br>Drill length 5xD |                      |                      |                      |                      |                      |                      |                      |                      |
|------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SOMT 04<br>Ø12 - Ø13.5                               | SOMT 05<br>Ø14 - Ø16 | SOMT 06<br>Ø17 - Ø19 | SOMT 07<br>Ø20 - Ø22 | SOMT 08<br>Ø23 - Ø26 | SOMT 09<br>Ø27 - Ø31 | SOMT 11<br>Ø32 - Ø36 | SOMT 13<br>Ø37 - Ø43 | SOMT 15<br>Ø44 - Ø50 |
| 0.04-0.05                                            | 0.04-0.05            | 0.04-0.05            | 0.04-0.05            | 0.04-0.06            | 0.06-0.08            | 0.06-0.08            | 0.08-0.10            | 0.08-0.10            |
| 0.06-0.08                                            | 0.06-0.08            | 0.06-0.08            | 0.06-0.10            | 0.06-0.10            | 0.08-0.12            | 0.08-0.12            | 0.08-0.14            | 0.10-0.14            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            | 0.10-0.15            | 0.10-0.15            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            | 0.10-0.15            | 0.10-0.15            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            | 0.10-0.15            | 0.10-0.15            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.12                                            | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.10-0.20            | 0.10-0.20            | 0.10-0.22            |
| 0.06-0.12                                            | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.10-0.20            | 0.10-0.20            | 0.10-0.22            |
| 0.06-0.12                                            | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.10-0.20            | 0.10-0.20            | 0.10-0.22            |
| 0.06-0.12                                            | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.16            | 0.08-0.18            | 0.10-0.20            | 0.10-0.20            | 0.10-0.22            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.08-0.12            | 0.08-0.12            | 0.08-0.16            | 0.08-0.18            | 0.10-0.18            | 0.10-0.20            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.08-0.12            | 0.08-0.12            | 0.08-0.16            | 0.08-0.18            | 0.10-0.18            | 0.10-0.20            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.18            | 0.10-0.18            | 0.10-0.20            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.18            | 0.10-0.18            | 0.10-0.20            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.12            | 0.06-0.12            | 0.08-0.16            | 0.08-0.18            | 0.10-0.18            | 0.10-0.20            |
| 0.08-0.14                                            | 0.08-0.14            | 0.08-0.14            | 0.08-0.16            | 0.08-0.16            | 0.10-0.18            | 0.10-0.18            | 0.10-0.20            | 0.10-0.20            |
| 0.08-0.14                                            | 0.08-0.14            | 0.08-0.14            | 0.08-0.16            | 0.08-0.16            | 0.10-0.18            | 0.10-0.18            | 0.10-0.20            | 0.10-0.20            |
| 0.08-0.14                                            | 0.08-0.14            | 0.08-0.14            | 0.08-0.16            | 0.08-0.16            | 0.10-0.18            | 0.10-0.18            | 0.10-0.20            | 0.10-0.20            |
| 0.08-0.14                                            | 0.08-0.14            | 0.08-0.14            | 0.08-0.16            | 0.08-0.16            | 0.10-0.18            | 0.10-0.18            | 0.10-0.20            | 0.10-0.20            |
| 0.08-0.12                                            | 0.08-0.12            | 0.08-0.14            | 0.08-0.16            | 0.08-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.16            |
| 0.08-0.12                                            | 0.08-0.12            | 0.08-0.14            | 0.08-0.16            | 0.08-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.16            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.15            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.15            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.08-0.15            | 0.08-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.06-0.15                                            | 0.06-0.15            | 0.06-0.15            | 0.08-0.16            | 0.08-0.16            | 0.10-0.16            | 0.10-0.16            | 0.10-0.17            | 0.10-0.17            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.06-0.09            | 0.06-0.09            | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.06-0.09            | 0.06-0.09            | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.06-0.09            | 0.06-0.09            | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.06-0.09            | 0.06-0.09            | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.08            | 0.06-0.09            | 0.06-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.08            | 0.06-0.09            | 0.06-0.09            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |

# Recommended Cutting Conditions



## Machining data for TOP-DRILL cartridge

| ISO         | Material                                                           |                              | Condition             | Tensile strength (N/mm²) | Hardness HB | Material No. | Cutting speed Vc (m/min) |
|-------------|--------------------------------------------------------------------|------------------------------|-----------------------|--------------------------|-------------|--------------|--------------------------|
| P           | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                      | Annealed              | 420                      | 125         | 1            | 250-350                  |
|             |                                                                    | >=0.25%C                     | Annealed              | 650                      | 190         | 2            | 160-250                  |
|             |                                                                    | <0.55%C                      | Quenched and tempered | 850                      | 250         | 3            | 140-240                  |
|             |                                                                    | >=0.55%C                     | Annealed              | 750                      | 220         | 4            | 140-240                  |
|             |                                                                    |                              | Quenched and tempered | 1000                     | 300         | 5            | 140-240                  |
|             | Low alloy steel and cast steel (Less than 5% of alloying elements) |                              | Annealed              | 600                      | 200         | 6            | 140-240                  |
|             |                                                                    |                              | Quenched and tempered | 930                      | 275         | 7            | 100-180                  |
|             |                                                                    |                              |                       | 1000                     | 300         | 8            | 100-180                  |
|             |                                                                    |                              |                       | 1200                     | 350         | 9            | 100-180                  |
|             | High alloy steel, cast steel and tool steel                        |                              | Annealed              | 680                      | 200         | 10           | 140-200                  |
|             |                                                                    |                              | Quenched and tempered | 1100                     | 325         | 11           | 100-160                  |
| M           | Stainless steel and cast steel                                     | Ferritic / martensitic       | 680                   | 200                      | 12          | 150-250      |                          |
|             |                                                                    | Martensitic                  | 820                   | 240                      | 13          | 150-250      |                          |
|             |                                                                    | Austenitic                   | 600                   | 180                      | 14          | 150-250      |                          |
| K           | Gray cast iron (GG)                                                | Ferritic                     |                       | 160                      | 15          | 160-260      |                          |
|             |                                                                    | Pearlitic                    |                       | 250                      | 16          | 160-260      |                          |
|             | Cast iron nodular (GGG)                                            | Ferritic                     |                       | 180                      | 17          | 160-260      |                          |
|             |                                                                    | Pearlitic                    |                       | 260                      | 18          | 160-260      |                          |
|             | Malleable cast iron                                                | Ferritic                     |                       | 130                      | 19          | 120-220      |                          |
| Pearlitic   |                                                                    |                              | 230                   | 20                       | 120-220     |              |                          |
| N           | Aluminum - Wrought alloy                                           | Not cureable                 |                       | 60                       | 21          | 200-350      |                          |
|             |                                                                    | Cured                        |                       | 100                      | 22          | 200-350      |                          |
|             | Aluminum-cast, alloyed                                             | <=12% Si                     | Not cureable          |                          | 75          | 23           | 200-350                  |
|             |                                                                    |                              | Cured                 |                          | 90          | 24           | 200-350                  |
|             |                                                                    | >12% Si                      | High temp.            |                          | 130         | 25           | 200-350                  |
|             | Copper alloys                                                      | >1% Pb                       | Free cutting          |                          | 110         | 26           | 150-250                  |
|             |                                                                    |                              | Brass                 |                          | 90          | 27           | 150-250                  |
|             |                                                                    |                              | Electrolitic copper   |                          | 100         | 28           | 150-250                  |
|             | Non-metallic                                                       | Duroplastics, fiber plastics |                       | 70 Shore D               | 29          | 150-250      |                          |
| Hard rubber |                                                                    |                              | 55 Shore D            | 30                       | 150-250     |              |                          |
| S           | High temp. alloys                                                  | Fe based                     | Annealed              |                          | 200         | 31           | 30-60                    |
|             |                                                                    |                              | Cured                 |                          | 280         | 32           | 30-60                    |
|             |                                                                    | Ni or Co based               | Annealed              |                          | 250         | 33           | 30-60                    |
|             |                                                                    |                              | Cured                 |                          | 350         | 34           | 30-60                    |
|             |                                                                    |                              | Cast                  |                          | 320         | 35           | 30-60                    |
|             | Titanium, Ti alloys                                                | Pure                         | Rm 400                | 190                      | 36          | 50-80        |                          |
|             |                                                                    | Alpha+beta alloys cured      | Rm 1050               | 310                      | 37          | 50-80        |                          |
| H           | Hardened steel                                                     | Hardened                     |                       | 55HRC                    | 38          | 30-60        |                          |
|             |                                                                    | Hardened                     |                       | 60HRC                    | 39          | 30-60        |                          |
|             | Chilled cast iron                                                  | Cast                         |                       | 400                      | 40          | 30-60        |                          |
|             | Cast iron nodular                                                  | Hardened                     |                       | 55HRC                    | 41          | 30-60        |                          |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



Machining data for TOP-DRILL cartridge

| Feed (mm/rev) vs. drill diameter<br>Drill length 2,3,4xD |                      |                      |                      |                      |                      |
|----------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SOMT 09<br>Ø51 - Ø55                                     | SOMT 11<br>Ø56 - Ø60 | SOMT 11<br>Ø61 - Ø65 | SOMT 11<br>Ø66 - Ø70 | SOMT 13<br>Ø71 - Ø75 | SOMT 13<br>Ø76 - Ø80 |
| 0.06-0.12                                                | 0.06-0.12            | 0.06-0.12            | 0.06-0.12            | 0.06-0.12            | 0.06-0.12            |
| 0.06-0.16                                                | 0.06-0.16            | 0.06-0.16            | 0.06-0.16            | 0.06-0.16            | 0.06-0.16            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.20                                                | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            |
| 0.08-0.20                                                | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            |
| 0.08-0.20                                                | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            |
| 0.08-0.20                                                | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            |
| 0.08-0.20                                                | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            | 0.08-0.20            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                                | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.10-0.22                                                | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            |
| 0.10-0.22                                                | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            |
| 0.10-0.22                                                | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            |
| 0.10-0.22                                                | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            | 0.10-0.22            |
| 0.10-0.18                                                | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.10-0.18                                                | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.18                                                | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            |
| 0.06-0.18                                                | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            |
| 0.06-0.18                                                | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            |
| 0.06-0.18                                                | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            |
| 0.06-0.18                                                | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18            |
| 0.10-0.18                                                | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.10-0.18                                                | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.10-0.18                                                | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.10-0.18                                                | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.10                                                | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                                | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                                | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                                | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                                | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                                | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                                | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.10                                                | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.10                                                | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.10                                                | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.10                                                | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |

# Recommended Cutting Conditions



## Machining data for T-DRILL 2,3,4xD

| ISO                     | Material                                                           |                              | Condition             | Tensile strength (N/mm²) | Hardness HB | Material No. | Cutting speed Vc (m/min) |         |
|-------------------------|--------------------------------------------------------------------|------------------------------|-----------------------|--------------------------|-------------|--------------|--------------------------|---------|
| P                       | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                      | Annealed              | 420                      | 125         | 1            | 250-350                  |         |
|                         |                                                                    | >=0.25%C                     | Annealed              | 650                      | 190         | 2            | 180-250                  |         |
|                         |                                                                    | <0.55%C                      | Quenched and tempered | 850                      | 250         | 3            | 160-220                  |         |
|                         |                                                                    | >=0.55%C                     | Annealed              | 750                      | 220         | 4            | 160-220                  |         |
|                         |                                                                    |                              | Quenched and tempered | 1000                     | 300         | 5            | 160-220                  |         |
|                         | Low alloy steel and cast steel (Less than 5% of alloying elements) |                              | Annealed              | 600                      | 200         | 6            | 150-220                  |         |
|                         |                                                                    |                              | Quenched and tempered |                          | 930         | 275          | 7                        | 120-160 |
|                         |                                                                    |                              |                       |                          | 1000        | 300          | 8                        | 120-160 |
|                         |                                                                    |                              |                       |                          | 1200        | 350          | 9                        | 120-160 |
|                         | High alloy steel, cast steel and tool steel                        |                              | Annealed              | 680                      | 200         | 10           | 140-180                  |         |
|                         |                                                                    |                              | Quenched and tempered | 1100                     | 325         | 11           | 130-180                  |         |
| M                       | Stainless steel and cast steel                                     | Ferritic / martensitic       | 680                   | 200                      | 12          | 170-240      |                          |         |
|                         |                                                                    | Martensitic                  | 820                   | 240                      | 13          | 170-240      |                          |         |
|                         |                                                                    | Austenitic                   | 600                   | 180                      | 14          | 170-240      |                          |         |
| K                       | Gray cast iron (GG)                                                | Ferritic                     |                       | 160                      | 15          | 180-250      |                          |         |
|                         |                                                                    | Pearlitic                    |                       | 250                      | 16          | 180-250      |                          |         |
|                         | Cast iron nodular (GGG)                                            | Ferritic                     |                       | 180                      | 17          | 180-250      |                          |         |
|                         |                                                                    | Pearlitic                    |                       | 260                      | 18          | 180-250      |                          |         |
|                         | Malleable cast iron                                                | Ferritic                     |                       | 130                      | 19          | 130-200      |                          |         |
| Pearlitic               |                                                                    |                              | 230                   | 20                       | 130-200     |              |                          |         |
| N                       | Aluminum - Wrought alloy                                           | Not cureable                 |                       | 60                       | 21          | 330-380      |                          |         |
|                         |                                                                    | Cured                        |                       | 100                      | 22          | 330-380      |                          |         |
|                         | Aluminum-cast, alloyed                                             | <=12% Si                     | Not cureable          |                          | 75          | 23           | 330-380                  |         |
|                         |                                                                    |                              | Cured                 |                          | 90          | 24           | 330-380                  |         |
|                         |                                                                    | >12% Si                      | High temp.            |                          | 130         | 25           | 330-380                  |         |
|                         | Copper alloys                                                      | >1% Pb                       | Free cutting          |                          | 110         | 26           | 150-230                  |         |
|                         |                                                                    |                              | Brass                 |                          | 90          | 27           | 150-230                  |         |
|                         |                                                                    |                              | Electrolitic copper   |                          | 100         | 28           | 150-230                  |         |
|                         | Non-metallic                                                       | Duroplastics, fiber plastics |                       | 70 Shore D               | 29          | 150-230      |                          |         |
| Hard rubber             |                                                                    |                              | 55 Shore D            | 30                       | 150-230     |              |                          |         |
| S                       | High temp. alloys                                                  | Fe based                     | Annealed              |                          | 200         | 31           | 30-60                    |         |
|                         |                                                                    |                              | Cured                 |                          | 280         | 32           | 30-60                    |         |
|                         |                                                                    | Ni or Co based               | Annealed              |                          | 250         | 33           | 30-60                    |         |
|                         |                                                                    |                              | Cured                 |                          | 350         | 34           | 30-60                    |         |
|                         |                                                                    |                              | Cast                  |                          | 320         | 35           | 30-60                    |         |
|                         | Titanium, Ti alloys                                                | Pure                         | Rm 400                | 190                      | 36          | 30-60        |                          |         |
| Alpha+beta alloys cured |                                                                    | Rm 1050                      | 310                   | 37                       | 30-60       |              |                          |         |
| H                       | Hardened steel                                                     | Hardened                     |                       | 55HRC                    | 38          | 30-60        |                          |         |
|                         |                                                                    | Hardened                     |                       | 60HRC                    | 39          | 30-60        |                          |         |
|                         | Chilled cast iron                                                  | Cast                         |                       | 400                      | 40          | 30-60        |                          |         |
|                         | Cast iron nodular                                                  | Hardened                     |                       | 55HRC                    | 41          | 30-60        |                          |         |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for T-DRILL 2,3,4xD

| Feed (mm/rev) vs. drill diameter<br>Drill length 2,3,4xD |                      |                      |                      |                      |                      |
|----------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SPMG 05<br>Ø12.5 - Ø15                                   | SPMG 06<br>Ø16 - Ø21 | SPMG 07<br>Ø22 - Ø27 | SPMG 09<br>Ø28 - Ø33 | SPMG 11<br>Ø34 - Ø41 | SPMG 14<br>Ø42 - Ø50 |
| 0.04-0.06                                                | 0.04-0.06            | 0.04-0.08            | 0.04-0.08            | 0.06-0.10            | 0.06-0.12            |
| 0.05-0.08                                                | 0.06-0.10            | 0.06-0.12            | 0.07-0.13            | 0.08-0.15            | 0.08-0.16            |
| 0.06-0.12                                                | 0.08-0.15            | 0.10-0.18            | 0.12-0.22            | 0.12-0.24            | 0.13-0.25            |
| 0.06-0.12                                                | 0.08-0.15            | 0.10-0.18            | 0.12-0.22            | 0.12-0.24            | 0.13-0.25            |
| 0.06-0.12                                                | 0.08-0.15            | 0.10-0.18            | 0.12-0.22            | 0.12-0.24            | 0.13-0.25            |
| 0.06-0.12                                                | 0.08-0.14            | 0.10-0.18            | 0.12-0.20            | 0.12-0.20            | 0.13-0.20            |
| 0.06-0.15                                                | 0.06-0.15            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.06-0.15                                                | 0.06-0.15            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18            |
| 0.06-0.10                                                | 0.06-0.10            | 0.08-0.12            | 0.08-0.14            | 0.08-0.14            | 0.08-0.14            |
| 0.06-0.10                                                | 0.08-0.12            | 0.10-0.15            | 0.12-0.15            | 0.12-0.18            | 0.13-0.18            |
| 0.05-0.10                                                | 0.06-0.12            | 0.08-0.15            | 0.09-0.16            | 0.10-0.17            | 0.11-0.18            |
| 0.05-0.10                                                | 0.06-0.12            | 0.08-0.15            | 0.09-0.16            | 0.10-0.17            | 0.11-0.18            |
| 0.05-0.10                                                | 0.06-0.12            | 0.08-0.15            | 0.09-0.16            | 0.10-0.17            | 0.11-0.18            |
| 0.06-0.12                                                | 0.08-0.16            | 0.12-0.20            | 0.15-0.25            | 0.16-0.28            | 0.18-0.30            |
| 0.06-0.12                                                | 0.08-0.16            | 0.12-0.20            | 0.15-0.25            | 0.16-0.28            | 0.18-0.30            |
| 0.06-0.12                                                | 0.08-0.16            | 0.12-0.20            | 0.15-0.25            | 0.16-0.28            | 0.18-0.30            |
| 0.06-0.12                                                | 0.08-0.16            | 0.12-0.20            | 0.15-0.25            | 0.16-0.28            | 0.18-0.30            |
| 0.06-0.10                                                | 0.08-0.15            | 0.10-0.18            | 0.12-0.20            | 0.15-0.23            | 0.16-0.25            |
| 0.06-0.10                                                | 0.08-0.15            | 0.10-0.18            | 0.12-0.20            | 0.15-0.23            | 0.16-0.25            |
| 0.06-0.14                                                | 0.08-0.15            | 0.10-0.20            | 0.12-0.22            | 0.14-0.23            | 0.15-0.26            |
| 0.06-0.14                                                | 0.08-0.15            | 0.10-0.20            | 0.12-0.22            | 0.14-0.23            | 0.15-0.26            |
| 0.06-0.14                                                | 0.08-0.15            | 0.10-0.20            | 0.12-0.22            | 0.14-0.23            | 0.15-0.26            |
| 0.06-0.14                                                | 0.08-0.15            | 0.10-0.20            | 0.12-0.22            | 0.14-0.23            | 0.15-0.26            |
| 0.06-0.13                                                | 0.06-0.13            | 0.08-0.15            | 0.08-0.15            | 0.08-0.15            | 0.08-0.15            |
| 0.06-0.13                                                | 0.06-0.13            | 0.08-0.15            | 0.08-0.15            | 0.08-0.15            | 0.08-0.15            |
| 0.06-0.13                                                | 0.06-0.13            | 0.08-0.15            | 0.08-0.15            | 0.08-0.15            | 0.08-0.15            |
| 0.06-0.13                                                | 0.06-0.13            | 0.08-0.15            | 0.08-0.15            | 0.08-0.15            | 0.08-0.15            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |
| 0.05-0.08                                                | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |
| 0.05-0.10                                                | 0.06-0.14            | 0.08-0.18            | 0.10-0.22            | 0.14-0.23            | 0.15-0.24            |
| 0.05-0.10                                                | 0.06-0.14            | 0.08-0.18            | 0.10-0.22            | 0.14-0.23            | 0.15-0.24            |
| 0.05-0.09                                                | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.09                                                | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.09                                                | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.09                                                | 0.05-0.09            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10            |

# Recommended Cutting Conditions



## Machining data for T-DRILL 5xD

| ISO | Material                                                           |                         | Condition                    | Tensile strength (N/mm²) | Hardness HB | Material No. | Cutting speed Vc (m/min) |
|-----|--------------------------------------------------------------------|-------------------------|------------------------------|--------------------------|-------------|--------------|--------------------------|
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                 | Annealed                     | 420                      | 125         | 1            | 250-350                  |
|     |                                                                    | >=0.25%C                | Annealed                     | 650                      | 190         | 2            | 180-250                  |
|     |                                                                    | <0.55%C                 | Quenched and tempered        | 850                      | 250         | 3            | 160-220                  |
|     |                                                                    | >=0.55%C                | Annealed                     | 750                      | 220         | 4            | 160-220                  |
|     |                                                                    |                         | Quenched and tempered        | 1000                     | 300         | 5            | 160-220                  |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) |                         | Annealed                     | 600                      | 200         | 6            | 150-220                  |
|     |                                                                    |                         | Quenched and tempered        | 930                      | 275         | 7            | 120-160                  |
|     |                                                                    |                         |                              | 1000                     | 300         | 8            | 120-160                  |
|     |                                                                    |                         |                              | 1200                     | 350         | 9            | 120-160                  |
|     | High alloy steel, cast steel and tool steel                        |                         | Annealed                     | 680                      | 200         | 10           | 140-180                  |
|     |                                                                    |                         | Quenched and tempered        | 1100                     | 325         | 11           | 130-180                  |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic  | 680                          | 200                      | 12          | 170-240      |                          |
|     |                                                                    | Martensitic             | 820                          | 240                      | 13          | 170-240      |                          |
|     |                                                                    | Austenitic              | 600                          | 180                      | 14          | 170-240      |                          |
| K   | Gray cast iron (GG)                                                | Ferritic                |                              | 160                      | 15          | 180-250      |                          |
|     |                                                                    | Pearlitic               |                              | 250                      | 16          | 180-250      |                          |
|     | Cast iron nodular (GGG)                                            | Ferritic                |                              | 180                      | 17          | 180-250      |                          |
|     |                                                                    | Pearlitic               |                              | 260                      | 18          | 180-250      |                          |
|     | Malleable cast iron                                                | Ferritic                |                              | 130                      | 19          | 130-200      |                          |
|     |                                                                    | Pearlitic               |                              | 230                      | 20          | 130-200      |                          |
| N   | Aluminum - Wrought alloy                                           | Not cureable            |                              | 60                       | 21          | 330-380      |                          |
|     |                                                                    | Cured                   |                              | 100                      | 22          | 330-380      |                          |
|     | Aluminum-cast, alloyed                                             | <=12% Si                | Not cureable                 |                          | 75          | 23           | 330-380                  |
|     |                                                                    |                         | Cured                        |                          | 90          | 24           | 330-380                  |
|     |                                                                    | >12% Si                 | High temp.                   |                          | 130         | 25           | 330-380                  |
|     | Copper alloys                                                      | >1% Pb                  | Free cutting                 |                          | 110         | 26           | 150-230                  |
|     |                                                                    |                         | Brass                        |                          | 90          | 27           | 150-230                  |
|     |                                                                    |                         | Electrolitic copper          |                          | 100         | 28           | 150-230                  |
|     | Non-metallic                                                       |                         | Duroplastics, fiber plastics |                          | 70 Shore D  | 29           | 150-230                  |
|     |                                                                    | Hard rubber             |                              | 55 Shore D               | 30          | 150-230      |                          |
| S   | High temp. alloys                                                  | Fe based                | Annealed                     |                          | 200         | 31           | 30-60                    |
|     |                                                                    |                         | Cured                        |                          | 280         | 32           | 30-60                    |
|     |                                                                    | Ni or Co based          | Annealed                     |                          | 250         | 33           | 30-60                    |
|     |                                                                    |                         | Cured                        |                          | 350         | 34           | 30-60                    |
|     |                                                                    |                         | Cast                         |                          | 320         | 35           | 30-60                    |
|     | Titanium, Ti alloys                                                |                         | Pure                         | Rm 400                   | 190         | 36           | 30-60                    |
|     |                                                                    | Alpha+beta alloys cured | Rm 1050                      | 310                      | 37          | 30-60        |                          |
| H   | Hardened steel                                                     | Hardened                |                              | 55HRC                    | 38          | 30-60        |                          |
|     |                                                                    | Hardened                |                              | 60HRC                    | 39          | 30-60        |                          |
|     | Chilled cast iron                                                  | Cast                    |                              | 400                      | 40          | 30-60        |                          |
|     | Cast iron nodular                                                  | Hardened                |                              | 55HRC                    | 41          | 30-60        |                          |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for T-DRILL 5xD

| Feed (mm/rev) vs. drill diameter<br>Drill length 5xD |                      |                      |                      |                      |                      |
|------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SPMG 05<br>Ø12.5 - Ø15                               | SPMG 06<br>Ø16 - Ø21 | SPMG 07<br>Ø22 - Ø27 | SPMG 09<br>Ø28 - Ø33 | SPMG 11<br>Ø34 - Ø41 | SPMG 14<br>Ø42 - Ø50 |
| 0.04-0.05                                            | 0.04-0.05            | 0.04-0.06            | 0.04-0.07            | 0.06-0.08            | 0.06-0.10            |
| 0.06-0.08                                            | 0.06-0.08            | 0.06-0.10            | 0.07-0.12            | 0.08-0.13            | 0.08-0.14            |
| 0.06-0.10                                            | 0.08-0.13            | 0.10-0.16            | 0.12-0.20            | 0.12-0.22            | 0.13-0.23            |
| 0.06-0.10                                            | 0.08-0.13            | 0.10-0.16            | 0.12-0.20            | 0.12-0.22            | 0.13-0.23            |
| 0.06-0.10                                            | 0.08-0.13            | 0.10-0.16            | 0.12-0.20            | 0.12-0.22            | 0.13-0.23            |
| 0.06-0.10                                            | 0.08-0.12            | 0.10-0.16            | 0.12-0.18            | 0.12-0.18            | 0.13-0.18            |
| 0.06-0.12                                            | 0.06-0.13            | 0.08-0.16            | 0.08-0.16            | 0.08-0.17            | 0.08-0.17            |
| 0.06-0.12                                            | 0.06-0.13            | 0.08-0.16            | 0.08-0.16            | 0.08-0.17            | 0.08-0.17            |
| 0.06-0.12                                            | 0.06-0.13            | 0.08-0.16            | 0.08-0.16            | 0.08-0.17            | 0.08-0.17            |
| 0.06-0.08                                            | 0.06-0.08            | 0.08-0.10            | 0.08-0.12            | 0.08-0.12            | 0.08-0.12            |
| 0.06-0.09                                            | 0.08-0.10            | 0.10-0.13            | 0.12-0.13            | 0.12-0.15            | 0.12-0.16            |
| 0.05-0.09                                            | 0.06-0.10            | 0.08-0.13            | 0.09-0.15            | 0.10-0.15            | 0.10-0.17            |
| 0.05-0.09                                            | 0.06-0.10            | 0.08-0.13            | 0.09-0.15            | 0.10-0.15            | 0.10-0.17            |
| 0.05-0.09                                            | 0.06-0.10            | 0.08-0.13            | 0.09-0.15            | 0.10-0.15            | 0.10-0.17            |
| 0.06-0.10                                            | 0.08-0.15            | 0.12-0.18            | 0.15-0.22            | 0.16-0.25            | 0.18-0.28            |
| 0.06-0.10                                            | 0.08-0.15            | 0.12-0.18            | 0.15-0.22            | 0.16-0.25            | 0.18-0.28            |
| 0.06-0.10                                            | 0.08-0.15            | 0.12-0.18            | 0.15-0.22            | 0.16-0.25            | 0.18-0.28            |
| 0.06-0.10                                            | 0.08-0.15            | 0.12-0.18            | 0.15-0.22            | 0.16-0.25            | 0.18-0.28            |
| 0.06-0.08                                            | 0.08-0.12            | 0.10-0.16            | 0.12-0.18            | 0.15-0.22            | 0.16-0.23            |
| 0.06-0.08                                            | 0.08-0.12            | 0.10-0.16            | 0.12-0.18            | 0.15-0.22            | 0.16-0.23            |
| 0.06-0.12                                            | 0.08-0.15            | 0.10-0.13            | 0.12-0.18            | 0.14-0.20            | 0.14-0.24            |
| 0.06-0.12                                            | 0.08-0.15            | 0.10-0.13            | 0.12-0.18            | 0.14-0.20            | 0.14-0.24            |
| 0.06-0.12                                            | 0.08-0.15            | 0.10-0.13            | 0.12-0.18            | 0.14-0.20            | 0.14-0.24            |
| 0.06-0.12                                            | 0.08-0.15            | 0.10-0.13            | 0.12-0.18            | 0.14-0.20            | 0.14-0.24            |
| 0.06-0.12                                            | 0.08-0.15            | 0.10-0.13            | 0.12-0.18            | 0.14-0.20            | 0.14-0.24            |
| 0.06-0.12                                            | 0.06-0.12            | 0.08-0.13            | 0.08-0.13            | 0.08-0.14            | 0.08-0.14            |
| 0.06-0.12                                            | 0.06-0.12            | 0.08-0.13            | 0.08-0.13            | 0.08-0.14            | 0.08-0.14            |
| 0.06-0.12                                            | 0.06-0.12            | 0.08-0.13            | 0.08-0.13            | 0.08-0.14            | 0.08-0.14            |
| 0.06-0.12                                            | 0.06-0.12            | 0.08-0.13            | 0.08-0.13            | 0.08-0.14            | 0.08-0.14            |
| 0.06-0.12                                            | 0.06-0.12            | 0.08-0.13            | 0.08-0.13            | 0.08-0.14            | 0.08-0.14            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            |
| 0.05-0.07                                            | 0.05-0.07            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            | 0.05-0.08            |
| 0.05-0.09                                            | 0.08-0.13            | 0.08-0.17            | 0.10-0.20            | 0.14-0.22            | 0.14-0.24            |
| 0.05-0.09                                            | 0.08-0.13            | 0.08-0.17            | 0.10-0.20            | 0.14-0.22            | 0.14-0.24            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |
| 0.05-0.08                                            | 0.05-0.08            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            | 0.05-0.09            |



# Recommended Cutting Conditions



## Machining data for T-DRILL cartridge

| ISO | Material                                                                    |                       | Condition                    | Tensile strength<br>(N/mm <sup>2</sup> ) | Hardness<br>HB | Material<br>No. | Cutting<br>speed<br>Vc (m/min) |
|-----|-----------------------------------------------------------------------------|-----------------------|------------------------------|------------------------------------------|----------------|-----------------|--------------------------------|
| P   | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C               | Annealed                     | 420                                      | 125            | 1               | 250-350                        |
|     |                                                                             | >=0.25%C              | Annealed                     | 650                                      | 190            | 2               | 180-250                        |
|     |                                                                             | <0.55%C               | Quenched and tempered        | 850                                      | 250            | 3               | 160-220                        |
|     |                                                                             | >=0.55%C              | Annealed                     | 750                                      | 220            | 4               | 160-220                        |
|     |                                                                             |                       | Quenched and tempered        | 1000                                     | 300            | 5               | 160-220                        |
|     | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                       | Annealed                     | 600                                      | 200            | 6               | 150-220                        |
|     |                                                                             | Quenched and tempered |                              | 930                                      | 275            | 7               | 120-160                        |
|     |                                                                             |                       |                              | 1000                                     | 300            | 8               | 120-160                        |
|     |                                                                             |                       |                              | 1200                                     | 350            | 9               | 120-160                        |
|     | High alloy steel, cast steel<br>and tool steel                              |                       | Annealed                     | 680                                      | 200            | 10              | 140-180                        |
|     |                                                                             | Quenched and tempered | 1100                         | 325                                      | 11             | 130-180         |                                |
| M   | Stainless steel<br>and cast steel                                           |                       | Ferritic / martensitic       | 680                                      | 200            | 12              | 170-240                        |
|     |                                                                             |                       | Martensitic                  | 820                                      | 240            | 13              | 170-240                        |
|     |                                                                             |                       | Austenitic                   | 600                                      | 180            | 14              | 170-240                        |
|     |                                                                             |                       |                              |                                          |                |                 |                                |
| K   | Gray cast iron<br>(GG)                                                      |                       | Ferritic                     |                                          | 160            | 15              | 180-250                        |
|     |                                                                             |                       | Pearlitic                    |                                          | 250            | 16              | 180-250                        |
|     | Cast iron nodular<br>(GGG)                                                  |                       | Ferritic                     |                                          | 180            | 17              | 180-250                        |
|     |                                                                             |                       | Pearlitic                    |                                          | 260            | 18              | 180-250                        |
|     | Malleable cast iron                                                         |                       | Ferritic                     |                                          | 130            | 19              | 130-200                        |
|     |                                                                             |                       | Pearlitic                    |                                          | 230            | 20              | 130-200                        |
| N   | Aluminum - Wrought alloy                                                    |                       | Not cureable                 |                                          | 60             | 21              | 330-380                        |
|     |                                                                             |                       | Cured                        |                                          | 100            | 22              | 330-380                        |
|     | Aluminum-<br>cast, alloyed                                                  | <=12% Si              | Not cureable                 |                                          | 75             | 23              | 330-380                        |
|     |                                                                             |                       | Cured                        |                                          | 90             | 24              | 330-380                        |
|     | >12% Si                                                                     | High temp.            |                              | 130                                      | 25             | 330-380         |                                |
|     |                                                                             | >1% Pb                | Free cutting                 |                                          | 110            | 26              | 150-230                        |
|     | Copper alloys                                                               |                       | Brass                        |                                          | 90             | 27              | 150-230                        |
|     |                                                                             |                       | Electrolitic copper          |                                          | 100            | 28              | 150-230                        |
|     | Non-metallic                                                                |                       | Duroplastics, fiber plastics |                                          | 70 Shore D     | 29              | 150-230                        |
|     |                                                                             |                       | Hard rubber                  |                                          | 55 Shore D     | 30              | 150-230                        |
| S   | High temp.<br>alloys                                                        | Fe based              | Annealed                     |                                          | 200            | 31              | 30-60                          |
|     |                                                                             |                       | Cured                        |                                          | 280            | 32              | 30-60                          |
|     |                                                                             | Ni or<br>Co based     | Annealed                     |                                          | 250            | 33              | 30-60                          |
|     |                                                                             |                       | Cured                        |                                          | 350            | 34              | 30-60                          |
|     |                                                                             |                       | Cast                         |                                          | 320            | 35              | 30-60                          |
|     | Titanium, Ti alloys                                                         |                       | Pure                         | Rm 400                                   | 190            | 36              | 30-60                          |
|     |                                                                             |                       | Alpha+beta alloys cured      | Rm 1050                                  | 310            | 37              | 30-60                          |
| H   | Hardened steel                                                              | Hardened              |                              | 55HRC                                    | 38             | 30-60           |                                |
|     |                                                                             | Hardened              |                              | 60HRC                                    | 39             | 30-60           |                                |
|     | Chilled cast iron                                                           | Cast                  |                              | 400                                      | 40             | 30-60           |                                |
|     | Cast iron nodular                                                           | Hardened              |                              | 55HRC                                    | 41             | 30-60           |                                |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for T-DRILL cartridge

| Feed (mm/rev) vs. drill diameter<br>Drill length 5xD |                      |                      |                     |                      |                      |
|------------------------------------------------------|----------------------|----------------------|---------------------|----------------------|----------------------|
| SPMG 07<br>Ø51 - Ø53                                 | SPMG 07<br>Ø54 - Ø56 | SPMG 09<br>Ø57 - Ø62 | SPMG 09<br>Ø63- Ø66 | SPMG 11<br>Ø67 - Ø73 | SPMG 12<br>Ø74 - Ø80 |
| 0.06-0.12                                            | 0.06-0.12            | 0.06-0.12            | 0.06-0.12           | 0.06-0.12            | 0.06-0.12            |
| 0.06-0.16                                            | 0.06-0.12            | 0.06-0.16            | 0.06-0.16           | 0.06-0.16            | 0.06-0.16            |
| 0.08-0.16                                            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16           | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.16                                            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16           | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.16                                            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16           | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18           | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18           | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18           | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.18                                            | 0.08-0.18            | 0.08-0.18            | 0.08-0.18           | 0.08-0.18            | 0.08-0.18            |
| 0.08-0.16                                            | 0.08-0.16            | 0.08-0.16            | 0.08-0.16           | 0.08-0.16            | 0.08-0.16            |
| 0.06-0.12                                            | 0.06-0.12            | 0.08-0.15            | 0.08-0.15           | 0.08-0.15            | 0.08-0.15            |
| 0.06-0.12                                            | 0.06-0.12            | 0.08-0.15            | 0.08-0.15           | 0.08-0.15            | 0.08-0.15            |
| 0.06-0.12                                            | 0.06-0.12            | 0.08-0.15            | 0.08-0.15           | 0.08-0.15            | 0.08-0.15            |
| 0.12-0.20                                            | 0.12-0.20            | 0.12-0.20            | 0.12-0.20           | 0.15-0.22            | 0.15-0.22            |
| 0.12-0.20                                            | 0.12-0.20            | 0.12-0.20            | 0.12-0.20           | 0.15-0.22            | 0.15-0.22            |
| 0.12-0.20                                            | 0.12-0.20            | 0.12-0.20            | 0.12-0.20           | 0.15-0.22            | 0.15-0.22            |
| 0.12-0.20                                            | 0.12-0.20            | 0.12-0.20            | 0.12-0.20           | 0.15-0.22            | 0.15-0.22            |
| 0.10-0.18                                            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18           | 0.12-0.20            | 0.12-0.20            |
| 0.10-0.18                                            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18           | 0.12-0.20            | 0.12-0.20            |
| 0.06-0.18                                            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18           | 0.06-0.18            | 0.06-0.18            |
| 0.06-0.18                                            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18           | 0.06-0.18            | 0.06-0.18            |
| 0.06-0.18                                            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18           | 0.06-0.18            | 0.06-0.18            |
| 0.06-0.18                                            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18           | 0.06-0.18            | 0.06-0.18            |
| 0.06-0.18                                            | 0.06-0.18            | 0.06-0.18            | 0.06-0.18           | 0.06-0.18            | 0.06-0.18            |
| 0.10-0.18                                            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18           | 0.10-0.18            | 0.10-0.18            |
| 0.10-0.18                                            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18           | 0.10-0.18            | 0.10-0.18            |
| 0.10-0.18                                            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18           | 0.10-0.18            | 0.10-0.18            |
| 0.10-0.18                                            | 0.10-0.18            | 0.10-0.18            | 0.10-0.18           | 0.10-0.18            | 0.10-0.18            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10           | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10           | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10           | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10           | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10           | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10           | 0.06-0.10            | 0.06-0.10            |
| 0.06-0.10                                            | 0.06-0.10            | 0.06-0.10            | 0.06-0.10           | 0.06-0.10            | 0.06-0.10            |
| 0.05-0.10                                            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10           | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.10                                            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10           | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.10                                            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10           | 0.05-0.10            | 0.05-0.10            |
| 0.05-0.10                                            | 0.05-0.10            | 0.05-0.10            | 0.05-0.10           | 0.05-0.10            | 0.05-0.10            |

# Recommended Cutting Conditions



## Machining data for TOP-CAP

| ISO          | Material                                                                    |                              | Condition             | Tensile strength<br>(N/mm²) | Hardness<br>HB | Material<br>No. |
|--------------|-----------------------------------------------------------------------------|------------------------------|-----------------------|-----------------------------|----------------|-----------------|
| P            | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C                      | Annealed              | 420                         | 125            | 1               |
|              |                                                                             | >=0.25%C                     | Annealed              | 650                         | 190            | 2               |
|              |                                                                             | <0.55%C                      | Quenched and tempered | 850                         | 250            | 3               |
|              |                                                                             | >=0.55%C                     | Annealed              | 750                         | 220            | 4               |
|              |                                                                             |                              | Quenched and tempered | 1000                        | 300            | 5               |
|              | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                              | Annealed              | 600                         | 200            | 6               |
|              |                                                                             |                              | Quenched and tempered | 930                         | 275            | 7               |
|              |                                                                             |                              |                       | 1000                        | 300            | 8               |
|              |                                                                             |                              |                       | 1200                        | 350            | 9               |
|              | High alloy steel, cast steel<br>and tool steel                              |                              | Annealed              | 680                         | 200            | 10              |
|              |                                                                             |                              | Quenched and tempered | 1100                        | 325            | 11              |
| M            | Stainless steel<br>and cast steel                                           | Ferritic / martensitic       | 680                   | 200                         | 12             |                 |
|              |                                                                             | Martensitic                  | 820                   | 240                         | 13             |                 |
|              |                                                                             | Austenitic                   | 600                   | 180                         | 14             |                 |
| K            | Gray cast iron<br>(GG)                                                      | Ferritic                     |                       | 160                         | 15             |                 |
|              |                                                                             | Pearlitic                    |                       | 250                         | 16             |                 |
|              | Cast iron nodular<br>(GGG)                                                  | Ferritic                     |                       | 180                         | 17             |                 |
|              |                                                                             | Pearlitic                    |                       | 260                         | 18             |                 |
|              | Malleable cast iron                                                         | Ferritic                     |                       | 130                         | 19             |                 |
|              |                                                                             | Pearlitic                    |                       | 230                         | 20             |                 |
| N            | Aluminum - Wrought alloy                                                    | Not cureable                 |                       | 60                          | 21             |                 |
|              |                                                                             | Cured                        |                       | 100                         | 22             |                 |
|              | Aluminum-<br>cast, alloyed                                                  | <=12% Si                     | Not cureable          |                             | 75             | 23              |
|              |                                                                             |                              | Cured                 |                             | 90             | 24              |
|              |                                                                             | >12% Si                      | High temp.            |                             | 130            | 25              |
|              | Copper alloys                                                               | >1% Pb                       | Free cutting          |                             | 110            | 26              |
|              |                                                                             |                              | Brass                 |                             | 90             | 27              |
|              |                                                                             |                              | Electrolitic copper   |                             | 100            | 28              |
| Non-metallic |                                                                             | Duroplastics, fiber plastics |                       | 70 Shore D                  | 29             |                 |
|              |                                                                             | Hard rubber                  |                       | 55 Shore D                  | 30             |                 |
| S            | High temp.<br>alloys                                                        | Fe based                     | Annealed              |                             | 200            | 31              |
|              |                                                                             |                              | Cured                 |                             | 280            | 32              |
|              |                                                                             | Ni or<br>Co based            | Annealed              |                             | 250            | 33              |
|              |                                                                             |                              | Cured                 |                             | 350            | 34              |
|              |                                                                             |                              | Cast                  |                             | 320            | 35              |
|              | Titanium, Ti alloys                                                         | Pure                         | Rm 400                | 190                         | 36             |                 |
|              |                                                                             | Alpha+beta alloys cured      | Rm 1050               | 310                         | 37             |                 |
| H            | Hardened steel                                                              | Hardened                     |                       | 55HRC                       | 38             |                 |
|              |                                                                             | Hardened                     |                       | 60HRC                       | 39             |                 |
|              | Chilled cast iron                                                           | Cast                         |                       | 400                         | 40             |                 |
|              | Cast iron nodular                                                           | Hardened                     |                       | 55HRC                       | 41             |                 |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for TOP-CAP

| Drilling   |               | Turning & boring |               | Grooving   |               |
|------------|---------------|------------------|---------------|------------|---------------|
| Vc (m/min) | Feed (mm/rev) | Vc (m/min)       | Feed (mm/rev) | Vc (m/min) | Feed (mm/rev) |
| 120-260    | 0.05-0.06     | 140-280          | 0.04-0.14     | 120-250    | 0.04-0.25     |
| 80-190     | 0.05-0.15     | 90-200           | 0.04-0.12     | 80-180     | 0.04-0.25     |
| 100-280    | 0.06-0.18     | 100-200          | 0.04-0.15     | 80-180     | 0.04-0.25     |
| 100-280    | 0.06-0.18     | 100-200          | 0.04-0.15     | 80-180     | 0.04-0.25     |
| 100-280    | 0.06-0.18     | 100-200          | 0.04-0.15     | 80-180     | 0.04-0.25     |
| 100-280    | 0.06-0.18     | 100-200          | 0.04-0.15     | 80-180     | 0.04-0.25     |
| 60-180     | 0.04-0.15     | 80-180           | 0.07-0.12     | 60-160     | 0.04-0.25     |
| 60-180     | 0.04-0.15     | 80-180           | 0.07-0.12     | 60-160     | 0.04-0.25     |
| 60-180     | 0.04-0.15     | 80-180           | 0.07-0.12     | 60-160     | 0.04-0.25     |
| 80-190     | 0.05-0.15     | 80-200           | 0.04-0.12     | 80-160     | 0.04-0.25     |
| 50-150     | 0.04-0.14     | 60-150           | 0.04-0.12     | 50-120     | 0.04-0.25     |
| 50-210     | 0.04-0.15     | 60-230           | 0.07-0.12     | 50-200     | 0.04-0.25     |
| 50-210     | 0.04-0.15     | 60-230           | 0.07-0.12     | 50-200     | 0.04-0.25     |
| 50-210     | 0.04-0.15     | 60-230           | 0.07-0.12     | 50-200     | 0.04-0.25     |
| 100-300    | 0.06-0.23     | 120-230          | 0.07-0.2      | 100-200    | 0.04-0.25     |
| 100-300    | 0.06-0.23     | 120-230          | 0.07-0.2      | 100-200    | 0.04-0.25     |
| 100-300    | 0.06-0.23     | 120-230          | 0.07-0.2      | 100-200    | 0.04-0.25     |
| 100-300    | 0.06-0.23     | 120-230          | 0.07-0.2      | 100-200    | 0.04-0.25     |
| 100-200    | 0.06-0.15     | 120-230          | 0.04-0.13     | 100-200    | 0.04-0.25     |
| 100-200    | 0.06-0.15     | 120-230          | 0.04-0.13     | 100-200    | 0.04-0.25     |
| 120-500    | 0.05-0.3      | 120-700          | 0.04-0.25     | 100-700    | 0.04-0.25     |
| 120-500    | 0.05-0.3      | 120-700          | 0.04-0.25     | 100-700    | 0.04-0.25     |
| 120-500    | 0.05-0.3      | 120-700          | 0.04-0.25     | 100-700    | 0.04-0.25     |
| 120-500    | 0.05-0.3      | 120-700          | 0.04-0.25     | 100-700    | 0.04-0.25     |
| 120-500    | 0.05-0.3      | 120-700          | 0.04-0.25     | 100-700    | 0.04-0.25     |
| 80-380     | 0.05-0.23     | 80-500           | 0.04-0.2      | 80-350     | 0.04-0.25     |
| 80-380     | 0.05-0.23     | 80-500           | 0.04-0.2      | 80-350     | 0.04-0.25     |
| 80-380     | 0.05-0.23     | 80-500           | 0.04-0.2      | 80-350     | 0.04-0.25     |
| 50-140     | 0.04-0.14     | 50-160           | 0.04-0.12     | 50-140     | 0.04-0.25     |
| 50-140     | 0.04-0.14     | 50-160           | 0.04-0.12     | 50-140     | 0.04-0.25     |
| 20-50      | 0.04-0.05     | 20-80            | 0.04-0.05     | 20-50      | 0.04-0.05     |
| 20-50      | 0.04-0.05     | 20-80            | 0.04-0.05     | 20-50      | 0.04-0.05     |
| 20-50      | 0.04-0.05     | 20-80            | 0.04-0.05     | 20-50      | 0.04-0.05     |
| 20-50      | 0.04-0.05     | 20-80            | 0.04-0.05     | 20-50      | 0.04-0.05     |
| 20-50      | 0.04-0.05     | 20-80            | 0.04-0.05     | 20-50      | 0.04-0.05     |
| 30-60      | 0.04-0.05     | 30-100           | 0.04-0.05     | 30-80      | 0.04-0.05     |
| 30-60      | 0.04-0.05     | 30-100           | 0.04-0.05     | 30-80      | 0.04-0.05     |
| 20-40      | 0.04-0.05     | 20-70            | 0.04-0.05     | 20-50      | 0.04-0.05     |
| 20-40      | 0.04-0.05     | 20-70            | 0.04-0.05     | 20-50      | 0.04-0.05     |
| 20-40      | 0.04-0.05     | 20-70            | 0.04-0.05     | 20-50      | 0.04-0.05     |
| 20-40      | 0.04-0.05     | 20-70            | 0.04-0.05     | 20-50      | 0.04-0.05     |

# Recommended Cutting Conditions



## Machining data for DRILL-SPEED 3,5,8xD

| ISO | Material                                                           | Condition                        | Tensile strength (N/mm <sup>2</sup> ) | Hardness HB | Material No. |
|-----|--------------------------------------------------------------------|----------------------------------|---------------------------------------|-------------|--------------|
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C<br>Annealed              | 420                                   | 125         | 1            |
|     |                                                                    | >=0.25%C<br>Annealed             | 650                                   | 190         | 2            |
|     |                                                                    | <0.55%C<br>Quenched and tempered | 850                                   | 250         | 3            |
|     |                                                                    | >=0.55%C<br>Annealed             | 750                                   | 220         | 4            |
|     |                                                                    | Quenched and tempered            | 1000                                  | 300         | 5            |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed                         | 600                                   | 200         | 6            |
|     |                                                                    | Quenched and tempered            | 930                                   | 275         | 7            |
|     |                                                                    |                                  | 1000                                  | 300         | 8            |
|     |                                                                    |                                  | 1200                                  | 350         | 9            |
|     | High alloy steel, cast steel and tool steel                        | Annealed                         | 680                                   | 200         | 10           |
|     |                                                                    | Quenched and tempered            | 1100                                  | 325         | 11           |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic           | 680                                   | 200         | 12           |
|     |                                                                    | Martensitic                      | 820                                   | 240         | 13           |
|     |                                                                    | Austenitic                       | 600                                   | 180         | 14           |
| K   | Gray cast iron (GG)                                                | Ferritic                         |                                       | 160         | 15           |
|     |                                                                    | Pearlitic                        |                                       | 250         | 16           |
|     | Cast iron nodular (GGG)                                            | Ferritic                         |                                       | 180         | 17           |
|     |                                                                    | Pearlitic                        |                                       | 260         | 18           |
|     | Malleable cast iron                                                | Ferritic                         |                                       | 130         | 19           |
|     |                                                                    | Pearlitic                        |                                       | 230         | 20           |
| N   | Aluminum - Wrought alloy                                           | Not cureable                     |                                       | 60          | 21           |
|     |                                                                    | Cured                            |                                       | 100         | 22           |
|     | Aluminum-cast, alloyed                                             | <=12% Si<br>Not cureable         |                                       | 75          | 23           |
|     |                                                                    | Cured                            |                                       | 90          | 24           |
|     |                                                                    | >12% Si<br>High temp.            |                                       | 130         | 25           |
|     | Copper alloys                                                      | >1% Pb<br>Free cutting           |                                       | 110         | 26           |
|     |                                                                    | Brass                            |                                       | 90          | 27           |
|     |                                                                    | Electrolitic copper              |                                       | 100         | 28           |
|     | Non-metallic                                                       | Duroplastics, fiber plastics     |                                       | 70 Shore D  | 29           |
|     |                                                                    | Hard rubber                      |                                       | 55 Shore D  | 30           |
| S   | High temp. alloys                                                  | Fe based<br>Annealed             |                                       | 200         | 31           |
|     |                                                                    |                                  |                                       | 280         | 32           |
|     |                                                                    | Ni or Co based<br>Annealed       |                                       | 250         | 33           |
|     |                                                                    |                                  |                                       | 350         | 34           |
|     |                                                                    |                                  |                                       | 320         | 35           |
|     | Titanium, Ti alloys                                                | Pure                             | Rm 400                                | 190         | 36           |
|     |                                                                    | Alpha+beta alloys cured          | Rm 1050                               | 310         | 37           |
| H   | Hardened steel                                                     | Hardened                         |                                       | 55HRC       | 38           |
|     |                                                                    | Hardened                         |                                       | 60HRC       | 39           |
|     | Chilled cast iron                                                  | Cast                             |                                       | 400         | 40           |
|     | Cast iron nodular                                                  | Hardened                         |                                       | 55HRC       | 41           |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

**DRILL SPEED**  
INDEXABLE 3 FLUTE



# Recommended Cutting Conditions



## Machining data for DRILL-RUSH

| ISO                     | Material                                                                    |                        | Condition                    | Tensile strength<br>(N/mm <sup>2</sup> ) | Hardness<br>HB | Material<br>No. | Cutting<br>speed<br>Vc (m/min) |        |
|-------------------------|-----------------------------------------------------------------------------|------------------------|------------------------------|------------------------------------------|----------------|-----------------|--------------------------------|--------|
| P                       | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C                | Annealed                     | 420                                      | 125            | 1               | 80-140                         |        |
|                         |                                                                             | >=0.25%C               | Annealed                     | 650                                      | 190            | 2               | 80-130                         |        |
|                         |                                                                             | <0.55%C                | Quenched and tempered        | 850                                      | 250            | 3               | 80-120                         |        |
|                         |                                                                             | >=0.55%C               | Annealed                     | 750                                      | 220            | 4               | 70-110                         |        |
|                         |                                                                             |                        | Quenched and tempered        | 1000                                     | 300            | 5               | 50-90                          |        |
|                         | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                        | Annealed                     | 600                                      | 200            | 6               | 70-120                         |        |
|                         |                                                                             |                        | Quenched and tempered        |                                          | 930            | 275             | 7                              | 70-110 |
|                         |                                                                             |                        |                              |                                          | 1000           | 300             | 8                              | 50-90  |
|                         |                                                                             |                        |                              |                                          | 1200           | 350             | 9                              | 40-70  |
|                         | High alloy steel, cast steel<br>and tool steel                              |                        | Annealed                     | 680                                      | 200            | 10              | 50-90                          |        |
|                         |                                                                             |                        | Quenched and tempered        | 1100                                     | 325            | 11              | 40-80                          |        |
| M                       | Stainless steel<br>and cast steel                                           | Ferritic / martensitic | 680                          | 200                                      | 12             | 40-70           |                                |        |
|                         |                                                                             | Martensitic            | 820                          | 240                                      | 13             | 40-70           |                                |        |
|                         |                                                                             | Austenitic             | 600                          | 180                                      | 14             | 30-70           |                                |        |
| K                       | Gray cast iron<br>(GG)                                                      | Ferritic               |                              | 160                                      | 15             | 90-160          |                                |        |
|                         |                                                                             | Pearlitic              |                              | 250                                      | 16             | 80-140          |                                |        |
|                         | Cast iron nodular<br>(GGG)                                                  | Ferritic               |                              | 180                                      | 17             | 90-180          |                                |        |
|                         |                                                                             | Pearlitic              |                              | 260                                      | 18             | 80-140          |                                |        |
|                         | Malleable cast iron                                                         | Ferritic               |                              | 130                                      | 19             | 90-160          |                                |        |
|                         |                                                                             | Pearlitic              |                              | 230                                      | 20             | 80-140          |                                |        |
| N                       | Aluminum - Wrought alloy                                                    | Not cureable           |                              | 60                                       | 21             | 90-220          |                                |        |
|                         |                                                                             | Cured                  |                              | 100                                      | 22             | 90-220          |                                |        |
|                         | Aluminum-<br>cast, alloyed                                                  | <=12% Si               | Not cureable                 |                                          | 75             | 23              | 90-220                         |        |
|                         |                                                                             |                        | Cured                        |                                          | 90             | 24              | 90-220                         |        |
|                         |                                                                             | >12% Si                | High temp.                   |                                          | 130            | 25              | 80-160                         |        |
|                         | Copper alloys                                                               | >1% Pb                 | Free cutting                 |                                          | 110            | 26              | 90-220                         |        |
|                         |                                                                             |                        | Brass                        |                                          | 90             | 27              | 90-220                         |        |
|                         |                                                                             |                        | Electrolitic copper          |                                          | 100            | 28              | 90-220                         |        |
|                         | Non-metallic                                                                |                        | Duroplastics, fiber plastics |                                          | 70 Shore D     | 29              |                                |        |
|                         |                                                                             | Hard rubber            |                              | 55 Shore D                               | 30             |                 |                                |        |
| S                       | High temp.<br>alloys                                                        | Fe based               | Annealed                     |                                          | 200            | 31              | 30-60                          |        |
|                         |                                                                             |                        | Cured                        |                                          | 280            | 32              | 20-50                          |        |
|                         |                                                                             | Ni or<br>Co based      | Annealed                     |                                          | 250            | 33              | 20-50                          |        |
|                         |                                                                             |                        | Cured                        |                                          | 350            | 34              | 20-50                          |        |
|                         |                                                                             |                        | Cast                         |                                          | 320            | 35              | 20-50                          |        |
|                         | Titanium, Ti alloys                                                         | Pure                   | Rm 400                       | 190                                      | 36             | 20-50           |                                |        |
| Alpha+beta alloys cured |                                                                             | Rm 1050                | 310                          | 37                                       | 20-50          |                 |                                |        |
| H                       | Hardened steel                                                              | Hardened               |                              | 55HRC                                    | 38             | 20-50           |                                |        |
|                         |                                                                             | Hardened               |                              | 60HRC                                    | 39             | 20-50           |                                |        |
|                         | Chilled cast iron                                                           | Cast                   |                              | 400                                      | 40             |                 |                                |        |
|                         | Cast iron nodular                                                           | Hardened               |                              | 55HRC                                    | 41             |                 |                                |        |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for DRILL-RUSH

| Feed (mm/rev) vs. drill diameter |           |           |           |             |             |             |             |             |
|----------------------------------|-----------|-----------|-----------|-------------|-------------|-------------|-------------|-------------|
| Ø4 - Ø4.9                        | Ø5 - Ø5.9 | Ø6 - Ø7.9 | Ø8 - Ø9.9 | Ø10 - Ø11.9 | Ø12 - Ø13.9 | Ø14 - Ø15.9 | Ø16 - Ø19.9 | Ø20 - Ø25.9 |
| 0.04-0.08                        | 0.07-0.11 | 0.09-0.13 | 0.12-0.22 | 0.15-0.28   | 0.18-0.30   | 0.20-0.35   | 0.25-0.45   | 0.25-0.45   |
| 0.04-0.08                        | 0.07-0.11 | 0.09-0.13 | 0.12-0.22 | 0.15-0.28   | 0.18-0.30   | 0.20-0.35   | 0.25-0.45   | 0.25-0.45   |
| 0.04-0.08                        | 0.07-0.11 | 0.09-0.13 | 0.12-0.22 | 0.15-0.28   | 0.18-0.30   | 0.20-0.35   | 0.25-0.45   | 0.25-0.45   |
| 0.04-0.08                        | 0.07-0.11 | 0.09-0.13 | 0.12-0.22 | 0.15-0.28   | 0.18-0.30   | 0.20-0.35   | 0.25-0.45   | 0.25-0.45   |
| 0.04-0.08                        | 0.07-0.11 | 0.09-0.13 | 0.12-0.22 | 0.15-0.28   | 0.18-0.30   | 0.20-0.35   | 0.25-0.45   | 0.25-0.45   |
| 0.04-0.08                        | 0.07-0.13 | 0.09-0.15 | 0.12-0.25 | 0.14-0.28   | 0.16-0.32   | 0.18-0.35   | 0.23-0.40   | 0.25-0.45   |
| 0.04-0.08                        | 0.07-0.13 | 0.09-0.15 | 0.12-0.25 | 0.14-0.28   | 0.16-0.32   | 0.18-0.35   | 0.23-0.40   | 0.25-0.45   |
| 0.04-0.08                        | 0.07-0.13 | 0.09-0.15 | 0.12-0.25 | 0.14-0.28   | 0.16-0.32   | 0.18-0.35   | 0.23-0.40   | 0.25-0.45   |
| 0.04-0.08                        | 0.07-0.13 | 0.09-0.15 | 0.12-0.25 | 0.14-0.28   | 0.16-0.32   | 0.18-0.35   | 0.23-0.40   | 0.25-0.45   |
| 0.06-0.08                        | 0.07-0.11 | 0.09-0.12 | 0.12-0.20 | 0.12-0.22   | 0.15-0.25   | 0.18-0.28   | 0.20-0.30   | 0.22-0.33   |
| 0.06-0.08                        | 0.07-0.11 | 0.09-0.12 | 0.12-0.20 | 0.12-0.22   | 0.15-0.25   | 0.18-0.28   | 0.20-0.30   | 0.22-0.33   |
| 0.05-0.07                        | 0.06-0.08 | 0.08-0.10 | 0.10-0.15 | 0.12-0.18   | 0.14-0.20   | 0.16-0.24   | 0.16-0.26   | 0.18-0.30   |
| 0.05-0.07                        | 0.06-0.08 | 0.08-0.10 | 0.10-0.15 | 0.12-0.18   | 0.14-0.20   | 0.16-0.24   | 0.16-0.26   | 0.18-0.30   |
| 0.05-0.07                        | 0.06-0.08 | 0.08-0.10 | 0.10-0.15 | 0.12-0.18   | 0.14-0.20   | 0.16-0.24   | 0.16-0.26   | 0.18-0.30   |
| 0.04-0.08                        | 0.10-0.15 | 0.12-0.18 | 0.15-0.30 | 0.20-0.35   | 0.25-0.40   | 0.30-0.45   | 0.35-0.55   | 0.35-0.60   |
| 0.04-0.08                        | 0.10-0.15 | 0.12-0.18 | 0.15-0.30 | 0.20-0.35   | 0.25-0.40   | 0.30-0.45   | 0.35-0.55   | 0.35-0.60   |
| 0.04-0.08                        | 0.10-0.15 | 0.12-0.18 | 0.15-0.30 | 0.20-0.35   | 0.25-0.40   | 0.30-0.45   | 0.35-0.55   | 0.35-0.60   |
| 0.04-0.08                        | 0.10-0.15 | 0.12-0.18 | 0.15-0.30 | 0.20-0.35   | 0.25-0.40   | 0.30-0.45   | 0.35-0.55   | 0.35-0.60   |
| 0.04-0.08                        | 0.10-0.15 | 0.12-0.18 | 0.15-0.30 | 0.20-0.35   | 0.25-0.40   | 0.30-0.45   | 0.35-0.55   | 0.35-0.60   |
| 0.04-0.08                        | 0.10-0.15 | 0.12-0.18 | 0.15-0.30 | 0.20-0.35   | 0.25-0.40   | 0.30-0.45   | 0.35-0.55   | 0.35-0.60   |
|                                  |           | 0.15-0.30 | 0.20-0.35 | 0.25-0.40   | 0.30-0.45   | 0.35-0.50   | 0.40-0.60   | 0.45-0.70   |
|                                  |           | 0.15-0.30 | 0.20-0.35 | 0.25-0.40   | 0.30-0.45   | 0.35-0.50   | 0.40-0.60   | 0.45-0.70   |
|                                  |           | 0.15-0.30 | 0.20-0.35 | 0.25-0.40   | 0.30-0.45   | 0.35-0.50   | 0.40-0.60   | 0.45-0.70   |
|                                  |           | 0.15-0.30 | 0.20-0.35 | 0.25-0.40   | 0.30-0.45   | 0.35-0.50   | 0.40-0.60   | 0.45-0.70   |
|                                  |           | 0.15-0.30 | 0.20-0.35 | 0.25-0.40   | 0.30-0.45   | 0.35-0.50   | 0.40-0.60   | 0.45-0.70   |
|                                  |           | 0.15-0.30 | 0.20-0.35 | 0.25-0.40   | 0.30-0.45   | 0.35-0.50   | 0.40-0.60   | 0.45-0.70   |
|                                  |           | 0.15-0.30 | 0.20-0.35 | 0.25-0.40   | 0.30-0.45   | 0.35-0.50   | 0.40-0.60   | 0.45-0.70   |
|                                  |           | 0.15-0.30 | 0.20-0.35 | 0.25-0.40   | 0.30-0.45   | 0.35-0.50   | 0.40-0.60   | 0.45-0.70   |
|                                  |           |           |           |             |             |             |             |             |
|                                  |           |           |           |             |             |             |             |             |
|                                  |           | 0.05-0.07 | 0.06-0.11 | 0.08-0.13   | 0.10-0.15   | 0.12-0.18   | 0.12-0.20   | 0.14-0.22   |
|                                  |           | 0.05-0.07 | 0.06-0.11 | 0.08-0.13   | 0.10-0.15   | 0.12-0.18   | 0.12-0.20   | 0.14-0.22   |
|                                  |           | 0.05-0.07 | 0.06-0.11 | 0.08-0.13   | 0.10-0.15   | 0.12-0.18   | 0.12-0.20   | 0.14-0.22   |
|                                  |           | 0.05-0.07 | 0.06-0.11 | 0.08-0.13   | 0.10-0.15   | 0.12-0.18   | 0.12-0.20   | 0.14-0.22   |
|                                  |           | 0.05-0.07 | 0.06-0.11 | 0.08-0.13   | 0.10-0.15   | 0.12-0.18   | 0.12-0.20   | 0.14-0.22   |
|                                  |           | 0.05-0.07 | 0.06-0.12 | 0.08-0.15   | 0.10-0.18   | 0.12-0.20   | 0.14-0.22   | 0.16-0.25   |
|                                  |           | 0.05-0.07 | 0.06-0.12 | 0.08-0.15   | 0.10-0.18   | 0.12-0.20   | 0.14-0.22   | 0.16-0.25   |
|                                  |           | 0.05-0.07 | 0.06-0.12 | 0.08-0.15   | 0.10-0.18   | 0.12-0.20   | 0.14-0.22   | 0.16-0.25   |
|                                  |           | 0.05-0.07 | 0.06-0.12 | 0.08-0.15   | 0.10-0.18   | 0.12-0.20   | 0.14-0.22   | 0.16-0.25   |
|                                  |           |           |           |             |             |             |             |             |
|                                  |           |           |           |             |             |             |             |             |



# Recommended Cutting Conditions



## Machining data for MODU-R-DRILL

| ISO | Material                                                           | Condition                     | Tensile strength (N/mm <sup>2</sup> ) | Hardness HB | Material No. | Cutting speed Vc (m/min) |
|-----|--------------------------------------------------------------------|-------------------------------|---------------------------------------|-------------|--------------|--------------------------|
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C Annealed              | 420                                   | 125         | 1            | 120-200                  |
|     |                                                                    | >=0.25%C Annealed             | 650                                   | 190         | 2            | 120-200                  |
|     |                                                                    | <0.55%C Quenched and tempered | 850                                   | 250         | 3            | 130-190                  |
|     |                                                                    | >=0.55%C Annealed             | 750                                   | 220         | 4            | 130-190                  |
|     |                                                                    | Quenched and tempered         | 1000                                  | 300         | 5            | 130-190                  |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed                      | 600                                   | 200         | 6            | 100-200                  |
|     |                                                                    |                               | 930                                   | 275         | 7            | 100-200                  |
|     |                                                                    | Quenched and tempered         | 1000                                  | 300         | 8            | 100-200                  |
|     |                                                                    |                               | 1200                                  | 350         | 9            | 100-200                  |
|     | High alloy steel, cast steel and tool steel                        | Annealed                      | 680                                   | 200         | 10           | 100-160                  |
|     |                                                                    | Quenched and tempered         | 1100                                  | 325         | 11           | 100-160                  |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic        | 680                                   | 200         | 12           | 80-140                   |
|     |                                                                    | Martensitic                   | 820                                   | 240         | 13           | 80-140                   |
|     |                                                                    | Austenitic                    | 600                                   | 180         | 14           | 80-140                   |
| K   | Gray cast iron (GG)                                                | Ferritic                      |                                       | 160         | 15           | 100-250                  |
|     |                                                                    | Pearlitic                     |                                       | 250         | 16           | 100-250                  |
|     | Cast iron nodular (GGG)                                            | Ferritic                      |                                       | 180         | 17           | 100-250                  |
|     |                                                                    | Pearlitic                     |                                       | 260         | 18           | 100-250                  |
|     | Malleable cast iron                                                | Ferritic                      |                                       | 130         | 19           | 100-250                  |
|     |                                                                    | Pearlitic                     |                                       | 230         | 20           | 100-250                  |
| N   | Aluminum - Wrought alloy                                           | Not cureable                  |                                       | 60          | 21           | 160-260                  |
|     |                                                                    | Cured                         |                                       | 100         | 22           | 160-260                  |
|     | Aluminum-cast, alloyed                                             | <=12% Si Not cureable         |                                       | 75          | 23           | 160-260                  |
|     |                                                                    | Cured                         |                                       | 90          | 24           | 160-260                  |
|     |                                                                    | >12% Si High temp.            |                                       | 130         | 25           | 160-260                  |
|     | Copper alloys                                                      | >1% Pb Free cutting           |                                       | 110         | 26           | 160-260                  |
|     |                                                                    | Brass                         |                                       | 90          | 27           | 160-260                  |
|     |                                                                    | Electrolitic copper           |                                       | 100         | 28           | 160-260                  |
|     | Non-metallic                                                       | Duroplastics, fiber plastics  |                                       | 70 Shore D  | 29           |                          |
|     |                                                                    | Hard rubber                   |                                       | 55 Shore D  | 30           |                          |
| S   | High temp. alloys                                                  | Fe based Annealed             |                                       | 200         | 31           | 30-60                    |
|     |                                                                    |                               |                                       | 280         | 32           | 30-80                    |
|     |                                                                    | Ni or Co based Annealed       |                                       | 250         | 33           | 30-80                    |
|     |                                                                    |                               |                                       | 350         | 34           | 30-80                    |
|     |                                                                    |                               |                                       | 320         | 35           | 30-80                    |
|     | Titanium, Ti alloys                                                | Pure                          | Rm 400                                | 190         | 36           | 30-80                    |
|     |                                                                    | Alpha+beta alloys cured       | Rm 1050                               | 310         | 37           | 30-80                    |
| H   | Hardened steel                                                     | Hardened                      |                                       | 55HRC       | 38           | 20-50                    |
|     |                                                                    | Hardened                      |                                       | 60HRC       | 39           | 20-50                    |
|     | Chilled cast iron                                                  | Cast                          |                                       | 400         | 40           |                          |
|     | Cast iron nodular                                                  | Hardened                      |                                       | 55HRC       | 41           |                          |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for MODU-R-DRILL

| Feed (mm/rev) vs. drill diameter |                      |                      |                      |                      |                      |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SPGX 06<br>Ø26 - Ø28             | SPGX 07<br>Ø29 - Ø32 | SPGX 09<br>Ø33 - Ø36 | SPGX 11<br>Ø37 - Ø43 | SPGX 11<br>Ø44 - Ø45 | SPGX 14<br>Ø46 - Ø50 |
| 0.20-0.35                        | 0.25-0.35            | 0.2-0.4              | 0.25-0.4             | 0.28-0.45            | 0.28-0.45            |
| 0.20-0.35                        | 0.25-0.35            | 0.2-0.4              | 0.25-0.4             | 0.28-0.45            | 0.28-0.45            |
| 0.20-0.35                        | 0.25-0.35            | 0.2-0.4              | 0.25-0.4             | 0.28-0.45            | 0.28-0.45            |
| 0.20-0.35                        | 0.25-0.35            | 0.2-0.4              | 0.25-0.4             | 0.28-0.45            | 0.28-0.45            |
| 0.20-0.35                        | 0.25-0.35            | 0.2-0.4              | 0.25-0.4             | 0.28-0.45            | 0.28-0.45            |
| 0.20-0.33                        | 0.25-0.33            | 0.25-0.36            | 0.25-0.36            | 0.25-0.40            | 0.25-0.40            |
| 0.20-0.33                        | 0.25-0.33            | 0.25-0.36            | 0.25-0.36            | 0.25-0.40            | 0.25-0.40            |
| 0.20-0.33                        | 0.25-0.33            | 0.25-0.36            | 0.25-0.36            | 0.25-0.40            | 0.25-0.40            |
| 0.20-0.33                        | 0.25-0.33            | 0.25-0.36            | 0.25-0.36            | 0.25-0.40            | 0.25-0.40            |
| 0.20-0.33                        | 0.25-0.33            | 0.25-0.36            | 0.25-0.36            | 0.25-0.40            | 0.25-0.40            |
| 0.12-0.24                        | 0.15-0.24            | 0.16-0.25            | 0.18-0.28            | 0.18-0.30            | 0.18-0.30            |
| 0.12-0.24                        | 0.15-0.24            | 0.16-0.25            | 0.18-0.28            | 0.18-0.30            | 0.18-0.30            |
| 0.12-0.24                        | 0.15-0.24            | 0.16-0.25            | 0.18-0.28            | 0.18-0.30            | 0.18-0.30            |
| 0.25-0.45                        | 0.25-0.45            | 0.3-0.5              | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            |
| 0.25-0.45                        | 0.25-0.45            | 0.3-0.5              | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            |
| 0.25-0.45                        | 0.25-0.45            | 0.3-0.5              | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            |
| 0.25-0.45                        | 0.25-0.45            | 0.3-0.5              | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            |
| 0.25-0.45                        | 0.25-0.45            | 0.3-0.5              | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            |
| 0.25-0.45                        | 0.25-0.45            | 0.3-0.5              | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            |
| 0.3-0.5                          | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            | 0.4-0.6              | 0.4-0.6              |
| 0.3-0.5                          | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            | 0.4-0.6              | 0.4-0.6              |
| 0.3-0.5                          | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            | 0.4-0.6              | 0.4-0.6              |
| 0.3-0.5                          | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            | 0.4-0.6              | 0.4-0.6              |
| 0.3-0.5                          | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            | 0.4-0.6              | 0.4-0.6              |
| 0.3-0.5                          | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            | 0.4-0.6              | 0.4-0.6              |
| 0.3-0.5                          | 0.3-0.5              | 0.35-0.55            | 0.35-0.55            | 0.4-0.6              | 0.4-0.6              |
|                                  |                      |                      |                      |                      |                      |
|                                  |                      |                      |                      |                      |                      |
| 0.1-0.16                         | 0.10-0.18            | 0.15-0.20            | 0.15-0.22            | 0.16-0.24            | 0.16-0.24            |
| 0.1-0.16                         | 0.10-0.18            | 0.15-0.20            | 0.15-0.22            | 0.16-0.24            | 0.16-0.24            |
| 0.1-0.16                         | 0.10-0.18            | 0.15-0.20            | 0.15-0.22            | 0.16-0.24            | 0.16-0.24            |
| 0.1-0.16                         | 0.10-0.18            | 0.15-0.20            | 0.15-0.22            | 0.16-0.24            | 0.16-0.24            |
| 0.1-0.16                         | 0.10-0.18            | 0.15-0.20            | 0.15-0.22            | 0.16-0.24            | 0.16-0.24            |
| 0.1-0.16                         | 0.10-0.18            | 0.15-0.20            | 0.15-0.22            | 0.16-0.24            | 0.16-0.24            |
| 0.1-0.16                         | 0.12-0.18            | 0.14-0.20            | 0.14-0.20            | 0.16-0.22            | 0.16-0.22            |
| 0.1-0.16                         | 0.12-0.18            | 0.14-0.20            | 0.14-0.20            | 0.16-0.22            | 0.16-0.22            |
|                                  |                      |                      |                      |                      |                      |
|                                  |                      |                      |                      |                      |                      |

# Recommended Cutting Conditions



## Machining data for SPADE-RUSH

| ISO         | Material                                                                    |                              | Condition             | Tensile strength<br>(N/mm <sup>2</sup> ) | Hardness<br>HB | Material<br>No. | Cutting<br>speed<br>Vc (m/min) |
|-------------|-----------------------------------------------------------------------------|------------------------------|-----------------------|------------------------------------------|----------------|-----------------|--------------------------------|
| P           | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C                      | Annealed              | 420                                      | 125            | 1               | 80-140                         |
|             |                                                                             | >=0.25%C                     | Annealed              | 650                                      | 190            | 2               | 80-130                         |
|             |                                                                             | <0.55%C                      | Quenched and tempered | 850                                      | 250            | 3               | 80-120                         |
|             |                                                                             | >=0.55%C                     | Annealed              | 750                                      | 220            | 4               | 70-110                         |
|             |                                                                             |                              | Quenched and tempered | 1000                                     | 300            | 5               | 50-90                          |
|             | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                              | Annealed              | 600                                      | 200            | 6               | 80-120                         |
|             |                                                                             |                              | Quenched and tempered | 930                                      | 275            | 7               | 70-110                         |
|             |                                                                             |                              |                       | 1000                                     | 300            | 8               | 50-90                          |
|             |                                                                             |                              |                       | 1200                                     | 350            | 9               | 40-70                          |
|             | High alloy steel, cast steel<br>and tool steel                              |                              | Annealed              | 680                                      | 200            | 10              | 50-90                          |
|             |                                                                             |                              | Quenched and tempered | 1100                                     | 325            | 11              | 40-80                          |
| M           | Stainless steel<br>and cast steel                                           | Ferritic / martensitic       | 680                   | 200                                      | 12             | 40-70           |                                |
|             |                                                                             | Martensitic                  | 820                   | 240                                      | 13             | 40-70           |                                |
|             |                                                                             | Austenitic                   | 600                   | 180                                      | 14             | 30-70           |                                |
| K           | Gray cast iron<br>(GG)                                                      | Ferritic                     |                       | 160                                      | 15             | 90-180          |                                |
|             |                                                                             | Pearlitic                    |                       | 250                                      | 16             | 80-140          |                                |
|             | Cast iron nodular<br>(GGG)                                                  | Ferritic                     |                       | 180                                      | 17             | 90-165          |                                |
|             |                                                                             | Pearlitic                    |                       | 260                                      | 18             | 80-140          |                                |
|             | Malleable cast iron                                                         | Ferritic                     |                       | 130                                      | 19             | 90-160          |                                |
|             |                                                                             | Pearlitic                    |                       | 230                                      | 20             | 80-140          |                                |
| N           | Aluminum - Wrought alloy                                                    | Not cureable                 |                       | 60                                       | 21             | 90-220          |                                |
|             |                                                                             | Cured                        |                       | 100                                      | 22             | 90-220          |                                |
|             | Aluminum-<br>cast, alloyed                                                  | <=12% Si                     | Not cureable          |                                          | 75             | 23              | 90-220                         |
|             |                                                                             |                              | Cured                 |                                          | 90             | 24              | 90-220                         |
|             | >12% Si                                                                     | High temp.                   |                       | 130                                      | 25             | 80-160          |                                |
|             | Copper alloys                                                               | >1% Pb                       | Free cutting          |                                          | 110            | 26              | 90-220                         |
|             |                                                                             |                              | Brass                 |                                          | 90             | 27              | 90-220                         |
|             |                                                                             | Electrolitic copper          |                       | 100                                      | 28             | 90-220          |                                |
|             | Non-metallic                                                                | Duroplastics, fiber plastics |                       |                                          | 70 Shore D     | 29              |                                |
| Hard rubber |                                                                             |                              |                       | 55 Shore D                               | 30             |                 |                                |
| S           | High temp.<br>alloys                                                        | Fe based                     | Annealed              |                                          | 200            | 31              | 30-60                          |
|             |                                                                             |                              | Cured                 |                                          | 280            | 32              | 20-50                          |
|             |                                                                             | Ni or<br>Co based            | Annealed              |                                          | 250            | 33              | 20-50                          |
|             |                                                                             |                              | Cured                 |                                          | 350            | 34              | 20-50                          |
|             |                                                                             |                              | Cast                  |                                          | 320            | 35              | 20-50                          |
|             | Titanium, Ti alloys                                                         | Pure                         | Rm 400                | 190                                      | 36             | 20-50           |                                |
|             |                                                                             | Alpha+beta alloys cured      | Rm 1050               | 310                                      | 37             | 20-50           |                                |
| H           | Hardened steel                                                              | Hardened                     |                       | 55HRC                                    | 38             | 20-50           |                                |
|             |                                                                             | Hardened                     |                       | 60HRC                                    | 39             | 20-50           |                                |
|             | Chilled cast iron                                                           | Cast                         |                       | 400                                      | 40             |                 |                                |
|             | Cast iron nodular                                                           | Hardened                     |                       | 55HRC                                    | 41             |                 |                                |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for SPADE-RUSH

| Feed (mm/rev) vs. drill diameter |           |             |           |             |           |           |
|----------------------------------|-----------|-------------|-----------|-------------|-----------|-----------|
| Ø20 - Ø25.9                      |           | Ø26 - Ø29.9 |           | Ø30 - Ø34.9 |           | Ø35 - Ø41 |
| LCD...-P                         | LCD...-P+ | LCD...-P    | LCD...-P+ | LCD...-P    | LCD...-P+ |           |
| 0.30-0.50                        | 0.25-0.45 | 0.30-0.50   | 0.30-0.50 | 0.30-0.50   | 0.30-0.50 | 0.35-0.55 |
| 0.30-0.50                        | 0.25-0.45 | 0.30-0.50   | 0.30-0.50 | 0.30-0.50   | 0.30-0.50 | 0.35-0.55 |
| 0.30-0.50                        | 0.25-0.45 | 0.30-0.50   | 0.30-0.50 | 0.30-0.50   | 0.30-0.50 | 0.35-0.55 |
| 0.30-0.50                        | 0.25-0.45 | 0.30-0.50   | 0.30-0.50 | 0.30-0.50   | 0.30-0.50 | 0.35-0.55 |
| 0.30-0.50                        | 0.25-0.45 | 0.30-0.50   | 0.30-0.50 | 0.30-0.50   | 0.30-0.50 | 0.35-0.55 |
| 0.25-0.45                        | 0.20-0.40 | 0.25-0.45   | 0.25-0.45 | 0.25-0.45   | 0.25-0.45 | 0.30-0.50 |
| 0.25-0.45                        | 0.20-0.40 | 0.25-0.45   | 0.25-0.45 | 0.25-0.45   | 0.25-0.45 | 0.30-0.50 |
| 0.25-0.45                        | 0.20-0.40 | 0.25-0.45   | 0.25-0.45 | 0.25-0.45   | 0.25-0.45 | 0.30-0.50 |
| 0.25-0.45                        | 0.20-0.40 | 0.25-0.45   | 0.25-0.45 | 0.25-0.45   | 0.25-0.45 | 0.30-0.50 |
| 0.25-0.35                        | 0.20-0.30 | 0.25-0.35   | 0.25-0.35 | 0.25-0.35   | 0.25-0.35 | 0.30-0.40 |
| 0.25-0.35                        | 0.20-0.30 | 0.25-0.35   | 0.25-0.35 | 0.25-0.35   | 0.25-0.35 | 0.30-0.40 |
| 0.15-0.30                        |           | 0.15-0.30   |           | 0.15-0.30   |           | 0.20-0.35 |
| 0.15-0.30                        |           | 0.15-0.30   |           | 0.15-0.30   |           | 0.20-0.35 |
| 0.15-0.30                        |           | 0.15-0.30   |           | 0.15-0.30   |           | 0.20-0.35 |
| 0.35-0.55                        | 0.30-0.50 | 0.35-0.55   | 0.35-0.55 | 0.35-0.55   | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55                        | 0.30-0.50 | 0.35-0.55   | 0.35-0.55 | 0.35-0.55   | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55                        | 0.30-0.50 | 0.35-0.55   | 0.35-0.55 | 0.35-0.55   | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55                        | 0.30-0.50 | 0.35-0.55   | 0.35-0.55 | 0.35-0.55   | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55                        | 0.30-0.50 | 0.35-0.55   | 0.35-0.55 | 0.35-0.55   | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55                        | 0.30-0.50 | 0.35-0.55   | 0.35-0.55 | 0.35-0.55   | 0.35-0.55 | 0.40-0.60 |
| 0.40-0.60                        |           | 0.40-0.60   |           | 0.40-0.60   |           | 0.50-0.70 |
| 0.40-0.60                        |           | 0.40-0.60   |           | 0.40-0.60   |           | 0.50-0.70 |
| 0.40-0.60                        |           | 0.40-0.60   |           | 0.40-0.60   |           | 0.50-0.70 |
| 0.40-0.60                        |           | 0.40-0.60   |           | 0.40-0.60   |           | 0.50-0.70 |
| 0.40-0.60                        |           | 0.40-0.60   |           | 0.40-0.60   |           | 0.50-0.70 |
| 0.40-0.60                        |           | 0.40-0.60   |           | 0.40-0.60   |           | 0.50-0.70 |
| 0.40-0.60                        |           | 0.40-0.60   |           | 0.40-0.60   |           | 0.50-0.70 |
|                                  |           |             |           |             |           |           |
|                                  |           |             |           |             |           |           |
| 0.10-0.20                        |           | 0.10-0.20   |           | 0.15-0.25   |           | 0.15-0.25 |
| 0.10-0.20                        |           | 0.10-0.20   |           | 0.15-0.25   |           | 0.15-0.25 |
| 0.10-0.20                        |           | 0.10-0.20   |           | 0.15-0.25   |           | 0.15-0.25 |
| 0.10-0.20                        |           | 0.10-0.20   |           | 0.15-0.25   |           | 0.15-0.25 |
| 0.10-0.20                        |           | 0.10-0.20   |           | 0.15-0.25   |           | 0.15-0.25 |
| 0.10-0.20                        |           | 0.10-0.20   |           | 0.15-0.25   |           | 0.15-0.25 |
| 0.10-0.20                        |           | 0.10-0.20   |           | 0.15-0.25   |           | 0.15-0.25 |
| 0.10-0.20                        |           | 0.10-0.20   |           | 0.15-0.25   |           | 0.15-0.25 |
|                                  |           |             |           |             |           |           |
|                                  |           |             |           |             |           |           |

# Recommended Cutting Conditions



## Machining data for SOLID-3-DRILL

| ISO       | Material                                                                    |                        | Condition                    | Tensile strength<br>(N/mm²) | Hardness<br>HB | Material<br>No. | Cutting<br>speed<br>Vc (m/min) |
|-----------|-----------------------------------------------------------------------------|------------------------|------------------------------|-----------------------------|----------------|-----------------|--------------------------------|
| P         | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C                | Annealed                     | 420                         | 125            | 1               | 80-140                         |
|           |                                                                             | >=0.25%C               | Annealed                     | 650                         | 190            | 2               | 80-130                         |
|           |                                                                             | <0.55%C                | Quenched and tempered        | 850                         | 250            | 3               | 80-120                         |
|           |                                                                             | >=0.55%C               | Annealed                     | 750                         | 220            | 4               | 70-110                         |
|           |                                                                             |                        | Quenched and tempered        | 1000                        | 300            | 5               | 50-90                          |
|           | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                        | Annealed                     | 600                         | 200            | 6               | 80-120                         |
|           |                                                                             |                        | Quenched and tempered        | 930                         | 275            | 7               | 70-110                         |
|           |                                                                             |                        |                              | 1000                        | 300            | 8               | 50-90                          |
|           |                                                                             |                        |                              | 1200                        | 350            | 9               | 40-70                          |
|           | High alloy steel, cast steel<br>and tool steel                              |                        | Annealed                     | 680                         | 200            | 10              | 50-90                          |
|           |                                                                             |                        | Quenched and tempered        | 1100                        | 325            | 11              | 40-80                          |
| M         | Stainless steel<br>and cast steel                                           | Ferritic / martensitic | 680                          | 200                         | 12             |                 |                                |
|           |                                                                             | Martensitic            | 820                          | 240                         | 13             |                 |                                |
|           |                                                                             | Austenitic             | 600                          | 180                         | 14             |                 |                                |
| K         | Gray cast iron<br>(GG)                                                      | Ferritic               |                              | 160                         | 15             | 80-140          |                                |
|           |                                                                             | Pearlitic              |                              | 250                         | 16             | 70-120          |                                |
|           | Cast iron nodular<br>(GGG)                                                  | Ferritic               |                              | 180                         | 17             | 80-120          |                                |
|           |                                                                             | Pearlitic              |                              | 260                         | 18             | 70-110          |                                |
|           | Malleable cast iron                                                         | Ferritic               |                              | 130                         | 19             | 80-120          |                                |
| Pearlitic |                                                                             |                        | 230                          | 20                          | 70-110         |                 |                                |
| N         | Aluminum - Wrought alloy                                                    | Not cureable           |                              | 60                          | 21             |                 |                                |
|           |                                                                             | Cured                  |                              | 100                         | 22             |                 |                                |
|           | Aluminum-<br>cast, alloyed                                                  | <=12% Si               | Not cureable                 |                             | 75             | 23              |                                |
|           |                                                                             |                        | Cured                        |                             | 90             | 24              |                                |
|           |                                                                             | >12% Si                | High temp.                   |                             | 130            | 25              |                                |
|           | Copper alloys                                                               | >1% Pb                 | Free cutting                 |                             | 110            | 26              |                                |
|           |                                                                             |                        | Brass                        |                             | 90             | 27              |                                |
|           |                                                                             |                        | Electrolitic copper          |                             | 100            | 28              |                                |
|           | Non-metallic                                                                |                        | Duroplastics, fiber plastics |                             | 70 Shore D     | 29              |                                |
|           |                                                                             | Hard rubber            |                              | 55 Shore D                  | 30             |                 |                                |
| S         | High temp.<br>alloys                                                        | Fe based               | Annealed                     |                             | 200            | 31              |                                |
|           |                                                                             |                        | Cured                        |                             | 280            | 32              |                                |
|           |                                                                             | Ni or<br>Co based      | Annealed                     |                             | 250            | 33              |                                |
|           |                                                                             |                        | Cured                        |                             | 350            | 34              |                                |
|           |                                                                             |                        | Cast                         |                             | 320            | 35              |                                |
|           | Titanium, Ti alloys                                                         |                        | Pure                         | Rm 400                      | 190            | 36              |                                |
|           |                                                                             |                        | Alpha+beta alloys cured      | Rm 1050                     | 310            | 37              |                                |
| H         | Hardened steel                                                              | Hardened               |                              | 55HRC                       | 38             |                 |                                |
|           |                                                                             | Hardened               |                              | 60HRC                       | 39             |                 |                                |
|           | Chilled cast iron                                                           | Cast                   |                              | 400                         | 40             |                 |                                |
|           | Cast iron nodular                                                           | Hardened               |                              | 55HRC                       | 41             |                 |                                |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# SOLID 3 DRILL

[illegible]

# Recommended Cutting Conditions



## Machining data for H-DRILL

| ISO                     | Material                                                                    |                            | Condition                    | Tensile strength<br>(N/mm²) | Hardness<br>HB | Material<br>No. | Cutting<br>speed<br>Vc (m/min) |
|-------------------------|-----------------------------------------------------------------------------|----------------------------|------------------------------|-----------------------------|----------------|-----------------|--------------------------------|
| P                       | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C                    | Annealed                     | 420                         | 125            | 1               | 80-120                         |
|                         |                                                                             | >=0.25%C                   | Annealed                     | 650                         | 190            | 2               | 80-110                         |
|                         |                                                                             | <0.55%C                    | Quenched and tempered        | 850                         | 250            | 3               | 70-100                         |
|                         |                                                                             | >=0.55%C                   | Annealed                     | 750                         | 220            | 4               | 70-100                         |
|                         | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                            | Quenched and tempered        | 1000                        | 300            | 5               | 70-100                         |
|                         |                                                                             | Annealed                   |                              | 600                         | 200            | 6               | 70-90                          |
|                         |                                                                             |                            |                              | 930                         | 275            | 7               | 70-90                          |
|                         |                                                                             |                            | Quenched and tempered        |                             | 1000           | 300             | 8                              |
|                         |                                                                             | 1200                       |                              | 350                         | 9              | 40-70           |                                |
|                         | High alloy steel, cast steel<br>and tool steel                              |                            | Annealed                     | 680                         | 200            | 10              | 50-80                          |
|                         |                                                                             |                            | Quenched and tempered        | 1100                        | 325            | 11              | 40-70                          |
| M                       | Stainless steel<br>and cast steel                                           | Ferritic / martensitic     | 680                          | 200                         | 12             | 30-60           |                                |
|                         |                                                                             | Martensitic                | 820                          | 240                         | 13             | 30-60           |                                |
|                         |                                                                             | Austenitic                 | 600                          | 180                         | 14             | 30-60           |                                |
| K                       | Gray cast iron<br>(GG)                                                      | Ferritic                   |                              | 160                         | 15             | 65-80           |                                |
|                         |                                                                             | Pearlitic                  |                              | 250                         | 16             | 65-80           |                                |
|                         | Cast iron nodular<br>(GGG)                                                  | Ferritic                   |                              | 180                         | 17             | 85-105          |                                |
|                         |                                                                             | Pearlitic                  |                              | 260                         | 18             | 75-90           |                                |
|                         | Malleable cast iron                                                         | Ferritic                   |                              | 130                         | 19             | 65-80           |                                |
| N                       | Aluminum - Wrought alloy                                                    |                            | Pearlitic                    | 230                         | 20             | 65-80           |                                |
|                         |                                                                             |                            | Not cureable                 | 60                          | 21             | 70-200          |                                |
|                         |                                                                             | Cured                      | 100                          | 22                          | 70-200         |                 |                                |
|                         |                                                                             | Aluminum-<br>cast, alloyed | <=12% Si                     | Not cureable                | 75             | 23              | 70-200                         |
|                         |                                                                             |                            | Cured                        | 90                          | 24             | 70-200          |                                |
|                         |                                                                             | >12% Si                    | High temp.                   | 130                         | 25             | 70-150          |                                |
|                         |                                                                             |                            | >1% Pb                       | Free cutting                | 110            | 26              | 70-200                         |
|                         | Copper alloys                                                               |                            |                              | Brass                       | 90             | 27              | 70-200                         |
|                         |                                                                             |                            | Electrolitic copper          | 100                         | 28             | 70-200          |                                |
|                         |                                                                             | Non-metallic               | Duroplastics, fiber plastics |                             | 70 Shore D     | 29              |                                |
| Hard rubber             |                                                                             |                            |                              | 55 Shore D                  | 30             |                 |                                |
| S                       | High temp.<br>alloys                                                        | Fe based                   | Annealed                     |                             | 200            | 31              | 15-40                          |
|                         |                                                                             |                            | Cured                        |                             | 280            | 32              | 15-40                          |
|                         |                                                                             | Ni or<br>Co based          | Annealed                     |                             | 250            | 33              | 15-40                          |
|                         |                                                                             |                            | Cured                        |                             | 350            | 34              | 15-40                          |
|                         |                                                                             |                            | Cast                         |                             | 320            | 35              | 15-40                          |
|                         | Titanium, Ti alloys                                                         | Pure                       | Rm 400                       | 190                         | 36             |                 |                                |
| Alpha+beta alloys cured |                                                                             | Rm 1050                    | 310                          | 37                          |                |                 |                                |
| H                       | Hardened steel                                                              | Hardened                   |                              | 55HRC                       | 38             | 10-40           |                                |
|                         |                                                                             | Hardened                   |                              | 60HRC                       | 39             | 10-40           |                                |
|                         | Chilled cast iron                                                           | Cast                       |                              | 400                         | 40             |                 |                                |
|                         | Cast iron nodular                                                           | Hardened                   |                              | 55HRC                       | 41             |                 |                                |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel ■ Stainless steel ■ Cast iron ■ Nonferrous ■ High temp. alloys ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for H-DRILL

| Feed (mm/rev) vs. drill diameter |           |            |
|----------------------------------|-----------|------------|
| Ø3 - Ø5                          | Ø5.1 - Ø8 | Ø8.1 - Ø12 |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.08-0.18                        | 0.10-0.20 | 0.15-0.25  |
| 0.08-0.18                        | 0.10-0.20 | 0.15-0.25  |
| 0.06-0.12                        | 0.10-0.15 | 0.12-0.18  |
| 0.06-0.12                        | 0.10-0.15 | 0.12-0.18  |
| 0.06-0.12                        | 0.10-0.15 | 0.12-0.18  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.20                        | 0.15-0.25 | 0.20-0.30  |
| 0.10-0.25                        | 0.15-0.35 | 0.25-0.45  |
| 0.10-0.25                        | 0.15-0.35 | 0.25-0.45  |
| 0.10-0.25                        | 0.15-0.35 | 0.25-0.45  |
| 0.10-0.25                        | 0.15-0.35 | 0.25-0.45  |
| 0.10-0.25                        | 0.15-0.35 | 0.25-0.45  |
| 0.08-0.18                        | 0.15-0.25 | 0.20-0.35  |
| 0.08-0.18                        | 0.15-0.25 | 0.20-0.35  |
| 0.08-0.18                        | 0.15-0.25 | 0.20-0.35  |
|                                  |           |            |
|                                  |           |            |
| 0.02-0.08                        | 0.04-0.10 | 0.06-0.12  |
| 0.02-0.08                        | 0.04-0.10 | 0.06-0.12  |
| 0.02-0.08                        | 0.04-0.10 | 0.06-0.12  |
| 0.02-0.08                        | 0.04-0.10 | 0.06-0.12  |
| 0.02-0.08                        | 0.04-0.10 | 0.06-0.12  |
|                                  |           |            |
|                                  |           |            |
| 0.02-0.08                        | 0.04-0.10 | 0.06-0.12  |
| 0.02-0.08                        | 0.04-0.10 | 0.06-0.12  |
|                                  |           |            |
|                                  |           |            |



# Recommended Cutting Conditions



## Machining data for TBTA 3/5/7 & TBTA-R

| ISO       | Material                                                           |                        | Condition                    | Tensile strength (N/mm²) | Hardness HB | Material No. | Cutting speed Vc (m/min) |        |
|-----------|--------------------------------------------------------------------|------------------------|------------------------------|--------------------------|-------------|--------------|--------------------------|--------|
| P         | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                | Annealed                     | 420                      | 125         | 1            | 60-120                   |        |
|           |                                                                    | >=0.25%C               | Annealed                     | 650                      | 190         | 2            | 60-120                   |        |
|           |                                                                    | <0.55%C                | Quenched and tempered        | 850                      | 250         | 3            | 60-120                   |        |
|           |                                                                    | >=0.55%C               | Annealed                     | 750                      | 220         | 4            | 60-120                   |        |
|           |                                                                    |                        | Quenched and tempered        | 1000                     | 300         | 5            | 50-100                   |        |
|           | Low alloy steel and cast steel (Less than 5% of alloying elements) |                        | Annealed                     | 600                      | 200         | 6            | 50-100                   |        |
|           |                                                                    |                        | Quenched and tempered        |                          | 930         | 275          | 7                        | 50-100 |
|           |                                                                    |                        |                              |                          | 1000        | 300          | 8                        | 50-100 |
|           |                                                                    |                        |                              |                          | 1200        | 350          | 9                        | 50-100 |
|           | High alloy steel, cast steel and tool steel                        |                        | Annealed                     | 680                      | 200         | 10           | 60-120                   |        |
|           |                                                                    |                        | Quenched and tempered        | 1100                     | 325         | 11           | 60-120                   |        |
| M         | Stainless steel and cast steel                                     | Ferritic / martensitic | 680                          | 200                      | 12          | 60-110       |                          |        |
|           |                                                                    | Martensitic            | 820                          | 240                      | 13          | 60-110       |                          |        |
|           |                                                                    | Austenitic             | 600                          | 180                      | 14          | 60-110       |                          |        |
| K         | Gray cast iron (GG)                                                | Ferritic               |                              | 160                      | 15          | 60-100       |                          |        |
|           |                                                                    | Pearlitic              |                              | 250                      | 16          | 60-100       |                          |        |
|           | Cast iron nodular (GGG)                                            | Ferritic               |                              | 180                      | 17          | 60-100       |                          |        |
|           |                                                                    | Pearlitic              |                              | 260                      | 18          | 60-100       |                          |        |
|           | Malleable cast iron                                                | Ferritic               |                              | 130                      | 19          | 60-100       |                          |        |
| Pearlitic |                                                                    |                        | 230                          | 20                       | 60-100      |              |                          |        |
| N         | Aluminum - Wrought alloy                                           | Not cureable           |                              | 60                       | 21          | 60-130       |                          |        |
|           |                                                                    | Cured                  |                              | 100                      | 22          | 60-130       |                          |        |
|           | Aluminum-cast, alloyed                                             | <=12% Si               | Not cureable                 |                          | 75          | 23           | 60-130                   |        |
|           |                                                                    |                        | Cured                        |                          | 90          | 24           | 60-130                   |        |
|           |                                                                    | >12% Si                | High temp.                   |                          | 130         | 25           | 60-130                   |        |
|           |                                                                    | >1% Pb                 | Free cutting                 |                          | 110         | 26           | 60-130                   |        |
|           | Copper alloys                                                      |                        | Brass                        |                          | 90          | 27           | 60-130                   |        |
|           |                                                                    |                        | Electrolitic copper          |                          | 100         | 28           | 60-130                   |        |
|           | Non-metallic                                                       |                        | Duroplastics, fiber plastics |                          | 70 Shore D  | 29           |                          |        |
|           |                                                                    | Hard rubber            |                              | 55 Shore D               | 30          |              |                          |        |
| S         | High temp. alloys                                                  | Fe based               | Annealed                     |                          | 200         | 31           | 20-65                    |        |
|           |                                                                    |                        | Cured                        |                          | 280         | 32           | 20-65                    |        |
|           |                                                                    | Ni or Co based         | Annealed                     |                          | 250         | 33           | 20-65                    |        |
|           |                                                                    |                        | Cured                        |                          | 350         | 34           | 20-65                    |        |
|           |                                                                    |                        | Cast                         |                          | 320         | 35           | 20-65                    |        |
|           | Titanium, Ti alloys                                                |                        | Pure                         | Rm 400                   | 190         | 36           | 30-100                   |        |
|           |                                                                    |                        | Alpha+beta alloys cured      | Rm 1050                  | 310         | 37           | 30-100                   |        |
| H         | Hardened steel                                                     | Hardened               |                              | 55HRC                    | 38          |              |                          |        |
|           |                                                                    | Hardened               |                              | 60HRC                    | 39          |              |                          |        |
|           | Chilled cast iron                                                  | Cast                   |                              | 400                      | 40          |              |                          |        |
|           | Cast iron nodular                                                  | Hardened               |                              | 55HRC                    | 41          |              |                          |        |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for TBTA 3/5/7 & TBTA-R

| Feed (mm/rev) vs. drill diameter |                 |                 |                 |           |
|----------------------------------|-----------------|-----------------|-----------------|-----------|
| Ø38.00 - Ø39.99                  | Ø40.00 - Ø51.99 | Ø52.00 - Ø63.99 | Ø64.00 - Ø84.99 | Ø85.00 -  |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.13                        | 0.10-0.15       | 0.13-0.18       | 0.15-0.20       | 0.18-0.23 |
| 0.08-0.13                        | 0.10-0.15       | 0.13-0.18       | 0.15-0.20       | 0.18-0.23 |
| 0.08-0.13                        | 0.10-0.15       | 0.13-0.18       | 0.15-0.20       | 0.18-0.23 |
| 0.08-0.13                        | 0.10-0.15       | 0.13-0.18       | 0.15-0.20       | 0.18-0.23 |
| 0.08-0.13                        | 0.10-0.15       | 0.13-0.18       | 0.15-0.20       | 0.18-0.23 |
| 0.08-0.13                        | 0.10-0.15       | 0.13-0.18       | 0.15-0.20       | 0.18-0.23 |
| 0.08-0.20                        | 0.10-0.25       | 0.13-0.28       | 0.15-0.30       | 0.18-0.33 |
| 0.08-0.20                        | 0.10-0.25       | 0.13-0.28       | 0.15-0.30       | 0.18-0.33 |
| 0.08-0.20                        | 0.10-0.25       | 0.13-0.28       | 0.15-0.30       | 0.18-0.33 |
| 0.08-0.20                        | 0.10-0.25       | 0.13-0.28       | 0.15-0.30       | 0.18-0.33 |
| 0.08-0.20                        | 0.10-0.25       | 0.13-0.28       | 0.15-0.30       | 0.18-0.33 |
| 0.08-0.20                        | 0.10-0.25       | 0.13-0.28       | 0.15-0.30       | 0.18-0.33 |
| 0.08-0.20                        | 0.10-0.25       | 0.13-0.28       | 0.15-0.30       | 0.18-0.33 |
|                                  |                 |                 |                 |           |
|                                  |                 |                 |                 |           |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
| 0.08-0.15                        | 0.10-0.20       | 0.13-0.23       | 0.15-0.25       | 0.18-0.30 |
|                                  |                 |                 |                 |           |
|                                  |                 |                 |                 |           |
|                                  |                 |                 |                 |           |
|                                  |                 |                 |                 |           |

# Recommended Cutting Conditions



## Machining data for TBTA-FB, BTE

| ISO | Material                                                           | Condition                     | Tensile strength (N/mm <sup>2</sup> ) | Hardness HB | Material No. | Cutting speed Vc (m/min) |
|-----|--------------------------------------------------------------------|-------------------------------|---------------------------------------|-------------|--------------|--------------------------|
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C Annealed              | 420                                   | 125         | 1            | 70-130                   |
|     |                                                                    | >=0.25%C Annealed             | 650                                   | 190         | 2            | 70-130                   |
|     |                                                                    | <0.55%C Quenched and tempered | 850                                   | 250         | 3            | 70-130                   |
|     |                                                                    | >=0.55%C Annealed             | 750                                   | 220         | 4            | 70-130                   |
|     |                                                                    | Quenched and tempered         | 1000                                  | 300         | 5            | 70-130                   |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed                      | 600                                   | 200         | 6            | 70-120                   |
|     |                                                                    |                               | 930                                   | 275         | 7            | 60-120                   |
|     |                                                                    | Quenched and tempered         | 1000                                  | 300         | 8            | 60-120                   |
|     |                                                                    |                               | 1200                                  | 350         | 9            | 60-120                   |
|     | High alloy steel, cast steel and tool steel                        | Annealed                      | 680                                   | 200         | 10           | 70-130                   |
|     |                                                                    | Quenched and tempered         | 1100                                  | 325         | 11           | 70-130                   |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic        | 680                                   | 200         | 12           | 70-130                   |
|     |                                                                    | Martensitic                   | 820                                   | 240         | 13           | 70-130                   |
|     |                                                                    | Austenitic                    | 600                                   | 180         | 14           | 70-130                   |
| K   | Gray cast iron (GG)                                                | Ferritic                      |                                       | 160         | 15           | 60-110                   |
|     |                                                                    | Pearlitic                     |                                       | 250         | 16           | 60-110                   |
|     | Cast iron nodular (GGG)                                            | Ferritic                      |                                       | 180         | 17           | 50-110                   |
|     |                                                                    | Pearlitic                     |                                       | 260         | 18           | 50-110                   |
|     | Malleable cast iron                                                | Ferritic                      |                                       | 130         | 19           | 70-110                   |
|     |                                                                    | Pearlitic                     |                                       | 230         | 20           | 70-110                   |
| N   | Aluminum - Wrought alloy                                           | Not cureable                  |                                       | 60          | 21           | 65-130                   |
|     |                                                                    | Cured                         |                                       | 100         | 22           | 65-130                   |
|     | Aluminum-cast, alloyed                                             | <=12% Si Not cureable         |                                       | 75          | 23           | 65-130                   |
|     |                                                                    | Cured                         |                                       | 90          | 24           | 65-130                   |
|     |                                                                    | >12% Si High temp.            |                                       | 130         | 25           | 65-130                   |
|     | Copper alloys                                                      | >1% Pb Free cutting           |                                       | 110         | 26           | 65-130                   |
|     |                                                                    | Brass                         |                                       | 90          | 27           | 65-130                   |
|     |                                                                    | Electrolitic copper           |                                       | 100         | 28           | 65-130                   |
| S   | High temp. alloys                                                  | Fe based Annealed             |                                       | 70 Shore D  | 29           |                          |
|     |                                                                    |                               |                                       | 55 Shore D  | 30           |                          |
|     |                                                                    | Cured                         |                                       | 200         | 31           | 20-50                    |
|     |                                                                    |                               |                                       | 280         | 32           | 20-50                    |
|     |                                                                    | Ni or Co based Annealed       |                                       | 250         | 33           | 20-50                    |
|     |                                                                    |                               |                                       | 350         | 34           | 20-50                    |
|     | Titanium, Ti alloys                                                | Cast                          |                                       | 320         | 35           | 20-50                    |
|     |                                                                    | Pure                          | Rm 400                                | 190         | 36           | 30-60                    |
|     |                                                                    | Alpha+beta alloys cured       | Rm 1050                               | 310         | 37           | 30-60                    |
|     |                                                                    |                               |                                       |             |              |                          |
| H   | Hardened steel                                                     | Hardened                      |                                       | 55HRC       | 38           |                          |
|     |                                                                    | Hardened                      |                                       | 60HRC       | 39           |                          |
|     | Chilled cast iron                                                  | Cast                          |                                       | 400         | 40           |                          |
|     | Cast iron nodular                                                  | Hardened                      |                                       | 55HRC       | 41           |                          |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for TBTA-FB, BTE

| TBTA-FB                          |                 | BTE                         |                                  |
|----------------------------------|-----------------|-----------------------------|----------------------------------|
| Feed (mm/rev) vs. drill diameter |                 | Cutting speed<br>Vc (m/min) | Feed (mm/rev) vs. drill diameter |
| Ø25.00 - Ø43.00                  | Ø43.01 - Ø65.00 |                             | Ø15.60 - Ø16.70                  |
| 0.10-0.30                        | 0.12-0.35       | 80-140                      | 0.10-0.16                        |
| 0.10-0.30                        | 0.12-0.35       | 80-130                      | 0.10-0.16                        |
| 0.10-0.30                        | 0.12-0.35       | 80-120                      | 0.10-0.16                        |
| 0.10-0.30                        | 0.12-0.35       | 70-110                      | 0.10-0.16                        |
| 0.10-0.30                        | 0.12-0.35       | 50-90                       | 0.10-0.12                        |
| 0.10-0.30                        | 0.12-0.35       | 70-120                      | 0.10-0.16                        |
| 0.10-0.30                        | 0.12-0.35       | 70-110                      | 0.10-0.12                        |
| 0.10-0.30                        | 0.12-0.35       | 50-90                       | 0.10-0.12                        |
| 0.10-0.30                        | 0.12-0.35       | 40-70                       | 0.10-0.12                        |
| 0.10-0.30                        | 0.12-0.35       | 50-90                       | 0.10-0.16                        |
| 0.10-0.30                        | 0.12-0.35       | 40-80                       | 0.10-0.12                        |
| 0.10-0.30                        | 0.12-0.35       | 40-70                       | 0.04-0.16                        |
| 0.10-0.30                        | 0.12-0.35       | 40-70                       | 0.04-0.16                        |
| 0.10-0.30                        | 0.12-0.35       | 30-70                       | 0.04-0.14                        |
| 0.10-0.25                        | 0.12-0.35       | 90-160                      | 0.06-0.16                        |
| 0.10-0.25                        | 0.12-0.35       | 80-140                      | 0.06-0.16                        |
| 0.10-0.25                        | 0.12-0.35       | 90-180                      | 0.06-0.16                        |
| 0.10-0.25                        | 0.12-0.35       | 80-140                      | 0.06-0.16                        |
| 0.10-0.25                        | 0.12-0.35       | 90-160                      | 0.06-0.16                        |
| 0.10-0.25                        | 0.12-0.35       | 80-140                      | 0.06-0.16                        |
| 0.10-0.25                        | 0.12-0.35       | 90-220                      | 0.08-0.16                        |
| 0.08-0.23                        | 0.12-0.27       | 90-220                      | 0.08-0.16                        |
| 0.08-0.23                        | 0.12-0.27       | 90-220                      | 0.08-0.16                        |
| 0.08-0.23                        | 0.12-0.27       | 90-220                      | 0.08-0.16                        |
| 0.08-0.23                        | 0.12-0.27       | 80-160                      | 0.08-0.16                        |
| 0.08-0.23                        | 0.12-0.27       | 90-220                      | 0.08-0.16                        |
| 0.08-0.23                        | 0.12-0.27       | 90-220                      | 0.08-0.16                        |
| 0.08-0.23                        | 0.12-0.27       | 90-220                      | 0.08-0.16                        |
|                                  |                 |                             |                                  |
|                                  |                 |                             |                                  |
| 0.08-0.23                        | 0.12-0.27       | 30-60                       | 0.06-0.14                        |
| 0.08-0.23                        | 0.12-0.27       | 20-50                       | 0.06-0.14                        |
| 0.08-0.23                        | 0.12-0.27       | 20-50                       | 0.06-0.14                        |
| 0.08-0.23                        | 0.12-0.27       | 20-50                       | 0.06-0.14                        |
| 0.08-0.23                        | 0.12-0.27       | 20-50                       | 0.06-0.14                        |
| 0.08-0.23                        | 0.12-0.27       | 20-50                       | 0.06-0.12                        |
| 0.08-0.23                        | 0.12-0.27       | 20-50                       | 0.06-0.12                        |
|                                  |                 |                             |                                  |
|                                  |                 |                             |                                  |
|                                  |                 |                             |                                  |
|                                  |                 |                             |                                  |

# Recommended Cutting Conditions



## Machining data for BTA & BTS

| ISO                   | Material                                                                    |                              | Condition             | Tensile strength<br>(N/mm²) | Hardness<br>HB | Material<br>No. | Cutting<br>speed<br>Vc (m/min) |
|-----------------------|-----------------------------------------------------------------------------|------------------------------|-----------------------|-----------------------------|----------------|-----------------|--------------------------------|
| P                     | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C                      | Annealed              | 420                         | 125            | 1               | 70-120                         |
|                       |                                                                             | >=0.25%C                     | Annealed              | 650                         | 190            | 2               | 70-120                         |
|                       |                                                                             | <0.55%C                      | Quenched and tempered | 850                         | 250            | 3               | 40-70                          |
|                       |                                                                             | >=0.55%C                     | Annealed              | 750                         | 220            | 4               | 70-120                         |
|                       |                                                                             |                              | Quenched and tempered | 1000                        | 300            | 5               | 55-100                         |
|                       | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) | Annealed                     |                       | 600                         | 200            | 6               | 70-100                         |
|                       |                                                                             |                              |                       | 930                         | 275            | 7               | 55-100                         |
|                       |                                                                             | Quenched and tempered        |                       | 1000                        | 300            | 8               | 55-100                         |
|                       |                                                                             |                              |                       | 1200                        | 350            | 9               | 55-100                         |
|                       | High alloy steel, cast steel<br>and tool steel                              | Annealed                     | 680                   | 200                         | 10             | 50-85           |                                |
| Quenched and tempered |                                                                             | 1100                         | 325                   | 11                          | 55-100         |                 |                                |
| M                     | Stainless steel<br>and cast steel                                           | Ferritic / martensitic       | 680                   | 200                         | 12             | 60-100          |                                |
|                       |                                                                             | Martensitic                  | 820                   | 240                         | 13             | 60-100          |                                |
|                       |                                                                             | Austenitic                   | 600                   | 180                         | 14             | 60-100          |                                |
| K                     |                                                                             | Gray cast iron<br>(GG)       | Ferritic              |                             | 160            | 15              | 60-100                         |
|                       | Pearlitic                                                                   |                              |                       | 250                         | 16             | 60-100          |                                |
|                       | Cast iron nodular<br>(GGG)                                                  | Ferritic                     |                       | 180                         | 17             | 80-100          |                                |
|                       |                                                                             | Pearlitic                    |                       | 260                         | 18             | 80-100          |                                |
|                       | Malleable cast iron                                                         | Ferritic                     |                       | 130                         | 19             | 50-100          |                                |
|                       |                                                                             | Pearlitic                    |                       | 230                         | 20             | 50-100          |                                |
| N                     | Aluminum - Wrought alloy                                                    | Not cureable                 |                       | 60                          | 21             | 65-130          |                                |
|                       |                                                                             | Cured                        |                       | 100                         | 22             | 65-100          |                                |
|                       | Aluminum-<br>cast, alloyed                                                  | <=12% Si                     | Not cureable          |                             | 75             | 23              | 65-130                         |
|                       |                                                                             |                              | Cured                 |                             | 90             | 24              | 65-130                         |
|                       | >12% Si                                                                     | High temp.                   |                       | 130                         | 25             | 65-130          |                                |
|                       |                                                                             | >1% Pb                       | Free cutting          |                             | 110            | 26              | 65-130                         |
|                       | Copper alloys                                                               |                              | Brass                 |                             | 90             | 27              | 65-130                         |
|                       |                                                                             |                              | Electrolitic copper   |                             | 100            | 28              | 65-130                         |
|                       | Non-metallic                                                                | Duroplastics, fiber plastics |                       | 70 Shore D                  | 29             |                 |                                |
| Hard rubber           |                                                                             |                              | 55 Shore D            | 30                          |                |                 |                                |
| S                     | High temp.<br>alloys                                                        | Fe based                     | Annealed              |                             | 200            | 31              | 10-50                          |
|                       |                                                                             |                              | Cured                 |                             | 280            | 32              | 10-50                          |
|                       |                                                                             | Ni or<br>Co based            | Annealed              |                             | 250            | 33              | 10-50                          |
|                       |                                                                             |                              | Cured                 |                             | 350            | 34              | 10-50                          |
|                       |                                                                             |                              | Cast                  |                             | 320            | 35              | 10-50                          |
|                       | Titanium, Ti alloys                                                         | Pure                         | Rm 400                | 190                         | 36             | 30-50           |                                |
|                       |                                                                             | Alpha+beta alloys cured      | Rm 1050               | 310                         | 37             | 30-50           |                                |
| H                     | Hardened steel                                                              | Hardened                     |                       | 55HRC                       | 38             |                 |                                |
|                       |                                                                             | Hardened                     |                       | 60HRC                       | 39             |                 |                                |
|                       | Chilled cast iron                                                           | Cast                         |                       | 400                         | 40             |                 |                                |
|                       | Cast iron nodular                                                           | Hardened                     |                       | 55HRC                       | 41             |                 |                                |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel



| Feed (mm/rev) vs. drill diameter |                 |                 |                 |                 |
|----------------------------------|-----------------|-----------------|-----------------|-----------------|
| Ø8.00 - Ø20.00                   | Ø15.60 - Ø20.00 | Ø20.01 - Ø31.00 | Ø31.01 - Ø43.00 | Ø43.01 - Ø65.00 |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.17       | 0.13-0.20       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.17       | 0.13-0.20       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.17       | 0.13-0.20       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.17       | 0.13-0.20       | 0.16-0.30       |
| 0.05-0.10                        | 0.08-0.12       | 0.10-0.15       | 0.13-0.17       | 0.15-0.28       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.17       | 0.13-0.20       | 0.16-0.30       |
| 0.05-0.10                        | 0.08-0.12       | 0.10-0.15       | 0.13-0.17       | 0.15-0.28       |
| 0.05-0.10                        | 0.08-0.12       | 0.10-0.15       | 0.13-0.17       | 0.15-0.28       |
| 0.05-0.10                        | 0.08-0.12       | 0.10-0.15       | 0.13-0.17       | 0.15-0.28       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.17       | 0.13-0.20       | 0.16-0.30       |
| 0.05-0.10                        | 0.08-0.12       | 0.10-0.15       | 0.13-0.17       | 0.15-0.28       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.28       | 0.13-0.30       | 0.16-0.35       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.28       | 0.13-0.30       | 0.16-0.35       |
| 0.05-0.12                        | 0.05-0.12       | 0.08-0.25       | 0.10-0.28       | 0.15-0.33       |
| 0.05-0.13                        | 0.06-0.13       | 0.08-0.18       | 0.10-0.20       | 0.15-0.25       |
| 0.05-0.13                        | 0.06-0.13       | 0.08-0.18       | 0.10-0.20       | 0.15-0.25       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.17       | 0.13-0.20       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.17       | 0.13-0.20       | 0.16-0.30       |
| 0.05-0.13                        | 0.06-0.13       | 0.08-0.18       | 0.10-0.20       | 0.15-0.25       |
| 0.05-0.13                        | 0.06-0.13       | 0.08-0.18       | 0.10-0.20       | 0.15-0.25       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.20       | 0.15-0.25       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.20       | 0.15-0.25       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.20       | 0.15-0.25       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.20       | 0.15-0.25       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.20       | 0.15-0.25       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.20       | 0.15-0.25       | 0.16-0.30       |
| 0.05-0.13                        | 0.08-0.15       | 0.10-0.20       | 0.15-0.25       | 0.16-0.30       |
|                                  |                 |                 |                 |                 |
|                                  |                 |                 |                 |                 |
| 0.05-0.12                        | 0.06-0.12       | 0.08-0.15       | 0.12-0.18       | 0.15-0.25       |
| 0.05-0.12                        | 0.06-0.12       | 0.08-0.15       | 0.12-0.18       | 0.15-0.25       |
| 0.05-0.12                        | 0.06-0.12       | 0.08-0.15       | 0.12-0.18       | 0.15-0.25       |
| 0.05-0.12                        | 0.06-0.12       | 0.08-0.15       | 0.12-0.18       | 0.15-0.25       |
| 0.05-0.12                        | 0.06-0.12       | 0.08-0.15       | 0.12-0.18       | 0.15-0.25       |
| 0.05-0.10                        | 0.05-0.10       | 0.08-0.12       | 0.10-0.15       | 0.12-0.20       |
| 0.05-0.10                        | 0.05-0.10       | 0.08-0.12       | 0.10-0.15       | 0.12-0.20       |
|                                  |                 |                 |                 |                 |
|                                  |                 |                 |                 |                 |
|                                  |                 |                 |                 |                 |

# Recommended Cutting Conditions



## Machining data for WIN-GUN

| ISO | Material                                                           | Condition                     | Tensile strength (N/mm <sup>2</sup> ) | Hardness HB | Material No. | Cutting speed Vc (m/min) |
|-----|--------------------------------------------------------------------|-------------------------------|---------------------------------------|-------------|--------------|--------------------------|
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C Annealed              | 420                                   | 125         | 1            | 80-110-140               |
|     |                                                                    | >=0.25%C Annealed             | 650                                   | 190         | 2            | 80-105-130               |
|     |                                                                    | <0.55%C Quenched and tempered | 850                                   | 250         | 3            | 80-100-120               |
|     |                                                                    | >=0.55%C Annealed             | 750                                   | 220         | 4            | 70-90-110                |
|     |                                                                    | Quenched and tempered         | 1000                                  | 300         | 5            | 50-70-90                 |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed                      | 600                                   | 200         | 6            | 80-100-120               |
|     |                                                                    | Quenched and tempered         | 930                                   | 275         | 7            | 70-90-110                |
|     |                                                                    |                               | 1000                                  | 300         | 8            | 50-70-90                 |
|     |                                                                    |                               | 1200                                  | 350         | 9            | 40-55-70                 |
|     | High alloy steel, cast steel and tool steel                        | Annealed                      | 680                                   | 200         | 10           | 50-70-90                 |
|     |                                                                    | Quenched and tempered         | 1100                                  | 325         | 11           | 40-60-80                 |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic        | 680                                   | 200         | 12           | 40-55-70                 |
|     |                                                                    | Martensitic                   | 820                                   | 240         | 13           |                          |
| K   | Gray cast iron (GG)                                                | Ferritic                      |                                       | 160         | 15           | 90-125-160               |
|     |                                                                    | Pearlitic                     |                                       | 250         | 16           | 80-110-140               |
|     | Cast iron nodular (GGG)                                            | Ferritic                      |                                       | 180         | 17           | 90-135-180               |
|     |                                                                    | Pearlitic                     |                                       | 260         | 18           | 80-110-140               |
|     | Malleable cast iron                                                | Ferritic                      |                                       | 130         | 19           | 90-125-160               |
|     |                                                                    | Pearlitic                     |                                       | 230         | 20           | 80-110-140               |
| N   | Aluminum - Wrought alloy                                           | Not cureable                  |                                       | 60          | 21           | 90-155-220               |
|     |                                                                    | Cured                         |                                       | 100         | 22           |                          |
|     | Aluminum-cast, alloyed                                             | <=12% Si Not cureable         |                                       | 75          | 23           |                          |
|     |                                                                    | Cured                         |                                       | 90          | 24           |                          |
|     |                                                                    | >12% Si High temp.            |                                       | 130         | 25           | 80-120-160               |

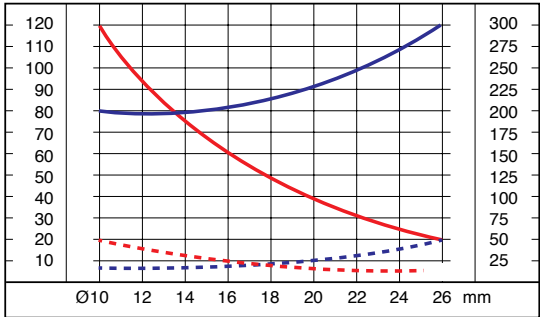
► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous

## Pressure and Coolant Flow Rate for WIN-GUN

Pressure (Bar)

Coolant Flow Rate (l/min)



Drilling Diameter (mm)

Q (l/min) P (bar)

— — GUN-DRILL Machines  
- - - - - - Milling and Turning Machines

# Recommended Cutting Conditions



## Machining data for WIN-GUN

| Feed (mm/rev) vs. drill diameter |                             |                             |                             |                             |
|----------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Ø10 - Ø11.9                      | Ø12 - Ø13.9                 | Ø14 - Ø15.9                 | Ø16 - Ø19.9                 | Ø20 - Ø25.9                 |
| 0.15<br><b>0.18</b><br>0.21      | 0.18<br><b>0.21</b><br>0.24 | 0.20<br><b>0.23</b><br>0.27 | 0.25<br><b>0.30</b><br>0.35 | 0.25<br><b>0.30</b><br>0.35 |
| 0.14<br><b>0.17</b><br>0.21      | 0.16<br><b>0.20</b><br>0.24 | 0.18<br><b>0.22</b><br>0.26 | 0.23<br><b>0.27</b><br>0.31 | 0.25<br><b>0.30</b><br>0.35 |
| 0.12<br><b>0.14</b><br>0.17      | 0.15<br><b>0.17</b><br>0.20 | 0.18<br><b>0.20</b><br>0.23 | 0.20<br><b>0.22</b><br>0.25 | 0.22<br><b>0.24</b><br>0.27 |
| 0.12<br><b>0.13</b><br>0.15      | 0.14<br><b>0.15</b><br>0.17 | 0.16<br><b>0.18</b><br>0.20 | 0.16<br><b>0.19</b><br>0.21 | 0.18<br><b>0.21</b><br>0.24 |
| 0.20<br><b>0.23</b><br>0.27      | 0.25<br><b>0.28</b><br>0.32 | 0.30<br><b>0.33</b><br>0.37 | 0.35<br><b>0.40</b><br>0.45 | 0.35<br><b>0.42</b><br>0.47 |
| 0.25<br><b>0.28</b><br>0.32      | 0.30<br><b>0.33</b><br>0.37 | 0.35<br><b>0.38</b><br>0.42 | 0.40<br><b>0.45</b><br>0.50 | 0.45<br><b>0.50</b><br>0.57 |

- **Red text:** Recommended cutting data
- Mandatory use of emulsion or oil when drilling
- For the 400 mm long tools, please reduce the cutting speed by 20%



# Recommended Cutting Conditions



Machining data for TRGD / TRGD3 / TRGDL / TBTA-TR

| ISO | Material                                                           | Condition                     | Tensile strength (N/mm <sup>2</sup> ) | Hardness HB | Material No. |
|-----|--------------------------------------------------------------------|-------------------------------|---------------------------------------|-------------|--------------|
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C Annealed              | 420                                   | 125         | 1            |
|     |                                                                    | >=0.25%C Annealed             | 650                                   | 190         | 2            |
|     |                                                                    | <0.55%C Quenched and tempered | 850                                   | 250         | 3            |
|     |                                                                    | >=0.55%C Annealed             | 750                                   | 220         | 4            |
|     |                                                                    | Quenched and tempered         | 1000                                  | 300         | 5            |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed                      | 600                                   | 200         | 6            |
|     |                                                                    | Quenched and tempered         | 930                                   | 275         | 7            |
|     |                                                                    |                               | 1000                                  | 300         | 8            |
|     |                                                                    |                               | 1200                                  | 350         | 9            |
|     | High alloy steel, cast steel and tool steel                        | Annealed                      | 680                                   | 200         | 10           |
|     |                                                                    | Quenched and tempered         | 1100                                  | 325         | 11           |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic        | 680                                   | 200         | 12           |
|     |                                                                    | Martensitic                   | 820                                   | 240         | 13           |
|     |                                                                    | Austenitic                    | 600                                   | 180         | 14           |
| K   | Gray cast iron (GG)                                                | Ferritic                      |                                       | 160         | 15           |
|     |                                                                    | Pearlitic                     |                                       | 250         | 16           |
|     | Cast iron nodular (GGG)                                            | Ferritic                      |                                       | 180         | 17           |
|     |                                                                    | Pearlitic                     |                                       | 260         | 18           |
|     | Malleable cast iron                                                | Ferritic                      |                                       | 130         | 19           |
|     |                                                                    | Pearlitic                     |                                       | 230         | 20           |
| N   | Aluminum - Wrought alloy                                           | Not cureable                  |                                       | 60          | 21           |
|     |                                                                    | Cured                         |                                       | 100         | 22           |
|     | Aluminum-cast, alloyed                                             | <=12% Si Not cureable         |                                       | 75          | 23           |
|     |                                                                    | Cured                         |                                       | 90          | 24           |
|     |                                                                    | >12% Si High temp.            |                                       | 130         | 25           |
|     | Copper alloys                                                      | >1% Pb Free cutting           |                                       | 110         | 26           |
|     |                                                                    | Brass                         |                                       | 90          | 27           |
|     |                                                                    | Electrolitic copper           |                                       | 100         | 28           |
|     | Non-metallic                                                       | Duroplastics, fiber plastics  |                                       | 70 Shore D  | 29           |
|     |                                                                    | Hard rubber                   |                                       | 55 Shore D  | 30           |
| S   | High temp. alloys                                                  | Fe based                      | Annealed                              | 200         | 31           |
|     |                                                                    |                               | Cured                                 | 280         | 32           |
|     |                                                                    | Ni or Co based                | Annealed                              | 250         | 33           |
|     |                                                                    |                               | Cured                                 | 350         | 34           |
|     |                                                                    |                               | Cast                                  | 320         | 35           |
|     | Titanium, Ti alloys                                                | Pure                          | Rm 400                                | 190         | 36           |
|     |                                                                    | Alpha+beta alloys cured       | Rm 1050                               | 310         | 37           |
| H   | Hardened steel                                                     | Hardened                      |                                       | 55 HRC      | 38           |
|     |                                                                    | Hardened                      |                                       | 60 HRC      | 39           |
|     | Chilled cast iron                                                  | Cast                          |                                       | 400         | 40           |
|     | Cast iron nodular                                                  | Hardened                      |                                       | 55 HRC      | 41           |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for TRGD / TRGD3 / TRGDL / TBTA-TR

| Feed (mm/rev) vs. drill diameter |               |               |               |               |               |                             |               |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|-----------------------------|---------------|
| TRGD / TRGD3 / TRGDL             |               |               |               |               |               | TBTA-TR                     |               |
| Cutting speed<br>Vc (m/min)      | Ø10.00-Ø11.80 | Ø12.00-Ø13.99 | Ø14.00-Ø15.99 | Ø16.00-Ø28.00 | Ø28.01-Ø40.00 | Cutting speed<br>Vc (m/min) | Ø16.00-Ø28.00 |
| 80-140                           | 0.05-0.08     | 0.05-0.10     | 0.05-0.10     | 0.05-0.10     | 0.05-0.15     | 90-130                      | 0.15-0.20     |
| 80-140                           | 0.05-0.14     | 0.05-0.16     | 0.05-0.10     | 0.05-0.10     | 0.05-0.15     | 90-130                      | 0.15-0.20     |
| 80-140                           | 0.05-0.14     | 0.05-0.16     | 0.05-0.16     | 0.05-0.20     | 0.05-0.20     | 90-130                      | 0.15-0.20     |
| 80-140                           | 0.05-0.14     | 0.05-0.16     | 0.05-0.16     | 0.05-0.20     | 0.05-0.20     | 70-130                      | 0.10-0.25     |
| 80-140                           | 0.05-0.14     | 0.05-0.16     | 0.05-0.16     | 0.05-0.20     | 0.05-0.20     | 70-130                      | 0.10-0.25     |
| 80-140                           | 0.05-0.14     | 0.05-0.16     | 0.05-0.10     | 0.05-0.10     | 0.05-0.15     | 70-120                      | 0.10-0.25     |
| 80-120                           | 0.05-0.14     | 0.05-0.16     | 0.05-0.16     | 0.05-0.20     | 0.05-0.20     | 60-120                      | 0.10-0.25     |
| 80-120                           |               |               | 0.05-0.16     | 0.05-0.20     | 0.05-0.20     | 60-120                      | 0.10-0.25     |
| 80-120                           |               |               | 0.05-0.16     | 0.05-0.20     | 0.05-0.20     | 60-120                      | 0.10-0.25     |
| 80-140                           |               |               | 0.05-0.10     | 0.05-0.10     | 0.05-0.15     | 70-130                      | 0.10-0.25     |
| 80-120                           |               |               | 0.05-0.16     | 0.05-0.20     | 0.05-0.20     | 70-130                      | 0.10-0.25     |
| 60-100                           | 0.05-0.08     | 0.05-0.10     | 0.05-0.10     | 0.05-0.10     | 0.05-0.15     | 80-130                      | 0.06-0.10     |
| 60-100                           | 0.05-0.08     | 0.05-0.10     | 0.05-0.10     | 0.05-0.10     | 0.05-0.15     | 80-130                      | 0.06-0.10     |
| 60-100                           | 0.05-0.08     | 0.05-0.10     | 0.05-0.10     | 0.05-0.10     | 0.05-0.15     | 80-130                      | 0.06-0.10     |
| 80-140                           | 0.05-0.20     | 0.05-0.25     | 0.05-0.25     | 0.05-0.30     | 0.05-0.30     | 50-110                      | 0.10-0.20     |
| 80-140                           | 0.05-0.20     | 0.05-0.25     | 0.05-0.25     | 0.05-0.30     | 0.05-0.30     | 50-110                      | 0.10-0.20     |
| 80-140                           | 0.05-0.20     | 0.05-0.25     | 0.05-0.25     | 0.05-0.30     | 0.05-0.30     | 60-110                      | 0.10-0.20     |
| 80-140                           | 0.05-0.20     | 0.05-0.25     | 0.05-0.25     | 0.05-0.30     | 0.05-0.30     | 60-110                      | 0.10-0.20     |
| 80-140                           |               |               | 0.05-0.25     | 0.05-0.30     | 0.05-0.30     | 70-110                      | 0.10-0.20     |
| 80-140                           |               |               | 0.05-0.25     | 0.05-0.30     | 0.05-0.30     | 70-110                      | 0.10-0.20     |
| 100-200                          | 0.05-0.18     | 0.05-0.20     | 0.05-0.20     | 0.05-0.20     | 0.05-0.25     | 65-130                      | 0.08-0.18     |
| 100-200                          | 0.05-0.18     | 0.05-0.20     | 0.05-0.20     | 0.05-0.20     | 0.05-0.25     | 65-130                      | 0.08-0.18     |
| 100-200                          | 0.05-0.18     | 0.05-0.20     | 0.05-0.20     | 0.05-0.20     | 0.05-0.25     | 65-130                      | 0.08-0.18     |
| 100-200                          | 0.05-0.18     | 0.05-0.20     | 0.05-0.20     | 0.05-0.20     | 0.05-0.25     | 65-130                      | 0.08-0.18     |
|                                  |               |               |               |               |               | 65-130                      | 0.08-0.18     |
|                                  |               |               |               |               |               | 65-130                      | 0.08-0.18     |
|                                  |               |               |               |               |               | 65-130                      | 0.08-0.18     |
|                                  |               |               |               |               |               | 65-130                      | 0.08-0.18     |
|                                  |               |               |               |               |               | 65-130                      | 0.08-0.18     |
| 20-50                            | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     | 20-50                       | 0.08-0.18     |
| 20-50                            | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     | 20-50                       | 0.08-0.18     |
| 20-50                            | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     | 20-50                       | 0.08-0.18     |
| 20-50                            | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     | 20-50                       | 0.08-0.18     |
| 20-50                            | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     | 20-50                       | 0.08-0.18     |
| 30-60                            | 0.04-0.10     | 0.05-0.13     | 0.05-0.13     | 0.05-0.15     | 0.05-0.18     | 30-60                       | 0.08-0.18     |
| 30-60                            | 0.04-0.10     | 0.05-0.13     | 0.05-0.13     | 0.05-0.15     | 0.05-0.18     | 30-60                       | 0.08-0.18     |
| 50-100                           | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     |                             |               |
| 50-100                           | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     |                             |               |
| 50-100                           | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     |                             |               |
| 50-100                           | 0.04-0.06     | 0.04-0.08     | 0.04-0.08     | 0.04-0.10     | 0.04-0.13     |                             |               |

[illegible]

# Recommended Cutting Conditions



## Machining data for XM-REAM

| ISO | Material                                                           | Condition                     | Tensile strength (N/mm²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | Feed (mm/rev) vs. reamer diameter |           |           |
|-----|--------------------------------------------------------------------|-------------------------------|--------------------------|-------------|--------------|--------------------------|-----------------------------------|-----------|-----------|
|     |                                                                    |                               |                          |             |              |                          | Ø8-9.99                           | Ø10-11.99 | Ø12-12.99 |
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C Annealed              | 420                      | 125         | 1            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     |                                                                    | >=0.25%C Annealed             | 650                      | 190         | 2            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     |                                                                    | <0.55%C Quenched and tempered | 850                      | 250         | 3            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     |                                                                    | >=0.55%C Annealed             | 750                      | 220         | 4            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     |                                                                    | Quenched and tempered         | 1000                     | 300         | 5            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed                      | 600                      | 200         | 6            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     |                                                                    |                               | 930                      | 275         | 7            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     |                                                                    | Quenched and tempered         | 1000                     | 300         | 8            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     |                                                                    |                               | 1200                     | 350         | 9            | 50-150                   | 0.25-0.50                         | 0.30-0.60 | 0.35-0.80 |
|     | High alloy steel, cast steel and tool steel                        | Annealed                      | 680                      | 200         | 10           | 20-60                    | 0.20-0.30                         | 0.25-0.40 | 0.30-0.50 |
|     |                                                                    | Quenched and tempered         | 1100                     | 325         | 11           | 20-60                    | 0.20-0.30                         | 0.25-0.40 | 0.30-0.50 |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic        | 680                      | 200         | 12           | 20-40                    | 0.20-0.30                         | 0.25-0.40 | 0.30-0.50 |
|     |                                                                    | Martensitic                   | 820                      | 240         | 13           | 20-40                    | 0.20-0.30                         | 0.25-0.40 | 0.30-0.50 |
|     |                                                                    | Austenitic                    | 600                      | 180         | 14           | 20-40                    | 0.20-0.30                         | 0.25-0.40 | 0.30-0.50 |
| K   | Gray cast iron (GG)                                                | Ferritic                      |                          | 160         | 15           | 50-200                   | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     |                                                                    | Pearlitic                     |                          | 250         | 16           | 50-200                   | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     | Cast iron nodular (GGG)                                            | Ferritic                      |                          | 180         | 17           | 50-200                   | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     |                                                                    | Pearlitic                     |                          | 260         | 18           | 50-200                   | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     | Malleable cast iron                                                | Ferritic                      |                          | 130         | 19           | 50-200                   | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     |                                                                    | Pearlitic                     |                          | 230         | 20           | 50-200                   | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
| N   | Aluminum - Wrought alloy                                           | Not cureable                  |                          | 60          | 21           | 100-250                  | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     |                                                                    | Cured                         |                          | 100         | 22           | 100-250                  | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     | Aluminum-cast, alloyed                                             | <=12% Si Not cureable         |                          | 75          | 23           | 100-250                  | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     |                                                                    | Cured                         |                          | 90          | 24           | 100-250                  | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     |                                                                    | >12% Si High temp.            |                          | 130         | 25           | 100-250                  | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     | Copper alloys                                                      | >1% Pb Free cutting           |                          | 110         | 26           | 100-250                  | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     |                                                                    | Brass                         |                          | 90          | 27           | 100-250                  | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
|     |                                                                    | Electrolitic copper           |                          | 100         | 28           | 100-250                  | 0.30-0.60                         | 0.35-0.80 | 0.40-1.00 |
| S   | High temp. alloys                                                  | Fe based                      |                          |             |              |                          |                                   |           |           |
|     |                                                                    |                               |                          |             |              |                          |                                   |           |           |
|     |                                                                    |                               |                          |             |              |                          |                                   |           |           |
|     |                                                                    | Ni or Co based                |                          |             |              |                          |                                   |           |           |
|     |                                                                    |                               |                          |             |              |                          |                                   |           |           |
|     |                                                                    |                               |                          |             |              |                          |                                   |           |           |
|     | Titanium, Ti alloys                                                | Pure                          | Rm 400                   | 190         | 36           |                          |                                   |           |           |
|     |                                                                    | Alpha+beta alloys cured       | Rm 1050                  | 310         | 37           |                          |                                   |           |           |
| H   | Hardened steel                                                     | Hardened                      |                          | 55 HRC      | 38           |                          |                                   |           |           |
|     |                                                                    | Hardened                      |                          | 60 HRC      | 39           |                          |                                   |           |           |
|     | Chilled cast iron                                                  | Cast                          |                          | 400         | 40           |                          |                                   |           |           |
|     | Cast iron nodular                                                  | Hardened                      |                          | 55 HRC      | 41           |                          |                                   |           |           |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for TM-REAM - Through hole

| ISO     | Material                                                           | Condition              | Material No.          | Through hole     |                  | Interrupted through Hole |                  |                  |
|---------|--------------------------------------------------------------------|------------------------|-----------------------|------------------|------------------|--------------------------|------------------|------------------|
| P       | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                | Annealed              | 1                | TT9030           | BL                       | TT9030           | BL               |
|         |                                                                    | >=0.25%C               | Annealed              | 2                | Vc = 80 - 200    |                          | Vc = 60 - 120    |                  |
|         |                                                                    | <0.55%C                | Quenched and tempered | 3                | B4 - B6          | fz = 0.08 - 0.21         | B4 - B6          | fz = 0.08 - 0.21 |
|         |                                                                    | >=0.55%C               | Annealed              | 4                |                  |                          |                  |                  |
|         |                                                                    | Quenched and tempered  | 5                     | B7 - B9          | fz = 0.12 - 0.27 | B7 - B9                  | fz = 0.09 - 0.21 |                  |
|         | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed               | 6                     | TT9030           | BL               | TT9030                   | BL               |                  |
|         |                                                                    | Quenched and tempered  | 7                     | Vc = 80 - 200    |                  | Vc = 60 - 120            |                  |                  |
|         |                                                                    |                        | 8                     | B4 - B6          | fz = 0.08 - 0.21 | B4 - B6                  | fz = 0.08 - 0.21 |                  |
|         |                                                                    |                        | 9                     | B7 - B9          | fz = 0.12 - 0.27 | B7 - B9                  | fz = 0.09 - 0.21 |                  |
|         | High alloy steel, cast steel and tool steel                        | Annealed               | 10                    | TT9030           | BL               | TT9030                   | BL               |                  |
|         |                                                                    | Quenched and tempered  | 11                    | Vc = 20 - 60     |                  | Vc = 20 - 60             |                  |                  |
| B4 - B6 |                                                                    |                        |                       | fz = 0.05 - 0.13 | B4 - B6          | fz = 0.04 - 0.11         |                  |                  |
| M       | Stainless steel and cast steel                                     | Ferritic / martensitic | 12                    | TT9030           | BL               | TT9030                   | BL               |                  |
|         |                                                                    | Martensitic            | 13                    | Vc = 20 - 40     |                  | Vc = 20 - 40             |                  |                  |
|         |                                                                    |                        |                       | B4 - B6          | fz = 0.05 - 0.13 | B4 - B6                  | fz = 0.04 - 0.11 |                  |
|         |                                                                    | Austenitic             | 14                    | B7 - B9          | fz = 0.07 - 0.17 | B7 - B9                  | fz = 0.05 - 0.14 |                  |
| K       | Gray cast iron (GG)                                                | Ferritic               | 15                    | TT9030           | BL               | TT9030                   | BL               |                  |
|         |                                                                    | Pearlitic              | 16                    | Vc = 120 - 220   |                  | Vc = 80 - 200            |                  |                  |
|         |                                                                    |                        |                       | B4 - B6          | fz = 0.08 - 0.18 | B4 - B6                  | fz = 0.05 - 0.13 |                  |
|         | B7 - B9                                                            | fz = 0.10 - 0.24       | B7 - B9               | fz = 0.07 - 0.17 |                  |                          |                  |                  |
|         | Cast iron nodular (GGG)                                            | Ferritic               | 17                    | TT9030           | AS or BL         | TT9030                   | BL               |                  |
|         |                                                                    | Pearlitic              | 18                    | Vc = 160 - 280   |                  | Vc = 150 - 250           |                  |                  |
|         |                                                                    |                        |                       | B4 - B6          | fz = 0.11 - 0.20 | B4 - B6                  | fz = 0.06 - 0.15 |                  |
|         | B7 - B9                                                            | fz = 0.11 - 0.24       | B7 - B9               | fz = 0.08 - 0.19 |                  |                          |                  |                  |
|         | Malleable cast iron                                                | Ferritic               | 19                    | TT9030           | AS or BL         | TT9030                   | BL               |                  |
|         |                                                                    | Pearlitic              | 20                    | Vc = 100 - 220   |                  | Vc = 100 - 220           |                  |                  |
| B4 - B6 |                                                                    |                        |                       | fz = 0.11 - 0.20 | B4 - B6          | fz = 0.06 - 0.15         |                  |                  |
| B7 - B9 | fz = 0.11 - 0.24                                                   | B7 - B9                | fz = 0.08 - 0.20      |                  |                  |                          |                  |                  |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for TM-REAM - Through hole

| ISO          | Material                 |                         | Condition                    | Material No.     | Through hole     |                  | Interrupted through Hole |                  |
|--------------|--------------------------|-------------------------|------------------------------|------------------|------------------|------------------|--------------------------|------------------|
| N            | Aluminum - Wrought alloy |                         | Not cureable                 | 21               | UF10             | BL or GS         | UF10                     | BL               |
|              |                          |                         | Cured                        | 22               | Vc = 150 - 400   |                  | Vc = 150 - 400           |                  |
|              | Aluminum-cast, alloyed   | <=12% Si                | Not cureable                 | 23               | B4 - B6          | fz = 0.08 - 0.16 | B4 - B6                  | fz = 0.08 - 0.16 |
|              |                          |                         | Cured                        | 24               |                  |                  |                          |                  |
|              |                          | >12% Si                 | High temp.                   | 25               | B7 - B9          | fz = 0.10 - 0.20 | B7 - B9                  | fz = 0.10 - 0.20 |
|              | Copper alloys            | >1% Pb                  | Free cutting                 | 26               | TT9030           | BL               | TT9030                   | BL               |
|              |                          |                         | Vc = 50 - 200                |                  | Vc = 50 - 200    |                  |                          |                  |
|              |                          |                         | Brass                        | 27               | B4 - B6          | fz = 0.08 - 0.18 | B4 - B6                  | fz = 0.05 - 0.13 |
|              |                          | Electrolitic copper     | 28                           | B7 - B9          | fz = 0.10 - 0.23 | B7 - B9          | fz = 0.07 - 0.16         |                  |
|              | Non-metallic             |                         | Duroplastics, fiber plastics | 29               | TT9030           | AS               | TT9030                   | AS               |
| Vc = 25 - 80 |                          |                         | Vc = 25 - 80                 |                  |                  |                  |                          |                  |
| Hard rubber  |                          |                         | 30                           | B4 - B6          | fz = 0.05 - 0.10 | B4 - B6          | fz = 0.05 - 0.10         |                  |
|              | B7 - B9                  | fz = 0.10 - 0.20        | B7 - B9                      | fz = 0.10 - 0.20 |                  |                  |                          |                  |
| S            | High temp. alloys        | Fe based                | Annealed                     | 31               | TT9030           | L *              | TT9030                   | L *              |
|              |                          |                         | Cured                        | 32               | Vc = 15 - 50     |                  | Vc = 15 - 50             |                  |
|              |                          | Ni or Co based          | Annealed                     | 33               |                  |                  |                          |                  |
|              |                          |                         | Cured                        | 34               | B4 - B6          | fz = 0.04 - 0.10 | B4 - B6                  | fz = 0.03 - 0.08 |
|              |                          |                         | Cast                         | 35               |                  |                  |                          |                  |
|              | Titanium, Ti alloys      | Pure                    | 36                           | B7 - B9          | fz = 0.05 - 0.13 | B4 - B6          | fz = 0.04 - 0.11         |                  |
|              |                          | Alpha+beta alloys cured | 37                           |                  |                  |                  |                          |                  |
| H            | Hardened steel           | Hardened                | 38                           | TT9030           | BL               | TT9030           | BL                       |                  |
|              |                          | Hardened                | 39                           | Vc = 25 - 50     |                  | Vc = 25 - 50     |                          |                  |
|              | Chilled cast iron        | Cast                    | 40                           | B4 - B6          | fz = 0.06 - 0.15 | B4 - B6          | fz = 0.06 - 0.15         |                  |
|              | Cast iron nodular        | Hardened                | 41                           | B7 - B9          | fz = 0.10 - 0.20 | B7 - B9          | fz = 0.10 - 0.20         |                  |

\* Standard edge geometries are not suitable for reaming titanium and high temperature alloys.  
In order to choose a proper geometry, please ask for our recommendations.

- ▶ The given cutting data recommendations refer to the short holders (3xD effective reaming overhang).  
For longer holders, the cutting speed to be reduced proportionally.
- ▶ For relatively large leading angles (spot-facing geometries), the feed to be reduced up to 30%.
- ▶ All the given cutting data recommendations refer to the machines with spindle through coolant supply.

### Legend:

|                       |   |              |                  |   |                  |
|-----------------------|---|--------------|------------------|---|------------------|
| Grade                 | → | TT9030       | BL               | ← | Cutting geometry |
| Cutting speed (m/min) | → | Vc = 10 - 20 |                  | ← | Feed (mm/tooth)  |
| TM-REAM head size     | → | B4-B6        | fz = 0.04 - 0.15 | ← |                  |
|                       | → | B7-B9        | fz = 0.05 - 0.20 | ← |                  |

# Recommended Cutting Conditions



## Machining data for TM-REAM - Blind hole

| ISO     | Material                                                           | Condition              | Material No.          | Blind hole       |                  | Interrupted blind hole |                  |                  |
|---------|--------------------------------------------------------------------|------------------------|-----------------------|------------------|------------------|------------------------|------------------|------------------|
| P       | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C                | Annealed              | 1                | TT9030           | AS                     | TT9030           | AS               |
|         |                                                                    | >=0.25%C               | Annealed              | 2                | Vc = 60-160      |                        | Vc = 60 - 120    |                  |
|         |                                                                    | <0.55%C                | Quenched and tempered | 3                | B4 - B6          | fz = 0.06 - 0.18       | B4 - B6          | fz = 0.05 - 0.15 |
|         |                                                                    | >=0.55%C               | Annealed              | 4                |                  |                        |                  |                  |
|         |                                                                    | Quenched and tempered  | 5                     | B7 - B9          | fz = 0.08 - 0.20 | B7 - B9                | fz = 0.07 - 0.16 |                  |
|         | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed               | 6                     | TT9030           | AS               | TT9030                 | AS               |                  |
|         |                                                                    | Quenched and tempered  | 7                     | Vc = 60-160      |                  | Vc = 60 - 120          |                  |                  |
|         |                                                                    |                        | 8                     | B4 - B6          | fz = 0.06 - 0.18 | B4 - B6                | fz = 0.05 - 0.15 |                  |
|         |                                                                    |                        | 9                     | B7 - B9          | fz = 0.08 - 0.20 | B7 - B9                | fz = 0.07 - 0.16 |                  |
|         | High alloy steel, cast steel and tool steel                        | Annealed               | 10                    | TT9030           | AS               | TT9030                 | AS               |                  |
|         |                                                                    | Quenched and tempered  | 11                    | Vc = 20 - 60     |                  | Vc = 20 - 60           |                  |                  |
| B4 - B6 |                                                                    |                        |                       | fz = 0.04 - 0.10 | B4 - B6          | fz = 0.03 - 0.08       |                  |                  |
| M       | Stainless steel and cast steel                                     | Ferritic / martensitic | 12                    | TT9030           | AS               | TT9030                 | AS               |                  |
|         |                                                                    | Martensitic            | 13                    | Vc = 20 - 40     |                  | Vc = 20 - 40           |                  |                  |
|         |                                                                    |                        |                       | B4 - B6          | fz = 0.04 - 0.10 | B4 - B6                | fz = 0.03 - 0.08 |                  |
|         |                                                                    | Austenitic             | 14                    | B7 - B9          | fz = 0.05 - 0.13 | B7 - B9                | fz = 0.05 - 0.10 |                  |
| K       | Gray cast iron (GG)                                                | Ferritic               | 15                    | TT9030           | AS               | TT9030                 | AS               |                  |
|         |                                                                    | Pearlitic              | 16                    | Vc = 80 - 200    |                  | Vc = 60 - 120          |                  |                  |
|         |                                                                    |                        |                       | B4 - B6          | fz = 0.06 - 0.18 | B4 - B6                | fz = 0.05 - 0.13 |                  |
|         | Cast iron nodular (GGG)                                            | Pearlitic              | 17                    | B7 - B9          | fz = 0.08 - 0.23 | B7 - B9                | fz = 0.08 - 0.18 |                  |
|         |                                                                    |                        |                       | TT9030           | AS               | TT9030                 | AS               |                  |
|         |                                                                    | Ferritic               | 18                    | Vc = 160 - 280   |                  | Vc = 160 - 240         |                  |                  |
|         | Malleable cast iron                                                | Pearlitic              | 19                    | B4 - B6          | fz = 0.06 - 0.18 | B4 - B6                | fz = 0.06 - 0.16 |                  |
|         |                                                                    |                        |                       | B7 - B9          | fz = 0.08 - 0.23 | B7 - B9                | fz = 0.08 - 0.18 |                  |
|         |                                                                    | Ferritic               | 20                    | TT9030           | AS               | TT9030                 | AS               |                  |
|         |                                                                    |                        |                       | Vc = 100 - 220   |                  | Vc = 100 - 220         |                  |                  |
|         |                                                                    |                        |                       | B4 - B6          | fz = 0.06 - 0.18 | B4 - B6                | fz = 0.05 - 0.15 |                  |
|         |                                                                    |                        |                       | B7 - B9          | fz = 0.08 - 0.23 | B7 - B9                | fz = 0.08 - 0.20 |                  |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions



## Machining data for TM-REAM - Blind hole

| ISO          | Material                 |                         | Condition                    | Material No.     | Blind hole       |                  | Interrupted blind hole |                  |
|--------------|--------------------------|-------------------------|------------------------------|------------------|------------------|------------------|------------------------|------------------|
| N            | Aluminum - Wrought alloy |                         | Not cureable                 | 21               | UF10             | GS or AS         | UF10                   | GS or AS         |
|              |                          |                         | Cured                        | 22               | Vc = 150 - 400   |                  | Vc = 150 - 300         |                  |
|              | Aluminum-cast, alloyed   | <=12% Si                | Not cureable                 | 23               | B4 - B6          | fz = 0.08 - 0.16 | B4 - B6                | fz = 0.07 - 0.15 |
|              |                          |                         | Cured                        | 24               |                  |                  |                        |                  |
|              |                          | >12% Si                 | High temp.                   | 25               | B7 - B9          | fz = 0.11 - 0.20 | B7 - B9                | fz = 0.11 - 0.20 |
|              | Copper alloys            | >1% Pb                  | Free cutting                 | 26               | TT9030           | AS               | TT9030                 | AS               |
|              |                          |                         | Vc = 50 - 200                |                  | Vc = 50 - 200    |                  |                        |                  |
|              |                          | Brass                   | 27                           | B4 - B6          | fz = 0.08 - 0.16 | B4 - B6          | fz = 0.08 - 0.16       |                  |
|              | Electrolitic copper      | 28                      | B7 - B9                      | fz = 0.10 - 0.20 | B7 - B9          | fz = 0.10 - 0.20 |                        |                  |
|              | Non-metallic             |                         | Duroplastics, fiber plastics | 29               | TT9030           | AS               | TT9030                 | AS               |
| Vc = 25 - 80 |                          |                         | Vc = 25 - 80                 |                  |                  |                  |                        |                  |
| Hard rubber  |                          |                         | 30                           | B4 - B6          | fz = 0.05 - 0.10 | B4 - B6          | fz = 0.05 - 0.10       |                  |
|              | B7 - B9                  | fz = 0.10 - 0.20        | B7 - B9                      | fz = 0.10 - 0.20 |                  |                  |                        |                  |
| S            | High temp. alloys        | Fe based                | Annealed                     | 31               | TT9030           | L *              | TT9030                 | L *              |
|              |                          |                         | Cured                        | 32               | Vc = 15 - 50     |                  | Vc = 15 - 50           |                  |
|              |                          | Ni or Co based          | Annealed                     | 33               |                  |                  |                        |                  |
|              |                          |                         | Cured                        | 34               | B4 - B6          | fz = 0.03 - 0.08 | B4 - B6                | fz = 0.03 - 0.08 |
|              |                          |                         | Cast                         | 35               |                  |                  |                        |                  |
|              | Titanium, Ti alloys      | Pure                    | 36                           | B7 - B9          | fz = 0.04 - 0.11 | B7 - B9          | fz = 0.04 - 0.11       |                  |
|              |                          | Alpha+beta alloys cured | 37                           |                  |                  |                  |                        |                  |
| H            | Hardened steel           |                         | Hardened                     | 38               | TT9030           | AS               | TT9030                 | AS               |
|              |                          |                         | Hardened                     | 39               | Vc = 25 - 50     |                  | Vc = 25 - 50           |                  |
|              | Chilled cast iron        |                         | Cast                         | 40               | B4 - B6          | fz = 0.05 - 0.13 | B4 - B6                | fz = 0.05 - 0.13 |
|              | Cast iron nodular        |                         | Hardened                     | 41               | B7 - B9          | fz = 0.10 - 0.20 | B7 - B9                | fz = 0.10 - 0.20 |

\* Standard edge geometries are not suitable for reaming titanium and high temperature alloys.

In order to choose a proper geometry, please ask for our recommendations.

- ▶ The given cutting data recommendations refer to the short holders (3xD effective reaming overhang). For longer holders, the cutting speed to be reduced proportionally.
- ▶ For relatively large leading angles (spot-facing geometries), the feed to be reduced up to 30%.
- ▶ All the given cutting data recommendations refer to the machines with spindle through coolant supply.

### Legend:

|                       |   |              |                  |   |                  |
|-----------------------|---|--------------|------------------|---|------------------|
| Grade                 | → | TT9030       | BL               | ← | Cutting geometry |
| Cutting speed (m/min) | → | Vc = 10 - 20 |                  | ← | Feed (mm/tooth)  |
| TM-REAM head size     | → | B4-B6        | fz = 0.04 - 0.15 | ← |                  |
|                       | → | B7-B9        | fz = 0.05 - 0.20 | ← |                  |



# Recommended Cutting Conditions



## Machining data for TB-REAM

|     |                                                                    |              | Lead A (15°/3°)<br>(Reaming allowance: 0.1 ~ 0.3) |          |                             |                |         |            |            |
|-----|--------------------------------------------------------------------|--------------|---------------------------------------------------|----------|-----------------------------|----------------|---------|------------|------------|
|     |                                                                    |              | Feed<br>(mm/rev)                                  | Rake (°) | Cutting speed<br>Vc (m/min) |                |         |            |            |
| ISO | Material                                                           | Material No. |                                                   |          | Carbide                     | Coated carbide | Cermet  | PCD        | CBN        |
| P   | Non-alloy steel and cast steel, free cutting steel                 | 1 - 5        | 0.1-0.4                                           | 6        | 40-60                       | 60-80          | 110-160 |            |            |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | 6 - 9        | 0.1-0.4                                           | 6        | 20-40                       | 40-60          | 110-160 |            |            |
|     | High alloyed steel, cast steel and tool steel                      | 10 - 11      | 0.1-0.4                                           | 6        | 20-40                       | 20-60          | 20-60   |            |            |
| M   | Stainless steel, cast steel                                        | 12 - 14      | 0.1-0.3                                           | 12       | 20-40                       | 40-60          | 20-60   |            |            |
| K   | Grey cast iron (GG)                                                | 15 - 16      | 0.1-0.3                                           | 0 / 6    | 40-60                       | 60-100         |         |            | Please ask |
|     | Cast iron nodular (GGG)                                            | 17 - 18      | 0.1-0.3                                           | 0 / 6    | 40-60                       | 60-100         |         |            |            |
|     | Malleable cast iron                                                | 19 - 20      | 0.1-0.3                                           | 0 / 6    | 40-60                       | 60-100         |         |            |            |
| N   | Aluminum wrought alloy                                             | 21 - 22      |                                                   |          |                             |                |         | Please ask |            |
|     | Aluminum-cast, alloyed                                             | 23 - 25      |                                                   |          |                             |                |         |            |            |
|     | Copper alloys                                                      | 26 - 28      |                                                   |          |                             |                |         |            |            |
|     | Non-metallic                                                       | 29 - 30      |                                                   |          |                             |                |         |            |            |

|     |                                                                    |              | Lead C (75°)<br>(Reaming allowance: 0.2 ~ 0.4) |          |                             |                |        |            |            |
|-----|--------------------------------------------------------------------|--------------|------------------------------------------------|----------|-----------------------------|----------------|--------|------------|------------|
|     |                                                                    |              | Feed<br>(mm/rev)                               | Rake (°) | Cutting speed<br>Vc (m/min) |                |        |            |            |
| ISO | Material                                                           | Material No. |                                                |          | Carbide                     | Coated carbide | Cermet | PCD        | CBN        |
| P   | Non-alloy steel and cast steel, free cutting steel                 | 1 - 5        |                                                |          |                             |                |        |            |            |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | 6 - 9        |                                                |          |                             |                |        |            |            |
|     | High alloyed steel, cast steel and tool steel                      | 10 - 11      |                                                |          |                             |                |        |            |            |
| M   | Stainless steel, cast steel                                        | 12 - 14      |                                                |          |                             |                |        |            | Please ask |
| K   | Grey cast iron (GG)                                                | 15 - 16      |                                                |          |                             |                |        |            |            |
|     | Cast iron nodular (GGG)                                            | 17 - 18      |                                                |          |                             |                |        |            |            |
|     | Malleable cast iron                                                | 19 - 20      |                                                |          |                             |                |        |            |            |
| N   | Aluminum wrought alloy                                             | 21 - 22      | 0.15-0.3                                       | 12       | 150-250                     |                |        | Please ask |            |
|     | Aluminum-cast, alloyed                                             | 23 - 25      | 0.15-0.3                                       | 12       | 150-250                     |                |        |            |            |
|     | Copper alloys                                                      | 26 - 28      |                                                |          |                             |                |        |            |            |
|     | Non-metallic                                                       | 29 - 30      |                                                |          |                             |                |        |            |            |

► The cutting conditions in the table below should be used to start a new application.  
Optimal conditions for a specific application should be evaluated by examining the results and changing the machining conditions accordingly.

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous

# Recommended Cutting Conditions



## Machining data for TB-REAM

|     |                                                                    |              | Lead B (30°/3°)<br>(Reaming allowance: 0.1 ~ 0.3) |          |                             |                |         |            |            |
|-----|--------------------------------------------------------------------|--------------|---------------------------------------------------|----------|-----------------------------|----------------|---------|------------|------------|
|     |                                                                    |              | Feed<br>(mm/rev)                                  | Rake (°) | Cutting speed<br>Vc (m/min) |                |         |            |            |
| ISO | Material                                                           | Material No. |                                                   |          | Carbide                     | Coated carbide | Cermet  | PCD        | CBN        |
| P   | Non-alloy steel and cast steel, free cutting steel                 | 1 - 5        | 0.1-0.4                                           | 6        | 60-80                       | 80-120         | 110-160 |            |            |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | 6 - 9        | 0.1-0.4                                           | 6        | 60-80                       | 80-120         | 110-160 |            |            |
|     | High alloyed steel, cast steel and tool steel                      | 10 - 11      | 0.1-0.4                                           | 6        | 40-60                       | 40-80          | 40-80   |            |            |
| M   | Stainless steel, cast steel                                        | 12 - 14      | 0.1-0.3                                           | 12       | 40-60                       | 60-80          | 60-80   |            |            |
| K   | Grey cast iron (GG)                                                | 15 - 16      | 0.1-0.3                                           | 0 / 6    | 60-80                       | 80-120         |         |            | Please ask |
|     | Cast iron nodular (GGG)                                            | 17 - 18      | 0.1-0.3                                           | 0 / 6    | 60-80                       | 80-120         |         |            |            |
|     | Malleable cast iron                                                | 19 - 20      | 0.1-0.3                                           | 0 / 6    | 60-80                       | 80-120         |         |            |            |
| N   | Aluminum wrought alloy                                             | 21 - 22      |                                                   | 12       | 160-200                     |                |         | Please ask |            |
|     | Aluminum-cast, alloyed                                             | 23 - 25      |                                                   | 12       | 160-200                     |                |         |            |            |
|     | Copper alloys                                                      | 26 - 28      |                                                   | 0        | 80-100                      |                |         |            |            |
|     | Non-metallic                                                       | 29 - 30      |                                                   | 0        | 10-70                       |                |         |            |            |

|     |                                                                    |              | Lead D (30°/3°)<br>(Reaming allowance: 0.1 ~ 0.2) |          |                             |                |         |            |            |
|-----|--------------------------------------------------------------------|--------------|---------------------------------------------------|----------|-----------------------------|----------------|---------|------------|------------|
|     |                                                                    |              | Feed<br>(mm/rev)                                  | Rake (°) | Cutting speed<br>Vc (m/min) |                |         |            |            |
| ISO | Material                                                           | Material No. |                                                   |          | Carbide                     | Coated carbide | Cermet  | PCD        | CBN        |
| P   | Non-alloy steel and cast steel, free cutting steel                 | 1 - 5        | 0.1-0.4                                           | 6        | 60-80                       | 80-120         | 110-160 |            |            |
|     | Low alloy steel and cast steel (Less than 5% of alloying elements) | 6 - 9        | 0.1-0.4                                           | 6        | 60-80                       | 80-120         | 110-160 |            |            |
|     | High alloyed steel, cast steel and tool steel                      | 10 - 11      | 0.1-0.4                                           | 6        | 40-60                       | 40-80          | 40-80   |            |            |
| M   | Stainless steel, cast steel                                        | 12 - 14      | 0.1-0.3                                           | 12       | 40-60                       | 60-80          | 60-80   |            |            |
| K   | Grey cast iron (GG)                                                | 15 - 16      | 0.1-0.3                                           | 0 / 6    | 60-80                       | 80-120         |         |            | Please ask |
|     | Cast iron nodular (GGG)                                            | 17 - 18      | 0.1-0.3                                           | 0 / 6    | 60-80                       | 80-120         |         |            |            |
|     | Malleable cast iron                                                | 19 - 20      | 0.1-0.3                                           | 0 / 6    | 60-80                       | 80-120         |         |            |            |
| N   | Aluminum wrought alloy                                             | 21 - 22      |                                                   | 12       | 110-200                     |                |         | Please ask |            |
|     | Aluminum-cast, alloyed                                             | 23 - 25      |                                                   | 12       | 160-200                     |                |         |            |            |
|     | Copper alloys                                                      | 26 - 28      |                                                   | 0        | 80-100                      |                |         |            |            |
|     | Non-metallic                                                       | 29 - 30      |                                                   |          |                             |                |         |            |            |

► The cutting conditions in the table below should be used to start a new application.  
Optimal conditions for a specific application should be evaluated by examining the results and changing the machining conditions accordingly.

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous

# Recommended Cutting Conditions



## Machining data for TS-REAM

| ISO          | Material                                                                    |                         | Condition                    | Tensile strength<br>(N/mm²) | Hardness<br>HB | Material<br>No. | Cutting<br>speed<br>Vc (m/min) |
|--------------|-----------------------------------------------------------------------------|-------------------------|------------------------------|-----------------------------|----------------|-----------------|--------------------------------|
| P            | Non-alloy steel,<br>cast steel, free<br>cutting steel                       | <0.25%C                 | Annealed                     | 420                         | 125            | 1               | 120-250                        |
|              |                                                                             | >=0.25%C                | Annealed                     | 650                         | 190            | 2               | 120-250                        |
|              |                                                                             | <0.55%C                 | Quenched and tempered        | 850                         | 250            | 3               | 120-250                        |
|              |                                                                             | >=0.55%C                | Annealed                     | 750                         | 220            | 4               |                                |
|              |                                                                             |                         | Quenched and tempered        | 1000                        | 300            | 5               |                                |
|              | Low alloy steel<br>and cast steel<br>(Less than 5% of<br>alloying elements) |                         | Annealed                     | 600                         | 200            | 6               | 120-250                        |
|              |                                                                             |                         | Quenched and tempered        | 930                         | 275            | 7               | 120-250                        |
|              |                                                                             |                         |                              | 1000                        | 300            | 8               | 120-250                        |
|              |                                                                             |                         |                              | 1200                        | 350            | 9               | 120-250                        |
|              | High alloy steel, cast steel<br>and tool steel                              |                         | Annealed                     | 680                         | 200            | 10              | 120-250                        |
|              |                                                                             |                         | Quenched and tempered        | 1100                        | 325            | 11              | 120-250                        |
| M            | Stainless steel<br>and cast steel                                           | Ferritic / martensitic  | 680                          | 200                         | 12             | 60-120          |                                |
|              |                                                                             | Martensitic             | 820                          | 240                         | 13             | 60-120          |                                |
|              |                                                                             | Austenitic              | 600                          | 180                         | 14             | 60-120          |                                |
| K            | Gray cast iron<br>(GG)                                                      | Ferritic                |                              | 160                         | 15             | 60-120          |                                |
|              |                                                                             | Pearlitic               |                              | 250                         | 16             | 60-120          |                                |
|              | Cast iron nodular<br>(GGG)                                                  | Ferritic                |                              | 180                         | 17             | 60-120          |                                |
|              |                                                                             | Pearlitic               |                              | 260                         | 18             | 60-120          |                                |
|              | Malleable cast iron                                                         | Ferritic                |                              | 130                         | 19             | 60-120          |                                |
|              |                                                                             | Pearlitic               |                              | 230                         | 20             | 60-120          |                                |
| N            | Aluminum - Wrought alloy                                                    |                         | Not cureable                 |                             | 60             | 21              | 250-500                        |
|              |                                                                             |                         | Cured                        |                             | 100            | 22              | 250-500                        |
|              | Aluminum-<br>cast, alloyed                                                  | <=12% Si                | Not cureable                 |                             | 75             | 23              | 250-500                        |
|              |                                                                             |                         | Cured                        |                             | 90             | 24              | 250-500                        |
|              |                                                                             | >12% Si                 | High temp.                   |                             | 130            | 25              |                                |
|              |                                                                             | >1% Pb                  | Free cutting                 |                             | 110            | 26              |                                |
|              | Copper alloys                                                               |                         | Brass                        |                             | 90             | 27              |                                |
|              |                                                                             |                         | Electrolitic copper          |                             | 100            | 28              |                                |
| Non-metallic |                                                                             |                         | Duroplastics, fiber plastics |                             | 70 Shore D     | 29              |                                |
|              |                                                                             |                         | Hard rubber                  |                             | 55 Shore D     | 30              |                                |
| S            | High temp.<br>alloys                                                        | Fe based                | Annealed                     |                             | 200            | 31              |                                |
|              |                                                                             |                         | Cured                        |                             | 280            | 32              |                                |
|              |                                                                             | Ni or<br>Co based       | Annealed                     |                             | 250            | 33              | 25-50                          |
|              |                                                                             |                         | Cured                        |                             | 350            | 34              | 25-50                          |
|              |                                                                             |                         | Cast                         |                             | 320            | 35              |                                |
|              | Titanium, Ti alloys                                                         | Pure                    | Rm 400                       | 190                         | 36             | 30-80           |                                |
|              |                                                                             | Alpha+beta alloys cured | Rm 1050                      | 310                         | 37             | 30-80           |                                |
| H            | Hardened steel                                                              | Hardened                |                              | 55HRC                       | 38             | 25-60           |                                |
|              |                                                                             | Hardened                |                              | 60HRC                       | 39             |                 |                                |
|              | Chilled cast iron                                                           | Cast                    |                              | 400                         | 40             |                 |                                |
|              | Cast iron nodular                                                           | Hardened                |                              | 55HRC                       | 41             |                 |                                |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

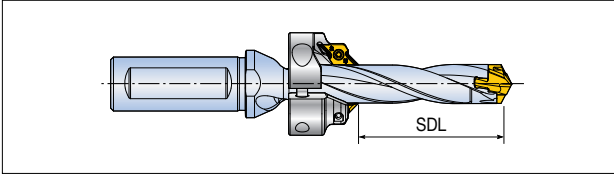
# Recommended Cutting Conditions



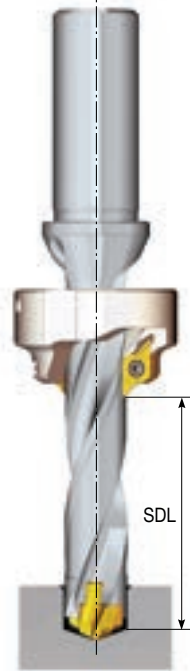
## Machining data for TS-REAM

| Feed (mm/rev) vs. reamer diameter |             |              |               |
|-----------------------------------|-------------|--------------|---------------|
| Ø3.0 - Ø5.0                       | Ø6.0 - Ø7.0 | Ø8.0 - Ø10.0 | Ø10.5 - Ø12.0 |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
|                                   |             |              |               |
|                                   |             |              |               |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
|                                   |             |              |               |
|                                   |             |              |               |
|                                   |             |              |               |
|                                   |             |              |               |
|                                   |             |              |               |
|                                   |             |              |               |
|                                   |             |              |               |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
|                                   |             |              |               |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
| 0.10-0.40                         | 0.15-0.70   | 0.50-1.40    | 0.80-1.60     |
|                                   |             |              |               |
|                                   |             |              |               |
|                                   |             |              |               |

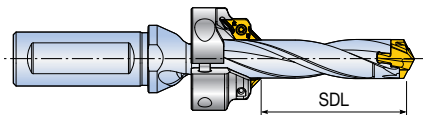
## ► Chamfering ring design - DRILL-RUSH



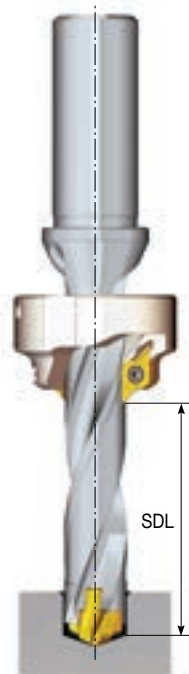
|    | Designation            | CFR designation | SDL |     |
|----|------------------------|-----------------|-----|-----|
|    |                        |                 | min | max |
| 3D | TCD 130-134-16T3/S0-3D | CFR D130-A45    | 19  | 19  |
|    | 135-139-16T3/S0-3D     | CFR D135-A45    | 19  | 20  |
|    | 140-144-16T3/S0-3D     | CFR D140-A45    | 21  | 22  |
|    | 145-149-16T3/S0-3D     | CFR D145-A45    | 22  | 23  |
|    | 150-159-20T3/S0-3D     | CFR D150-A45    | 23  | 23  |
|    | 160-169-20T3/S0-3D     | CFR D160-A45    | 24  | 25  |
|    | 170-179-20T3/S0-3D     | CFR D170-A45    | 26  | 28  |
|    | 180-189-25T2/S0-3D     | CFR D180-A45    | 27  | 30  |
|    | 190-199-25T2/S0-3D     | CFR D190-A45    | 29  | 33  |
|    | 200-209-25T2/S0-3D     | CFR D200-A45    | 30  | 36  |
|    | 210-219-25T2/S0-3D     | CFR D210-A45    | 32  | 39  |
|    | 220-229-25T2/S0-3D     | CFR D220-A45    | 33  | 42  |
|    | 230-239-32T2/S0-3D     | CFR D230-A45    | 35  | 45  |
|    | 240-249-32T2/S0-3D     | CFR D240-A45    | 36  | 48  |
| 5D | 250-259-32T2/S0-3D     | CFR D250-A45    | 38  | 51  |
|    | TCD 100-104-16T3/S0-5D | CFR D100-A45    | 28  | 28  |
|    | 105-109-16T3/S0-5D     | CFR D105-A45    | 29  | 30  |
|    | 110-114-16T3/S0-5D     | CFR D110-A45    | 31  | 33  |
|    | 115-119-16T3/S0-5D     | CFR D115-A45    | 32  | 35  |
|    | 120-124-16T3/S0-5D     | CFR D120-A45    | 33  | 45  |
|    | 125-129-16T3/S0-5D     | CFR D125-A45    | 34  | 40  |
|    | 130-134-16T3/S0-5D     | CFR D130-A45    | 36  | 43  |
|    | 135-139-16T3/S0-5D     | CFR D135-A45    | 37  | 43  |
|    | 140-144-16T3/S0-5D     | CFR D140-A45    | 38  | 48  |
|    | 145-149-16T3/S0-5D     | CFR D145-A45    | 39  | 48  |
|    | 150-159-20T3/S0-5D     | CFR D150-A45    | 41  | 53  |
|    | 160-169-20T3/S0-5D     | CFR D160-A45    | 43  | 58  |
|    | 170-179-20T3/S0-5D     | CFR D170-A45    | 46  | 63  |
|    | 180-189-25T2/S0-5D     | CFR D180-A45    | 48  | 68  |
|    | 190-199-25T2/S0-5D     | CFR D190-A45    | 51  | 73  |
|    | 200-209-25T2/S0-5D     | CFR D200-A45    | 53  | 78  |
|    | 210-219-25T2/S0-5D     | CFR D210-A45    | 56  | 79  |
|    | 220-229-25T2/S0-5D     | CFR D220-A45    | 58  | 84  |
|    | 230-239-32T2/S0-5D     | CFR D230-A45    | 61  | 89  |
|    | 240-249-32T2/S0-5D     | CFR D240-A45    | 63  | 94  |
|    | 250-259-32T2/S0-5D     | CFR D250-A45    | 66  | 99  |



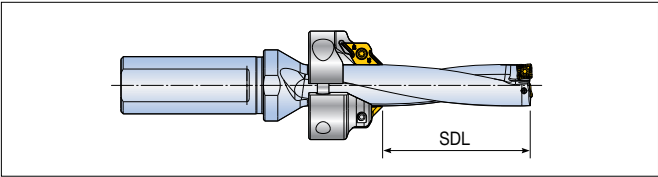
## ► Chamfering ring design - DRILL-RUSH



|     | Designation            | CFR designation | SDL |     |
|-----|------------------------|-----------------|-----|-----|
|     |                        |                 | min | max |
| 8D  | TCD 100-104-16T3/S0-8D | CFR D100-A45    | 45  | 58  |
|     | 105-109-16T3/S0-8D     | CFR D105-A45    | 49  | 62  |
|     | 110-114-16T3/S0-8D     | CFR D110-A45    | 49  | 66  |
|     | 115-119-16T3/S0-8D     | CFR D115-A45    | 53  | 70  |
|     | 120-124-16T3/S0-8D     | CFR D120-A45    | 53  | 74  |
|     | 125-129-16T3/S0-8D     | CFR D125-A45    | 57  | 78  |
|     | 130-134-16T3/S0-8D     | CFR D130-A45    | 57  | 82  |
|     | 135-139-16T3/S0-8D     | CFR D135-A45    | 61  | 84  |
|     | 140-144-16T3/S0-8D     | CFR D140-A45    | 61  | 88  |
|     | 145-149-16T3/S0-8D     | CFR D145-A45    | 65  | 92  |
|     | 150-159-20T3/S0-8D     | CFR D150-A45    | 65  | 96  |
|     | 160-169-20T3/S0-8D     | CFR D160-A45    | 69  | 103 |
|     | 170-179-20T3/S0-8D     | CFR D170-A45    | 73  | 111 |
|     | 180-189-25T2/S0-8D     | CFR D180-A45    | 77  | 118 |
|     | 190-199-25T2/S0-8D     | CFR D190-A45    | 81  | 126 |
|     | 200-209-25T2/S0-8D     | CFR D200-A45    | 85  | 134 |
|     | 210-219-25T2/S0-8D     | CFR D210-A45    | 89  | 142 |
|     | 220-229-25T2/S0-8D     | CFR D220-A45    | 93  | 150 |
|     | 230-239-32T2/S0-8D     | CFR D230-A45    | 97  | 158 |
|     | 240-249-32T2/S0-8D     | CFR D240-A45    | 101 | 166 |
|     | 250-259-32T2/S0-8D     | CFR D250-A45    | 105 | 174 |
| 12D | TCD 120-124-16S0-12D   | CFR D120-A45    | 87  | 121 |
|     | 125-129-16S0-12D       | CFR D125-A45    | 90  | 127 |
|     | 130-134-16S0-12D       | CFR D130-A45    | 93  | 133 |
|     | 135-139-16S0-12D       | CFR D135-A45    | 96  | 137 |
|     | 140-144-16S0-12D       | CFR D140-A45    | 99  | 143 |
|     | 145-149-16S0-12D       | CFR D145-A45    | 102 | 149 |
|     | 150-159-20S0-12D       | CFR D150-A45    | 105 | 155 |
|     | 160-169-20S0-12D       | CFR D160-A45    | 111 | 166 |
|     | 170-179-20S0-12D       | CFR D170-A45    | 117 | 178 |
|     | 180-189-25S0-12D       | CFR D180-A45    | 123 | 189 |
|     | 190-199-25S0-12D       | CFR D190-A45    | 129 | 201 |
|     | 200-209-25S0-12D       | CFR D200-A45    | 135 | 213 |
|     | 210-219-25S0-12D       | CFR D210-A45    | 141 | 225 |
|     | 220-229-25S0-12D       | CFR D220-A45    | 147 | 237 |



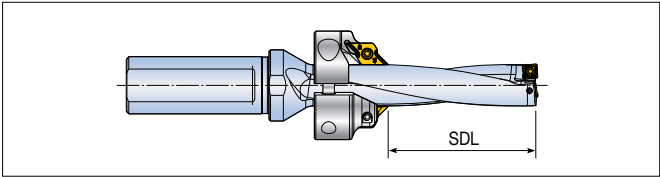
► Chamfering ring design - TOP-DRILL and T-DRILL



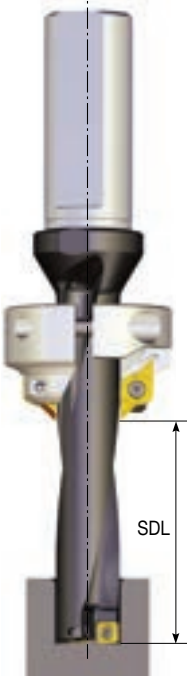
|    | TOP-DRILL    | T-DRILL          | CFR designation | SDL |     |
|----|--------------|------------------|-----------------|-----|-----|
|    |              |                  |                 | min | max |
| 3D | TOP -        | TDR 3125-20T2-05 | CFR D125-A45    | 16  | 16  |
|    | -            | 3130-20T2-05     | CFR D130-A45    | 16  | 16  |
|    | -            | 3135-20T2-05     | CFR D135-A45    | 17  | 18  |
|    | 3140-20T2-05 | 3140-20T2-05     | CFR D140-A45    | 17  | 18  |
|    | 3145-20T2-05 | 3145-20T2-05     | CFR D145-A45    | 18  | 19  |
|    | 3150-20T2-05 | 3150-20T2-05     | CFR D150-A45    | 18  | 19  |
|    | 3155-20T2-05 | 3155-25T2-06     | CFR D160-A45    | 19  | 21  |
|    | 3160-20T2-05 | 3160-25T2-06     | CFR D160-A45    | 19  | 21  |
|    | 3165-25T2-06 | 3165-25T2-06     | CFR D170-A45    | 21  | 24  |
|    | 3170-25T2-06 | 3170-25T2-06     | CFR D170-A45    | 22  | 24  |
|    | 3175-25T2-06 | 3175-25T2-06     | CFR D180-A45    | 23  | 27  |
|    | 3180-25T2-06 | 3180-25T2-06     | CFR D180-A45    | 23  | 26  |
|    | 3185-25T2-06 | 3185-25T2-06     | CFR D180-A45    | 24  | 29  |
|    | 3190-25T2-06 | 3190-25T2-06     | CFR D190-A45    | 25  | 29  |
|    | 3195-25T2-07 | 3195-25T2-06     | CFR D190-A45    | 25  | 32  |
|    | 3200-25T2-07 | 3200-25T2-06     | CFR D200-A45    | 26  | 32  |
|    | 3205-25T2-07 | 3205-25T2-06     | CFR D200-A45    | 27  | 35  |
|    | 3210-25T2-07 | 3210-25T2-06     | CFR D210-A45    | 27  | 35  |
|    | 3215-25T2-07 | 3215-25T2-07     | CFR D210-A45    | 28  | 38  |
|    | 3220-25T2-07 | 3220-25T2-07     | CFR D220-A45    | 29  | 38  |
|    | 3225-25T2-08 | 3225-25T2-07     | CFR D220-A45    | 29  | 41  |
|    | 3230-25T2-08 | 3230-25T2-07     | CFR D230-A45    | 30  | 41  |
|    | 3235-25T2-08 | 3235-25T2-07     | CFR D230-A45    | 31  | 44  |
|    | 3240-25T2-08 | 3240-25T2-07     | CFR D240-A45    | 31  | 44  |
|    | 3245-25T2-08 | 3245-25T2-07     | CFR D240-A45    | 32  | 47  |
|    | 3250-25T2-08 | 3250-25T2-07     | CFR D250-A45    | 33  | 47  |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |



► Chamfering ring designation - TOP-DRILL and T-DRILL



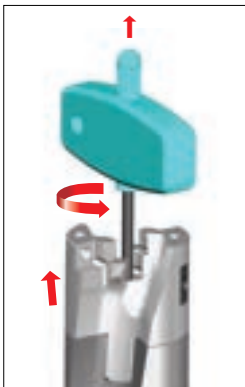
|    | TOP-DRILL    | T-DRILL          | CFR designation | SDL |     |
|----|--------------|------------------|-----------------|-----|-----|
|    |              |                  |                 | min | max |
| 4D | TOP -        | TDR 4125-20T2-05 | CFR D125-A45    | 25  | 26  |
|    | -            | 4130-20T2-05     | CFR D130-A45    | 25  | 26  |
|    | -            | 4135-20T2-05     | CFR D135-A45    | 27  | 30  |
|    | 4140-20T2-05 | 4140-20T2-05     | CFR D140-A45    | 28  | 30  |
|    | 4145-20T2-05 | 4145-20T2-05     | CFR D145-A45    | 29  | 34  |
|    | 4150-20T2-05 | 4150-20T2-05     | CFR D150-A45    | 30  | 34  |
|    | 4155-20T2-05 | 4155-25T2-06     | CFR D160-A45    | 31  | 37  |
|    | 4160-20T2-05 | 4160-25T2-06     | CFR D160-A45    | 32  | 37  |
|    | 4165-25T2-06 | 4165-25T2-06     | CFR D170-A45    | 33  | 41  |
|    | 4170-25T2-06 | 4170-25T2-06     | CFR D170-A45    | 34  | 41  |
|    | 4175-25T2-06 | 4175-25T2-06     | CFR D180-A45    | 35  | 45  |
|    | 4180-25T2-06 | 4180-25T2-06     | CFR D180-A45    | 36  | 44  |
|    | 4185-25T2-06 | 4185-25T2-06     | CFR D180-A45    | 37  | 48  |
|    | 4190-25T2-06 | 4190-25T2-06     | CFR D190-A45    | 38  | 48  |
|    | 4195-25T2-07 | 4195-25T2-06     | CFR D190-A45    | 39  | 52  |
|    | 4200-25T2-07 | 4200-25T2-06     | CFR D200-A45    | 40  | 52  |
|    | 4205-25T2-07 | 4205-25T2-06     | CFR D200-A45    | 41  | 56  |
|    | 4210-25T2-07 | 4210-25T2-06     | CFR D210-A45    | 42  | 56  |
|    | 4215-25T2-07 | 4215-25T2-07     | CFR D210-A45    | 43  | 60  |
|    | 4220-25T2-07 | 4220-25T2-07     | CFR D220-A45    | 44  | 60  |
|    | 4225-25T2-08 | 4225-25T2-07     | CFR D220-A45    | 45  | 64  |
|    | 4230-25T2-08 | 4230-25T2-07     | CFR D230-A45    | 46  | 64  |
|    | 4235-25T2-08 | 4235-25T2-07     | CFR D230-A45    | 47  | 68  |
|    | 4240-25T2-08 | 4240-25T2-07     | CFR D240-A45    | 48  | 68  |
|    | 4245-25T2-08 | 4245-25T2-07     | CFR D240-A45    | 49  | 72  |
|    | 4250-25T2-08 | 4250-25T2-07     | CFR D250-A45    | 50  | 72  |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |
|    |              |                  |                 |     |     |



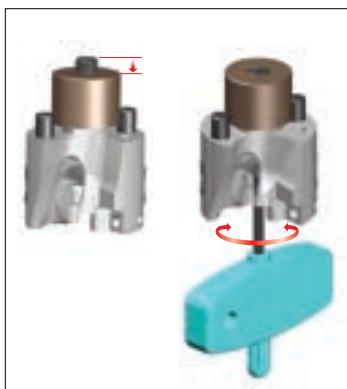


## ► Modular head replacement instructions

1. Remove both outer inserts, then remove the center drill head.  
(When clamping, go in the reverse order)
2. Use a wrench to turn the screw counter-clock-wise to remove the modular head.
3. Insert the setting gauge into the bottom of the disconnected modular head.



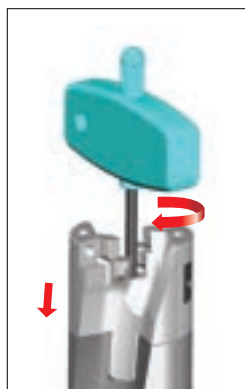
4. Rotate the screw to adjust to the same height with the setting gauge.



Setting gauge

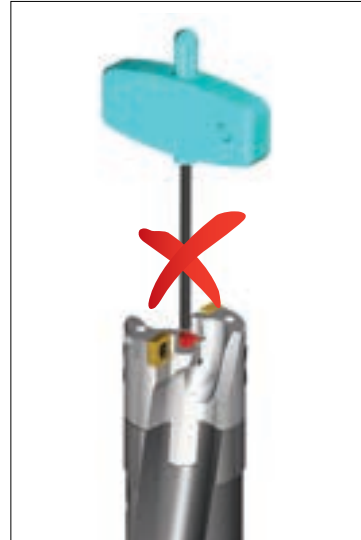
| Drill dia. | Designation       |
|------------|-------------------|
| D26-D29    | SG TNDH D26-29-TP |
| D30-D35    | SG TNDH D30-35-TP |
| D36-D39    | SG TNDH D36-39-TP |
| D40-D43    | SG TNDH D40-43-TP |
| D44-D50    | SG TNDH D44-50-TP |

5. Remove the height adjusted modular head from the setting gauge and attach it to the holder.



## ► Modular head disassembly in the event of center drill damage

If the modular head cannot be unclamped due to center drill damage, insert the wrench into the rear section of the shank. Then, turn it clock-wise to disassemble the modular head.



Damaged center drill



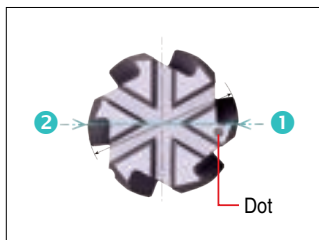
Disassembling wrench

Wrench handle

► Disassembling wrench and handle are included with the modular drill holder. (MDB Dxx/xx...)

## ► XM-REAM user guide and notice

### How to check reamer diameter



Measure the dot side edge **1** and opposite side edge **2**.

### Reaming allowance

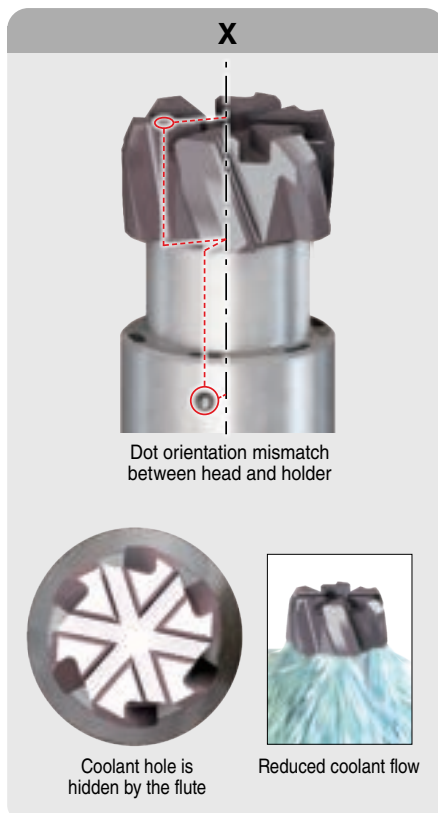
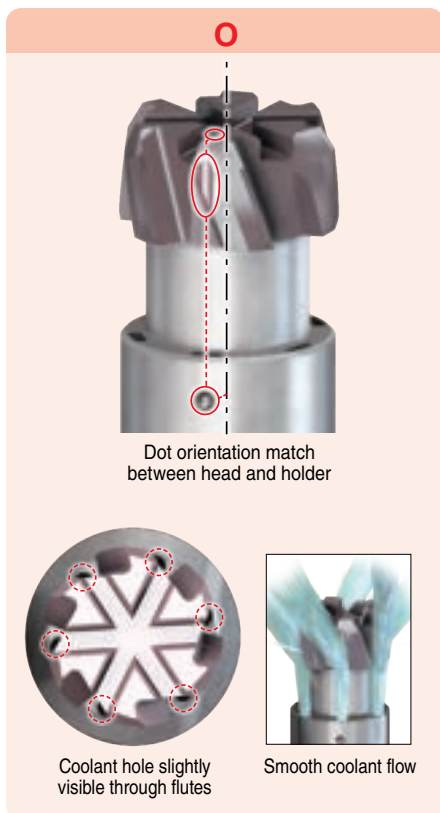
| Material          | Diameter  |           |
|-------------------|-----------|-----------|
|                   | < Ø10     | Ø10-12    |
| Steel & Cast iron | 0.07-0.10 | 0.07-0.15 |
| Aluminum & brass  | 0.07-0.10 | 0.10-0.15 |

\* Based on diameter

Ex) Ø9.85-9.93 mm pre-hole is recommended for Ø10H7 reaming in cast iron.

### Caution

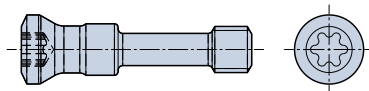
- To ensure smooth coolant flow, the dot and slot orientation of the head must be aligned as illustrated.



## ► Screw torque

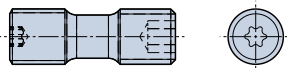
### For SPADE-RUSH

| Designation        | Thread | Length | Torx    | Tightening Torque |
|--------------------|--------|--------|---------|-------------------|
| <b>TS 30138D33</b> | M3     | 13.8   | Torx 10 | 2.0 Nm            |
| <b>TS 40178D25</b> | M4     | 17.8   | Torx 20 | 4.5 Nm            |
| <b>TS 40198D28</b> | M4     | 19.8   | Torx 20 | 4.5 Nm            |
| <b>TS 40210D3</b>  | M4     | 21     | Torx 20 | 5.0 Nm            |
| <b>TS 50230D3</b>  | M5     | 23     | Torx 20 | 5.0 Nm            |
| <b>TS 50250D35</b> | M5     | 25     | Torx 25 | 5.5 Nm            |
| <b>TS 60265D4</b>  | M6     | 26.5   | Torx 25 | 6.0 Nm            |
| <b>TS 60285D42</b> | M6     | 28.5   | Torx 25 | 6.0 Nm            |
| <b>TS 60320D5</b>  | M6     | 31     | Torx 25 | 6.0 Nm            |
| <b>TS 80340D6</b>  | M8     | 34     | Torx 25 | 7.0 Nm            |



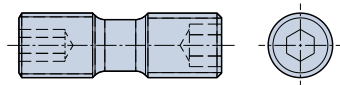
### For MODU-R-DRILL

| Designation         | Thread | Length | Torx   | Tightening Torque |
|---------------------|--------|--------|--------|-------------------|
| <b>TDPS 0512-T7</b> | M5     | 12     | Torx 7 | 1.0 Nm            |
| <b>TDPS 0618-T8</b> | M6     | 18     | Torx 8 | 2.0 Nm            |



### For MODU-R-DRILL

| Designation           | Thread | Length | Torx        | Tightening Torque |
|-----------------------|--------|--------|-------------|-------------------|
| <b>TDPS 0722-W3.0</b> | M7     | 22     | Hexa 3.0 mm | 5.0 Nm            |



# Technical Data

## ► Hole tolerance

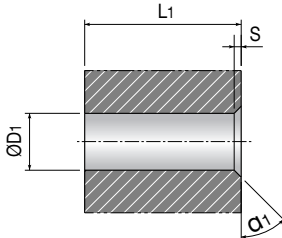
| Diameter<br>D(mm) |    | Tolerance (µm) |              |              |              |              |              |            |             |             |            |            |            |            |            |          |          |
|-------------------|----|----------------|--------------|--------------|--------------|--------------|--------------|------------|-------------|-------------|------------|------------|------------|------------|------------|----------|----------|
| >D                | ≤D | B10            | C9           | C10          | D8           | D9           | D10          | E7         | E8          | E9          | F6         | F7         | F8         | G6         | G7         | H6       | H7       |
| –                 | 3  | +180<br>+140   | +85<br>+60   | +100<br>+60  | +34<br>+20   | +45<br>+20   | +60<br>+20   | +24<br>+14 | +28<br>+14  | +39<br>+14  | +12<br>+6  | +16<br>+6  | +20<br>+6  | +8<br>+2   | +12<br>+2  | +6<br>0  | +10<br>0 |
| 3                 | 6  | +180<br>+140   | +100<br>+70  | +118<br>+70  | +48<br>+30   | +60<br>+30   | +78<br>+30   | +32<br>+20 | +38<br>+20  | +50<br>+20  | +18<br>+10 | +22<br>+10 | +28<br>+10 | +12<br>+4  | +16<br>+4  | +8<br>0  | +12<br>0 |
| 6                 | 10 | +208<br>+150   | +116<br>+80  | +138<br>+80  | +62<br>+40   | +76<br>+40   | +98<br>+40   | +40<br>+25 | +47<br>+25  | +61<br>+25  | +22<br>+13 | +28<br>+13 | +35<br>+13 | +14<br>+5  | +20<br>+5  | +9<br>0  | +15<br>0 |
| 10                | 14 | +220<br>+150   | +138<br>+95  | +165<br>+95  | +77<br>+50   | +93<br>+50   | +120<br>+50  | +50<br>+32 | +59<br>+32  | +75<br>+32  | +27<br>+16 | +34<br>+16 | +43<br>+16 | +17<br>+6  | +24<br>+6  | +11<br>0 | +18<br>0 |
| 14                | 18 |                |              |              |              |              |              |            |             |             |            |            |            |            |            |          |          |
| 18                | 24 | +244<br>+160   | +162<br>+110 | +194<br>+110 | +98<br>+65   | +117<br>+65  | +149<br>+65  | +61<br>+40 | +73<br>+40  | +92<br>+40  | +33<br>+20 | +41<br>+20 | +53<br>+20 | +20<br>+7  | +28<br>+7  | +13<br>0 | +21<br>0 |
| 24                | 30 |                |              |              |              |              |              |            |             |             |            |            |            |            |            |          |          |
| 30                | 40 | +270<br>+170   | +182<br>+120 | +220<br>+120 | +119<br>+80  | +142<br>+80  | +180<br>+80  | +75<br>+50 | +89<br>+50  | +112<br>+50 | +41<br>+25 | +50<br>+25 | +64<br>+25 | +25<br>+9  | +34<br>+9  | +16<br>0 | +25<br>0 |
| 40                | 50 | +280<br>+180   | +192<br>+130 | +230<br>+130 |              |              |              |            |             |             |            |            |            |            |            |          |          |
| 50                | 65 | +310<br>+190   | +214<br>+140 | +260<br>+140 | +146<br>+100 | +174<br>+100 | +220<br>+146 | +90<br>+60 | +106<br>+60 | +134<br>+60 | +49<br>+30 | +60<br>+30 | +76<br>+30 | +29<br>+10 | +40<br>+10 | +19<br>0 | +30<br>0 |
| 65                | 80 | +320<br>+200   | +224<br>+150 | +270<br>+150 |              |              |              |            |             |             |            |            |            |            |            |          |          |

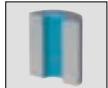
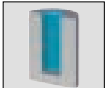
# Technical Data

## ► Hole tolerance

| Tolerance (µm) |          |           |      |       |           |           |           |           |            |           |            |            |            |            |            |             |            |  |
|----------------|----------|-----------|------|-------|-----------|-----------|-----------|-----------|------------|-----------|------------|------------|------------|------------|------------|-------------|------------|--|
| H8             | H9       | H10       | JS6  | JS7   | K6        | K7        | M6        | M7        | N6         | N7        | P6         | P7         | R7         | S7         | T7         | U7          | X7         |  |
| +14<br>0       | +25<br>0 | +40<br>0  | ±3   | ±5    | 0<br>-6   | 0<br>-10  | -2<br>-8  | -2<br>-12 | -4<br>-10  | -4<br>-14 | -6<br>-12  | -6<br>-16  | -10<br>-20 | -14<br>-24 | -          | -18<br>-28  | -20<br>-30 |  |
| +18<br>0       | +30<br>0 | +48<br>0  | ±4   | ±6    | +2<br>-6  | +3<br>-9  | -1<br>-9  | 0<br>-12  | -5<br>-13  | -4<br>-16 | -9<br>-17  | -8<br>-20  | -11<br>-23 | -15<br>-27 | -          | -19<br>-31  | -24<br>-36 |  |
| +22<br>0       | +36<br>0 | +58<br>0  | ±4.5 | ±7.5  | +2<br>-7  | +5<br>-10 | -3<br>-12 | 0<br>-15  | -7<br>-16  | -4<br>-19 | -12<br>-21 | -9<br>-24  | -13<br>-28 | -17<br>-32 | -          | -22<br>-37  | -28<br>-43 |  |
| +27<br>0       | +43<br>0 | +70<br>0  | ±5.5 | ±9    | +2<br>-9  | +6<br>-12 | -4<br>-15 | 0<br>-18  | -9<br>-20  | -5<br>-23 | -15<br>-26 | -11<br>-29 | -16<br>-34 | -21<br>-39 | -          | -26<br>-44  | -33<br>-51 |  |
|                |          |           |      |       |           |           |           |           |            |           |            |            |            |            |            |             | -38<br>-56 |  |
| +33<br>0       | +52<br>0 | +84<br>0  | ±6.5 | ±10.5 | +2<br>-11 | +6<br>-15 | -4<br>-17 | 0<br>-21  | -11<br>-24 | -7<br>-28 | -18<br>-31 | -14<br>-35 | -20<br>-41 | -27<br>-48 | -          | -33<br>-54  | -46<br>-67 |  |
|                |          |           |      |       |           |           |           |           |            |           |            |            |            |            |            |             | -56<br>-77 |  |
| +39<br>0       | +62<br>0 | +100<br>0 | ±8   | ±12.5 | +3<br>-13 | +7<br>-18 | -4<br>-20 | 0<br>-25  | -12<br>-28 | -8<br>-33 | -21<br>-37 | -17<br>-42 | -25<br>-50 | -34<br>-59 | -39<br>-64 | -51<br>-76  | -          |  |
|                |          |           |      |       |           |           |           |           |            |           |            |            |            |            |            |             | -61<br>-86 |  |
| +46<br>0       | +74<br>0 | +120<br>0 | ±9.5 | ±15   | +4<br>-15 | +9<br>-21 | -5<br>-24 | 0<br>-30  | -14<br>-33 | -9<br>-39 | -26<br>-45 | -21<br>-51 | -30<br>-60 | -42<br>-72 | -55<br>-85 | -76<br>-106 | -          |  |
|                |          |           |      |       |           |           |           |           |            |           |            |            | -32<br>-62 | -48<br>-78 | -64<br>-94 | -91<br>-121 |            |  |

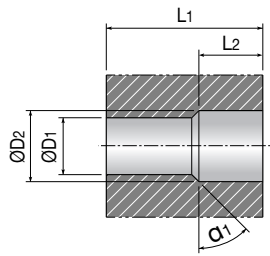
## ► Specific dimensions

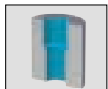


Through ☐  
ØD1 \_\_\_\_\_  
Q1 \_\_\_\_\_  
•Hole tolerance \_\_\_\_\_

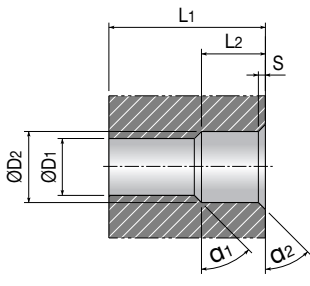
Blind ☐  
L1 \_\_\_\_\_  
S \_\_\_\_\_






Through ☐  
ØD1 \_\_\_\_\_  
L1 \_\_\_\_\_  
Q1 \_\_\_\_\_  
•Hole tolerance \_\_\_\_\_

Blind ☐  
ØD2 \_\_\_\_\_  
L2 \_\_\_\_\_






Through ☐  
ØD1 \_\_\_\_\_  
L1 \_\_\_\_\_  
Q1 \_\_\_\_\_  
S \_\_\_\_\_  
•Hole tolerance \_\_\_\_\_

Blind ☐  
ØD2 \_\_\_\_\_  
L2 \_\_\_\_\_  
Q2 \_\_\_\_\_

Comment

Drill type

•TOPDRILL \_\_\_\_\_ ☐  
•T-DRILL \_\_\_\_\_ ☐

Technical data

•Machine type  
MCT ☐ Lathe ☐  
Vertical ☐ Horizontal ☐  
Machine name \_\_\_\_\_  
Power \_\_\_\_\_ kW

•Coolant supply  
Internal ☐ External ☐  
Coolant pressure \_\_\_\_\_ bar  
Coolant type \_\_\_\_\_

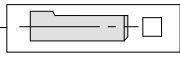
Workpiece

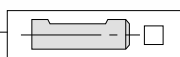
•Part \_\_\_\_\_  
•Material \_\_\_\_\_  
•Hardness \_\_\_\_\_

Shank type

  
Cylindrical shank (ISO 9766)

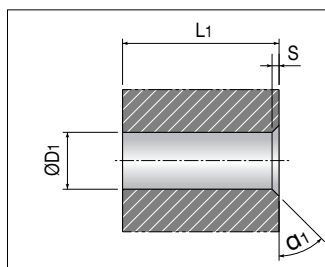
  
Whistle notch shank

  
Cylindrical with flat type

  
Weldon shank

# Tailor-made Order Form

## ► Specific dimensions



Through ☐

Blind ☐

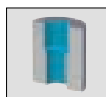
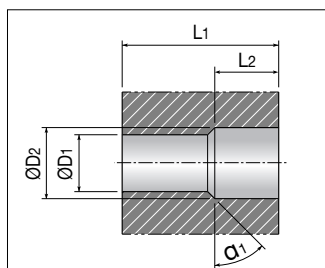
ØD1 \_\_\_\_\_

L1 \_\_\_\_\_

α1 \_\_\_\_\_

S \_\_\_\_\_

•Hole tolerance \_\_\_\_\_



Through ☐

Blind ☐

ØD1 \_\_\_\_\_

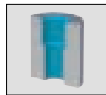
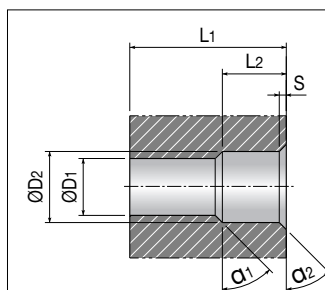
ØD2 \_\_\_\_\_

L1 \_\_\_\_\_

L2 \_\_\_\_\_

α1 \_\_\_\_\_

•Hole tolerance \_\_\_\_\_



Through ☐

Blind ☐

ØD1 \_\_\_\_\_

ØD2 \_\_\_\_\_

L1 \_\_\_\_\_

L2 \_\_\_\_\_

α1 \_\_\_\_\_

α2 \_\_\_\_\_

•Hole tolerance \_\_\_\_\_

Comment

### Technical data

#### •Machine type

MCT ☐ Lathe ☐

Vertical ☐ Horizontal ☐

Machine name \_\_\_\_\_

Power \_\_\_\_\_ kW

#### •Coolant supply

Internal ☐ External ☐

Coolant pressure \_\_\_\_\_ bar

Coolant type \_\_\_\_\_

### Workpiece

#### •Part

\_\_\_\_\_

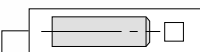
#### •Material

\_\_\_\_\_

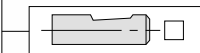
#### •Hardness

\_\_\_\_\_

### Shank type



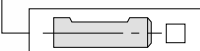
Cylindrical shank (ISO 9766)



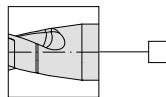
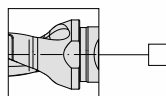
Whistle notch shank



Cylindrical with flat type



Weldon shank



•Shank dia: \_\_\_\_\_

•Shank length: \_\_\_\_\_



## ► Specific dimensions

• DC, DC\_2 would be hole dimensions and please note hole tolerance if possible

### Technical data

- Machine type
  - MCT ☐ Lathe ☐
  - Vertical ☐ Horizontal ☐
  - Machine name \_\_\_\_\_
  - Power \_\_\_\_\_ kW
- Coolant supply
  - Internal ☐ External ☐
  - Coolant pressure \_\_\_\_\_ bar
  - Coolant type \_\_\_\_\_

### Workpiece

- Part \_\_\_\_\_
- Material \_\_\_\_\_
- Hardness \_\_\_\_\_

### Hole type

- Blind hole ☐
- Through hole ☐

### Coating

- TiAlN ☐
- Non-coated ☐

### Shank type

- ☐ Cylindrical shank
- ☐ Whistle notch shank
- ☐ Cylindrical with flat type
- ☐ Weldon shank

### Comment

# Tailor-made Order Form



## ► Deep hole drilling order form

★: Mandatory data field

|                  |                  |
|------------------|------------------|
| Company name :   | Inquiry number : |
| Address :        | Inquiry date :   |
| Contact person : | Customer No :    |

|                                                     |                                                                                                       |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Workpiece<br>(If possible, please attach a drawing) |                                                                                                       |
| Product name                                        |                                                                                                       |
| Hole diameter (ø)                                   | (mm)                                                                                                  |
| Hole depth (drilling length)                        | (mm)                                                                                                  |
| No. of holes                                        |                                                                                                       |
| Tolerance (of hole)                                 |                                                                                                       |
| Surface finish (Rz, Ra...)                          |                                                                                                       |
| Deviation (mm/100)                                  |                                                                                                       |
| Straightness (mm/100)                               |                                                                                                       |
| Material                                            |                                                                                                       |
| Material (DIN, AISI, JIS...)                        |                                                                                                       |
| Hardness (HB, HS, HRC...)                           |                                                                                                       |
| Condition ★                                         | <input type="checkbox"/> Annealed <input type="checkbox"/> Quenched <input type="checkbox"/> Tempered |
|                                                     | <input type="checkbox"/> Cast <input type="checkbox"/>                                                |
|                                                     | <input type="checkbox"/> Other <input type="checkbox"/>                                               |

|                         |                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------|
| Machine                 |                                                                                               |
| Machine supplier name   |                                                                                               |
| Machine type/model      |                                                                                               |
| Rigidity                | <input type="checkbox"/> Good <input type="checkbox"/> Normal <input type="checkbox"/> Bad    |
| Date of manufacture     |                                                                                               |
| Retrofitted             | <input type="checkbox"/> NC lathe <input type="checkbox"/> M/C <input type="checkbox"/> Other |
| Double rotation (TR/WR) | <input type="checkbox"/> Tool and workpiece                                                   |
| Rotating workpiece (WR) | <input type="checkbox"/>                                                                      |
| Rotating tool (TR)      | <input type="checkbox"/>                                                                      |
| Safety devices          |                                                                                               |
| Motor power             | (kW)                                                                                          |

|                       |                                                                         |
|-----------------------|-------------------------------------------------------------------------|
| Type of coolant       |                                                                         |
| Coolant supplier name |                                                                         |
| Water based           | <input type="checkbox"/> Soluble <input type="checkbox"/> Emulsion    % |
| Oil based             | <input type="checkbox"/>                                                |
| Coolant pressure      | (bar)                                                                   |
| Coolant volume        | (L/min)                                                                 |

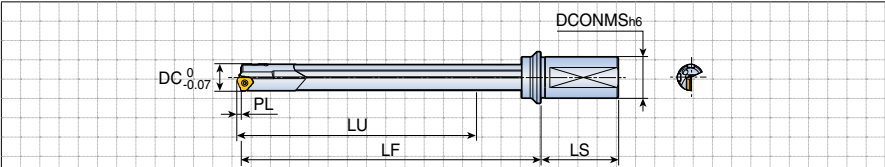
**TDEEP**

★: Mandatory data field

★ Please sketch your drilling application

D

► Deep hole drilling order form



Sketch of drilling application

• Note: It may be necessary to change several of the parameters that you indicated based on our experience with your application.

|                                                  |  |
|--------------------------------------------------|--|
| Tool                                             |  |
| Quantity                                         |  |
| Nominal diameter and tolerance                   |  |
| - Please fill in dimensions on the sketch above. |  |
| Driver                                           |  |
| Code No                                          |  |

- For standard drivers, please use codes from next pages and for special drivers, please attach sketch and specifications.

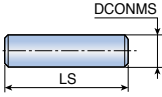
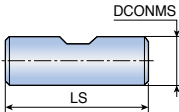
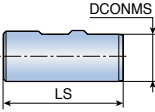
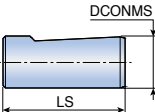
|                                                                     |                                                                                                                           |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Workpiece<br>(If possible, please attach a drawing)                 |                                                                                                                           |
| Material description<br>(DIN material number or any other standard) |                                                                                                                           |
| Hardness and properties                                             |                                                                                                                           |
| Hole type                                                           | <input type="checkbox"/> Blind hole <input type="checkbox"/> Through hole <input type="checkbox"/> Drilling into pre-hole |
|                                                                     | <input type="checkbox"/> Angled entry <input type="checkbox"/> Drilling into solid <input type="checkbox"/> Boring        |
|                                                                     | <input type="checkbox"/> Angled exit                                                                                      |
| Drilling depth                                                      | mm                                                                                                                        |
| Hole tolerance                                                      |                                                                                                                           |
| Application                                                         | Workpiece <input type="checkbox"/> Stationary <input type="checkbox"/> Rotating                                           |
|                                                                     | Tool <input type="checkbox"/> Stationary <input type="checkbox"/> Rotating                                                |

|              |                    |                                                                                                  |                  |
|--------------|--------------------|--------------------------------------------------------------------------------------------------|------------------|
| Machine      |                    |                                                                                                  |                  |
| Machine type |                    |                                                                                                  |                  |
| Power        |                    | kW                                                                                               |                  |
| Cutting data | Cutting speed (Vc) | m/min                                                                                            |                  |
|              | Revolutions        | Nmin :    RPM                                                                                    | Nmax :    RPM    |
|              | Feed               | Fmin :    mm/rev                                                                                 | Fmin :    mm/rev |
|              | Feed rate (VF)     | mm/min                                                                                           |                  |
| Coolant      | Coolant type       | <input type="checkbox"/> Oil <input type="checkbox"/> Soluble oil <input type="checkbox"/> Other |                  |
|              | Coolant pressure   | Bar                                                                                              |                  |
|              | Coolant volume     | liter/min                                                                                        |                  |

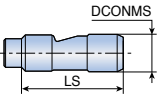
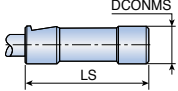
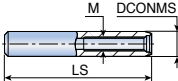
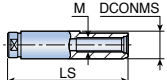
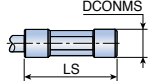
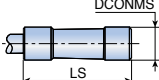
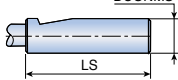
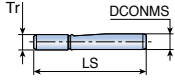
## ► Standard gundrill drivers for machining centers and lathes

### Drivers

Drivers are available for dedicated and CNC machines as well as any specified diameter or length. Please note that the driver codes and technical data can be found in the chart below.

| Driver type                          | Drawing                                                                                                                                                                | DCONMS x LS | Driver code |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| Cylindrical<br>DIN1835A<br>DIN6535HA |                                                                                       | 20x50       | 10          |
|                                      |                                                                                                                                                                        | 25x56       | 11          |
|                                      |                                                                                                                                                                        | 32x60       | 12          |
|                                      |                                                                                                                                                                        | 40x70       | 13          |
|                                      |                                                                                                                                                                        | .75x2.03"   | 95          |
|                                      |                                                                                                                                                                        | 1.00x2.28"  | 96          |
|                                      |                                                                                                                                                                        | 1.25x2.28"  | 97          |
| Weldon<br>DIN1835B<br>DIN6535HB      | <br> | 20x50       | 22          |
|                                      |                                                                                                                                                                        | 25x56       | 23          |
|                                      |                                                                                                                                                                        | 32x60       | 24          |
|                                      |                                                                                                                                                                        | 40x70       | 25          |
|                                      |                                                                                                                                                                        | .75x2.03"   | 99          |
|                                      |                                                                                                                                                                        | 1.00x2.28"  | 100         |
|                                      |                                                                                                                                                                        | 1.25x2.28"  | 101         |
| Whistle notch<br>DIN1835E            |                                                                                       | 20x50       | 34          |
|                                      |                                                                                                                                                                        | 25x56       | 35          |
|                                      |                                                                                                                                                                        | 32x60       | 36          |
|                                      |                                                                                                                                                                        | 40x70       | 37          |

## ► Standard drivers for gundrill machines

| Driver type                  | Drawing                                                                             | DCONMS x LS    | Driver code |
|------------------------------|-------------------------------------------------------------------------------------|----------------|-------------|
| DIN228AK                     |    | CM2            | 46          |
|                              |                                                                                     | CM3            | 47          |
|                              |                                                                                     | CM4            | 48          |
| DIN228BK                     |    | CM2            | 50          |
|                              |                                                                                     | CM3            | 51          |
|                              |                                                                                     | CM4            | 52          |
| Central clamping surface 15° |    | .750x2.75"     | 56          |
|                              |                                                                                     | 25x70          | 57          |
|                              |                                                                                     | 1.00x2.75"     | 58          |
|                              |                                                                                     | 1.25x2.75"     | 59          |
|                              |                                                                                     | 1.50x2.75"     | 60          |
| Frontal clamping surface 15° |    | 16x50          | 61          |
| Cylindrical with thread      |    | 25x100 M16x1.5 | 66          |
|                              |                                                                                     | 36x120 M24x1.5 | 67          |
| VDI design                   |    | 25x112 M16x1.5 | 70          |
|                              |                                                                                     | 36x135 M24x1.5 | 71          |
| Central clamping hexagonal   |    | 25x70          | 72          |
|                              |                                                                                     | 32x70          | 73          |
| Central clamping tapered     |   | .75x2.75"      | 76          |
|                              |                                                                                     | 20x70          | 77          |
| Frontal clamping surface 2°  |  | 1.00x2.75"     | 80          |
|                              |                                                                                     | 1.00x3.94"     | 81          |
|                              |                                                                                     | 1.25x2.75"     | 82          |
|                              |                                                                                     | 1.25x3.94"     | 83          |
|                              |                                                                                     | 1.50x2.75"     | 84          |
|                              |                                                                                     | 1.50x3.94"     | 85          |
| Trapezoidal thread           |  | 28x126 Tr 28x2 | 88          |
|                              |                                                                                     | 36x162 Tr 36x2 | 89          |
| Spraymist driver             |  | 25x50          | 91          |
|                              |                                                                                     | 35x60          | 92          |

## ► Reamer order form

★: Mandatory data field

Date: \_\_\_\_\_ Subsidiary: \_\_\_\_\_

Company★: \_\_\_\_\_ Enquiry dead line: \_\_\_\_\_

Contact person: \_\_\_\_\_

Address: \_\_\_\_\_

| Request reason                    |                                  |
|-----------------------------------|----------------------------------|
| New tool <input type="checkbox"/> | Problem <input type="checkbox"/> |
| Quality                           |                                  |
| Cycle time                        |                                  |
| Alternative supplier              |                                  |
| Other                             |                                  |

| Existing tool |  |
|---------------|--|
| Maker         |  |
| Tool type     |  |
| Speed & Feed  |  |
| Tool life     |  |
| No of teeth   |  |
| Coolant type  |  |

| Machine          |                                                                                                                    |
|------------------|--------------------------------------------------------------------------------------------------------------------|
| Model            |                                                                                                                    |
| Type★            | vertical <input type="checkbox"/><br>horizontal <input type="checkbox"/><br>multi-spindle <input type="checkbox"/> |
| Adaption★        |                                                                                                                    |
| Max RPM          |                                                                                                                    |
| Power            |                                                                                                                    |
| Spindle accuracy |                                                                                                                    |
| Coolant          |                                                                                                                    |

| Workpiece      |                     |
|----------------|---------------------|
| Description★   |                     |
| Hardness★      |                     |
| Pre-hole size★ | (Tolerance : _____) |
| Depth★         |                     |

| Bore type                |                          |
|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |

| Clamping information |  |
|----------------------|--|
|                      |  |

| Lubricant        |                          |
|------------------|--------------------------|
| Oil              | <input type="checkbox"/> |
| MQL              | <input type="checkbox"/> |
| Emulsion         | <input type="checkbox"/> |
| Ratio of mixture |                          |
| Coolant pressure |                          |

| Quality requirement |  |
|---------------------|--|
| Tolerance★          |  |
| Surface finish(Ra)★ |  |
| Roundness           |  |
| Straightness        |  |
| Cylindricity        |  |
| Concentricity       |  |

| Tool               |                                                                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type★              | TM(Index multi-edge) <input type="checkbox"/> TB(Single blade) <input type="checkbox"/> TS(Solid) <input type="checkbox"/> Other <input type="checkbox"/> ( _____ ) |
| Diameter★          |                                                                                                                                                                     |
| Depth of cut★      |                                                                                                                                                                     |
| Coolant★           | Internal <input type="checkbox"/> External <input type="checkbox"/>                                                                                                 |
| Shank type★        |                                                                                                                                                                     |
| Holder type        | Collet <input type="checkbox"/> Hydraulic <input type="checkbox"/> Other <input type="checkbox"/>                                                                   |
| Adjustable adaptor | Yes <input type="checkbox"/> No <input type="checkbox"/>                                                                                                            |

# MILLING





# MILLING



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### Tool Selection Guide

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| Extended Flute Cutters              | E21 |
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### Grades

E39

### Milling Cutters

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| Face Mills                          | E44  |
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| High Feed End Mills & Modular Heads | E181 |
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## Guide to Icons



➤ **Entering Angle**



➤ Angled Screw



➤ Insert Page



➤ Cutting Condition  
Page



➤ Ramping Data Page



➤ Arbor Style Page



➤ [Technical Data Page](#)



➤ Torque Page



➤ Cutter Page



## Milling Inserts

|                                       |      |
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| Insert Designation System             | E252 |
| Inserts                               | E254 |
| Tailor-made Inserts                   | E320 |
| <b>Recommended Cutting Conditions</b> | E322 |
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| <b>Ramping Data</b>                   | E340 |

# Tool Selection Guide

## Face mills

|                       |                   |                                                                                     | TANGSPEED                                                                         | MILLRUSH                                                                          | MILL2RUSH                                                                         | MILL2RUSH                                                                         | WINMILL                                                                            |
|-----------------------|-------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Series                |                   |                                                                                     | 4T-TF90                                                                           | 3P TF90                                                                           | 6N TF90                                                                           | SCRM90TN                                                                          | TFM90AV                                                                            |
|                       |                   |                                                                                     |  |  |  |  |  |
| Pages                 |                   |                                                                                     | E44                                                                               | E45-E47                                                                           | E48-E49                                                                           | E50-E51                                                                           | E52                                                                                |
| Approach angle        |                   |                                                                                     | 90°                                                                               | 90°                                                                               | 90°                                                                               | 90°                                                                               | 90°                                                                                |
| Max. depth of cut(mm) |                   |                                                                                     | 8.3-12.5                                                                          | 4.7-15                                                                            | 4.1-9.2                                                                           | 13-15                                                                             | 10                                                                                 |
| Diameter range(mm)    |                   |                                                                                     | Ø40-Ø200                                                                          | Ø32-Ø250                                                                          | Ø40-Ø250                                                                          | Ø50-Ø250                                                                          | Ø40-Ø63                                                                            |
| Insert                |                   |                                                                                     | LPK(H)U 0904<br>LPKU 1407                                                         | 3PK(H)T 0603<br>3PK(H)T 1004<br>3PK(H)T 1505<br>3PK(H)T 1906                      | 6NKU 0403<br>6NGU 0604<br>6NGU 0905                                               | TNMX 1806<br>TNM(G)X 2207                                                         | AVKT 1004<br>AVCT 1004-AL                                                          |
| Application           | Facing            |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | High feed milling |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ○                                                                                  |
|                       | Shouldering       |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Slotting          |   | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Straight ramping  |  | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Helical ramping   |  | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Side slotting     |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Profiling         |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ○                                                                                  |
|                       | Step down         |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Counter boring    |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## Face mills

| CHASEMILL                                                                        | CHASE2MILL                                                                        | CHASE4MILL                                                                        | CHASE8MILL                                                                        | CHASEALU                                                                          | CHASE4FINISH                                                                       |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| TFM90AX<br>2S-TFM90AP<br>TFM90AP                                                 | TFM90AN                                                                           | 4N TF90                                                                           | 8D-TF90                                                                           | TFM90XEV                                                                          | For Finishing<br>4W-TF90                                                           |
|  |  |  |  |  |  |
| E53 -E56                                                                         | E57                                                                               | E58-E59                                                                           | E60-E62                                                                           | E63                                                                               | E64                                                                                |
| 90°                                                                              | 90°                                                                               | 90°                                                                               | 90°                                                                               | 90°                                                                               | -                                                                                  |
| 5.5-17.9                                                                         | 11-15                                                                             | 3.5-13.8                                                                          | 5.0-8.5                                                                           | 16-21                                                                             | 0.5                                                                                |
| Ø32-Ø200                                                                         | Ø40-Ø200                                                                          | Ø32-Ø200                                                                          | Ø32-Ø160                                                                          | Ø40-Ø160                                                                          | Ø50-Ø160                                                                           |
| AXM(C)T 0602<br>APK(C)T 09T3<br>APK(C)T 1204<br>APK(C)T 1705<br>APKT1907         | ANM(H)X 1106<br>ANM(H)X 1607                                                      | 4NK(H)T 0402<br>4NK(H)T 0603<br>4NK(H)T 0904<br>4NKT 1106<br>4NKT 1407            | SQKU 0703<br>SQK(H)U 1004<br>SQK(H)U 1206                                         | XEVT 1605<br>XEVT 2206                                                            | 4WHU 1207                                                                          |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
| ○                                                                                |                                                                                   | ○                                                                                 |                                                                                   |                                                                                   |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                    |
| ○                                                                                |                                                                                   | ○                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

● Recommended, ○ Suitable

# Tool Selection Guide

## Face mills

|                       |                   |                                                                                     | <i>CHASE2QUAD</i>                                                                                              | <i>CHASE2QUAD</i>                                                                                             | <i>LIONMILL</i>                                                                             | <i>LIONMILL</i>                                                                             | <i>CHASE2QUAD</i>                                                                                        |
|-----------------------|-------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Series                |                   |                                                                                     | For Finishing<br>TFM90SNS<br> | For Finishing<br>TQ90SNS<br> | LM90TP<br> | LM90SE<br> | TFM90SN<br>TFM88SN<br> |
| Pages                 |                   |                                                                                     | E65                                                                                                            | E66                                                                                                           | E67                                                                                         | E68                                                                                         | E69-E70                                                                                                  |
| Approach angle        |                   |                                                                                     | 90°                                                                                                            | 90°                                                                                                           | 90°                                                                                         | 90°                                                                                         | 90°, 88°                                                                                                 |
| Max. depth of cut(mm) |                   |                                                                                     | 1.0                                                                                                            | 1.0                                                                                                           | 17.6                                                                                        | 17.0                                                                                        | 12.0                                                                                                     |
| Diameter range(mm)    |                   |                                                                                     | Ø50-Ø250                                                                                                       | Ø250-Ø400                                                                                                     | Ø80-Ø315                                                                                    | Ø125-Ø315                                                                                   | Ø50-Ø200                                                                                                 |
| Insert                |                   |                                                                                     | SNEX 1204<br>SNET 1205                                                                                         | SNEX 1204<br>SNET 1205                                                                                        | TPKN 2204                                                                                   | SEKX 2107                                                                                   | SNGX 1306<br>SNGX 1306 ZN                                                                                |
| Application           | Facing            |    | ●                                                                                                              | ●                                                                                                             | ●                                                                                           | ●                                                                                           | ●                                                                                                        |
|                       | High feed milling |    |                                                                                                                |                                                                                                               |                                                                                             |                                                                                             |                                                                                                          |
|                       | Shouldering       |    |                                                                                                                |                                                                                                               | ●                                                                                           | ●                                                                                           | ●                                                                                                        |
|                       | Slotting          |   |                                                                                                                |                                                                                                               |                                                                                             |                                                                                             |                                                                                                          |
|                       | Straight ramping  |  |                                                                                                                |                                                                                                               |                                                                                             |                                                                                             |                                                                                                          |
|                       | Helical ramping   |  |                                                                                                                |                                                                                                               |                                                                                             |                                                                                             |                                                                                                          |
|                       | Side slotting     |  |                                                                                                                |                                                                                                               |                                                                                             |                                                                                             |                                                                                                          |
|                       | Profiling         |  |                                                                                                                |                                                                                                               |                                                                                             |                                                                                             |                                                                                                          |
|                       | Step down         |  |                                                                                                                |                                                                                                               |                                                                                             |                                                                                             |                                                                                                          |
|                       | Counter boring    |  |                                                                                                                |                                                                                                               |                                                                                             |                                                                                             |                                                                                                          |

# Tool Selection Guide

## Face mills

| CHASE2QUAD                                                                       | LIONMILL                                                                          | CHASEMILL                                                                         | CHASE10MILL                                                                       | LIONMILL                                                                          | CHASE8SPEED                                                                        |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| TFM75SN                                                                          | LM75SP                                                                            | TFM75AP                                                                           | TFM65PT                                                                           | LM60SC                                                                            | 8D-TF45                                                                            |
|  |  |  |  |  |  |
| E71                                                                              | E72                                                                               | E73                                                                               | E74                                                                               | E75-E76                                                                           | E77-E78                                                                            |
| 75°                                                                              | 75°                                                                               | 75°                                                                               | 65°                                                                               | 60°                                                                               | 45°                                                                                |
| 9.5                                                                              | 9.5-12.5                                                                          | 3.9                                                                               | 3.3-6.5                                                                           | 13.0-18.0                                                                         | 4.2-6                                                                              |
| Ø50-Ø250                                                                         | Ø80-Ø315                                                                          | Ø80-Ø125                                                                          | Ø40-Ø125                                                                          | Ø125-Ø315                                                                         | Ø40-Ø200                                                                           |
| SNM(G)X 1306 EN<br>SNMX 1306 XTN                                                 | SPKN 1203<br>SPKN 1504                                                            | APKT 1705 PER-M<br>APKT 1705 PER-EM                                               | PTKU 0503<br>PTKU 1006                                                            | SCKN 2107<br>SCKN 2708                                                            | SQKU 1105<br>SQKU 1406                                                             |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
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● Recommended, ○ Suitable

# Tool Selection Guide

## Face mills

|                       |                   |                                                                                     |              |               |                |                |            |
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| Series                |                   |                                                                                     | 12D-TF45<br> | 14D-F45XN<br> | 14D-F45XNH<br> | 14D-F45XNW<br> | 7S-F45<br> |
| Pages                 |                   |                                                                                     | E79-E80                                                                                       | E81-E82                                                                                        | E83                                                                                             | E84                                                                                             | E85                                                                                          |
| Approach angle        |                   |                                                                                     | 45°                                                                                           | 45°                                                                                            | 45°                                                                                             | 45°                                                                                             | 45°                                                                                          |
| Max. depth of cut(mm) |                   |                                                                                     | 3.0-5.0                                                                                       | 3.5-5.0                                                                                        | 3.5-5.0                                                                                         | 5.0                                                                                             | 3.2                                                                                          |
| Diameter range(mm)    |                   |                                                                                     | Ø50-Ø250                                                                                      | Ø50-Ø250                                                                                       | Ø63-Ø125                                                                                        | Ø80-Ø315                                                                                        | Ø32-Ø125                                                                                     |
| Insert                |                   |                                                                                     | HXK(H)U 0605<br>HXK(H)U 1007                                                                  | XNM(H)U 0605<br>XNM(H)U 0906                                                                   | XNM(H)U 0605<br>XNM(H)U 0906                                                                    | XNHU 0906                                                                                       | 7EMT 0604                                                                                    |
| Application           | Facing            |    | ●                                                                                             | ●                                                                                              | ●                                                                                               | ●                                                                                               | ●                                                                                            |
|                       | High feed milling |    |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 |                                                                                              |
|                       | Shouldering       |    |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 |                                                                                              |
|                       | Slotting          |   |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 |                                                                                              |
|                       | Straight ramping  |  |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 | ●                                                                                            |
|                       | Helical ramping   |  |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 | ●                                                                                            |
|                       | Side slotting     |  |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 |                                                                                              |
|                       | Profiling         |  |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 |                                                                                              |
|                       | Step down         |  |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 |                                                                                              |
|                       | Counter boring    |  |                                                                                               |                                                                                                |                                                                                                 |                                                                                                 |                                                                                              |

# Tool Selection Guide

## Face mills

| CHASE2QUAD                                                                       | CHASE2QUAD                                                                        | CHASE2QUAD                                                                        | CHASE2QUAD                                                                        | CHASE2MILL                                                                        | LIONMILL                                                                           |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| TFM45SN                                                                          | TFM45SNS                                                                          | TFM45SNS-CA                                                                       | TFM45SNW<br>TQ45SNW                                                               | TFM45AN                                                                           | LM45SD                                                                             |
|  |  |  |  |  |  |
| E86                                                                              | E87                                                                               | E88                                                                               | E89                                                                               | E90                                                                               | E91                                                                                |
| 45°                                                                              | 45°                                                                               | 45°                                                                               | 45°                                                                               | 45°                                                                               | 45°                                                                                |
| 7.0                                                                              | 8.8                                                                               | 8.8                                                                               | 8.8                                                                               | 8.4                                                                               | 6.5-8.7                                                                            |
| Ø40-Ø250                                                                         | Ø63-Ø250                                                                          | Ø125-Ø315                                                                         | Ø80-Ø355                                                                          | Ø50-Ø160                                                                          | Ø80-Ø315                                                                           |
| SNM(G)X 1306 AN<br>SNMX 1306 XTN                                                 | SNMX 1607<br>SNHX 1606                                                            | SNMX 1607<br>SNHX 1606                                                            | SNHX 1606                                                                         | ANHX 1607 ANR-M                                                                   | SDKN 1203<br>SDKN 1504                                                             |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
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● Recommended, ○ Suitable



# Tool Selection Guide

## Face mills

|                       |                   |                                                                                     | <i>LIONMILL</i>                                                                             | <i>CHASE2MOLD</i>                                                                           | <i>CHASEMOLD</i>                                                                           | <i>CHASESPEED</i>                                                                          | <i>CHASESPEED</i>                                                                           |
|-----------------------|-------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Series                |                   |                                                                                     | LM45SE<br> | TFMRNS<br> | TFMRY<br> | TFMRN<br> | TFMRP<br> |
| Pages                 |                   |                                                                                     | E92                                                                                         | E93-E94                                                                                     | E95-E97                                                                                    | E98                                                                                        | E99                                                                                         |
| Approach angle        |                   |                                                                                     | 45°                                                                                         | -                                                                                           | -                                                                                          | -                                                                                          | -                                                                                           |
| Max. depth of cut(mm) |                   |                                                                                     | 6.5-8.7                                                                                     | 5.0-8.0                                                                                     | 4.0-10.0                                                                                   | 6.3                                                                                        | 6.3                                                                                         |
| Diameter range(mm)    |                   |                                                                                     | Ø80-Ø250                                                                                    | Ø32-Ø200                                                                                    | Ø32-Ø250                                                                                   | Ø50-Ø80                                                                                    | Ø50                                                                                         |
| Insert                |                   |                                                                                     | SEKN 1203<br>SEKN 1504                                                                      | RNMU 1004<br>RNMU 1205<br>RNMU 1606                                                         | RYM(H)X 0803<br>RYM(H)X 1004<br>RYM(H)X 1205<br>RYM(H)X 1606<br>RYMX 2007                  | RNGN 1207 FL                                                                               | RPGN 1204 FL                                                                                |
| Application           | Facing            |    | ●                                                                                           | ●                                                                                           | ●                                                                                          | ●                                                                                          | ●                                                                                           |
|                       | High feed milling |    |                                                                                             |                                                                                             |                                                                                            |                                                                                            |                                                                                             |
|                       | Shouldering       |    |                                                                                             |                                                                                             |                                                                                            |                                                                                            |                                                                                             |
|                       | Slotting          |   |                                                                                             |                                                                                             |                                                                                            |                                                                                            |                                                                                             |
|                       | Straight ramping  |  |                                                                                             | ●                                                                                           | ●                                                                                          | ●                                                                                          | ●                                                                                           |
|                       | Helical ramping   |  |                                                                                             | ●                                                                                           | ●                                                                                          | ●                                                                                          | ●                                                                                           |
|                       | Side slotting     |  |                                                                                             |                                                                                             |                                                                                            |                                                                                            |                                                                                             |
|                       | Profiling         |  |                                                                                             | ●                                                                                           | ●                                                                                          | ●                                                                                          | ●                                                                                           |
|                       | Step down         |  |                                                                                             |                                                                                             |                                                                                            |                                                                                            |                                                                                             |
|                       | Counter boring    |  |                                                                                             |                                                                                             |                                                                                            |                                                                                            |                                                                                             |

# Tool Selection Guide

## Face mills

| CERAMIC SPEED                                                                    | CERAMIC SPEED                                                                     | CHASE 10 MILL                                                                     | CHASE 8 SPEED                                                                     | WIN 4 FEED                                                                        | CHASE 4 FEED                                                                       |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| TFMBN-09CH                                                                       | TFMBN-12                                                                          | TFMPT                                                                             | 8D-TF20                                                                           | TFMBLV                                                                            | TFMBL                                                                              |
|  |  |  |  |  |  |
| E100                                                                             | E101                                                                              | E102                                                                              | E103                                                                              | E104                                                                              | E105-E106                                                                          |
| -                                                                                | -                                                                                 | 25°                                                                               | 20°                                                                               | -                                                                                 | -                                                                                  |
| 1.5                                                                              | 2.5                                                                               | 1.5-3.0                                                                           | 1.8-2.5                                                                           | 1.0                                                                               | 1.0-2.0                                                                            |
| Ø40-Ø50                                                                          | Ø50-Ø80                                                                           | Ø40-Ø200                                                                          | Ø50-Ø125                                                                          | Ø32-Ø66                                                                           | Ø32-Ø200                                                                           |
| BNGX 0904                                                                        | BNGX 1207                                                                         | PTKU 0503<br>PTKU 1006                                                            | SQKU 1105                                                                         | BLMV 0603                                                                         | BLMP 0603<br>BLMP 0904<br>BLMP 1105                                                |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 | ●                                                                                  |
| ●                                                                                | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 | ●                                                                                  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 | ●                                                                                  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

● Recommended, ○ Suitable

# Tool Selection Guide

## Face mills

|                       |                   |                                                                                     | CHASE <sup>2</sup> FEED                                                           | CHASE <sup>2</sup> FEED                                                           | CHASE <sup>2</sup> FEED                                                           |  |  |
|-----------------------|-------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--|--|
| Series                |                   |                                                                                     | TFMBL-13                                                                          | TFMSB                                                                             | TFMSR                                                                             |  |  |
|                       |                   |                                                                                     |  |  |  |  |  |
| Pages                 |                   |                                                                                     | E107-E108                                                                         | E109-E110                                                                         | E111-E112                                                                         |  |  |
| Approach angle        |                   |                                                                                     | -                                                                                 | -                                                                                 | -                                                                                 |  |  |
| Max. depth of cut(mm) |                   |                                                                                     | 2.0                                                                               | 1.0-2.0                                                                           | 0.7-2.0                                                                           |  |  |
| Diameter range(mm)    |                   |                                                                                     | Ø40-Ø250                                                                          | Ø32-Ø250                                                                          | Ø40-Ø200                                                                          |  |  |
| Insert                |                   |                                                                                     | BLMP 1306                                                                         | SBMT 0603<br>SBMT 0904<br>SBMT 1306                                               | SRMT 0703<br>SRMT 1004<br>SRMT 1406                                               |  |  |
| Application           | Facing            |    | ●                                                                                 | ●                                                                                 | ●                                                                                 |  |  |
|                       | High feed milling |    | ●                                                                                 | ●                                                                                 | ●                                                                                 |  |  |
|                       | Shouldering       |    |                                                                                   |                                                                                   |                                                                                   |  |  |
|                       | Slotting          |   |                                                                                   |                                                                                   |                                                                                   |  |  |
|                       | Straight ramping  |  | ●                                                                                 | ●                                                                                 | ●                                                                                 |  |  |
|                       | Helical ramping   |  | ●                                                                                 | ●                                                                                 | ●                                                                                 |  |  |
|                       | Side slotting     |  |                                                                                   |                                                                                   |                                                                                   |  |  |
|                       | Profiling         |  | ●                                                                                 | ●                                                                                 | ●                                                                                 |  |  |
|                       | Step down         |  |                                                                                   |                                                                                   |                                                                                   |  |  |
|                       | Counter boring    |  |                                                                                   |                                                                                   |                                                                                   |  |  |

# Tool Selection Guide

## End mills & modular heads

|                       |                     |                                                                                     |               |              |             |             |             |
|-----------------------|---------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Series                |                     |                                                                                     | 2S-TE90CV<br> | 4T-MTE90<br> | 4T-TE90<br> | 3P-TE90<br> | 6N TE90<br> |
| Pages                 |                     |                                                                                     | E113-E114                                                                                      | E115-E116                                                                                     | E117-E118                                                                                    | E119-E124                                                                                    | E125-E126                                                                                     |
| Approach angle        |                     |                                                                                     | 90°                                                                                            | 90°                                                                                           | 90°                                                                                          | 90°                                                                                          | 90°                                                                                           |
| Max. depth of cut(mm) |                     |                                                                                     | 5.0                                                                                            | 4.6                                                                                           | 4.6-8.3                                                                                      | 3.5-15.0                                                                                     | 4.1-9.2                                                                                       |
| Diameter range(mm)    |                     |                                                                                     | Ø6-Ø20                                                                                         | Ø10-Ø30                                                                                       | Ø10-Ø40                                                                                      | Ø8-Ø50                                                                                       | Ø20-Ø40                                                                                       |
| Insert                |                     |                                                                                     | CVK(H)T 0502                                                                                   | LPHU 05                                                                                       | LPK(H)U 0502<br>LPK(H)U 0904                                                                 | 3PKT 0402<br>3PK(H)T 0603<br>3PK(H)T 1004<br>3PK(H)T 1505<br>3PK(H)T 1906                    | 6NKT 0403<br>6NGU 0604<br>6NGU 0905                                                           |
| Application           | Facing              |    | ●                                                                                              | ●                                                                                             | ●                                                                                            | ●                                                                                            | ●                                                                                             |
|                       | High feed milling   |    | ○                                                                                              |                                                                                               |                                                                                              |                                                                                              |                                                                                               |
|                       | Shouldering         |    | ●                                                                                              | ●                                                                                             | ●                                                                                            | ●                                                                                            | ●                                                                                             |
|                       | Slotting            |    | ●                                                                                              | ●                                                                                             | ●                                                                                            | ●                                                                                            | ●                                                                                             |
|                       | Straight ramping    |   | ●                                                                                              | ●                                                                                             | ●                                                                                            | ●                                                                                            |                                                                                               |
|                       | Helical ramping     |  | ●                                                                                              | ●                                                                                             | ●                                                                                            | ●                                                                                            |                                                                                               |
|                       | Chamfer & serration |  |                                                                                                |                                                                                               |                                                                                              |                                                                                              |                                                                                               |
|                       | Profiling           |  | ○                                                                                              |                                                                                               |                                                                                              |                                                                                              |                                                                                               |
|                       | Plunging            |  |                                                                                                |                                                                                               |                                                                                              |                                                                                              |                                                                                               |
|                       | Step down           |  |                                                                                                |                                                                                               |                                                                                              |                                                                                              |                                                                                               |
|                       | Counter boring      |  |                                                                                                |                                                                                               |                                                                                              |                                                                                              |                                                                                               |

● Recommended, ○ Suitable

# Tool Selection Guide

## End mills & modular heads

|                       |                     |                                                                                     |              |            |                  |                                   |            |
|-----------------------|---------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Series                |                     |                                                                                     | SCRM90TN<br> | TE90AV<br> | MTE90AX-06-L<br> | TE90AX<br>2S-TE90AP<br>TE90AP<br> | TE90AN<br> |
| Pages                 |                     |                                                                                     | E127                                                                                          | E128-E129                                                                                   | E130                                                                                              | E131-E139                                                                                                          | E140-E141                                                                                    |
| Approach angle        |                     |                                                                                     | 90°                                                                                           | 90°                                                                                         | 90°                                                                                               | 90°                                                                                                                | 90°                                                                                          |
| Max. depth of cut(mm) |                     |                                                                                     | 13.0                                                                                          | 10.0                                                                                        | 5.5                                                                                               | 5.5-17.9                                                                                                           | 11.0-15.0                                                                                    |
| Diameter range(mm)    |                     |                                                                                     | Ø35-Ø40                                                                                       | Ø16-Ø40                                                                                     | Ø8-Ø30                                                                                            | Ø8-Ø42                                                                                                             | Ø25-Ø50                                                                                      |
| Insert                |                     |                                                                                     | TNMX 1806                                                                                     | AVKT 1004<br>AVCT 1004-AL                                                                   | AXCT 06-L                                                                                         | AXM(C)T 0602<br>APK(C)T 09T3<br>APK(C)T 1204<br>APK(C)T 1705<br>APKT 1907                                          | ANM(H)X 1106<br>ANM(H)X 1607                                                                 |
| Application           | Facing              |    | ●                                                                                             | ●                                                                                           | ●                                                                                                 | ●                                                                                                                  | ●                                                                                            |
|                       | High feed milling   |    |                                                                                               | ○                                                                                           |                                                                                                   | ○                                                                                                                  |                                                                                              |
|                       | Shouldering         |    | ●                                                                                             | ●                                                                                           | ●                                                                                                 | ●                                                                                                                  | ●                                                                                            |
|                       | Slotting            |    | ●                                                                                             | ●                                                                                           | ●                                                                                                 | ●                                                                                                                  | ●                                                                                            |
|                       | Straight ramping    |   |                                                                                               | ●                                                                                           |                                                                                                   | ●                                                                                                                  | ●                                                                                            |
|                       | Helical ramping     |  |                                                                                               | ●                                                                                           |                                                                                                   | ●                                                                                                                  | ●                                                                                            |
|                       | Chamfer & serration |  |                                                                                               |                                                                                             |                                                                                                   |                                                                                                                    |                                                                                              |
|                       | Profiling           |  |                                                                                               | ○                                                                                           |                                                                                                   | ○                                                                                                                  |                                                                                              |
|                       | Plunging            |  |                                                                                               | ●                                                                                           |                                                                                                   |                                                                                                                    |                                                                                              |
|                       | Step down           |  |                                                                                               | ●                                                                                           |                                                                                                   |                                                                                                                    |                                                                                              |
|                       | Counter boring      |  |                                                                                               |                                                                                             |                                                                                                   |                                                                                                                    |                                                                                              |
|                       | Drill mill          |  |                                                                                               |                                                                                             |                                                                                                   |                                                                                                                    |                                                                                              |

# Tool Selection Guide

## End mills & modular heads

| <i>CHASE4MILL</i>                                                                                  | <i>CHASE8MILL</i>                                                                                   | <i>CHASEALU</i>                                                                                            | <i>CHASEALU</i>                                                                                     | <i>MILLRUSH</i>                                                                                    | <i>CHASEQUAD</i>                                                                                 |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>4N TE90</b><br> | <b>8D-TE90</b><br> | <b>TE90XEV-HSK63A</b><br> | <b>TE90XEV</b><br> | <b>3P-TCF</b><br> | <b>TSF</b><br> |
| E142-E147                                                                                          | E148-E151                                                                                           | E152                                                                                                       | E153                                                                                                | E154-E155                                                                                          | E156                                                                                             |
| 90°                                                                                                | 90°                                                                                                 | 90°                                                                                                        | 90°                                                                                                 | 30°-60°                                                                                            | 90°                                                                                              |
| 3.5-13.8                                                                                           | 5.0-8.5                                                                                             | 16                                                                                                         | 16-21                                                                                               | 2.5-5.9                                                                                            | 5.6-13.4                                                                                         |
| Ø8-Ø42                                                                                             | Ø16-Ø40                                                                                             | Ø25-Ø50                                                                                                    | Ø25-Ø40                                                                                             | Ø3.3-Ø31                                                                                           | Ø12-Ø50                                                                                          |
| 4NKT 0402<br>4NK(H)T 0603<br>4NK(H)T 0904<br>4NKT 1106<br>4NKT 1407                                | SQKU 0703<br>SQK(H)U 1004<br>SQK(H)U 1206                                                           | XEVT 1605                                                                                                  | XEVT 1605<br>XEVT 2206                                                                              | 3PKT 0402<br>3PK(H)T 0603<br>3PK(H)T 1004                                                          | XOMT 0602<br>SPMG(T) 0904<br>SPMG(T) 1104<br>SPMG(T) 1405                                        |
| ●                                                                                                  | ●                                                                                                   | ●                                                                                                          | ●                                                                                                   |                                                                                                    | ●                                                                                                |
| ○                                                                                                  |                                                                                                     |                                                                                                            |                                                                                                     |                                                                                                    |                                                                                                  |
| ●                                                                                                  | ●                                                                                                   | ●                                                                                                          | ●                                                                                                   |                                                                                                    | ●                                                                                                |
| ●                                                                                                  | ●                                                                                                   | ●                                                                                                          | ●                                                                                                   |                                                                                                    | ●                                                                                                |
| ●                                                                                                  |                                                                                                     | ●                                                                                                          | ●                                                                                                   |                                                                                                    |                                                                                                  |
| ●                                                                                                  |                                                                                                     | ●                                                                                                          | ●                                                                                                   |                                                                                                    |                                                                                                  |
|                                                                                                    |                                                                                                     |                                                                                                            |                                                                                                     | ●                                                                                                  |                                                                                                  |
| ○                                                                                                  |                                                                                                     |                                                                                                            |                                                                                                     |                                                                                                    |                                                                                                  |
|                                                                                                    |                                                                                                     |                                                                                                            |                                                                                                     |                                                                                                    | ●                                                                                                |
| ●                                                                                                  |                                                                                                     | ●                                                                                                          | ●                                                                                                   |                                                                                                    |                                                                                                  |
|                                                                                                    |                                                                                                     |                                                                                                            |                                                                                                     |                                                                                                    | ●                                                                                                |
|                                                                                                    |                                                                                                     |                                                                                                            |                                                                                                     |                                                                                                    |                                                                                                  |

● Recommended, ○ Suitable

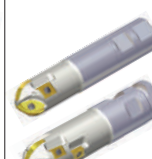
# Tool Selection Guide

End mills & modular heads

| Series                |                     |    |  |  |  |  |
|-----------------------|---------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                       |                     | TDM                                                                                 | TCF                                                                               | 7S-E45                                                                            | TBR                                                                               | TERNS                                                                              |
|                       |                     |    |  |  |  |  |
| Pages                 |                     | E157                                                                                | E158                                                                              | E159                                                                              | E160-E162                                                                         | E163-E164                                                                          |
| Approach angle        |                     | 90°                                                                                 | 45°-75°                                                                           | 45°                                                                               | 37°-90°                                                                           | -                                                                                  |
| Max. depth of cut(mm) |                     | 12-40                                                                               | -                                                                                 | 3.2                                                                               | 6.3-12.0                                                                          | 5.0-8.0                                                                            |
| Diameter range(mm)    |                     | Ø12-Ø50                                                                             | Ø8.3-Ø38.9                                                                        | Ø32-Ø50                                                                           | Ø12-Ø32                                                                           | Ø25-Ø50                                                                            |
| Insert                |                     | XOMT 0602<br>SPMG(T) 0904<br>SPMG(T) 1104<br>SPMG(T) 1405                           | SPMG(T) 1104                                                                      | 7EMT 0604                                                                         | BRHU 06R2<br>BRHU 12R3                                                            | RNMU 1004<br>RNMU 1205<br>RNMU 1606                                                |
| Application           | Facing              |    | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                  |
|                       | High feed milling   |    |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Shouldering         |    | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Slotting            |    | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Straight ramping    |   | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                  |
|                       | Helical ramping     |  | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                  |
|                       | Chamfer & serration |  |                                                                                   | ●                                                                                 |                                                                                   |                                                                                    |
|                       | Profiling           |  |                                                                                   |                                                                                   | ●                                                                                 | ●                                                                                  |
|                       | Plunging            |  | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Step down           |  | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Counter boring      |  | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Drill mill          |  | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## End mills & modular heads

| CHASEMOLD                                                                        | FINEBALL                                                                          | FINEBALL                                                                          | CHASESPEED                                                                        | DUETBALL                                                                          | TRIOBALL                                                                           |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| TERY                                                                             | TNF                                                                               | TNFR                                                                              | TERP                                                                              | 2F                                                                                | 3F                                                                                 |
|  |  |  |  |  |  |
| E165-E167                                                                        | E168-E170                                                                         | E171-E173                                                                         | E174-E175                                                                         | E176-E177                                                                         | E178                                                                               |
| -                                                                                | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                  |
| 4.0-10.0                                                                         | -                                                                                 | -                                                                                 | 4.7-6.3                                                                           | 11.8-55.3                                                                         | 39-94                                                                              |
| Ø16-Ø50                                                                          | Ø6-Ø32                                                                            | Ø6-Ø32                                                                            | Ø20-Ø40                                                                           | Ø16-Ø32                                                                           | Ø32-Ø50                                                                            |
| RYM(H)X 0803<br>RYM(H)X 1004<br>RYM(H)X 1205<br>RYM(H)X 1606<br>RYM(H)X 2007     | NFB( NFR )<br>NFLB<br>NFCB                                                        | NFR                                                                               | RPGN 0903 FL<br>RPGN 1204 FL                                                      | 2FB<br>APKT 09T3<br>APKT 1204                                                     | 3FB<br>CNHX 1311<br>CNHX 1606                                                      |
| ●                                                                                |                                                                                   | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                                                                                  | ○                                                                                 | ○                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | ○                                                                                 | ○                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

● Recommended, ○ Suitable



# Tool Selection Guide

End mills & modular heads

| Series                |                   | CHASE2BALL                                                                          | CHASE2BALL                                                                        |   |  |  |
|-----------------------|-------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|--|--|
|                       |                   | TDB50X                                                                              | TDB50X-WT                                                                         |   |  |  |
|                       |                   |    |  |   |  |  |
| Pages                 |                   | E179                                                                                | E180                                                                              |   |  |  |
| Approach angle        |                   | -                                                                                   | -                                                                                 |   |  |  |
| Max. depth of cut(mm) |                   | 59-69                                                                               | 59-69                                                                             |   |  |  |
| Diameter range(mm)    |                   | Ø50                                                                                 | Ø50                                                                               |   |  |  |
| Insert                |                   | 6RBE 50-M                                                                           | 6RBE 50-M                                                                         |   |  |  |
| Application           | Facing            |    |                                                                                   |   |  |  |
|                       | High feed milling |    |                                                                                   |   |  |  |
|                       | Shouldering       |    |                                                                                   |   |  |  |
|                       | Slotting          |    |                                                                                   |   |  |  |
|                       | Straight ramping  |   | ●                                                                                 | ● |  |  |
|                       | Helical ramping   |  | ●                                                                                 | ● |  |  |
|                       | Profiling         |  | ●                                                                                 | ● |  |  |
|                       | Plunging          |  |                                                                                   |   |  |  |
|                       | Step down         |  |                                                                                   |   |  |  |
|                       | Counter boring    |  |                                                                                   |   |  |  |
|                       | Drill mill        |  |                                                                                   |   |  |  |

# Tool Selection Guide

## High feed end mills & modular heads

|                       |                   |                                                                                     |          |          |           |           |           |
|-----------------------|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Series                |                   |                                                                                     | THFN<br> | TEBN<br> | TEBCS<br> | TEBNS<br> | TEPT<br> |
| Pages                 |                   |                                                                                     | E181-E182                                                                                 | E183-E184                                                                                 | E185                                                                                       | E186                                                                                       | E187                                                                                       |
| Approach angle        |                   |                                                                                     | 20°                                                                                       | -                                                                                         | -                                                                                          | -                                                                                          | 25°                                                                                        |
| Max. depth of cut(mm) |                   |                                                                                     | 0.3-0.5                                                                                   | 1.0-1.5                                                                                   | 0.5                                                                                        | 1.0                                                                                        | 1.5-3.0                                                                                    |
| Diameter range(mm)    |                   |                                                                                     | Ø6-Ø8                                                                                     | Ø16-Ø40                                                                                   | Ø10-Ø40                                                                                    | Ø16-Ø32                                                                                    | Ø20-Ø40                                                                                    |
| Insert                |                   |                                                                                     | HFN 060<br>HFN 080                                                                        | BNGX 0603<br>BNGX 0904                                                                    | BCGT 0403                                                                                  | BNGT 0603                                                                                  | PTKU 0503<br>PTKU 1006                                                                     |
| Application           | Facing            |    | ●                                                                                         | ●                                                                                         | ●                                                                                          | ●                                                                                          | ●                                                                                          |
|                       | High feed milling |    | ●                                                                                         | ●                                                                                         | ●                                                                                          | ●                                                                                          | ●                                                                                          |
|                       | Shouldering       |    | ○                                                                                         | ○                                                                                         |                                                                                            |                                                                                            | ○                                                                                          |
|                       | Slotting          |    |                                                                                           |                                                                                           |                                                                                            |                                                                                            |                                                                                            |
|                       | Straight ramping  |   | ●                                                                                         | ●                                                                                         | ●                                                                                          | ●                                                                                          | ●                                                                                          |
|                       | Helical ramping   |  | ●                                                                                         | ●                                                                                         | ●                                                                                          | ●                                                                                          | ●                                                                                          |
|                       | Profiling         |  | ●                                                                                         | ●                                                                                         | ●                                                                                          | ●                                                                                          | ●                                                                                          |
|                       | Plunging          |  |                                                                                           |                                                                                           |                                                                                            |                                                                                            |                                                                                            |
|                       | Step down         |  |                                                                                           |                                                                                           |                                                                                            |                                                                                            |                                                                                            |
|                       | Counter boring    |  |                                                                                           |                                                                                           |                                                                                            |                                                                                            |                                                                                            |
|                       | Drill mill        |  |                                                                                           |                                                                                           |                                                                                            |                                                                                            |                                                                                            |

● Recommended, ○ Suitable

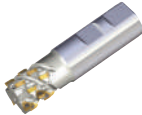
# Tool Selection Guide

## High feed end mills & modular heads

| Series                |                   |                                                                                     |           |          |             |          |          |
|-----------------------|-------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|                       |                   |                                                                                     | TEBLV<br> | TEBL<br> | TEBL-13<br> | TESB<br> | TESR<br> |
| Pages                 |                   |                                                                                     | E188-E190                                                                                  | E191-E198                                                                                 | E199                                                                                         | E200-E202                                                                                 | E203-E206                                                                                  |
| Approach angle        |                   |                                                                                     | -                                                                                          | -                                                                                         | -                                                                                            | -                                                                                         | -                                                                                          |
| Max. depth of cut(mm) |                   |                                                                                     | 0.7-1.0                                                                                    | 0.5-2.0                                                                                   | 2.0                                                                                          | 1.0-2.0                                                                                   | 0.7-2.0                                                                                    |
| Diameter range(mm)    |                   |                                                                                     | Ø16-Ø40                                                                                    | Ø8-Ø42                                                                                    | Ø32-Ø42                                                                                      | Ø16-Ø42                                                                                   | Ø16-Ø42                                                                                    |
| Insert                |                   |                                                                                     | BLMV 0603                                                                                  | BLMP 0402<br>BLMP 0603<br>BLMP 0904<br>BLMP 1105                                          | BLMP 1306                                                                                    | SBMT 0603<br>SBMT 0904<br>SBMT 1306                                                       | SRMT 0703<br>SRMT 1004<br>SRMT 1406                                                        |
| Application           | Facing            |    | ●                                                                                          | ●                                                                                         | ●                                                                                            | ●                                                                                         | ●                                                                                          |
|                       | High feed milling |    | ●                                                                                          | ●                                                                                         | ●                                                                                            | ●                                                                                         | ●                                                                                          |
|                       | Shouldering       |    | ○                                                                                          | ○                                                                                         | ○                                                                                            | ○                                                                                         |                                                                                            |
|                       | Slotting          |    |                                                                                            |                                                                                           |                                                                                              |                                                                                           |                                                                                            |
|                       | Straight ramping  |   | ●                                                                                          | ●                                                                                         | ●                                                                                            | ●                                                                                         | ●                                                                                          |
|                       | Helical ramping   |  | ●                                                                                          | ●                                                                                         | ●                                                                                            | ●                                                                                         | ●                                                                                          |
|                       | Profiling         |  | ●                                                                                          | ●                                                                                         | ●                                                                                            | ●                                                                                         | ●                                                                                          |
|                       | Plunging          |  | ●                                                                                          |                                                                                           |                                                                                              |                                                                                           |                                                                                            |
|                       | Step down         |  | ●                                                                                          |                                                                                           |                                                                                              |                                                                                           |                                                                                            |
|                       | Counter boring    |  |                                                                                            |                                                                                           |                                                                                              |                                                                                           |                                                                                            |
|                       | Drill mill        |  |                                                                                            |                                                                                           |                                                                                              |                                                                                           |                                                                                            |

# Tool Selection Guide

## Extended flute cutters

|                       |                    |                                                                                     | <i>TANGSPEED</i>                                                                            | <i>TANGSPEED</i>                                                                            | <i>CHASEVQUAD</i>                                                                                     | <i>CHASEVQUAD</i>                                                                                                   | <i>MILLRUSH</i>                                                                                        |
|-----------------------|--------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Series                |                    |                                                                                     | 4T-TEF<br> | 4T-TES<br> | 4S-TEF<br>4S-TES<br> | 4S-TFP<br>4S-TEF-B<br>4S-TES-B<br> | 3P TEF<br>3P TES<br> |
| Pages                 |                    |                                                                                     | E207                                                                                        | E208                                                                                        | E209-E210                                                                                             | E211-E213                                                                                                           | E214-E215                                                                                              |
| Approach angle        |                    |                                                                                     | 90°                                                                                         | 90°                                                                                         | 90°                                                                                                   | 90°                                                                                                                 | 90°                                                                                                    |
| Max. depth of cut(mm) |                    |                                                                                     | 15-51                                                                                       | 34-56                                                                                       | 52-77.9                                                                                               | 34-76                                                                                                               | 20-83                                                                                                  |
| Diameter range(mm)    |                    |                                                                                     | Ø16-Ø40                                                                                     | Ø50-Ø100                                                                                    | Ø32-Ø80                                                                                               | Ø40-Ø80                                                                                                             | Ø20-Ø100                                                                                               |
| Insert                |                    |                                                                                     | LPK(H)U 0502<br>LPK(H)U 0904                                                                | LPKU 1407                                                                                   | SVKT 0938<br>SVK(H)T 1145                                                                             | SVKT 0938<br>SVK(H)T 1145                                                                                           | 3PK(H)T 0603<br>3PK(H)T 1004<br>3PK(H)T 1505<br>3PK(H)T 1906                                           |
| Application           | Facing             |    |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |
|                       | High feed milling  |    |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |
|                       | Shouldering        |    | ●                                                                                           | ●                                                                                           | ●                                                                                                     | ●                                                                                                                   | ●                                                                                                      |
|                       | Slotting           |    |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |
|                       | Trochoidal milling |  | ●                                                                                           | ●                                                                                           | ●                                                                                                     | ●                                                                                                                   |                                                                                                        |
|                       | Straight ramping   |  |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |
|                       | Helical ramping    |  |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |
|                       | Profiling          |  |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |
|                       | Plunging           |  |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |
|                       | Step down          |  |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |
|                       | Counter boring     |  |                                                                                             |                                                                                             |                                                                                                       |                                                                                                                     |                                                                                                        |

● Recommended, ○ Suitable

# Tool Selection Guide

## Extended flute cutters

|                       |                    |                                                                                     | <i>MILL2RUSH</i>                                                                  | <i>CHASE2MILL</i>                                                                 | <i>WINMILL</i>                                                                    | <i>CHASEMILL</i>                                                                  | <i>CHASEMILL</i>                                                                   |
|-----------------------|--------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Series                |                    |                                                                                     | TEF-TN<br>TES-TN                                                                  | TEF-AN<br>TES-AN                                                                  | TEF-AV10<br>TES-AV10                                                              | TEF-AX<br>2S-TEF-AP<br>TEF-AP                                                     | TES-AP                                                                             |
|                       |                    |                                                                                     |  |  |  |  |  |
| Pages                 |                    |                                                                                     | E216-E217                                                                         | E218-E219                                                                         | E220-E221                                                                         | E222                                                                              | E223                                                                               |
| Approach angle        |                    |                                                                                     | 90°                                                                               | 90°                                                                               | 90°                                                                               | 90°                                                                               | 90°                                                                                |
| Max. depth of cut(mm) |                    |                                                                                     | 48-71                                                                             | 40-69                                                                             | 27-44                                                                             | 16-45                                                                             | 45-88                                                                              |
| Diameter range(mm)    |                    |                                                                                     | Ø50-Ø100                                                                          | Ø32-Ø100                                                                          | Ø25-Ø50                                                                           | Ø16-Ø40                                                                           | Ø50-Ø100                                                                           |
| Insert                |                    |                                                                                     | TNMX 1806                                                                         | ANM(H)X 1106<br>ANM(H)X 1607                                                      | AVKT 1004<br>AVCT 1004-AL                                                         | AXM(C)T 0602<br>APK(C)T 09T3<br>APK(C)T 1204<br>APK(C)T 1705                      | APK(C)T 1204<br>APK(C)T 1705                                                       |
| Application           | Facing             |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | High feed milling  |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Shouldering        |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Slotting           |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Trochoidal milling |  |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 | ●                                                                                  |
|                       | Straight ramping   |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Helical ramping    |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Profiling          |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Plunging           |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Step down          |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Counter boring     |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## Extended flute cutters

|                                                                                                                           |  |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|                                           |  |  |  |  |  |
| <div>TEF</div> <div>TES</div> <div></div> |  |  |  |  |  |
| E224                                                                                                                      |  |  |  |  |  |
| 90°                                                                                                                       |  |  |  |  |  |
| 23.8-48.4                                                                                                                 |  |  |  |  |  |
| Ø32-Ø80                                                                                                                   |  |  |  |  |  |
| SPMG(T) 0904<br>SPMG(T) 1104<br>SPMG(T) 1405                                                                              |  |  |  |  |  |
|                                                                                                                           |  |  |  |  |  |
|                                                                                                                           |  |  |  |  |  |
| ●                                                                                                                         |  |  |  |  |  |
|                                                                                                                           |  |  |  |  |  |
|                                                                                                                           |  |  |  |  |  |
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|                                                                                                                           |  |  |  |  |  |

● Recommended, ○ Suitable

# Tool Selection Guide

## Slotting cutters

| Series                |                         |                                                                                     | TOP SLOT                                                                          | TOP SLOT                                                                          | TOP SLOT                                                                          | TOP SLOT                                                                          | TOP SLOT                                                                           |
|-----------------------|-------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                       |                         |                                                                                     | TSM-TS16                                                                          | TSM-SL                                                                            | TSM-FD-Z                                                                          | TSM-FD-ZN                                                                         | TSM-FD-S/W-ZN                                                                      |
|                       |                         |                                                                                     |  |  |  |  |  |
| Pages                 |                         |                                                                                     | E225-E226                                                                         | E227-E228                                                                         | E229-E230                                                                         | E231                                                                              | E232-E234                                                                          |
| Approach angle        |                         |                                                                                     | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                  |
| Max. width of cut(mm) |                         |                                                                                     | 1.2-6.0                                                                           | 3-6                                                                               | 3-10                                                                              | 10-20                                                                             | 10-26                                                                              |
| Diameter range(mm)    |                         |                                                                                     | Ø32.2-Ø80                                                                         | Ø25-Ø63                                                                           | Ø63-Ø250                                                                          | Ø80-Ø125                                                                          | Ø100-Ø315                                                                          |
| Insert                |                         |                                                                                     | TS16                                                                              | SLOT                                                                              | ZNHT                                                                              | ZNHU 080<br>ZNHU 110                                                              | ZNHU 080<br>ZNHU 110<br>ZNHU 140                                                   |
| Application           | Facing                  |    | ●                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Shouldering             |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Slotting                |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | T slotting              |    | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Side slotting           |  | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Internal groove milling |  | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Bottom shouldering      |  | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Slitting                |  |                                                                                   |                                                                                   | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       |                         |                                                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       |                         |                                                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## Slotting cutters

| TOP SLOT                                                                         | TOP SLOT                                                                          | TOP SLOT                                                                          | TSC Slotting Cutter                                                               | TANCSPEED                                                                         |  |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--|
| TSM-FF-Z                                                                         | TSM-FF-ZN                                                                         | TSM-FF-S/W-ZN                                                                     | TSC                                                                               | 4T-TSM-W                                                                          |  |
|  |  |  |  |  |  |
| E235                                                                             | E236                                                                              | E237-E239                                                                         | E240                                                                              | E241                                                                              |  |
| -                                                                                | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 |  |
| 3-10                                                                             | 10-20                                                                             | 10-26                                                                             | 1.6-4.52                                                                          | 7                                                                                 |  |
| Ø80-Ø160                                                                         | Ø63-Ø125                                                                          | Ø100-Ø315                                                                         | Ø75-Ø160                                                                          | Ø16-Ø40                                                                           |  |
| ZNHT                                                                             | ZNHU 080<br>ZNHU 110                                                              | ZNHU 080<br>ZNHU 110<br>ZNHU 140                                                  | TIMC<br>TIMJ<br>TIPV                                                              | LXHU 0502                                                                         |  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |  |
| ●                                                                                | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |  |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |  |
| ●                                                                                | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |  |
|                                                                                  |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |  |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |  |

● Recommended, ○ Suitable



# Tool Selection Guide

## Slotting cutters

| Series                |                         |                                                                                     | MAXITANG                                                                          | MAXITANG                                                                          | MAXISPEED                                                                         | MAXISPEED                                                                         | MAXISPEED                                                                          |
|-----------------------|-------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                       |                         |                                                                                     | 4T-TSM-TR                                                                         | 4T-TE90-TR                                                                        | TR-S                                                                              | TR-F                                                                              | TR-T-W55<br>TR-T-M60                                                               |
|                       |                         |                                                                                     |  |  |  |  |  |
| Pages                 |                         |                                                                                     | E242                                                                              | E243                                                                              | E244                                                                              | E245                                                                              | E246-E247                                                                          |
| Approach angle        |                         |                                                                                     | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                  |
| Max. width of cut(mm) |                         |                                                                                     | 7                                                                                 | 4.6                                                                               | 3-10                                                                              | 8-10                                                                              | 7.7-9.5                                                                            |
| Diameter range(mm)    |                         |                                                                                     | Ø23-Ø40                                                                           | Ø25-Ø40                                                                           | Ø24.7-Ø39.7                                                                       | Ø24.25-Ø39.25                                                                     | Ø24.7-Ø39.7                                                                        |
| Insert                |                         |                                                                                     | LXHU 0502                                                                         | LPK(H)U 0502                                                                      | -                                                                                 | -                                                                                 | -                                                                                  |
| Application           | Facing                  |    |                                                                                   | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                    |
|                       | Shouldering             |    |                                                                                   | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                    |
|                       | Slotting                |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | T slotting              |    | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                   |                                                                                    |
|                       | Side slotting           |  | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                   |                                                                                    |
|                       | Internal groove milling |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Bottom shouldering      |  | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                   |                                                                                    |
|                       | Slitting                |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | External threading      |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Internal threading      |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                  |
|                       |                         |                                                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## Milling inserts

|                       |                                                                                                           | WINMILL                                                                                           | MAXITANG                                                                                        | TANGSPEED                                                                                                                      | MILLRUSH                                                                                                                                                       | MILL2RUSH                                                                                                                 |
|-----------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Series                |                                                                                                           | CVK(H)T 0502<br> | LXHU 05-04<br> | LPK(H)U 0502<br>LPK(H)U 0904<br>LPKU 1407<br> | 3PKT 0402<br>3PK(H)T 0603<br>3PK(H)T 1004<br>3PK(H)T 1505<br>3PK(H)T 1906<br> | 6NKT 0403<br>6NGU 0604<br>6NGU 0905<br> |
| Material              |                                                                                                           | P M N S                                                                                           | P M K S H                                                                                       | P M K S H                                                                                                                      | P M K N S H                                                                                                                                                    | P M K N S H                                                                                                               |
| Pages                 |                                                                                                           | E281                                                                                              | E285                                                                                            | E284                                                                                                                           | E256-E257                                                                                                                                                      | E262-E263                                                                                                                 |
| Approach angle        |                                                                                                           | 90°                                                                                               | 90°                                                                                             | 90°                                                                                                                            | 90°                                                                                                                                                            | 90°                                                                                                                       |
| Max. depth of cut(mm) |                                                                                                           | 0.5-5                                                                                             | *                                                                                               | 4.6-12.5                                                                                                                       | 3.5-15                                                                                                                                                         | 4.1-9.2                                                                                                                   |
| Application           | Facing<br>               | ●                                                                                                 |                                                                                                 | ●                                                                                                                              | ●                                                                                                                                                              | ●                                                                                                                         |
|                       | High feed milling<br>    | ○                                                                                                 |                                                                                                 |                                                                                                                                |                                                                                                                                                                |                                                                                                                           |
|                       | Shouldering<br>          | ●                                                                                                 |                                                                                                 | ●                                                                                                                              | ●                                                                                                                                                              | ●                                                                                                                         |
|                       | Slotting<br>             | ●                                                                                                 |                                                                                                 | ●                                                                                                                              | ●                                                                                                                                                              | ●                                                                                                                         |
|                       | Straight ramping<br>     | ●                                                                                                 |                                                                                                 | ●                                                                                                                              | ●                                                                                                                                                              |                                                                                                                           |
|                       | Helical ramping<br>    | ●                                                                                                 |                                                                                                 | ●                                                                                                                              | ●                                                                                                                                                              |                                                                                                                           |
|                       | Step down<br>          |                                                                                                   |                                                                                                 |                                                                                                                                |                                                                                                                                                                |                                                                                                                           |
|                       | Profiling<br>          | ○                                                                                                 |                                                                                                 |                                                                                                                                |                                                                                                                                                                |                                                                                                                           |
|                       | T slotting<br>         |                                                                                                   | ●                                                                                               |                                                                                                                                |                                                                                                                                                                |                                                                                                                           |
|                       | Side slotting<br>      |                                                                                                   | ●                                                                                               |                                                                                                                                |                                                                                                                                                                |                                                                                                                           |
|                       | Bottom shouldering<br> |                                                                                                   | ●                                                                                               |                                                                                                                                |                                                                                                                                                                |                                                                                                                           |

▶ \* Marked: For CDX, refer to the cutter page

● Recommended, ○ Suitable

# Tool Selection Guide

## Milling inserts

|                       |                     |                                                                                     | <b>MILL2RUSH</b>                                                                                                             | <b>WINMILL</b>                                                                                           | <b>CHASEMILL</b>                                                                                        | <b>CHASEMILL</b>                                                                                                                                                                                  | <b>CHASEMILL</b>                                                                                           |
|-----------------------|---------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Series                |                     |                                                                                     | <b>TNMX 1806</b><br><b>TNM(G)X 2207</b><br> | <b>AVK(C)T 1004</b><br> | <b>AXCT 0602-L</b><br> | <b>AXM(C)T 0602</b><br><b>APK(C)T 09T3</b><br><b>APK(C)T 1204</b><br><b>APK(C)T 1705</b><br><b>APKT 1907</b><br> | <b>APCT 12-PCD35</b><br> |
| Material              |                     |                                                                                     | P M K S H                                                                                                                    | P M K N S H                                                                                              | P M S                                                                                                   | P M K N S H                                                                                                                                                                                       | N                                                                                                          |
| Pages                 |                     |                                                                                     | E312                                                                                                                         | E274                                                                                                     | E273                                                                                                    | E266-E273                                                                                                                                                                                         | E267                                                                                                       |
| Approach angle        |                     |                                                                                     | 90°                                                                                                                          | 90°                                                                                                      | 90°                                                                                                     | 90°                                                                                                                                                                                               | 90°                                                                                                        |
| Max. depth of cut(mm) |                     |                                                                                     | 13-15                                                                                                                        | 1.0-10                                                                                                   | 5.5                                                                                                     | 0.5-17.9                                                                                                                                                                                          | 3.5                                                                                                        |
| Application           | Facing              |    | ●                                                                                                                            | ●                                                                                                        | ●                                                                                                       | ●                                                                                                                                                                                                 | ●                                                                                                          |
|                       | High feed milling   |    |                                                                                                                              | ○                                                                                                        |                                                                                                         | ○                                                                                                                                                                                                 |                                                                                                            |
|                       | Shouldering         |    | ●                                                                                                                            | ●                                                                                                        | ●                                                                                                       | ●                                                                                                                                                                                                 | ●                                                                                                          |
|                       | Slotting            |    | ●                                                                                                                            | ●                                                                                                        | ●                                                                                                       | ●                                                                                                                                                                                                 | ●                                                                                                          |
|                       | Straight ramping    |   |                                                                                                                              | ●                                                                                                        |                                                                                                         | ●                                                                                                                                                                                                 |                                                                                                            |
|                       | Helical ramping     |  |                                                                                                                              | ●                                                                                                        |                                                                                                         | ●                                                                                                                                                                                                 |                                                                                                            |
|                       | Chamfer & serration |  |                                                                                                                              |                                                                                                          |                                                                                                         |                                                                                                                                                                                                   |                                                                                                            |
|                       | Profiling           |  |                                                                                                                              | ○                                                                                                        |                                                                                                         | ○                                                                                                                                                                                                 |                                                                                                            |
|                       | Plunging            |  |                                                                                                                              |                                                                                                          |                                                                                                         |                                                                                                                                                                                                   |                                                                                                            |
|                       | Step down           |  |                                                                                                                              |                                                                                                          |                                                                                                         |                                                                                                                                                                                                   |                                                                                                            |
|                       | Counter boring      |  |                                                                                                                              |                                                                                                          |                                                                                                         |                                                                                                                                                                                                   |                                                                                                            |

# Tool Selection Guide

## Milling inserts

| CHASE2MILL                                                                        | CHASE4MILL                                                                        | CHASE3MILL                                                                        | CHASE8SPEED                                                                       | CHASEALU                                                                          | CHASE4FINISH                                                                      |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| ANM(H)X 1106<br>ANM(H)X 1607                                                      | 4NKT 0402<br>4NK(H)T 0603<br>4NK(H)T 0904<br>4NK(H)T 1106<br>4NK(H)T 1407         | SQKU 0703<br>SQK(H)U 1004<br>SQK(H)U 1206                                         | SQKU 1105<br>SQKU 1406                                                            | XEVT 1605<br>XEVT 2206                                                            | 4WHU 1207                                                                         |
|  |  |  |  |  |  |
| P M K N S H                                                                       | P M K N S H                                                                       | P M K S H                                                                         | P M K S H                                                                         | N                                                                                 | P M K N S H                                                                       |
| E265                                                                              | E258-E260                                                                         | E305                                                                              | E306-E307                                                                         | E315                                                                              | E261                                                                              |
| 90°                                                                               | 90°                                                                               | 90°                                                                               | 20°,45°                                                                           | 90°                                                                               | 90°                                                                               |
| 11-15                                                                             | 0.5-13.8                                                                          | 5.0-8.5                                                                           | 1.8-6.0                                                                           | 14-21                                                                             | 0.5                                                                               |
| ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |
|                                                                                   | ○                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                   |
| ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                   |
| ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |
| ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |                                                                                   |
|                                                                                   | ○                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   | ●                                                                                 |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

● Recommended, ○ Suitable

# Tool Selection Guide

## Milling inserts

|                       |                     |                                                                                     | CHASE2QUAD                                                                        | LIONMILL                                                                          | LIONMILL                                                                          | CHASEVQUAD                                                                        | CHASE2QUAD                                                                         |
|-----------------------|---------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                       |                     |                                                                                     | SNEX 1204<br>SNET 1205                                                            | TPKN 2204                                                                         | SEKX 2107                                                                         | SVK(H)T 0938<br>SVK(H)T 1145                                                      | SNGX 1306...<br>SNGX 1306 ZN                                                       |
| Series                |                     |                                                                                     |  |  |  |  |  |
| Material              |                     |                                                                                     | P K                                                                               | P M K                                                                             | P K                                                                               | P M K S H                                                                         | P M K                                                                              |
| Pages                 |                     |                                                                                     | E299                                                                              | E313                                                                              | E297                                                                              | E309                                                                              | E301                                                                               |
| Approach angle        |                     |                                                                                     | 90°                                                                               | 90°                                                                               | 90°                                                                               | 90°                                                                               | 90°                                                                                |
| Max. depth of cut(mm) |                     |                                                                                     | 1.0                                                                               | 17.6                                                                              | 17                                                                                | 7-10                                                                              | 10-20                                                                              |
| Application           | Facing              |    | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                  |
|                       | High feed milling   |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Shouldering         |    |                                                                                   | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Slotting            |    |                                                                                   | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                    |
|                       | Straight ramping    |    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Helical ramping     |   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Chamfer & serration |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Profiling           |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Plunging            |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Step down           |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Counter boring      |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

## Milling inserts

● Recommended, ○ Suitable

# Tool Selection Guide

## Milling inserts

| Series                |                     | CHASE2HEPTA                                                                         | CHASEHEPTA                                                                        | CHASE2QUAD                                                                        | CHASE2QUAD                                                                        | CHASE2MILL                                                                         |
|-----------------------|---------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                       |                     | XNM(H)U 0605<br>XNM(H)U 0906                                                        | 7EMT 0604                                                                         | SNM(G)X 1306 AN...<br>SNMX 1306 XTN                                               | SNMX 1607<br>SNHX 1606                                                            | ANHX 1607                                                                          |
|                       |                     |    |  |  |  |  |
| Material              |                     | P M K                                                                               | P M K                                                                             | P M K N                                                                           | P M K                                                                             | P M K N S                                                                          |
| Pages                 |                     | E316-E317                                                                           | E264                                                                              | E300                                                                              | E302                                                                              | E265                                                                               |
| Approach angle        |                     | 45°                                                                                 | 45°                                                                               | 45°                                                                               | 45°                                                                               | 45°                                                                                |
| Max. depth of cut(mm) |                     | 1.0-5.0                                                                             | 3.2                                                                               | 6-7                                                                               | 8.8                                                                               | 8.4                                                                                |
| Application           | Facing              |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | High feed milling   |    |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Shouldering         |    |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Slotting            |    |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Straight ramping    |   | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Helical ramping     |  | ●                                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                       | Chamfer & serration |  | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                    |
|                       | Profiling           |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Plunging            |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Step down           |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Counter boring      |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## Milling inserts

| LIONMILL                                                                         | SPEEDBARREL                                                                       | CHASE2MOLD                                                                        | CHASEMOLD                                                                         | CHASESPEED                                                                        | CERAMICSPEED                                                                      |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| SDKN 1203<br>SDKN 1504<br>SEKN 1203<br>SEKN 1504                                 | BRHU 06R2<br>BRHU 12R3                                                            | RNMU 1004<br>RNMU 1205<br>RNMU 1606                                               | RYM(H)X 0803<br>RYM(H)X 1004<br>RYM(H)X 1205<br>RYM(H)X 1606<br>RYMX 2007         | RNGN 1207 FL<br>RPGN 0903 FL<br>RPGN 1204 FL                                      | BCGT 0403                                                                         |
|  |  |  |  |  |  |
| P                                                                                | P M K S H                                                                         | P M K S H                                                                         | P M K S H                                                                         | S                                                                                 | S                                                                                 |
| E296-E297                                                                        | E280                                                                              | E292                                                                              | E293-E294                                                                         | E291                                                                              | E278                                                                              |
| 45°                                                                              | 90°,75°,45°                                                                       | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 |
| 6.5-8.7                                                                          | 4.2-12.0                                                                          | 5-8                                                                               | 4-10                                                                              | 4.7-6.3                                                                           | 0.5                                                                               |
| ●                                                                                |                                                                                   | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ○                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |
|                                                                                  |                                                                                   | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |
| ●                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

● Recommended, ○ Suitable



# Tool Selection Guide

## Milling inserts

| Series                |                     | CERAMIC SPEED                                                                       | CERAMIC SPEED                                                                     | CERAMIC SPEED                                                                     | CHASE TO MILL                                                                     | WIN 4 FEED                                                                         |
|-----------------------|---------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                       |                     | BNGT 0603                                                                           | BNGX 0603<br>BNGX 0904                                                            | BNGX 1207                                                                         | PTKU 0503<br>PTKU 1006                                                            | BLMV 0603                                                                          |
|                       |                     |    |  |  |  |  |
| Material              |                     | S                                                                                   | S                                                                                 | S                                                                                 | P M K                                                                             | P M K S H                                                                          |
| Pages                 |                     | E278                                                                                | E279                                                                              | E279                                                                              | E290                                                                              | E277                                                                               |
| Approach angle        |                     | -                                                                                   | -                                                                                 | -                                                                                 | 25°                                                                               | -                                                                                  |
| Max. depth of cut(mm) |                     | 1.0                                                                                 | 1.5                                                                               | 2.5                                                                               | 1.5-3.0                                                                           | 0.7-1.0                                                                            |
| Application           | Facing              |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | High feed milling   |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Shouldering         |    | ○                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                  |
|                       | Slotting            |    |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Straight ramping    |    | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Helical ramping     |   | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Chamfer & serration |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Profiling           |  | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Plunging            |  |                                                                                   |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Step down           |  |                                                                                   |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Counter boring      |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Drill mill          |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

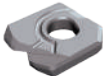
## Milling inserts

| CHASE4FEED                                                                       | CHASE2FEED                                                                        | CHASEFEED                                                                         | CHASEFEED                                                                         | MILLRUSH                                                                          | CHASEQUAD                                                                         |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| BLMP 0402<br>BLMP 0603<br>BLMP 0904<br>BLMP 1105                                 | BLMP 1306                                                                         | SBMT 0603<br>SBMT 0904<br>SBMT 1306                                               | SRMT 07<br>SRMT 10<br>SRMT 14                                                     | 3PKT 0402<br>3PK(H)T 0603<br>3PK(H)T 1004                                         | SPMG(T) 0904<br>SPMG(T) 1104<br>SPMG(T) 1405<br>XOMT 0602                         |
|  |  |  |  |  |  |
| P M K S H                                                                        | P M K S H                                                                         | P M K S H                                                                         |                                                                                   | P M K N S H                                                                       | P M K                                                                             |
| E275                                                                             | E276                                                                              | E295                                                                              | E308                                                                              | E256-E257                                                                         | E303                                                                              |
| -                                                                                | -                                                                                 | -                                                                                 |                                                                                   | 30°-60°                                                                           | 15°-45°, 90°                                                                      |
| 0.5-2.0                                                                          | 2.0                                                                               | 1.0-2.0                                                                           | 0.7-2.0                                                                           | -                                                                                 | -                                                                                 |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                   |
| ○                                                                                | ○                                                                                 | ○                                                                                 |                                                                                   |                                                                                   | ●                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 | ●                                                                                 |
| ●                                                                                | ●                                                                                 | ●                                                                                 | ●                                                                                 |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ●                                                                                 |

● Recommended, ○ Suitable

# Tool Selection Guide

## Milling inserts

| Series                |                     |    |  |  |  |  |
|-----------------------|---------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                       |                     | HFN 060<br>HFN 080                                                                  | NFLB                                                                              | NFCB                                                                              | NFB                                                                               | NFR                                                                                |
|                       |                     |    |  |  |  |  |
| Material              |                     | <div>P M K S H</div>                                                                | <div>P M K S H</div>                                                              | <div>P M K S H</div>                                                              | <div>P M K S H</div>                                                              | <div>P M K S H</div>                                                               |
| Pages                 |                     | E282                                                                                | E287                                                                              | E287                                                                              | E286                                                                              | E288-E289                                                                          |
| Approach angle        |                     | -                                                                                   | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                  |
| Max. depth of cut(mm) |                     | 0.3-0.5                                                                             | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                  |
| Application           | Facing              |    | ●                                                                                 |                                                                                   |                                                                                   | ●                                                                                  |
|                       | High feed milling   |    | ●                                                                                 |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Shouldering         |    | ○                                                                                 |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Slotting            |    |                                                                                   |                                                                                   |                                                                                   | ●                                                                                  |
|                       | Straight ramping    |    | ●                                                                                 |                                                                                   | ●                                                                                 | ●                                                                                  |
|                       | Helical ramping     |   | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                    |
|                       | Chamfer & serration |  |                                                                                   |                                                                                   |                                                                                   | ○                                                                                  |
|                       | Profiling           |  | ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                  |
|                       | Plunging            |  |                                                                                   |                                                                                   | ○                                                                                 | ○                                                                                  |
|                       | Step down           |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                       | Counter boring      |  |                                                                                   |                                                                                   | ○                                                                                 | ○                                                                                  |
|                       | Drill mill          |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Tool Selection Guide

## Milling inserts

|                       |                                                                                                                | <i>DUETBALL</i>                                                                          | <i>TRIOBALL</i>                                                                          | <i>CHASE2BALL</i>                                                                         | <i>TOPSLOT</i>                                                                            | <i>TOPSLOT</i>                                                                            |
|-----------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Series                |                                                                                                                | 2FB<br> | 3FB<br> | 6RBE<br> | TS16<br> | SLOT<br> |
| Material              |                                                                                                                | P M K S H                                                                                | P M K S H                                                                                | P M K S H                                                                                 | P M K S H                                                                                 | P M K                                                                                     |
| Pages                 |                                                                                                                | E254                                                                                     | E255                                                                                     | E263                                                                                      | E314                                                                                      | E298                                                                                      |
| Approach angle        |                                                                                                                | -                                                                                        | -                                                                                        | -                                                                                         | -                                                                                         | -                                                                                         |
| Max. depth of cut(mm) |                                                                                                                | 11.8-44.7                                                                                | 39-94                                                                                    | 59-69                                                                                     | 4.8                                                                                       | *                                                                                         |
| Application           | Facing<br>                    |                                                                                          |                                                                                          |                                                                                           | ●                                                                                         |                                                                                           |
|                       | High feed milling<br>         |                                                                                          |                                                                                          |                                                                                           |                                                                                           |                                                                                           |
|                       | Shouldering<br>               |                                                                                          |                                                                                          |                                                                                           |                                                                                           |                                                                                           |
|                       | Slotting<br>                  | ●                                                                                        | ●                                                                                        | ●                                                                                         |                                                                                           |                                                                                           |
|                       | Straight ramping<br>          | ●                                                                                        | ●                                                                                        | ●                                                                                         |                                                                                           |                                                                                           |
|                       | Helical ramping<br>          |                                                                                          |                                                                                          |                                                                                           |                                                                                           |                                                                                           |
|                       | Chamfer & serration<br>     |                                                                                          |                                                                                          |                                                                                           |                                                                                           |                                                                                           |
|                       | Profiling<br>               | ●                                                                                        | ●                                                                                        | ●                                                                                         |                                                                                           |                                                                                           |
|                       | Side slotting<br>           |                                                                                          |                                                                                          |                                                                                           | ●                                                                                         | ●                                                                                         |
|                       | Internal groove milling<br> |                                                                                          |                                                                                          |                                                                                           |                                                                                           |                                                                                           |
|                       | Bottom shouldering<br>      |                                                                                          |                                                                                          |                                                                                           |                                                                                           |                                                                                           |
|                       | Slitting<br>                |                                                                                          |                                                                                          |                                                                                           |                                                                                           |                                                                                           |

► \*: For CDX, refer to the cutter page

● Recommended, ○ Suitable

# Tool Selection Guide

## Milling inserts

| Series                |                         | TOP SLOT                                                                            | TOP SLOT                                                                          | TSC slotting cutter                                                               | Tailor-made Insert                                                                |  |
|-----------------------|-------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--|
|                       |                         | ZNHT                                                                                | ZNHU                                                                              | TIMC<br>TIMJ<br>TIPV                                                              | LNC<br>PMIN<br>SNA<br>SNB                                                         |  |
|                       |                         |    |  |  |  |  |
| Material              |                         | P M K N                                                                             | P M K                                                                             | P M K N                                                                           | P M K N S H                                                                       |  |
| Pages                 |                         | E318                                                                                | E319                                                                              | E310-E311                                                                         | E320-E321                                                                         |  |
| Approach angle        |                         | -                                                                                   | -                                                                                 | -                                                                                 | -                                                                                 |  |
| Max. depth of cut(mm) |                         | *                                                                                   | *                                                                                 |                                                                                   | -                                                                                 |  |
| Application           | Facing                  |    |                                                                                   |                                                                                   | ●                                                                                 |  |
|                       | Shouldering             |    |                                                                                   |                                                                                   | ●                                                                                 |  |
|                       | Slotting                |    |                                                                                   |                                                                                   | ●                                                                                 |  |
|                       | T slotting              |    |                                                                                   |                                                                                   |                                                                                   |  |
|                       | Side slotting           |    | ●                                                                                 | ●                                                                                 | ●                                                                                 |  |
|                       | Internal groove milling |   |                                                                                   |                                                                                   |                                                                                   |  |
|                       | Bottom shouldering      |  |                                                                                   |                                                                                   |                                                                                   |  |
|                       | Slitting                |  | ●                                                                                 | ●                                                                                 | ●                                                                                 |  |
|                       |                         |                                                                                     |                                                                                   |                                                                                   |                                                                                   |  |
|                       |                         |                                                                                     |                                                                                   |                                                                                   |                                                                                   |  |

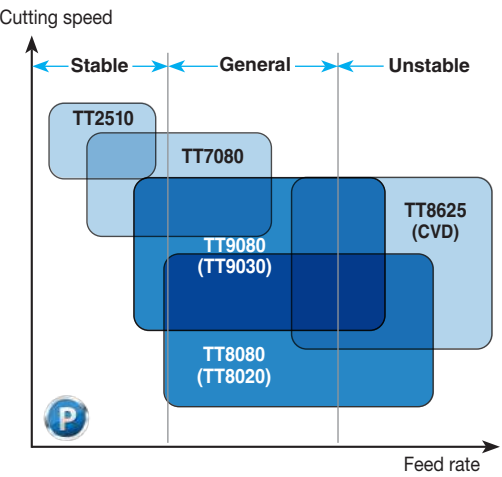
► \*: For CDX, refer to the cutter page

● Recommended, ○ Suitable

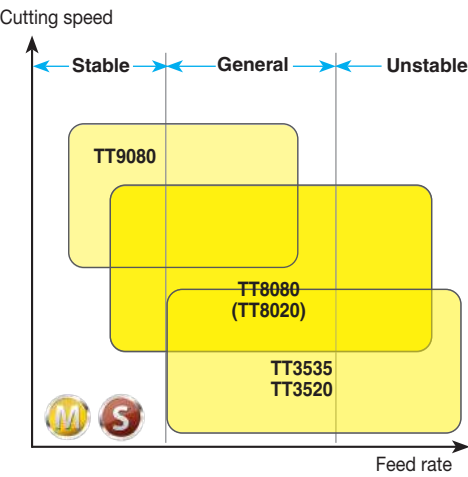
# Grades

## Selection guide for milling grades

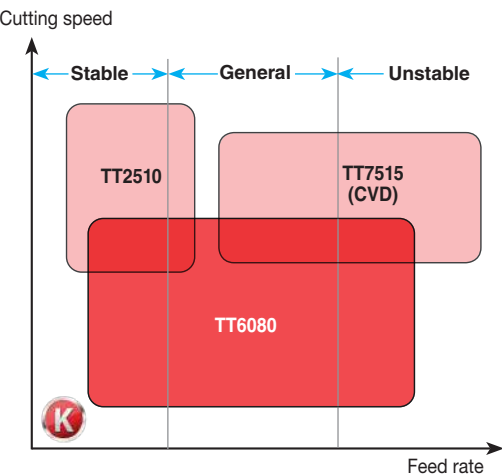
### For steel



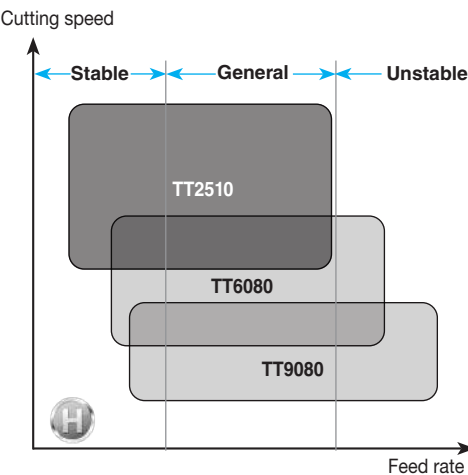
### For stainless steel & super alloy



### For cast iron



### For hardened material



# Grades

## Carbide grades

| Grades                      | ISO                                                                                              | Characteristics & applications                                                                                                                                                             |
|-----------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>K10</b><br>Carbide       | <b>K05 – K15</b><br><b>N05 – N15</b><br><b>S05 – S15</b>                                         | <ul style="list-style-type: none"> <li>• General machining of cast iron, aluminum alloys and non-ferrous materials</li> </ul>                                                              |
| <b>TT2510</b><br>PVD coated | <b>P05 – P25</b><br><b>H05 – H25</b>                                                             | <ul style="list-style-type: none"> <li>• High speed milling of pre-hardened steel and hardened steel</li> </ul>                                                                            |
| <b>TT3535</b><br>PVD coated | <b>M30 – M50</b><br><b>S30 – S50</b>                                                             | <ul style="list-style-type: none"> <li>• Interrupted and rough machining of stainless steel</li> <li>• Low speed and interrupted machining of Ti-Alloy and heat-resistant alloy</li> </ul> |
| <b>TT3520</b><br>CVD coated | <b>M30 – M50</b><br><b>S30 – S50</b>                                                             | <ul style="list-style-type: none"> <li>• Interrupted and rough machining of stainless steel</li> <li>• Low speed and interrupted machining of Ti-Alloy and heat-resistant alloy</li> </ul> |
| <b>TT6080</b><br>PVD coated | <b>K05 – K25</b><br><b>H05 – H25</b>                                                             | <ul style="list-style-type: none"> <li>• General machining for gray and ductile cast iron</li> <li>• Finish and medium machining of hardened steel</li> </ul>                              |
| <b>TT7080</b><br>PVD coated | <b>P05 – P25</b><br><b>K05 – K25</b>                                                             | <ul style="list-style-type: none"> <li>• General milling of steel</li> <li>• Heavy interrupted cutting of cast iron</li> </ul>                                                             |
| <b>TT9080</b><br>PVD coated | <b>P20 – P40</b><br><b>M20 – M40</b><br><b>S20 – S40</b>                                         | <ul style="list-style-type: none"> <li>• General machining of steel, stainless steel and heat-resistant alloy</li> </ul>                                                                   |
| <b>TT9030</b><br>PVD coated | <b>P20 – P40</b><br><b>M20 – M40</b><br><b>S20 – S40</b>                                         | <ul style="list-style-type: none"> <li>• General machining of steel, stainless steel and heat-resistant alloy</li> </ul>                                                                   |
| <b>TT8080</b><br>PVD coated | <b>P30 – P50</b><br><b>M30 – M50</b><br><b>S30 – S50</b>                                         | <ul style="list-style-type: none"> <li>• Interrupted and rough machining of steel and stainless steel</li> <li>• Low speed and interrupted machining of heat-resistant alloy</li> </ul>    |
| <b>TT8020</b><br>PVD coated | <b>P30 – P50</b><br><b>M30 – M50</b><br><b>S30 – S50</b>                                         | <ul style="list-style-type: none"> <li>• Interrupted and rough machining of steel and stainless steel</li> <li>• Low speed and interrupted machining of heat-resistant alloy</li> </ul>    |
| <b>TT5515</b><br>PVD coated | <b>P10 – P30</b><br><b>M10 – M30</b><br><b>K10 – K30</b><br><b>S10 – S30</b><br><b>H10 – H30</b> | <ul style="list-style-type: none"> <li>• High speed milling of steel and hardened steel</li> <li>• General milling of stainless steel, cast iron and heat-resistant alloy</li> </ul>       |
| <b>TT5525</b><br>PVD coated | <b>P20 – P40</b><br><b>M20 – M40</b><br><b>S20 – S40</b>                                         | <ul style="list-style-type: none"> <li>• General machining of steel, stainless steel and heat-resistant alloy</li> </ul>                                                                   |
| <b>TT7515</b><br>CVD coated | <b>K05 – K25</b><br><b>H05 – H25</b>                                                             | <ul style="list-style-type: none"> <li>• General machining for gray and ductile cast iron</li> <li>• Finish and medium machining of hardened steel</li> </ul>                              |
| <b>TT8625</b><br>CVD coated | <b>P30 – P45</b><br><b>M30 – M45</b>                                                             | <ul style="list-style-type: none"> <li>• Rough milling &amp; high speed drilling of carbon &amp; alloy steel</li> <li>• Medium speed milling of stainless steel</li> </ul>                 |

# Grades

## Cermet, ceramic and CBN grades

| Grades                          | ISO                                  | Charactristics & applications                                                                                             |
|---------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>CT7000</b><br>Cermet         | <b>P15 – P25</b><br><b>M15 – M25</b> | <ul style="list-style-type: none"><li>• Finish milling of steel and stainless steel</li></ul>                             |
| <b>AS10</b><br>Ceramic          | <b>K20 – K30</b>                     | <ul style="list-style-type: none"><li>• General milling of cast iron</li></ul>                                            |
| <b>TC3030</b><br>Ceramic        | <b>S25 – S35</b>                     | <ul style="list-style-type: none"><li>• High feed milling of super alloy</li><li>• SiAlON ceramic grade</li></ul>         |
| <b>TB7015</b><br>CBN            | <b>H25 – H35</b><br><b>K10 – K20</b> | <ul style="list-style-type: none"><li>• Machining of hardened steel</li><li>• High speed machining of cast iron</li></ul> |
| <b>TTA101</b><br>Diamond coated | <b>N05 – N15</b>                     | <ul style="list-style-type: none"><li>• High speed machining of AL alloy and non-ferrous matetrial</li></ul>              |
|                                 |                                      |                                                                                                                           |
|                                 |                                      |                                                                                                                           |
|                                 |                                      |                                                                                                                           |
|                                 |                                      |                                                                                                                           |
|                                 |                                      |                                                                                                                           |
|                                 |                                      |                                                                                                                           |
|                                 |                                      |                                                                                                                           |
|                                 |                                      |                                                                                                                           |
|                                 |                                      |                                                                                                                           |

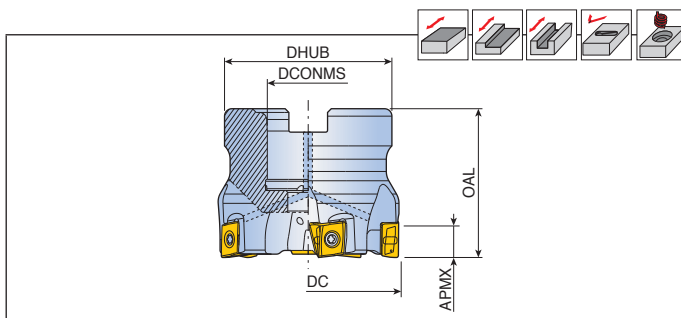




# Milling Cutters



## Face mills



| Designation               |    | Dimension (mm) |        |      |     |      | Coolant Arbor |       |     | Mounting bolt | Insert                     |
|---------------------------|----|----------------|--------|------|-----|------|---------------|-------|-----|---------------|----------------------------|
|                           |    | DC             | DCONMS | DHUB | OAL | APMX | hole          | style |     |               |                            |
| <b>4T-TF90-640-16R-09</b> | 6  | 40             | 16     | 38   | 40  | 8.3  | ●             | A     | 0.3 | SH M8x30      | LPK(H)U<br>0904...<br>E284 |
| <b>550-22R-09</b>         | 5  | 50             | 22     | 45   | 40  | 8.3  | ●             | A     | 0.4 | SH M10x30     |                            |
| <b>750-22R-09</b>         | 7  | 50             | 22     | 45   | 40  | 8.3  | ●             | A     | 0.4 | SH M10x30     |                            |
| <b>663-22R-09</b>         | 6  | 63             | 22     | 47   | 40  | 8.3  | ●             | A     | 0.5 | SH M10x30     |                            |
| <b>1063-22R-09</b>        | 10 | 63             | 22     | 47   | 40  | 8.3  | ●             | A     | 0.5 | SH M10x30     |                            |
| <b>4T-TF90-440-16R-14</b> | 4  | 40             | 16     | 38   | 40  | 12.5 | ●             | A     | 0.3 | SH M8x30      | LPKU<br>1407...<br>E284    |
| <b>450-22R-14</b>         | 4  | 50             | 22     | 45   | 40  | 12.5 | ●             | A     | 0.3 | SH M10x30     |                            |
| <b>650-22R-14</b>         | 6  | 50             | 22     | 45   | 40  | 12.5 | ●             | A     | 0.3 | SH M10x30     |                            |
| <b>563-22R-14</b>         | 5  | 63             | 22     | 47   | 40  | 12.5 | ●             | A     | 0.5 | SH M10x30     |                            |
| <b>863-22R-14</b>         | 8  | 63             | 22     | 47   | 40  | 12.5 | ●             | A     | 0.5 | SH M10x30     |                            |
| <b>780-27R-14</b>         | 7  | 80             | 27     | 58   | 50  | 12.5 | ●             | A     | 1.0 | SH M12x35     |                            |
| <b>1080-27R-14</b>        | 10 | 80             | 27     | 58   | 50  | 12.5 | ●             | A     | 1.2 | SH M12x35     |                            |
| <b>8100-32R-14</b>        | 8  | 100            | 32     | 85   | 50  | 12.5 | ●             | A     | 2.0 | SH M16x35     |                            |
| <b>12100-32R-14</b>       | 12 | 100            | 32     | 85   | 50  | 12.5 | ●             | A     | 2.1 | SH M16x35     |                            |
| <b>10125-40R-14</b>       | 10 | 125            | 40     | 85   | 63  | 12.5 | ●             | A     | 3.1 | SH M20x40     |                            |
| <b>14125-40R-14</b>       | 14 | 125            | 40     | 85   | 63  | 12.5 | ●             | A     | 3.3 | SH M20x40     |                            |
| <b>12160-40R-14</b>       | 12 | 160            | 40     | 110  | 63  | 12.5 | x             | C     | 4.1 | -             |                            |
| <b>16160-40R-14</b>       | 16 | 160            | 40     | 110  | 63  | 12.5 | x             | C     | 4.3 | -             |                            |
| <b>14200-60R-14</b>       | 14 | 200            | 60     | 130  | 63  | 12.5 | x             | C     | 5.7 | -             |                            |
| <b>18200-60R-14</b>       | 18 | 200            | 60     | 130  | 63  | 12.5 | x             | C     | 5.8 | -             |                            |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

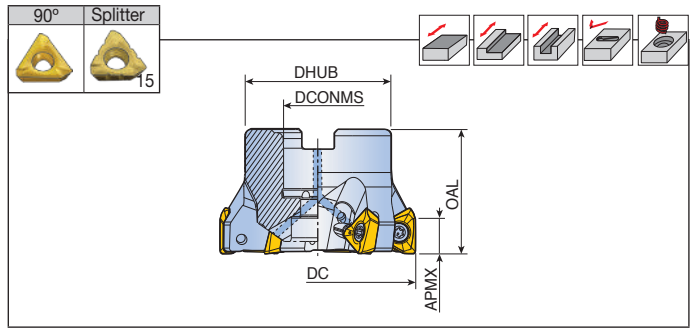
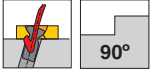
| Designation       | Screw       | Wrench       | Wrench handle |       |  |
|-------------------|-------------|--------------|---------------|-------|--|
|                   |             |              |               |       |  |
| <b>4T-TF90-09</b> | TS 30D082-P | TBLD T08P-W4 | THND 4W       | -     |  |
| <b>4T-TF90-14</b> | TS 40G110I  | TBLD T15-W6  | -             | SW6-T |  |
|                   |             |              |               |       |  |
|                   |             |              |               |       |  |



# 3P TF90-06/10/15



## Face mills



| Designation                |    | Dimension (mm) |        |      |     |      |   | Coolant hole | Arbor style | Kg        | Mounting bolt | Insert                      |
|----------------------------|----|----------------|--------|------|-----|------|---|--------------|-------------|-----------|---------------|-----------------------------|
|                            |    | DC             | DCONMS | DHUB | OAL | APMX |   |              |             |           |               |                             |
| <b>3P TF90- 632-16R-06</b> | 6  | 32             | 16     | 30   | 32  | 4.7  | ● | A            | 0.1         | SH M8x30  |               | 3PK(H)T 0603...<br>E256     |
| <b>732-16R-06</b>          | 7  | 32             | 16     | 30   | 32  | 4.7  | ● | A            | 0.1         | SH M8x30  |               |                             |
| <b>735-16R-06</b>          | 7  | 35             | 16     | 30   | 35  | 4.7  | ● | A            | 0.1         | SH M8x30  |               |                             |
| <b>840-16R-06</b>          | 8  | 40             | 16     | 38   | 40  | 4.7  | ● | A            | 0.2         | SH M8x30  |               |                             |
| <b>840-22R-06</b>          | 8  | 40             | 22     | 38   | 40  | 4.7  | ● | A            | 0.2         | SH M10x30 |               |                             |
| <b>3P TF90- 540-16R-10</b> | 5  | 40             | 16     | 38   | 40  | 7    | ● | A            | 0.3         | SH M8x30  |               | 3PK(H)T 1004...<br>E256     |
| <b>640-16R-10</b>          | 6  | 40             | 16     | 38   | 40  | 7    | ● | A            | 0.3         | SH M8x30  |               |                             |
| <b>650-22R-10</b>          | 6  | 50             | 22     | 45   | 40  | 7    | ● | A            | 0.4         | SH M10x30 |               |                             |
| <b>750-22R-10</b>          | 7  | 50             | 22     | 45   | 40  | 7    | ● | A            | 0.4         | SH M10x30 |               |                             |
| <b>663-22R-10</b>          | 6  | 63             | 22     | 47   | 40  | 7    | ● | A            | 0.5         | SH M10x30 |               |                             |
| <b>863-22R-10</b>          | 8  | 63             | 22     | 47   | 40  | 7    | ● | A            | 0.5         | SH M10x30 |               |                             |
| <b>963-22R-10</b>          | 9  | 63             | 22     | 47   | 40  | 7    | ● | A            | 0.5         | SH M10x30 |               | 3PK(H)T 1505...<br>E256-257 |
| <b>3P TF90- 450-22R-15</b> | 4  | 50             | 22     | 45   | 40  | 11   | ● | A            | 0.3         | SH M10x30 |               |                             |
| <b>550-22R-15</b>          | 5  | 50             | 22     | 45   | 40  | 11   | ● | A            | 0.3         | SH M10x30 |               |                             |
| <b>463-22R-15-B</b>        | 4  | 63             | 22     | 47   | 40  | 11   | ● | A            | 0.5         | SH M10x30 |               |                             |
| <b>463-27R-15-B</b>        | 4  | 63             | 27     | 58   | 50  | 11   | ● | A            | 0.5         | SH M12x35 |               |                             |
| <b>663-22R-15</b>          | 6  | 63             | 22     | 47   | 40  | 11   | ● | A            | 0.5         | SH M10x30 |               |                             |
| <b>480-27R-15-B</b>        | 4  | 80             | 27     | 58   | 50  | 11   | ● | A            | 1.0         | SH M12x35 |               |                             |
| <b>780-27R-15</b>          | 7  | 80             | 27     | 58   | 50  | 11   | ● | A            | 1.0         | SH M12x35 |               |                             |
| <b>880-27R-15</b>          | 8  | 80             | 27     | 58   | 50  | 11   | ● | A            | 1.0         | SH M12x35 |               |                             |
| <b>6100-32R-15-B</b>       | 6  | 100            | 32     | 85   | 50  | 11   | ● | A            | 1.8         | LH M16x35 |               |                             |
| <b>8100-32R-15</b>         | 8  | 100            | 32     | 85   | 50  | 11   | ● | A            | 1.9         | LH M16x35 |               |                             |
| <b>10100-32R-15</b>        | 10 | 100            | 32     | 85   | 50  | 11   | ● | A            | 1.9         | LH M16x35 |               |                             |
| <b>7125-40R-15-B</b>       | 7  | 125            | 40     | 85   | 63  | 11   | ● | A            | 3.0         | SH M20x40 |               |                             |
| <b>8125-40R-15</b>         | 8  | 125            | 40     | 85   | 63  | 11   | ● | A            | 3.0         | SH M20x40 |               |                             |
| <b>10125-40R-15</b>        | 10 | 125            | 40     | 85   | 63  | 11   | ● | A            | 3.1         | SH M20x40 |               |                             |
| <b>12125-40R-15</b>        | 12 | 125            | 40     | 85   | 63  | 11   | ● | A            | 3.1         | SH M20x40 |               |                             |
| <b>8160-40R-15</b>         | 8  | 160            | 40     | 85   | 63  | 11   | x | C            | 4.4         | -         |               |                             |
| <b>12160-40R-15</b>        | 12 | 160            | 40     | 110  | 63  | 11   | x | C            | 4.4         | -         |               |                             |
| <b>15160-40R-15</b>        | 15 | 160            | 40     | 110  | 63  | 11   | x | C            | 4.4         | -         |               |                             |
| <b>15200-60R-15</b>        | 15 | 200            | 60     | 130  | 63  | 11   | x | C            | 6.0         | -         |               |                             |
| <b>18200-60R-15</b>        | 18 | 200            | 60     | 130  | 63  | 11   | x | C            | 5.8         | -         |               |                             |
|                            |    |                |        |      |     |      |   |              |             |           |               |                             |
|                            |    |                |        |      |     |      |   |              |             |           |               |                             |
|                            |    |                |        |      |     |      |   |              |             |           |               |                             |

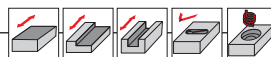
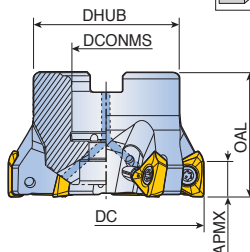
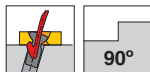


► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

# 3P TF90-19



## Face mills



| Designation                |  | Dimension (mm) |        |      |     |      | Coolant<br>hole | Arbor<br>style |  Kg | Mounting<br>bolt | Insert                                                                                                                           |
|----------------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|-----------------|----------------|--------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------|
|                            |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX |                 |                |                                                                                      |                  |                                                                                                                                  |
| <b>3P TF90- 463-22R-19</b> | 4                                                                                 | 63             | 22     | 47   | 40  | 15   | ●               | A              | 0.4                                                                                  | SH M10x30        | <div>3PK(H)T 1906...</div> <div> E256-257</div> |
| <b>663-22R-19</b>          | 6                                                                                 | 63             | 22     | 47   | 40  | 15   | ●               | A              | 0.9                                                                                  | SH M10x30        |                                                                                                                                  |
| <b>480-27R-19</b>          | 4                                                                                 | 80             | 27     | 58   | 50  | 15   | ●               | A              | 0.9                                                                                  | SH M12x35        |                                                                                                                                  |
| <b>780-27R-19</b>          | 7                                                                                 | 80             | 27     | 58   | 50  | 15   | ●               | A              | 1.0                                                                                  | SH M12x35        |                                                                                                                                  |
| <b>6100-32R-19</b>         | 6                                                                                 | 100            | 32     | 85   | 50  | 15   | ●               | A              | 1.8                                                                                  | LH M16x35        |                                                                                                                                  |
| <b>8100-32R-19</b>         | 8                                                                                 | 100            | 32     | 85   | 50  | 15   | ●               | A              | 2.6                                                                                  | LH M16x35        |                                                                                                                                  |
| <b>6125-40R-19</b>         | 6                                                                                 | 125            | 40     | 85   | 63  | 15   | ●               | A              | 3.0                                                                                  | SH M20x40        |                                                                                                                                  |
| <b>8125-40R-19</b>         | 8                                                                                 | 125            | 40     | 85   | 63  | 15   | ●               | A              | 3.0                                                                                  | SH M20x40        |                                                                                                                                  |
| <b>10125-40R-19</b>        | 10                                                                                | 125            | 40     | 85   | 63  | 15   | ●               | A              | 3.1                                                                                  | SH M20x40        |                                                                                                                                  |
| <b>8160-40R-19</b>         | 8                                                                                 | 160            | 40     | 110  | 63  | 15   | x               | C              | 4.2                                                                                  | -                |                                                                                                                                  |
| <b>12160-40R-19</b>        | 12                                                                                | 160            | 40     | 110  | 63  | 15   | x               | C              | 4.3                                                                                  | -                |                                                                                                                                  |
| <b>10200-60R-19</b>        | 10                                                                                | 200            | 60     | 130  | 63  | 15   | x               | C              | 6.0                                                                                  | -                |                                                                                                                                  |
| <b>14200-60R-19</b>        | 14                                                                                | 200            | 60     | 130  | 63  | 15   | x               | C              | 6.0                                                                                  | -                |                                                                                                                                  |
| <b>12250-60R-19</b>        | 12                                                                                | 250            | 60     | 160  | 63  | 15   | x               | C              | 10.5                                                                                 | -                |                                                                                                                                  |
| <b>16250-60R-19</b>        | 16                                                                                | 250            | 60     | 160  | 63  | 15   | x               | C              | 10.5                                                                                 | -                |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |
|                            |                                                                                   |                |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                                                  |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

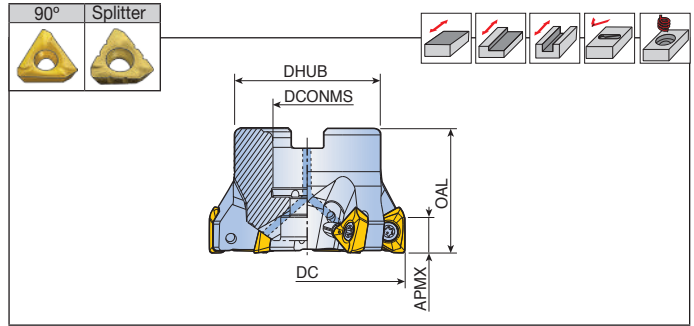
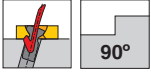
| Designation       | Screw          | Wrench |       |  |  |
|-------------------|----------------|--------|-------|--|--|
|                   |                |        |       |  |  |
| <b>3P TF90-06</b> | TS 20043I/HG-P | TD 6P  | -     |  |  |
| <b>3P TF90-10</b> | TS 25C065I/HG  | TD 8   | -     |  |  |
| <b>3P TF90-15</b> | TS 40B100I     | TD 15  | -     |  |  |
| <b>3P TF90-19</b> | TS 45120I      | -      | T-T20 |  |  |



# 3P TF90-15/19



Face mills (Inch bore)



| Designation                   |  | Dimension (mm) |        |      |     |      | Coolant hole | Arbor style |  Kg | Mounting bolt | Insert                                                                                                        |
|-------------------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|--------------|-------------|--------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------|
|                               |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX |              |             |                                                                                      |               |                                                                                                               |
| <b>3P TF90-480-25.4R-15-B</b> | 4                                                                                 | 80             | 25.4   | 70   | 50  | 11   | ●            | A           | 1.2                                                                                  | SH M12x35     |  3PK(H)T 1505...<br>E256-257 |
| <b>780-25.4R-15</b>           | 7                                                                                 | 80             | 25.4   | 70   | 50  | 11   | ●            | A           | 1.0                                                                                  | SH M12x35     |                                                                                                               |
| <b>880-25.4R-15</b>           | 8                                                                                 | 80             | 25.4   | 70   | 50  | 11   | ●            | A           | 1.0                                                                                  | SH M12x35     |                                                                                                               |
| <b>6100-31.75R-15-B</b>       | 6                                                                                 | 100            | 31.75  | 80   | 50  | 11   | ●            | B           | 1.5                                                                                  | -             |                                                                                                               |
| <b>8100-31.75R-15</b>         | 8                                                                                 | 100            | 31.75  | 80   | 50  | 11   | x            | B           | 1.9                                                                                  | -             |                                                                                                               |
| <b>10100-31.75R-15</b>        | 10                                                                                | 100            | 31.75  | 80   | 50  | 11   | x            | B           | 1.9                                                                                  | -             |                                                                                                               |
| <b>7125-38.1R-15-B</b>        | 7                                                                                 | 125            | 38.1   | 80   | 63  | 11   | x            | B           | 2.4                                                                                  | -             |                                                                                                               |
| <b>10125-38.1R-15</b>         | 10                                                                                | 125            | 38.1   | 80   | 63  | 11   | x            | B           | 3.1                                                                                  | -             |                                                                                                               |
| <b>12125-38.1R-15</b>         | 12                                                                                | 125            | 38.1   | 80   | 63  | 11   | x            | B           | 3.1                                                                                  | -             |                                                                                                               |
| <b>8160-50.8R-15</b>          | 8                                                                                 | 160            | 50.8   | 100  | 63  | 11   | x            | B           | 2.6                                                                                  | -             |                                                                                                               |
| <b>12160-50.8R-15</b>         | 12                                                                                | 160            | 50.8   | 100  | 63  | 11   | x            | B           | 4.4                                                                                  | -             |                                                                                                               |
| <b>15160-50.8R-15</b>         | 15                                                                                | 160            | 50.8   | 100  | 63  | 11   | x            | B           | 4.4                                                                                  | -             |                                                                                                               |
| <b>15200-47.625R-15</b>       | 15                                                                                | 200            | 47.625 | 130  | 63  | 11   | x            | C           | 6.0                                                                                  | -             |                                                                                                               |
| <b>3P TF90-480-25.4R-19</b>   | 4                                                                                 | 80             | 25.4   | 70   | 50  | 15   | ●            | A           | 0.9                                                                                  | SH M12x35     |  3PK(H)T 1906...<br>E256-257 |
| <b>780-25.4R-19</b>           | 7                                                                                 | 80             | 25.4   | 70   | 50  | 15   | ●            | A           | 1.0                                                                                  | SH M12x35     |                                                                                                               |
| <b>6100-31.75R-19</b>         | 6                                                                                 | 100            | 31.75  | 80   | 50  | 15   | x            | B           | 1.8                                                                                  | -             |                                                                                                               |
| <b>8100-31.75R-19</b>         | 8                                                                                 | 100            | 31.75  | 80   | 50  | 15   | x            | B           | 2.6                                                                                  | -             |                                                                                                               |
| <b>6125-38.1R-19</b>          | 6                                                                                 | 125            | 38.1   | 80   | 63  | 15   | x            | B           | 4.4                                                                                  | -             |                                                                                                               |
| <b>8125-38.1R-19</b>          | 8                                                                                 | 125            | 38.1   | 80   | 63  | 15   | x            | B           | 3.0                                                                                  | -             |                                                                                                               |
| <b>10125-38.1R-19</b>         | 10                                                                                | 125            | 38.1   | 80   | 63  | 15   | x            | B           | 3.1                                                                                  | -             |                                                                                                               |
| <b>8160-50.8R-19</b>          | 8                                                                                 | 160            | 50.8   | 100  | 63  | 15   | x            | B           | 4.2                                                                                  | -             |                                                                                                               |
| <b>12160-50.8R-19</b>         | 12                                                                                | 160            | 50.8   | 100  | 63  | 15   | x            | B           | 4.3                                                                                  | -             |                                                                                                               |
| <b>10200-47.625R-19</b>       | 10                                                                                | 200            | 47.625 | 130  | 63  | 15   | x            | C           | 6.0                                                                                  | -             |                                                                                                               |
| <b>14200-47.625R-19</b>       | 14                                                                                | 200            | 47.625 | 130  | 63  | 15   | x            | C           | 6.0                                                                                  | -             |                                                                                                               |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

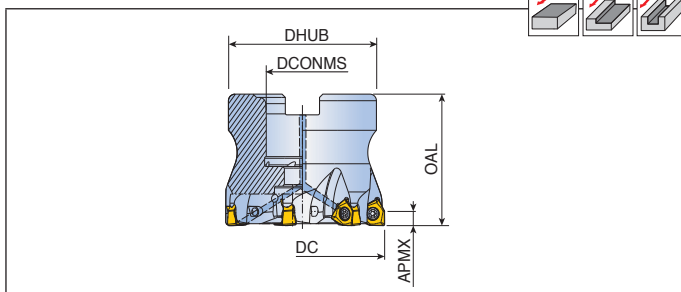
| Designation       | Screw      | Wrench |       |  |  |
|-------------------|------------|--------|-------|--|--|
|                   |            |        |       |  |  |
| <b>3P TF90-15</b> | TS 40B100I | TD 15  | -     |  |  |
| <b>3P TF90-19</b> | TS 45I20I  | -      | T-T20 |  |  |
|                   |            |        |       |  |  |
|                   |            |        |       |  |  |



# 6N TF90-04/06



## Face mills



| Designation               |    | Dimension (mm) |        |      |     |      | Coolant hole | Arbor style | Kg  | Mounting bolt | Insert                |
|---------------------------|----|----------------|--------|------|-----|------|--------------|-------------|-----|---------------|-----------------------|
|                           |    | DC             | DCONMS | DHUB | OAL | APMX |              |             |     |               |                       |
| <b>6N TF90-540-16R-04</b> | 5  | 40             | 16     | 38   | 40  | 4.1  | ●            | A           | 0.2 | SH M8x30      | 6N KU 0403...<br>E263 |
| <b>740-16R-04</b>         | 7  | 40             | 16     | 38   | 40  | 4.1  | ●            | A           | 0.2 | SH M8x30      |                       |
| <b>750-22R-04</b>         | 7  | 50             | 22     | 45   | 40  | 4.1  | ●            | A           | 0.3 | LH M10x25     |                       |
| <b>950-22R-04</b>         | 9  | 50             | 22     | 45   | 40  | 4.1  | ●            | A           | 0.3 | LH M10x25     |                       |
| <b>863-22R-04</b>         | 8  | 63             | 22     | 47   | 40  | 4.1  | ●            | A           | 0.5 | LH M10x25     |                       |
| <b>1063-22R-04</b>        | 10 | 63             | 22     | 47   | 40  | 4.1  | ●            | A           | 0.5 | LH M10x25     |                       |
| <b>6N TF90-440-16R-06</b> | 4  | 40             | 16     | 38   | 40  | 6.2  | ●            | A           | 0.3 | SH M8x30      | 6N GU 0604...<br>E262 |
| <b>450-22R-06</b>         | 4  | 50             | 22     | 45   | 40  | 6.2  | ●            | A           | 0.4 | LH M10x25     |                       |
| <b>650-22R-06</b>         | 6  | 50             | 22     | 45   | 40  | 6.2  | ●            | A           | 0.4 | LH M10x25     |                       |
| <b>463-22R-06</b>         | 4  | 63             | 22     | 47   | 40  | 6.2  | ●            | A           | 0.5 | LH M10x25     |                       |
| <b>663-22R-06</b>         | 6  | 63             | 22     | 47   | 40  | 6.2  | ●            | A           | 0.5 | LH M10x25     |                       |
| <b>763-22R-06</b>         | 7  | 63             | 22     | 47   | 40  | 6.2  | ●            | A           | 0.5 | LH M10x25     |                       |
| <b>580-27R-06</b>         | 5  | 80             | 27     | 58   | 50  | 6.2  | ●            | A           | 1.0 | SH M12x35     |                       |
| <b>680-27R-06</b>         | 6  | 80             | 27     | 58   | 50  | 6.2  | ●            | A           | 1.0 | SH M12x35     |                       |
| <b>780-27R-06</b>         | 7  | 80             | 27     | 58   | 50  | 6.2  | ●            | A           | 1.0 | SH M12x35     |                       |
| <b>980-27R-06</b>         | 9  | 80             | 27     | 58   | 50  | 6.2  | ●            | A           | 1.0 | SH M12x35     |                       |
| <b>6100-32R-06</b>        | 6  | 100            | 32     | 85   | 50  | 6.2  | ●            | A           | 1.9 | SH M16x35     |                       |
| <b>8100-32R-06</b>        | 8  | 100            | 32     | 85   | 50  | 6.2  | ●            | A           | 1.9 | SH M16x35     |                       |
| <b>11100-32R-06</b>       | 11 | 100            | 32     | 85   | 50  | 6.2  | ●            | A           | 1.9 | SH M16x35     |                       |
| <b>7125-40R-06</b>        | 7  | 125            | 40     | 85   | 63  | 6.2  | ●            | A           | 3.2 | SH M20x40     |                       |
| <b>11125-40R-06</b>       | 11 | 125            | 40     | 85   | 63  | 6.2  | ●            | A           | 3.2 | SH M20x40     |                       |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

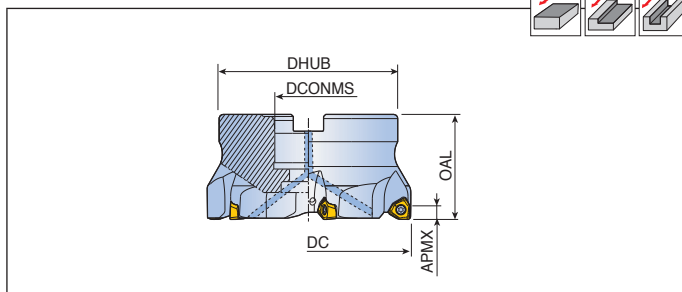
| Designation       | Screw        | Wrench |  |  |  |
|-------------------|--------------|--------|--|--|--|
|                   |              |        |  |  |  |
| <b>6N TF90-04</b> | TS 25064I    | TD 8   |  |  |  |
| <b>6N TF90-06</b> | TS 30085I/HG | TD 9   |  |  |  |
|                   |              |        |  |  |  |
|                   |              |        |  |  |  |



# 6N TF90-09



## Face mills



| Designation               |  | Dimension (mm) |        |      |     |      | Coolant hole | Arbor style |  Kg | Mounting bolt | Insert                                                                                                 |
|---------------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|--------------|-------------|--------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------|
|                           |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX |              |             |                                                                                      |               |                                                                                                        |
| <b>6N TF90-450-22R-09</b> | 4                                                                                 | 50             | 22     | 45   | 40  | 9.2  | ●            | A           | 0.3                                                                                  | LH M10x25     | 6NGU 0905...<br> E262 |
| <b>550-22R-09</b>         | 5                                                                                 | 50             | 22     | 45   | 40  | 9.2  | ●            | A           | 0.4                                                                                  | LH M10x25     |                                                                                                        |
| <b>463-22R-09</b>         | 4                                                                                 | 63             | 22     | 47   | 40  | 9.2  | ●            | A           | 0.5                                                                                  | LH M10x25     |                                                                                                        |
| <b>663-22R-09</b>         | 6                                                                                 | 63             | 22     | 47   | 40  | 9.2  | ●            | A           | 0.5                                                                                  | LH M10x25     |                                                                                                        |
| <b>763-22R-09</b>         | 7                                                                                 | 63             | 22     | 47   | 40  | 9.2  | ●            | A           | 0.5                                                                                  | LH M10x25     |                                                                                                        |
| <b>580-27R-09</b>         | 5                                                                                 | 80             | 27     | 58   | 50  | 9.2  | ●            | A           | 1.0                                                                                  | SH M12x35     |                                                                                                        |
| <b>780-27R-09</b>         | 7                                                                                 | 80             | 27     | 58   | 50  | 9.2  | ●            | A           | 1.1                                                                                  | SH M12x35     |                                                                                                        |
| <b>880-27R-09</b>         | 8                                                                                 | 80             | 27     | 58   | 50  | 9.2  | ●            | A           | 1.1                                                                                  | SH M12x35     |                                                                                                        |
| <b>980-27R-09</b>         | 9                                                                                 | 80             | 27     | 58   | 50  | 9.2  | ●            | A           | 1.1                                                                                  | SH M12x35     |                                                                                                        |
| <b>6100-32R-09</b>        | 6                                                                                 | 100            | 32     | 85   | 50  | 9.2  | ●            | A           | 1.9                                                                                  | LH M16x35     |                                                                                                        |
| <b>8100-32R-09</b>        | 8                                                                                 | 100            | 32     | 85   | 50  | 9.2  | ●            | A           | 1.8                                                                                  | LH M16x35     |                                                                                                        |
| <b>11100-32R-09</b>       | 11                                                                                | 100            | 32     | 85   | 50  | 9.2  | ●            | A           | 1.9                                                                                  | LH M16x35     |                                                                                                        |
| <b>7125-40R-09</b>        | 7                                                                                 | 125            | 40     | 85   | 63  | 9.2  | ●            | A           | 3.1                                                                                  | SH M20x40     |                                                                                                        |
| <b>8125-40R-09</b>        | 8                                                                                 | 125            | 40     | 85   | 63  | 9.2  | ●            | A           | 3.1                                                                                  | SH M20x40     |                                                                                                        |
| <b>11125-40R-09</b>       | 11                                                                                | 125            | 40     | 85   | 63  | 9.2  | ●            | A           | 3.1                                                                                  | SH M20x40     |                                                                                                        |
| <b>14125-40R-09</b>       | 14                                                                                | 125            | 40     | 85   | 63  | 9.2  | ●            | A           | 3.2                                                                                  | SH M20x40     |                                                                                                        |
| <b>12160-40R-09</b>       | 12                                                                                | 160            | 40     | 110  | 63  | 9.2  | x            | C           | 4.3                                                                                  | -             |                                                                                                        |
| <b>16160-40R-09</b>       | 16                                                                                | 160            | 40     | 110  | 63  | 9.2  | x            | C           | 4.3                                                                                  | -             |                                                                                                        |
| <b>14200-60R-09</b>       | 14                                                                                | 200            | 60     | 130  | 63  | 9.2  | x            | C           | 5.9                                                                                  | -             |                                                                                                        |
| <b>18200-60R-09</b>       | 18                                                                                | 200            | 60     | 130  | 63  | 9.2  | x            | C           | 5.9                                                                                  | -             |                                                                                                        |
| <b>18250-60R-09</b>       | 18                                                                                | 250            | 60     | 160  | 63  | 9.2  | x            | C           | 10.7                                                                                 | -             |                                                                                                        |
| <b>22250-60R-09</b>       | 22                                                                                | 250            | 60     | 160  | 63  | 9.2  | x            | C           | 10.8                                                                                 | -             |                                                                                                        |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation       | Screw      | Wrench |  |  |  |
|-------------------|------------|--------|--|--|--|
|                   |            |        |  |  |  |
| <b>6N TF90-09</b> | TS 40B100I | T-T15  |  |  |  |
|                   |            |        |  |  |  |
|                   |            |        |  |  |  |
|                   |            |        |  |  |  |
|                   |            |        |  |  |  |

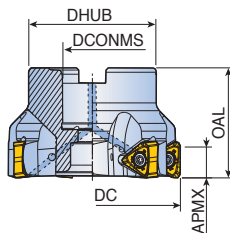
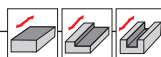
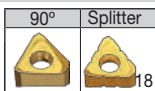
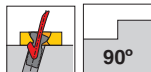




# SCRM90TN-18/22



## Face mills



| Designation                |    | Dimension (mm) |        |      |     |      |   | Coolant hole | Arbor style | Kg        | Mounting bolt | Insert                  |
|----------------------------|----|----------------|--------|------|-----|------|---|--------------|-------------|-----------|---------------|-------------------------|
|                            |    | DC             | DCONMS | DHUB | OAL | APMX |   |              |             |           |               |                         |
| <b>SCRM90TN 450-16R-18</b> | 4  | 50             | 16     | 38   | 40  | 13   | ● | A            | 0.3         | SH M8x30  |               | TNMX 1806...<br>E312    |
| <b>563-22R-18</b>          | 5  | 63             | 22     | 47   | 40  | 13   | ● | A            | 0.5         | SH M10x30 |               |                         |
| <b>580-27R-18</b>          | 5  | 80             | 27     | 58   | 50  | 13   | ● | A            | 1.1         | SH M12x35 |               |                         |
| <b>780-27R-18</b>          | 7  | 80             | 27     | 58   | 50  | 13   | ● | A            | 1.1         | SH M12x35 |               |                         |
| <b>6100-32R-18-B</b>       | 6  | 100            | 32     | 85   | 50  | 13   | ● | A            | 2.0         | SH M16x35 |               |                         |
| <b>8100-32R-18</b>         | 8  | 100            | 32     | 85   | 50  | 13   | ● | A            | 2.0         | SH M16x35 |               |                         |
| <b>7125-40R-18-B</b>       | 7  | 125            | 40     | 85   | 63  | 13   | ● | A            | 3.4         | SH M20x40 |               |                         |
| <b>10125-40R-18</b>        | 10 | 125            | 40     | 85   | 63  | 13   | ● | A            | 3.3         | SH M20x40 |               |                         |
| <b>10160-40R-18</b>        | 10 | 160            | 40     | 110  | 63  | 13   | x | C            | 4.5         | -         |               |                         |
| <b>14160-40R-18</b>        | 14 | 160            | 40     | 110  | 63  | 13   | x | C            | 4.5         | -         |               |                         |
| <b>16200-60R-18</b>        | 16 | 200            | 60     | 130  | 63  | 13   | x | C            | 6.2         | -         |               | TNM(G)X 2207...<br>E312 |
| <b>SCRM90TN 350-16R-22</b> | 3  | 50             | 16     | 38   | 40  | 15   | ● | A            | 0.3         | SH M8x30  |               |                         |
| <b>463-22R-22</b>          | 4  | 63             | 22     | 47   | 40  | 15   | ● | A            | 0.4         | SH M10x30 |               |                         |
| <b>580-27R-22</b>          | 5  | 80             | 27     | 58   | 50  | 15   | ● | A            | 0.9         | SH M12x35 |               |                         |
| <b>6100-32R-22</b>         | 6  | 100            | 32     | 85   | 50  | 15   | ● | A            | 1.8         | SH M16x35 |               |                         |
| <b>8125-40R-22</b>         | 8  | 125            | 40     | 85   | 63  | 15   | ● | A            | 3.0         | SH M20x40 |               |                         |
| <b>10160-40R-22</b>        | 10 | 160            | 40     | 110  | 63  | 15   | x | C            | 4.2         | -         |               |                         |
| <b>12200-60R-22</b>        | 12 | 200            | 60     | 130  | 63  | 15   | x | C            | 6           | -         |               |                         |
| <b>14250-60R-22</b>        | 14 | 250            | 60     | 160  | 63  | 15   | x | C            | 10.6        | -         |               |                         |
|                            |    |                |        |      |     |      |   |              |             |           |               |                         |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation        | Screw      | Wrench |  |  |  |
|--------------------|------------|--------|--|--|--|
|                    |            |        |  |  |  |
| <b>SCRM90TN-18</b> | TS 40B100I | T-T15  |  |  |  |
| <b>SCRM90TN-22</b> | TS 45I20I  | T-T20  |  |  |  |
|                    |            |        |  |  |  |
|                    |            |        |  |  |  |

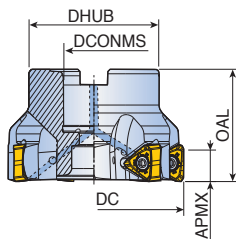
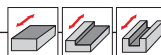


# MILL 2 RUSH

| 90°                                                                               | Splitter                                                                          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |



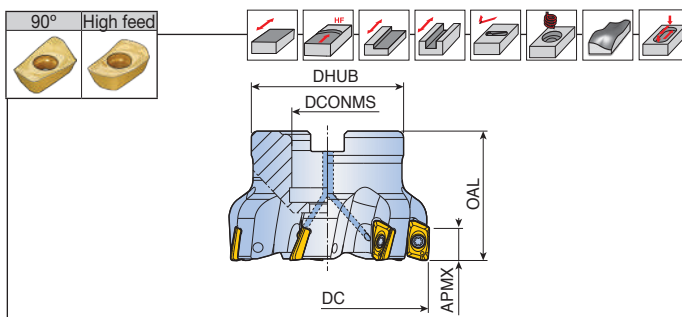
90°

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## Spare parts

| Designation        | Screw                                                                               | Wrench                                                                              |  |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                    |  |  |  |  |  |
| <b>SCRM90TN-18</b> | TS 40B100I                                                                          | T-T15                                                                               |  |  |  |
| <b>SCRM90TN-22</b> | TS 45I20I                                                                           | T-T20                                                                               |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |



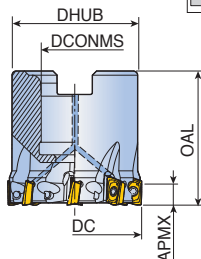
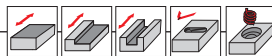
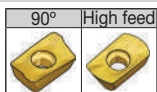


- ▶ When using the "AVKT 1004R-HF" insert, the cutter body needs to be modified to a corner radius of 3.0 mm
- ▶ For "AVKT 10" inserts with a corner radius larger than 1.6 mm ( $RE > 1.6$  mm), modify the cutter body corner radius as follows:  $R = RE + 0.2$  mm
- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation       | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                   |  |  |  |  |  |
| <b>TFM90AV-10</b> | TS 30B062/HG-P                                                                      | TD 8P                                                                               |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |



**CHASEMILL**



90°

- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ For "AXMT 06" inserts with a corner radius larger than 1.0 mm ( $RE > 1.0$  mm), modify the cutter body corner radius as follows:  $R = RE - 0.1$  mm
- ▶ For "APKT 09" inserts with a corner radius larger than 2.0 mm ( $RE > 2.0$  mm), modify the cutter body corner radius as follows:  $R = RE - 0.2$  mm

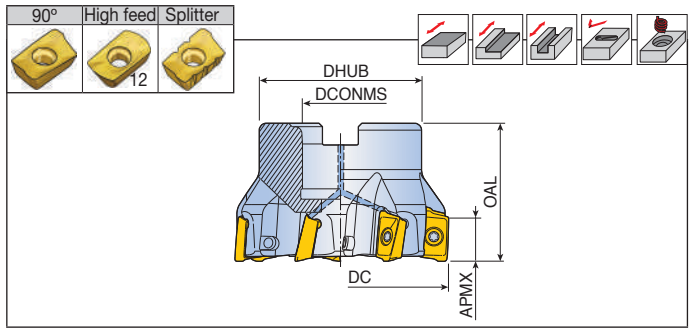
| Designation       | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                   |  |  |  |  |  |
| <b>TFM90AX</b>    | TS 18041I/HG                                                                        | TD 6P                                                                               |  |  |  |
| <b>2S-TFM90AP</b> | TS 25075I/HG                                                                        | TD 8                                                                                |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |



# TFM90AP-12/17



## Face mills

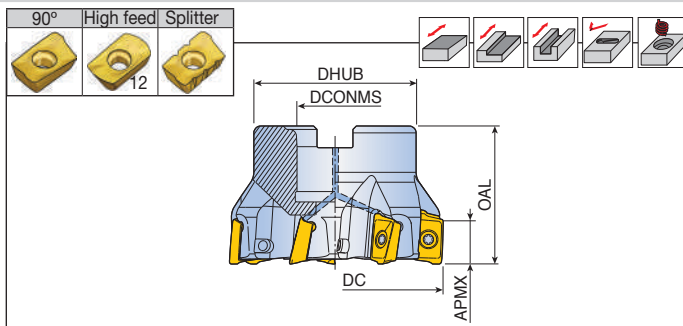


| Designation               |  | Dimension (mm) |        |      |     |      | Coolant hole | Arbor style |  Kg | Mounting bolt | Insert                                                                                                         |
|---------------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|--------------|-------------|--------------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------|
|                           |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX |              |             |                                                                                      |               |                                                                                                                |
| <b>TFM90AP 440-16R-12</b> | 4                                                                                 | 40             | 16     | 38   | 40  | 12   | ●            | A           | 0.2                                                                                  | SH M8x25      | APK(C)T 1204...<br> E267,E271 |
| <b>540-16R-12</b>         | 5                                                                                 | 40             | 16     | 38   | 40  | 12   | ●            | A           | 0.2                                                                                  | SH M8x25      |                                                                                                                |
| <b>550-22R-12</b>         | 5                                                                                 | 50             | 22     | 45   | 40  | 12   | ●            | A           | 0.3                                                                                  | SH M10x30     |                                                                                                                |
| <b>650-22R-12</b>         | 6                                                                                 | 50             | 22     | 45   | 40  | 12   | ●            | A           | 0.3                                                                                  | SH M10x30     |                                                                                                                |
| <b>563-22R-12</b>         | 5                                                                                 | 63             | 22     | 47   | 40  | 12   | ●            | A           | 0.5                                                                                  | SH M10x30     |                                                                                                                |
| <b>663-22R-12</b>         | 6                                                                                 | 63             | 22     | 47   | 40  | 12   | ●            | A           | 0.5                                                                                  | SH M10x30     |                                                                                                                |
| <b>763-22R-12</b>         | 7                                                                                 | 63             | 22     | 47   | 40  | 12   | ●            | A           | 0.5                                                                                  | SH M10x30     |                                                                                                                |
| <b>680-27R-12</b>         | 6                                                                                 | 80             | 27     | 58   | 50  | 12   | ●            | A           | 1.0                                                                                  | SH M10x25     |                                                                                                                |
| <b>880-27R-12</b>         | 8                                                                                 | 80             | 27     | 58   | 50  | 12   | ●            | A           | 1.0                                                                                  | SH M10x25     |                                                                                                                |
| <b>TFM90AP 440-16R-17</b> | 4                                                                                 | 40             | 16     | 38   | 40  | 16.1 | ●            | A           | 0.3                                                                                  | SH M8x30      | APK(C)T 1705...<br> E268-E269 |
| <b>350-22R-17-B</b>       | 3                                                                                 | 50             | 22     | 45   | 40  | 16.1 | ●            | A           | 0.4                                                                                  | SH M10x30     |                                                                                                                |
| <b>450-22R-17-B</b>       | 4                                                                                 | 50             | 22     | 45   | 40  | 16.1 | ●            | A           | 0.3                                                                                  | SH M10x30     |                                                                                                                |
| <b>550-22R-17</b>         | 5                                                                                 | 50             | 22     | 45   | 40  | 16.1 | ●            | A           | 0.4                                                                                  | SH M10x30     |                                                                                                                |
| <b>463-22R-17-B</b>       | 4                                                                                 | 63             | 22     | 47   | 40  | 16.1 | ●            | A           | 0.5                                                                                  | SH M10x30     |                                                                                                                |
| <b>663-22R-17</b>         | 6                                                                                 | 63             | 22     | 47   | 50  | 16.1 | ●            | A           | 0.5                                                                                  | SH M10x30     |                                                                                                                |
| <b>480-27R-17-B</b>       | 4                                                                                 | 80             | 27     | 58   | 50  | 16.1 | ●            | A           | 0.8                                                                                  | SH M12x35     |                                                                                                                |
| <b>680-27R-17</b>         | 6                                                                                 | 80             | 27     | 58   | 50  | 16.1 | ●            | A           | 0.9                                                                                  | SH M12x35     |                                                                                                                |
| <b>780-27R-17</b>         | 7                                                                                 | 80             | 27     | 58   | 50  | 16.1 | ●            | A           | 0.9                                                                                  | SH M12x35     |                                                                                                                |
| <b>6100-32R-17-B</b>      | 6                                                                                 | 100            | 32     | 85   | 50  | 16.1 | ●            | A           | 1.3                                                                                  | LH M16x35     |                                                                                                                |
| <b>8100-32R-17</b>        | 8                                                                                 | 100            | 32     | 85   | 50  | 16.1 | ●            | A           | 1.5                                                                                  | LH M16x35     |                                                                                                                |
| <b>7125-40R-17-B</b>      | 7                                                                                 | 125            | 40     | 85   | 63  | 16.1 | ●            | A           | 2.9                                                                                  | SH M20x40     |                                                                                                                |
| <b>8125-40R-17</b>        | 8                                                                                 | 125            | 40     | 85   | 63  | 16.1 | ●            | A           | 3.0                                                                                  | SH M20x40     |                                                                                                                |
| <b>9125-40R-17</b>        | 9                                                                                 | 125            | 40     | 85   | 63  | 16.1 | ●            | A           | 3.1                                                                                  | SH M20x40     |                                                                                                                |
| <b>8160-40R-17-B</b>      | 8                                                                                 | 160            | 40     | 110  | 63  | 16.1 | x            | C           | 4.1                                                                                  | -             |                                                                                                                |
| <b>10160-40R-17</b>       | 10                                                                                | 160            | 40     | 110  | 63  | 16.1 | x            | C           | 4.2                                                                                  | -             |                                                                                                                |
| <b>12200-60R-17</b>       | 12                                                                                | 200            | 60     | 130  | 63  | 16.1 | x            | C           | 6.1                                                                                  | -             |                                                                                                                |
|                           |                                                                                   |                |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |
|                           |                                                                                   |                |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |
|                           |                                                                                   |                |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |
|                           |                                                                                   |                |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |
|                           |                                                                                   |                |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |
|                           |                                                                                   |                |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |

- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ For "APKT 12" inserts with a corner radius larger than 1.6 mm ( $RE > 1.6$  mm), modify the cutter body corner radius as follows:  $R = RE - 0.5$  mm
- ▶ For "APKT 17" inserts with a corner radius larger than 1.6 mm ( $RE > 1.6$  mm), modify the cutter body corner radius as follows:  $R = RE - 0.8$  mm



**CHASEMILL**

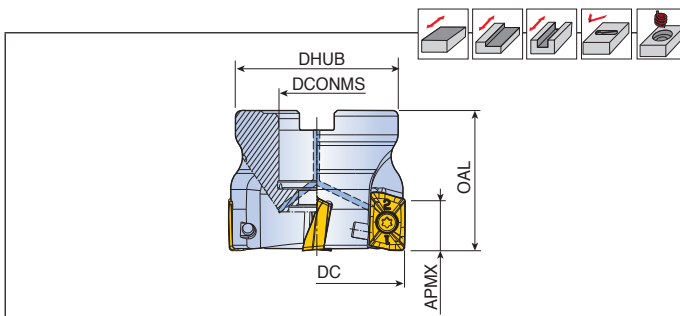
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- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ For "APKT 12" inserts with a corner radius larger than 1.6 mm ( $RE > 1.6$  mm), modify the cutter body corner radius as follows:  $R = RE - 0.5$  mm
- ▶ For "APKT 17" inserts with a corner radius larger than 1.6 mm ( $RE > 1.6$  mm), modify the cutter body corner radius as follows:  $R = RE - 0.8$  mm

| Designation                 | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|-----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                             |  |  |  |  |  |
| <b>TFM90AP-12</b>           | TS 35A088I/HG                                                                       | TD 10P                                                                              | -                                                                                   |  |  |
| <b>TFM90AP-17</b> (Ø40-Ø63) | TS 40093I/HG                                                                        | -                                                                                   | T-T15                                                                               |  |  |
| <b>TFM90AP-17</b> (Ø80-)    | TS 40120I/HG                                                                        | -                                                                                   | T-T15                                                                               |  |  |
|                             |                                                                                     |                                                                                     |                                                                                     |  |  |



**CHASE MILL**



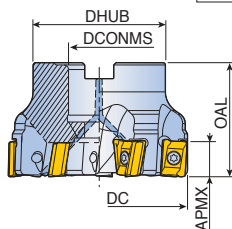
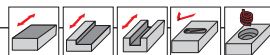
► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation          | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                      |  |  |  |  |  |
| <b>2S-TFM90AP-19</b> | TS 50115I                                                                           | T-T20                                                                               |  |  |  |
|                      |                                                                                     |                                                                                     |  |  |  |
|                      |                                                                                     |                                                                                     |  |  |  |
|                      |                                                                                     |                                                                                     |  |  |  |



# TFM90AN-11/16

## Face mills



| Designation        |  | Dimension (mm) |        |      |     |      | Coolant hole | Arbor style |  Kg | Mounting bolt | Insert                                                                                                    |           |
|--------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|--------------|-------------|--------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------|-----------|
|                    |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX |              |             |                                                                                      |               |                                                                                                           |           |
| TFM90AN 440-16R-11 | 4                                                                                 | 40             | 16     | 38   | 40  | 11   | ●            | A           | 0.2                                                                                  | SH M8x30      | ANM(H)X 1106...<br> E265 |           |
|                    | 450-22R-11                                                                        | 4              | 50     | 22   | 45  | 40   | 11           | ●           | A                                                                                    | 0.3           |                                                                                                           | SH M10x30 |
|                    | 650-22R-11                                                                        | 6              | 50     | 22   | 45  | 40   | 11           | ●           | A                                                                                    | 0.3           |                                                                                                           | SH M10x30 |
|                    | 563-22R-11                                                                        | 5              | 63     | 22   | 47  | 40   | 11           | ●           | A                                                                                    | 0.6           |                                                                                                           | SH M10x30 |
|                    | 763-22R-11                                                                        | 7              | 63     | 22   | 47  | 40   | 11           | ●           | A                                                                                    | 0.6           |                                                                                                           | SH M10x30 |
|                    | 880-27R-11                                                                        | 8              | 80     | 27   | 58  | 50   | 11           | ●           | A                                                                                    | 1.1           |                                                                                                           | SH M12x35 |
|                    | 1080-27R-11                                                                       | 10             | 80     | 27   | 58  | 50   | 11           | ●           | A                                                                                    | 1.1           |                                                                                                           | SH M12x35 |
|                    | 9100-32R-11                                                                       | 9              | 100    | 32   | 85  | 50   | 11           | ●           | A                                                                                    | 2.0           |                                                                                                           | SH M16x35 |
|                    | 12100-32R-11                                                                      | 12             | 100    | 32   | 85  | 50   | 11           | ●           | A                                                                                    | 2.0           |                                                                                                           | SH M16x35 |
|                    | 10125-40R-11                                                                      | 10             | 125    | 40   | 85  | 63   | 11           | ●           | A                                                                                    | 3.3           |                                                                                                           | SH M20x40 |
| 14125-40R-11       | 14                                                                                | 125            | 40     | 85   | 63  | 11   | ●            | A           | 3.4                                                                                  | SH M20x40     |                                                                                                           |           |
| TFM90AN 350-22R-16 | 3                                                                                 | 50             | 22     | 45   | 40  | 15   | ●            | A           | 0.4                                                                                  | SH M10x30     | ANM(H)X 1607...<br> E265 |           |
|                    | 450-22R-16                                                                        | 4              | 50     | 22   | 45  | 40   | 15           | ●           | A                                                                                    | 0.4           |                                                                                                           | SH M10x30 |
|                    | 463-22R-16                                                                        | 4              | 63     | 22   | 47  | 40   | 15           | ●           | A                                                                                    | 0.5           |                                                                                                           | SH M10x30 |
|                    | 663-22R-16                                                                        | 6              | 63     | 22   | 47  | 40   | 15           | ●           | A                                                                                    | 0.5           |                                                                                                           | SH M10x30 |
|                    | 580-27R-16                                                                        | 5              | 80     | 27   | 58  | 50   | 15           | ●           | A                                                                                    | 0.8           |                                                                                                           | SH M12x35 |
|                    | 680-27R-16                                                                        | 6              | 80     | 27   | 58  | 50   | 15           | ●           | A                                                                                    | 1.2           |                                                                                                           | SH M12x35 |
|                    | 780-27R-16                                                                        | 7              | 80     | 27   | 58  | 50   | 15           | ●           | A                                                                                    | 0.9           |                                                                                                           | SH M12x35 |
|                    | 5100-32R-16                                                                       | 5              | 100    | 32   | 85  | 50   | 15           | ●           | A                                                                                    | 1.3           |                                                                                                           | SH M16x35 |
|                    | 8100-32R-16                                                                       | 8              | 100    | 32   | 85  | 50   | 15           | ●           | A                                                                                    | 1.5           |                                                                                                           | SH M16x35 |
|                    | 7125-40R-16                                                                       | 7              | 125    | 40   | 85  | 63   | 15           | ●           | A                                                                                    | 3.9           |                                                                                                           | SH M20x40 |
|                    | 10125-40R-16                                                                      | 10             | 125    | 40   | 85  | 63   | 15           | ●           | A                                                                                    | 3.7           |                                                                                                           | SH M20x40 |
|                    | 8160-40R-16                                                                       | 8              | 160    | 40   | 110 | 63   | 15           | x           | C                                                                                    | 5.0           |                                                                                                           | -         |
|                    | 12160-40R-16                                                                      | 12             | 160    | 40   | 110 | 63   | 15           | x           | C                                                                                    | 5.3           |                                                                                                           | -         |
|                    | 14200-60R-16                                                                      | 14             | 200    | 60   | 130 | 63   | 15           | x           | C                                                                                    | 7.0           |                                                                                                           | -         |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

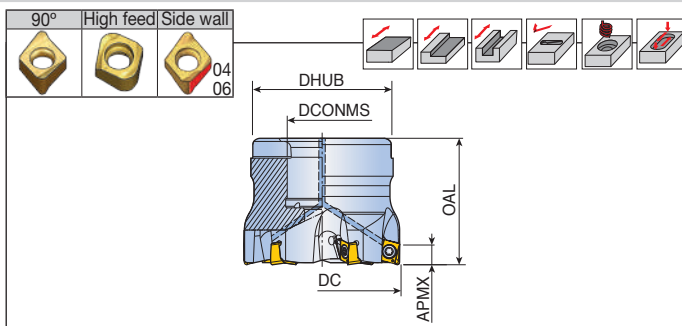
## Spare parts

| Designation       | Screw         | Wrench |       |  |  |
|-------------------|---------------|--------|-------|--|--|
|                   |               |        |       |  |  |
| <b>TFM90AN-11</b> | TS 35A088I/HG | TD 10P | -     |  |  |
| <b>TFM90AN-16</b> | TS 40120I     | -      | T-T15 |  |  |
|                   |               |        |       |  |  |
|                   |               |        |       |  |  |





## Face mills



| Designation                |  | Dimension (mm) |        |      |     |      | Coolant hole | Arbor style |  Kg | Mounting bolt | Insert                                                                                                           |
|----------------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|--------------|-------------|--------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------|
|                            |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX |              |             |                                                                                      |               |                                                                                                                  |
| <b>4N TF90- 832-16R-04</b> | 8                                                                                 | 32             | 16     | 30   | 32  | 3.5  | ●            | A           | 0.1                                                                                  | SH M8x25      | 4NK(H)T 0402....<br> E258-E260 |
| <b>1040-16R-04</b>         | 10                                                                                | 40             | 16     | 38   | 40  | 3.5  | ●            | A           | 0.2                                                                                  | SH M8x25      |                                                                                                                  |
| <b>4N TF90- 432-16R-06</b> | 4                                                                                 | 32             | 16     | 30   | 32  | 6.0  | ●            | A           | 0.1                                                                                  | SH M8x25      | 4NK(H)T 0603....<br> E258-E260 |
| <b>532-16R-06</b>          | 5                                                                                 | 32             | 16     | 30   | 32  | 6.0  | ●            | A           | 0.1                                                                                  | SH M8x25      |                                                                                                                  |
| <b>540-16R-06</b>          | 5                                                                                 | 40             | 16     | 38   | 40  | 6.0  | ●            | A           | 0.3                                                                                  | SH M8x25      |                                                                                                                  |
| <b>640-16R-06</b>          | 6                                                                                 | 40             | 16     | 38   | 40  | 6.0  | ●            | A           | 0.3                                                                                  | SH M8x25      |                                                                                                                  |
| <b>650-22R-06</b>          | 6                                                                                 | 50             | 22     | 45   | 40  | 6.0  | ●            | A           | 0.4                                                                                  | SH M10x30     |                                                                                                                  |
| <b>750-22R-06</b>          | 7                                                                                 | 50             | 22     | 47   | 40  | 6.0  | ●            | A           | 0.4                                                                                  | SH M10x30     |                                                                                                                  |
| <b>752-22R-06</b>          | 7                                                                                 | 52             | 22     | 47   | 40  | 6.0  | ●            | A           | 0.4                                                                                  | SH M10x30     |                                                                                                                  |
| <b>763-22R-06</b>          | 7                                                                                 | 63             | 22     | 47   | 40  | 6.0  | ●            | A           | 0.6                                                                                  | SH M10x30     |                                                                                                                  |
| <b>863-22R-06</b>          | 8                                                                                 | 63             | 22     | 47   | 40  | 6.0  | ●            | A           | 0.6                                                                                  | SH M10x30     |                                                                                                                  |
| <b>866-27R-06</b>          | 8                                                                                 | 66             | 27     | 58   | 50  | 6.0  | ●            | A           | 0.8                                                                                  | SH M10x30     |                                                                                                                  |
| <b>4N TF90- 540-16R-09</b> | 5                                                                                 | 40             | 16     | 38   | 40  | 8.0  | ●            | A           | 0.3                                                                                  | SH M8x25      | 4NK(H)T 0904...<br> E258-E260  |
| <b>650-22R-09</b>          | 6                                                                                 | 50             | 22     | 45   | 40  | 8.0  | ●            | A           | 0.3                                                                                  | LH M10x25     |                                                                                                                  |
| <b>563-22R-09</b>          | 5                                                                                 | 63             | 22     | 47   | 40  | 8.0  | ●            | A           | 0.5                                                                                  | LH M10x25     |                                                                                                                  |
| <b>763-22R-09</b>          | 7                                                                                 | 63             | 22     | 47   | 40  | 8.0  | ●            | A           | 0.5                                                                                  | LH M10x25     |                                                                                                                  |
| <b>780-27R-09</b>          | 7                                                                                 | 80             | 27     | 58   | 50  | 8.0  | ●            | A           | 1.0                                                                                  | SH M12x35     |                                                                                                                  |
| <b>980-27R-09</b>          | 9                                                                                 | 80             | 27     | 58   | 50  | 8.0  | ●            | A           | 1.1                                                                                  | SH M12x35     |                                                                                                                  |
| <b>9100-32R-09</b>         | 9                                                                                 | 100            | 32     | 85   | 50  | 8.0  | ●            | A           | 1.9                                                                                  | SH M16x35     |                                                                                                                  |
| <b>10125-40R-09</b>        | 10                                                                                | 125            | 40     | 85   | 63  | 8.0  | ●            | A           | 3.0                                                                                  | SH M20x40     |                                                                                                                  |

- ▶ Cutter body for '4NKT 040212R-HF' insert should be modified with body corner radius 1.2 mm
- ▶ Cutter body for '4NKT 060320R-HF' and '4NHT 060320R-F' inserts should be modified with body corner radius 2.0 mm
- ▶ Cutter body for '4NKT 090432R-HF' insert should be modified with body corner radius 3.2 mm
- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

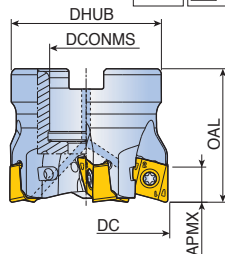
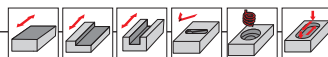
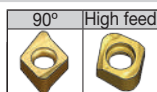
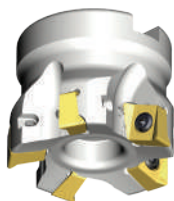
| Designation       | Screw         | Wrench |              | Wrench handle |  |
|-------------------|---------------|--------|--------------|---------------|--|
|                   |               |        |              |               |  |
| <b>4N TF90-04</b> | TS 180411/HG  | TD 6P  | -            | -             |  |
| <b>4N TF90-06</b> | TS 30B0681/HG | TD 8   | -            | -             |  |
| <b>4N TF90-09</b> | TS 35A0881/HG | -      | TBLD T10P-W6 | THND 6W       |  |
|                   |               |        |              |               |  |
|                   |               |        |              |               |  |



# 4N TF90-11/14



## Face mills



| Designation                |    | Dimension (mm) |        |      |     |      |   | Coolant hole | Arbor style | Kg        | Mounting bolt | Insert                    |
|----------------------------|----|----------------|--------|------|-----|------|---|--------------|-------------|-----------|---------------|---------------------------|
|                            |    | DC             | DCONMS | DHUB | OAL | APMX |   |              |             |           |               |                           |
| <b>4N TF90- 440-16R-11</b> | 4  | 40             | 16     | 38   | 40  | 10.5 | ● | A            | 0.2         | SH M8x30  |               | 4NKT 1106...<br>E258-E260 |
| <b>450-22R-11</b>          | 4  | 50             | 22     | 45   | 40  | 10.5 | ● | A            | 0.3         | LH M10x25 |               |                           |
| <b>550-22R-11</b>          | 5  | 50             | 22     | 45   | 40  | 10.5 | ● | A            | 0.3         | LH M10x25 |               |                           |
| <b>463-22R-11</b>          | 4  | 63             | 22     | 47   | 40  | 10.5 | ● | A            | 0.6         | LH M10x25 |               |                           |
| <b>663-22R-11</b>          | 6  | 63             | 22     | 47   | 40  | 10.5 | ● | A            | 0.5         | LH M10x25 |               |                           |
| <b>480-27R-11</b>          | 4  | 80             | 27     | 58   | 50  | 10.5 | ● | A            | 1.1         | SH M12x35 |               |                           |
| <b>680-27R-11</b>          | 6  | 80             | 27     | 58   | 50  | 10.5 | ● | A            | 1.0         | SH M12x35 |               |                           |
| <b>880-27R-11</b>          | 8  | 80             | 27     | 58   | 50  | 10.5 | ● | A            | 1.0         | SH M12x35 |               |                           |
| <b>9100-32R-11</b>         | 9  | 100            | 32     | 85   | 50  | 10.5 | ● | A            | 1.9         | SH M16x35 |               |                           |
| <b>10125-40R-11</b>        | 10 | 125            | 40     | 85   | 63  | 10.5 | ● | A            | 3.1         | SH M20x40 |               |                           |
| <b>4N TF90- 450-22R-14</b> | 4  | 50             | 22     | 45   | 45  | 13.8 | ● | A            | 0.4         | SH M10x25 |               | 4NKT 1407...<br>E258-E260 |
| <b>463-22R-14</b>          | 4  | 63             | 22     | 47   | 45  | 13.8 | ● | A            | 0.6         | SH M10x25 |               |                           |
| <b>663-22R-14</b>          | 6  | 63             | 22     | 47   | 45  | 13.8 | ● | A            | 0.6         | SH M10x25 |               |                           |
| <b>580-27R-14</b>          | 5  | 80             | 27     | 58   | 50  | 13.8 | ● | A            | 1.0         | SH M12x35 |               |                           |
| <b>780-27R-14</b>          | 7  | 80             | 27     | 58   | 50  | 13.8 | ● | A            | 1.0         | SH M12x35 |               |                           |
| <b>8100-32R-14</b>         | 8  | 100            | 32     | 85   | 50  | 13.8 | ● | A            | 1.9         | SH M16x35 |               |                           |
| <b>9125-40R-14</b>         | 9  | 125            | 40     | 85   | 63  | 13.8 | ● | A            | 3.0         | SH M20x40 |               |                           |
| <b>10160-40R-14</b>        | 10 | 160            | 40     | 110  | 63  | 13.8 | X | C            | 4.1         | -         |               |                           |
| <b>12200-60R-14</b>        | 12 | 200            | 60     | 130  | 63  | 13.8 | X | C            | 5.8         | -         |               |                           |

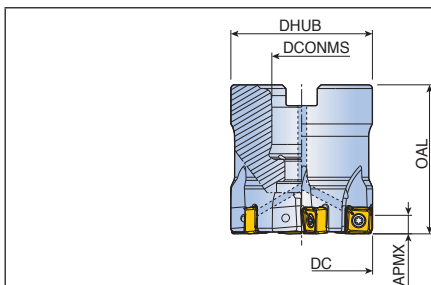
- ▶ Cutter body for '4NKT 110640R-HF' insert should be modified with body corner radius 4.0 mm
- ▶ Cutter body for '4NKT 140750R-HF' insert should be modified with body corner radius 5.0 mm
- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation       | Screw         | Wrench      | Wrench handle |  |  |
|-------------------|---------------|-------------|---------------|--|--|
|                   |               |             |               |  |  |
| <b>4N TF90-11</b> | TS 400931/HG  | TBLD T15-W6 | SW6-T         |  |  |
| <b>4N TF90-14</b> | TS 50A1211/HG | TBLD T20-W6 | SW6-T         |  |  |
|                   |               |             |               |  |  |
|                   |               |             |               |  |  |



**CHASE 8 MILL**  
90° FACING & SHOULDERING



-M / -ML

90°

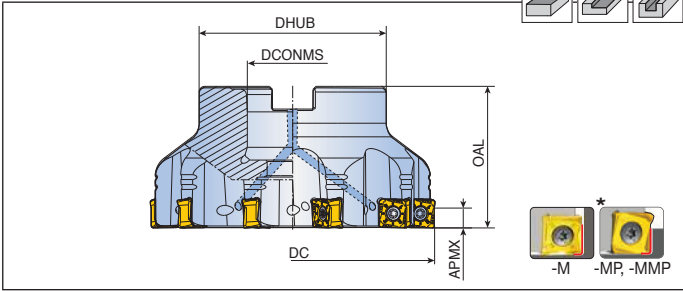
► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation       | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                   |  |  |  |  |  |
| <b>8D-TF90-07</b> | TS 25D060/HG-P                                                                      | TD 7P                                                                               |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |



# 8D-TF90-10

Face mills



| Designation                |  | Dimension (mm) |        |      |     |                   | Coolant hole | Arbor type |  Kg | Mounting bolt | Insert                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|-------------------|--------------|------------|--------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------|
|                            |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX              |              |            |                                                                                      |               |                                                                                                                              |
| <b>8D-TF90- 440-16R-10</b> | 4                                                                                 | 40             | 16     | 38   | 40  | 7.0 <sup>**</sup> | ●            | A          | 0.2                                                                                  | SH M8x25      | <div>SQK(H)U 1004...</div> <div> E305</div> |
| <b>550-22R-10</b>          | 5                                                                                 | 50             | 22     | 45   | 40  | 7.0 <sup>**</sup> | ●            | A          | 0.3                                                                                  | SH M10x30     |                                                                                                                              |
| <b>663-22R-10</b>          | 6                                                                                 | 63             | 22     | 47   | 40  | 7.0 <sup>**</sup> | ●            | A          | 0.5                                                                                  | SH M10x30     |                                                                                                                              |
| <b>863-22R-10</b>          | 8                                                                                 | 63             | 22     | 47   | 40  | 7.0 <sup>**</sup> | ●            | A          | 0.5                                                                                  | SH M10x30     |                                                                                                                              |
| <b>1063-22R-10</b>         | 10                                                                                | 63             | 22     | 47   | 40  | 7.0 <sup>**</sup> | ●            | A          | 0.6                                                                                  | SH M10x30     |                                                                                                                              |
| <b>880-27R-10</b>          | 8                                                                                 | 80             | 27     | 58   | 50  | 7.0 <sup>**</sup> | ●            | A          | 1.1                                                                                  | SH M12x35     |                                                                                                                              |
| <b>1080-27R-10</b>         | 10                                                                                | 80             | 27     | 58   | 50  | 7.0 <sup>**</sup> | ●            | A          | 1.1                                                                                  | SH M12x35     |                                                                                                                              |
| <b>10100-32R-10</b>        | 10                                                                                | 100            | 32     | 66   | 50  | 7.0 <sup>**</sup> | ●            | A          | 1.6                                                                                  | SH M16x35     |                                                                                                                              |
| <b>14100-32R-10</b>        | 14                                                                                | 100            | 32     | 66   | 50  | 7.0 <sup>**</sup> | ●            | A          | 1.7                                                                                  | SH M16x35     |                                                                                                                              |
| <b>12125-40R-10</b>        | 12                                                                                | 125            | 40     | 85   | 63  | 7.0 <sup>**</sup> | ●            | A          | 3.4                                                                                  | SH M20x40     |                                                                                                                              |
| <b>16125-40R-10</b>        | 16                                                                                | 125            | 40     | 85   | 63  | 7.0 <sup>**</sup> | ●            | A          | 3.5                                                                                  | SH M20x40     |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |
|                            |                                                                                   |                |        |      |     |                   |              |            |                                                                                      |               |                                                                                                                              |

- Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)  
► \*:Multi-Step milling is not recommended over the APMX ► \*\*:When applying SQHU insert, APMX is 6.5 mm.

## Spare parts

| Designation       | Screw         | Wrench |  |  |  |
|-------------------|---------------|--------|--|--|--|
|                   |               |        |  |  |  |
| <b>8D-TF90-10</b> | TS 35A088I/HG | TD 10P |  |  |  |
|                   |               |        |  |  |  |
|                   |               |        |  |  |  |
|                   |               |        |  |  |  |
|                   |               |        |  |  |  |

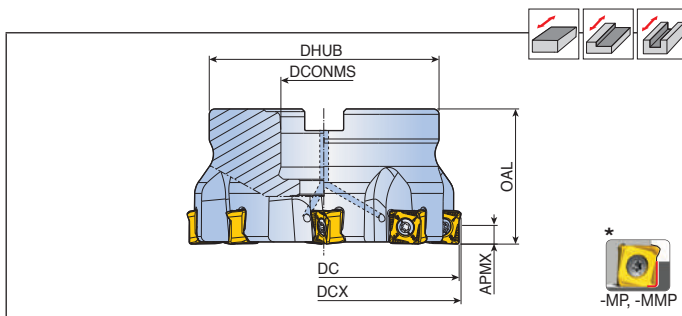
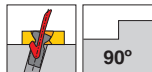
E352-E325

E326-E327

E328

# 8D-TF90-12

## Face mills



| Designation               |    | Dimension (mm) |       |        |      |     |       | Coolant Arbor |       | Kg  | Mounting bolt | Insert                     |
|---------------------------|----|----------------|-------|--------|------|-----|-------|---------------|-------|-----|---------------|----------------------------|
|                           |    | DC             | DCX   | DCONMS | DHUB | OAL | APMX  | hole          | style |     |               |                            |
| <b>8D-TF90-340-16R-12</b> | 3  | 40             | 41.3  | 16     | 38   | 40  | 8.5** | ●             | E     | 0.3 | KTB 32B       | SQK(H)U<br>1206...<br>E305 |
| <b>440-16R-12</b>         | 4  | 40             | 41.3  | 16     | 38   | 40  | 8.5** | ●             | E     | 0.3 | KTB 32B       |                            |
| <b>450-22R-12</b>         | 4  | 50             | 51.3  | 22     | 45   | 40  | 8.5** | ●             | A     | 0.3 | SH M10x30     |                            |
| <b>650-22R-12</b>         | 6  | 50             | 51.3  | 22     | 45   | 40  | 8.5** | ●             | A     | 0.4 | SH M10x30     |                            |
| <b>563-22R-12</b>         | 5  | 63             | 64.3  | 22     | 47   | 40  | 8.5** | ●             | A     | 0.5 | SH M10x30     |                            |
| <b>863-22R-12</b>         | 8  | 63             | 64.3  | 22     | 47   | 40  | 8.5** | ●             | A     | 0.6 | SH M10x30     |                            |
| <b>680-27R-12</b>         | 6  | 80             | 81.3  | 27     | 58   | 50  | 8.5** | ●             | A     | 1.1 | SH M12x35     |                            |
| <b>680-25.4R-12</b>       | 6  | 80             | 81.3  | 25.4   | 70   | 50  | 8.5** | ●             | A     | 1.3 | SH M12x35     |                            |
| <b>980-27R-12</b>         | 9  | 80             | 81.3  | 27     | 58   | 50  | 8.5** | ●             | A     | 1.2 | SH M12x35     |                            |
| <b>1180-27R-12</b>        | 11 | 80             | 81.3  | 27     | 58   | 50  | 8.5** | ●             | A     | 1.2 | SH M12x35     |                            |
| <b>8100-32R-12</b>        | 8  | 100            | 101.3 | 32     | 66   | 50  | 8.5** | ●             | A     | 1.6 | SH M16x35     |                            |
| <b>8100-31.75R-12</b>     | 8  | 100            | 101.3 | 31.75  | 80   | 50  | 8.5** | x             | B     | 1.8 | -             |                            |
| <b>11100-32R-12</b>       | 11 | 100            | 101.3 | 32     | 66   | 50  | 8.5** | ●             | A     | 1.7 | SH M16x35     |                            |
| <b>14100-32R-12</b>       | 14 | 100            | 101.3 | 32     | 66   | 50  | 8.5** | ●             | A     | 1.7 | SH M16x35     |                            |
| <b>10125-40R-12</b>       | 10 | 125            | 126.3 | 40     | 85   | 63  | 8.5** | ●             | A     | 3.4 | SH M20x40     |                            |
| <b>10125-38.1R-12</b>     | 10 | 125            | 126.3 | 38.1   | 80   | 63  | 8.5** | x             | B     | 3.0 | -             |                            |
| <b>18125-40R-12</b>       | 18 | 125            | 126.3 | 40     | 85   | 63  | 8.5** | ●             | A     | 3.5 | SH M20x40     |                            |
| <b>12160-40R-12</b>       | 12 | 160            | 161.3 | 40     | 110  | 63  | 8.5** | x             | C     | 4.7 | -             |                            |
| <b>12160-50.8R-12</b>     | 12 | 160            | 161.3 | 50.8   | 100  | 63  | 8.5** | x             | B     | 4.9 | -             |                            |
| <b>22160-40R-12</b>       | 22 | 160            | 161.3 | 40     | 110  | 63  | 8.5** | x             | C     | 4.9 | -             |                            |

► DC: Cutting diameter      ► DCX: Cutting diameter maximum

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

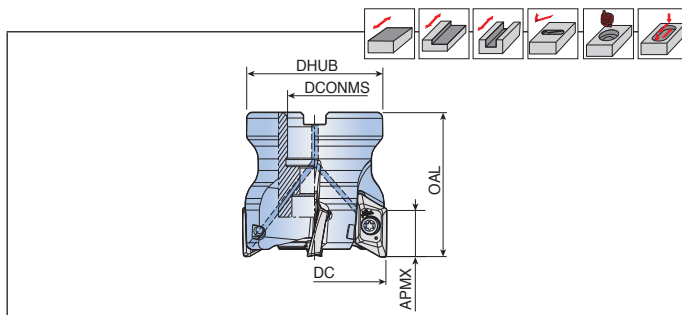
► \*: Multi-Step milling is not recommended over the APMX      ► \*\*: When applying SQHU insert, APMX is 8.0mm.

## Spare parts

| Designation       | Screw        | Wrench      | Wrench handle |  |  |
|-------------------|--------------|-------------|---------------|--|--|
| <b>8D-TF90-12</b> | TS 40M100/HG | TBLD T15-W6 | SW6-T         |  |  |
|                   |              |             |               |  |  |
|                   |              |             |               |  |  |
|                   |              |             |               |  |  |



## Face mills



| Designation                |  | Dimension (mm) |        |      |     |      | Coolant<br>hole | Arbor<br>style | Max<br>RPM |  | Mounting<br>bolt | Insert                                                                                                                    |
|----------------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|-----------------|----------------|------------|-----------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------|
|                            |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX |                 |                |            |                                                                                   |                  |                                                                                                                           |
| <b>TFM90XEV 340-16R-16</b> | 3                                                                                 | 40             | 16     | 38   | 50  | 16   | ●               | A              | 41,200     | 0.2                                                                               | SH M8x35-C       | <div>XEVT 1605...</div> <div> E315</div> |
| <b>350-22R-16</b>          | 3                                                                                 | 50             | 22     | 47   | 50  | 16   | ●               | A              | 41,200     | 0.3                                                                               | SH M8x35-C       |                                                                                                                           |
| <b>363-22R-16</b>          | 3                                                                                 | 63             | 22     | 47   | 50  | 16   | ●               | A              | 41,200     | 0.5                                                                               | SH M8x35-C       |                                                                                                                           |
| <b>450-22R-16</b>          | 4                                                                                 | 50             | 22     | 45   | 50  | 16   | ●               | A              | 36,800     | 0.3                                                                               | SH M10x30-C      |                                                                                                                           |
| <b>563-22R-16</b>          | 5                                                                                 | 63             | 22     | 47   | 50  | 16   | ●               | A              | 32,700     | 0.5                                                                               | SH M10x30-C      |                                                                                                                           |
| <b>480-27R-16</b>          | 4                                                                                 | 80             | 27     | 58   | 50  | 16   | ●               | A              | 29,000     | 0.9                                                                               | LH M12x30-C      |                                                                                                                           |
| <b>580-27R-16</b>          | 5                                                                                 | 80             | 27     | 58   | 50  | 16   | ●               | A              | 29,000     | 0.9                                                                               | LH M12x30-C      |                                                                                                                           |
| <b>680-27R-16</b>          | 6                                                                                 | 80             | 27     | 58   | 50  | 16   | ●               | A              | 29,000     | 0.8                                                                               | LH M12x30-C      |                                                                                                                           |
| <b>6100-32R-16</b>         | 6                                                                                 | 100            | 32     | 66   | 63  | 16   | ●               | A              | 26,000     | 1.6                                                                               | SH M16x35-C      |                                                                                                                           |
| <b>7125-40R-16</b>         | 7                                                                                 | 125            | 40     | 85   | 63  | 16   | ●               | A              | 23,200     | 2.5                                                                               | SH M20x40-C      |                                                                                                                           |
| <b>8160-40R-16</b>         | 8                                                                                 | 160            | 40     | 110  | 63  | 16   | x               | C              | 20,000     | 3.8                                                                               | -                |                                                                                                                           |
|                            |                                                                                   |                |        |      |     |      |                 |                |            |                                                                                   |                  |                                                                                                                           |
| <b>TFM90XEV 350-22R-22</b> | 3                                                                                 | 50             | 22     | 45   | 55  | 21   | ●               | A              | 31,400     | 0.4                                                                               | SH M10x30-C      | <div>XEVT 2206...</div> <div> E315</div> |
| <b>463-22R-22</b>          | 4                                                                                 | 63             | 22     | 47   | 55  | 21   | ●               | A              | 28,000     | 0.6                                                                               | SH M10x30-C      |                                                                                                                           |
| <b>580-27R-22</b>          | 5                                                                                 | 80             | 27     | 58   | 55  | 21   | ●               | A              | 24,800     | 1.0                                                                               | LH M12x30-C      |                                                                                                                           |
| <b>6100-32R-22</b>         | 6                                                                                 | 100            | 32     | 85   | 63  | 21   | ●               | A              | 22,200     | 2.1                                                                               | SH M16x35-C      |                                                                                                                           |
| <b>7125-40R-22</b>         | 7                                                                                 | 125            | 40     | 85   | 63  | 21   | ●               | A              | 19,900     | 2.8                                                                               | SH M20x40-C      |                                                                                                                           |
|                            |                                                                                   |                |        |      |     |      |                 |                |            |                                                                                   |                  |                                                                                                                           |
|                            |                                                                                   |                |        |      |     |      |                 |                |            |                                                                                   |                  |                                                                                                                           |
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|                            |                                                                                   |                |        |      |     |      |                 |                |            |                                                                                   |                  |                                                                                                                           |

► For "XEVT" inserts with a corner radius larger than 3.2 mm ( $RE > 3.2$  mm), modify the cutter body corner radius as follows:  $R = RE - 0.3$  mm

## Spare parts

| Designation        | Screw        | Wrench |  |  |  |
|--------------------|--------------|--------|--|--|--|
|                    |              |        |  |  |  |
| <b>TFM90XEV-16</b> | TS 400931/HG | T-T15  |  |  |  |
| <b>TFM90XEV-22</b> | TS 50115I    | T-T20  |  |  |  |
|                    |              |        |  |  |  |
|                    |              |        |  |  |  |
|                    |              |        |  |  |  |



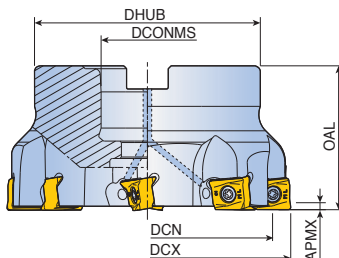
E352-E325

E326-E327

E328

E380-E384

# CHASE 4 FINISH



- ▶ DCN: Cutting diameter minimum
- ▶ DCX: Cutting diameter maximum

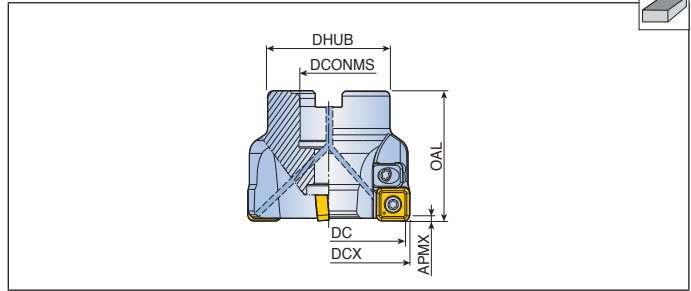
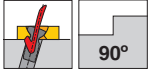
| Designation       | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                   |  |  |  |  |  |
| <b>4W-TF90-12</b> | TS 40A115I                                                                          | TBLD T15-W6                                                                         | SW6-T                                                                               |  |  |
|                   |                                                                                     |                                                                                     |                                                                                     |  |  |
|                   |                                                                                     |                                                                                     |                                                                                     |  |  |
|                   |                                                                                     |                                                                                     |                                                                                     |  |  |
|                   |                                                                                     |                                                                                     |                                                                                     |  |  |



# TFM90SNS-12



Face mills for finishing



| Designation                |    | Dimension (mm) |        |        |      |     |      | Coolant hole | Arbor style | Kg   | Mounting bolt | Insert                                     |
|----------------------------|----|----------------|--------|--------|------|-----|------|--------------|-------------|------|---------------|--------------------------------------------|
|                            |    | DCX            | DC     | DCONMS | DHUB | OAL | APMX |              |             |      |               |                                            |
| <b>TFM90SNS 350-22R-12</b> | 3  | 50             | 43.35  | 22     | 45   | 50  | 1.0  | ●            | A           | 0.5  | SH M10x40     | SNEX<br>1204...<br>SNET<br>1205...<br>E299 |
| <b>463-22R-12</b>          | 4  | 63             | 56.35  | 22     | 47   | 50  | 1.0  | ●            | A           | 0.7  | SH M10x40     |                                            |
| <b>680-27R-12</b>          | 6  | 80             | 73.35  | 27     | 58   | 50  | 1.0  | ●            | A           | 1.0  | SH M12x35     |                                            |
| <b>8100-32R-12</b>         | 8  | 100            | 93.35  | 32     | 66   | 63  | 1.0  | ●            | A           | 2.0  | SH M16x30     |                                            |
| <b>12100-32R-12</b>        | 12 | 100            | 93.35  | 32     | 66   | 63  | 1.0  | ●            | A           | 2.0  | SH M16x30     |                                            |
| <b>10125-40R-12</b>        | 10 | 125            | 118.35 | 40     | 85   | 63  | 1.0  | x            | B           | 2.9  | -             |                                            |
| <b>16125-40R-12</b>        | 16 | 125            | 118.35 | 40     | 85   | 63  | 1.0  | x            | B           | 2.9  | -             |                                            |
| <b>12160-40R-12</b>        | 12 | 160            | 153.35 | 40     | 110  | 63  | 1.0  | x            | C           | 4.4  | -             |                                            |
| <b>20160-40R-12</b>        | 20 | 160            | 153.35 | 40     | 110  | 63  | 1.0  | x            | C           | 4.4  | -             |                                            |
| <b>16200-60R-12</b>        | 16 | 200            | 193.35 | 60     | 130  | 63  | 1.0  | x            | C           | 6.0  | -             |                                            |
| <b>24200-60R-12</b>        | 24 | 200            | 193.35 | 60     | 130  | 63  | 1.0  | x            | C           | 6.0  | -             |                                            |
| <b>30250-60R-12</b>        | 30 | 250            | 243.35 | 60     | 160  | 63  | 1.0  | x            | C           | 10.8 | -             |                                            |
|                            |    |                |        |        |      |     |      |              |             |      |               |                                            |
|                            |    |                |        |        |      |     |      |              |             |      |               |                                            |
|                            |    |                |        |        |      |     |      |              |             |      |               |                                            |
|                            |    |                |        |        |      |     |      |              |             |      |               |                                            |
|                            |    |                |        |        |      |     |      |              |             |      |               |                                            |
|                            |    |                |        |        |      |     |      |              |             |      |               |                                            |
|                            |    |                |        |        |      |     |      |              |             |      |               |                                            |
|                            |    |                |        |        |      |     |      |              |             |      |               |                                            |

- Recommend to very stable machining condition at cast iron & steel
- Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

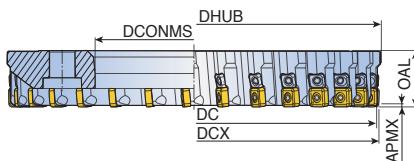
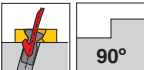
## Spare parts

| Designation        | Screw      | Adj. wedge | Adj. screw | Wrench |  |
|--------------------|------------|------------|------------|--------|--|
| <b>TFM90SNS-12</b> | TS 35C110I | AJS 1010R  | AWS 0620   | T-T15  |  |
|                    |            |            |            |        |  |
|                    |            |            |            |        |  |
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|                    |            |            |            |        |  |





# CHASE 2 QUAD

[illegible]

## Spare parts

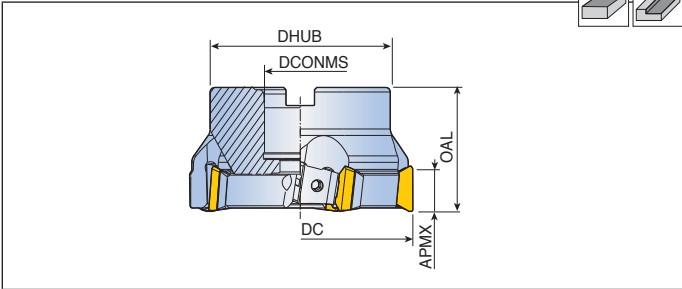
| Designation       | Screw                                                                               | Adj. wedge                                                                          | Adj. screw                                                                          | Wrench                                                                              |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                   |  |  |  |  |  |
| <b>TQ90SNS-12</b> | TS 35C110I                                                                          | AJS 1010R                                                                           | AWS 0620                                                                            | T-T15                                                                               |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



LM90TP-22



Face mills (Inch bore)



| Designation         |  | Dimension (mm) |        |      |     |      | Arbor style |  Kg | Mounting bolt | Insert                                                                                                                    |
|---------------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|-------------|--------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                   | DC             | DCONMS | DHUB | OAL | APMX |             |                                                                                      |               |                                                                                                                           |
| LM90TP 480-25.4R-22 | 4                                                                                 | 80             | 25.4   | 70   | 50  | 17.6 | A           | 1.2                                                                                  | SH M12x35     | <div>TPKN 2204...</div> <div> E313</div> |
| 5100-31.75R-22      | 5                                                                                 | 100            | 31.75  | 80   | 55  | 17.6 | A           | 2.2                                                                                  | SH M16x35     |                                                                                                                           |
| 6125-38.1R-22       | 6                                                                                 | 125            | 38.1   | 80   | 63  | 17.6 | B           | 3.0                                                                                  | -             |                                                                                                                           |
| 8160-50.8R-22       | 8                                                                                 | 160            | 50.8   | 100  | 63  | 17.6 | B           | 4.7                                                                                  | -             |                                                                                                                           |
| 10200-47.625R-22    | 10                                                                                | 200            | 47.625 | 130  | 63  | 17.6 | C           | 6.4                                                                                  | -             |                                                                                                                           |
| 12250-47.625R-22    | 12                                                                                | 250            | 47.625 | 160  | 63  | 17.6 | C           | 10.7                                                                                 | -             |                                                                                                                           |
| 14315-47.625R-22    | 14                                                                                | 315            | 47.625 | 220  | 63  | 17.6 | D           | 16.7                                                                                 | -             |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
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|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
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|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
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|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
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|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
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|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
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|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |
|                     |                                                                                   |                |        |      |     |      |             |                                                                                      |               |                                                                                                                           |

► Metric bore cutter is available upon request

Spare parts

| Designation       | Carbide shim | Wedge | Shim screw | Wedge screw | Wrench | Shim screw wrench |
|-------------------|--------------|-------|------------|-------------|--------|-------------------|
|                   |              |       |            |             |        | <sup>(1)</sup>    |
| LM90TP-22 (Ø80)   | TSTP 22N     | WPA 8 | TS 40B100I | TS 80160W   | T-W 4  | T-T15             |
| LM90TP-22 (Ø100-) | TSTP 22N     | WPA 8 | TS 40B100I | TS 80200W   | T-W 4  | T-T15             |
|                   |              |       |            |             |        |                   |
|                   |              |       |            |             |        |                   |

Cutting Condition  
E322-E325

Arbor Style  
E326-E327

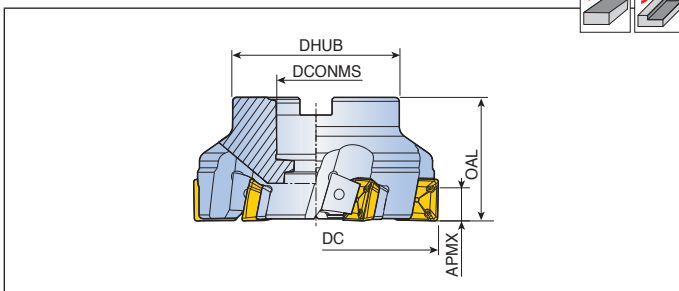
Torque  
E328

► The shim screw wrench T-T15<sup>(1)</sup> shall be ordered separately

# LM90SE-21



## Face mills



| Designation                |    | Dimension (mm) |        |      |     |      | Arbor style | Kg   | Mounting bolt | Insert               |
|----------------------------|----|----------------|--------|------|-----|------|-------------|------|---------------|----------------------|
|                            |    | DC             | DCONMS | DHUB | OAL | APMX |             |      |               |                      |
| <b>LM90SE6125-40R-21</b>   | 6  | 125            | 40     | 85   | 63  | 17.0 | A           | 3.4  | SH M20x40     | SEKX 2107...<br>E297 |
| <b>8160-40R-21</b>         | 8  | 160            | 40     | 110  | 63  | 17.0 | C           | 5.3  | -             |                      |
| <b>10200-60R-21</b>        | 10 | 200            | 60     | 130  | 80  | 17.0 | C           | 9.6  | -             |                      |
| <b>12200-60R-21</b>        | 12 | 200            | 60     | 130  | 80  | 17.0 | C           | 9.5  | -             |                      |
| <b>12250-60R-21</b>        | 12 | 250            | 60     | 160  | 80  | 17.0 | C           | 16.4 | -             |                      |
| <b>14250-60R-21</b>        | 14 | 250            | 60     | 160  | 80  | 17.0 | C           | 16.4 | -             |                      |
| <b>12315-60R-21</b>        | 12 | 315            | 60     | 220  | 80  | 17.0 | D           | 21.0 | -             |                      |
| <b>LM90SE6125-38.1R-21</b> | 6  | 125            | 38.1   | 85   | 63  | 17.0 | B           | 3.4  | -             |                      |
| <b>8160-50.8R-21</b>       | 8  | 160            | 50.8   | 110  | 63  | 17.0 | B           | 5.3  | -             |                      |
| <b>10200-47.625R-21</b>    | 10 | 200            | 47.625 | 130  | 80  | 17.0 | C           | 9.6  | -             |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |
|                            |    |                |        |      |     |      |             |      |               |                      |

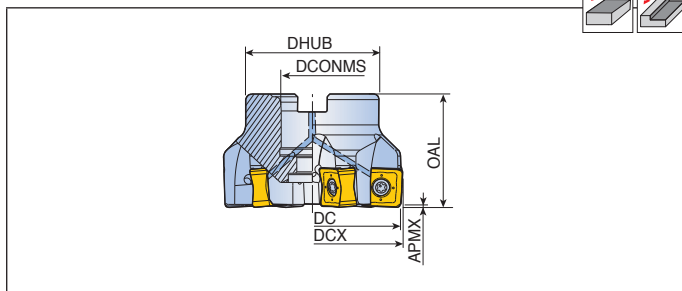
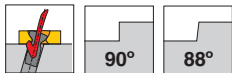
## Spare parts

| Designation              | Shim        | Shim screw    | Wedge      | Wedge screw | Wedge screw wrench | Shim screw wrench |
|--------------------------|-------------|---------------|------------|-------------|--------------------|-------------------|
|                          |             |               |            |             |                    |                   |
| <b>LM90SE-21 (-Ø200)</b> | TSSE 21N-ST | TS 50C130I/HG | WPA 8-SE16 | TS 80160W   | T-W 4              | T-T20             |
| <b>LM90SE-21 (Ø250-)</b> | TSSE 21N-ST | TS 50C130I/HG | WPA 8-SE16 | TS 80200W   | T-W 4              | T-T20             |
|                          |             |               |            |             |                    |                   |
|                          |             |               |            |             |                    |                   |
|                          |             |               |            |             |                    |                   |

► The shim screw wrench<sup>(1)</sup> shall be ordered separately



## Face mills



| Designation |               |  | Dimension (mm) |       |        |      |     |      |      | Coolant Arbor |     |  Kg | Mounting bolt                                                                                                                     | Insert |
|-------------|---------------|-----------------------------------------------------------------------------------|----------------|-------|--------|------|-----|------|------|---------------|-----|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------|
|             |               |                                                                                   | DC             | DCX   | DCONMS | DHUB | OAL | APMX | hole | style         |     |                                                                                      |                                                                                                                                   |        |
| TFM90SN     | 550-22R-13    | 5                                                                                 | 50             | 50.7  | 22     | 45   | 40  | 12.0 | ●    | A             | 0.3 | SH M10x30                                                                            | SNG(M)X<br>1306 ...<br>SNKX<br>1306 ...<br> E301 |        |
|             | 663-22R-13    | 6                                                                                 | 63             | 63.7  | 22     | 47   | 40  | 12.0 | ●    | A             | 0.5 | SH M10x30                                                                            |                                                                                                                                   |        |
|             | 780-27R-13    | 7                                                                                 | 80             | 80.7  | 27     | 70   | 50  | 12.0 | ●    | A             | 1.2 | SH M12x35                                                                            |                                                                                                                                   |        |
|             | 980-27R-13*   | 9                                                                                 | 80             | 80.7  | 27     | 70   | 50  | 12.0 | ●    | A             | 1.2 | SH M12x35                                                                            |                                                                                                                                   |        |
|             | 8100-32R-13   | 8                                                                                 | 100            | 100.8 | 32     | 85   | 50  | 12.0 | ●    | A             | 1.9 | SH M16x30                                                                            |                                                                                                                                   |        |
|             | 13100-32R-13* | 13                                                                                | 100            | 100.8 | 32     | 85   | 50  | 12.0 | ●    | A             | 1.9 | SH M16x30                                                                            |                                                                                                                                   |        |
|             | 10125-40R-13  | 10                                                                                | 125            | 125.8 | 40     | 85   | 63  | 12.0 | x    | B             | 2.8 | -                                                                                    |                                                                                                                                   |        |
|             | 16125-40R-13* | 16                                                                                | 125            | 125.8 | 40     | 85   | 63  | 12.0 | x    | B             | 2.8 | -                                                                                    |                                                                                                                                   |        |
| TFM88SN     | 550-22R-13    | 5                                                                                 | 50             | 51.2  | 22     | 45   | 40  | 12.0 | ●    | A             | 0.3 | SH M10x30                                                                            | SNG(M)X<br>1306 ZN...<br> E301                   |        |
|             | 663-22R-13    | 6                                                                                 | 63             | 64.2  | 22     | 47   | 40  | 12.0 | ●    | A             | 0.5 | SH M10x30                                                                            |                                                                                                                                   |        |
|             | 780-27R-13    | 7                                                                                 | 80             | 81.2  | 27     | 70   | 50  | 12.0 | ●    | A             | 1.2 | SH M12x35                                                                            |                                                                                                                                   |        |
|             | 980-27R-13*   | 9                                                                                 | 80             | 81.2  | 27     | 70   | 50  | 12.0 | ●    | A             | 1.2 | SH M12x35                                                                            |                                                                                                                                   |        |
|             | 8100-32R-13   | 8                                                                                 | 100            | 101.2 | 32     | 85   | 50  | 12.0 | ●    | A             | 1.9 | SH M16x30                                                                            |                                                                                                                                   |        |
|             | 11100-32R-13* | 11                                                                                | 100            | 101.2 | 32     | 85   | 50  | 12.0 | ●    | A             | 1.9 | SH M16x30                                                                            |                                                                                                                                   |        |
|             | 10125-40R-13  | 10                                                                                | 125            | 126.1 | 40     | 85   | 63  | 12.0 | x    | B             | 2.8 | -                                                                                    |                                                                                                                                   |        |
|             | 14125-40R-13* | 14                                                                                | 125            | 126.1 | 40     | 85   | 63  | 12.0 | x    | B             | 2.8 | -                                                                                    |                                                                                                                                   |        |
|             | 12160-40R-13  | 12                                                                                | 160            | 161.1 | 40     | 110  | 63  | 12.0 | x    | C             | 4.2 | -                                                                                    |                                                                                                                                   |        |
|             | 18160-40R-13* | 18                                                                                | 160            | 161.1 | 40     | 110  | 63  | 12.0 | x    | C             | 4.2 | -                                                                                    |                                                                                                                                   |        |
|             | 14200-60R-13  | 14                                                                                | 200            | 201.1 | 60     | 130  | 63  | 12.0 | x    | C             | 6.0 | -                                                                                    |                                                                                                                                   |        |
|             | 22200-60R-13* | 22                                                                                | 200            | 201.1 | 60     | 130  | 63  | 12.0 | x    | C             | 6.0 | -                                                                                    |                                                                                                                                   |        |
|             |               |                                                                                   |                |       |        |      |     |      |      |               |     |                                                                                      |                                                                                                                                   |        |

► \*: Fine pitch cutter for cast iron

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation    | Screw      | Wrench |  |  |  |
|----------------|------------|--------|--|--|--|
|                |            |        |  |  |  |
| <b>TFM90SN</b> | TS 40B100I | T-T15  |  |  |  |
| <b>TFM88SN</b> | TS 40B100I | T-T15  |  |  |  |
|                |            |        |  |  |  |
|                |            |        |  |  |  |
|                |            |        |  |  |  |

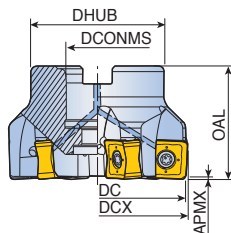


# CHASE 2 QUAD



90°

88°



- ▶ \*: Fine pitch cutter for cast iron
- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation    | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                |  |  |  |  |  |
| <b>TFM90SN</b> | TS 40B100I                                                                          | T-T15                                                                               |  |  |  |
| <b>TFM88SN</b> | TS 40B100I                                                                          | T-T15                                                                               |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |



E322-E325



E326-E327

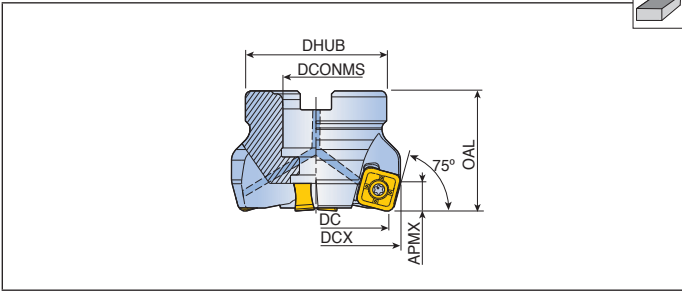
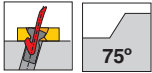


E328

# TFM75SN-13



## Face mills



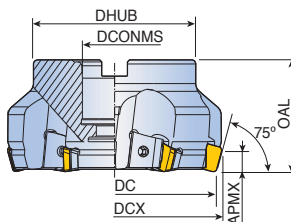
| Designation                  |  | Dimension (mm) |       |        |      |     |      |   | Coolant hole | Arbor style |  Kg | Mounting bolt                                                                                                               | Insert |
|------------------------------|-----------------------------------------------------------------------------------|----------------|-------|--------|------|-----|------|---|--------------|-------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------|
|                              |                                                                                   | DC             | DCX   | DCONMS | DHUB | OAL | APMX |   |              |             |                                                                                      |                                                                                                                             |        |
| <b>TFM75SN 450-22R-13</b>    | 4                                                                                 | 50             | 55.4  | 22     | 45   | 40  | 9.5  | ● | A            | 0.4         | LH M10x25                                                                            |  SNM(G)X 1306 EN... SNMX 1306 XTN... E300 |        |
| <b>650-22R-13</b>            | 6                                                                                 | 50             | 55.4  | 22     | 45   | 40  | 9.5  | ● | A            | 0.4         | LH M10x25                                                                            |                                                                                                                             |        |
| <b>663-22R-13</b>            | 6                                                                                 | 63             | 68.4  | 22     | 47   | 40  | 9.5  | ● | A            | 0.6         | LH M10x25                                                                            |                                                                                                                             |        |
| <b>863-22R-13</b>            | 8                                                                                 | 63             | 68.4  | 22     | 47   | 40  | 9.5  | ● | A            | 0.6         | LH M10x25                                                                            |                                                                                                                             |        |
| <b>780-27R-13</b>            | 7                                                                                 | 80             | 85.4  | 27     | 70   | 50  | 9.5  | ● | A            | 1.3         | LH M12x30                                                                            |                                                                                                                             |        |
| <b>1080-27R-13</b>           | 10                                                                                | 80             | 85.4  | 27     | 70   | 50  | 9.5  | ● | A            | 1.3         | LH M12x30                                                                            |                                                                                                                             |        |
| <b>8100-32R-13</b>           | 8                                                                                 | 100            | 105.4 | 32     | 85   | 50  | 9.5  | ● | A            | 1.9         | LH M16x35                                                                            |                                                                                                                             |        |
| <b>12100-32R-13</b>          | 12                                                                                | 100            | 105.4 | 32     | 85   | 50  | 9.5  | ● | A            | 2.0         | LH M16x35                                                                            |                                                                                                                             |        |
| <b>10125-40R-13</b>          | 10                                                                                | 125            | 130.3 | 40     | 85   | 63  | 9.5  | ● | A            | 3.2         | SH M20x40                                                                            |                                                                                                                             |        |
| <b>16125-40R-13</b>          | 16                                                                                | 125            | 130.4 | 40     | 85   | 63  | 9.5  | ● | A            | 3.3         | SH M20x40                                                                            |                                                                                                                             |        |
| <b>12160-40R-13</b>          | 12                                                                                | 160            | 165.3 | 40     | 110  | 63  | 9.5  | x | C            | 4.7         | -                                                                                    |                                                                                                                             |        |
| <b>20160-40R-13</b>          | 20                                                                                | 160            | 165.4 | 40     | 110  | 63  | 9.5  | x | C            | 4.8         | -                                                                                    |                                                                                                                             |        |
| <b>16200-60R-13</b>          | 16                                                                                | 200            | 205.3 | 60     | 130  | 63  | 9.5  | x | C            | 6.4         | -                                                                                    |                                                                                                                             |        |
| <b>22200-60R-13</b>          | 22                                                                                | 200            | 205.4 | 60     | 130  | 63  | 9.5  | x | C            | 6.4         | -                                                                                    |                                                                                                                             |        |
| <b>20250-60R-13</b>          | 20                                                                                | 250            | 255.3 | 60     | 160  | 63  | 9.5  | x | C            | 11.7        | -                                                                                    |                                                                                                                             |        |
| <b>TFM75SN 580-25.4R-13B</b> | 5                                                                                 | 80             | 85.4  | 25.4   | 70   | 50  | 9.5  | ● | A            | 1.3         | LH M12x30                                                                            |                                                                                                                             |        |
| <b>1080-25.4R-13</b>         | 10                                                                                | 80             | 85.4  | 25.4   | 70   | 50  | 9.5  | ● | A            | 1.5         | LH M12x30                                                                            |                                                                                                                             |        |
| <b>6100-31.75R-13B</b>       | 6                                                                                 | 100            | 105.4 | 31.75  | 80   | 50  | 9.5  | x | B            | 1.9         | -                                                                                    |                                                                                                                             |        |
| <b>8125-38.1R-13B</b>        | 8                                                                                 | 125            | 130.3 | 38.1   | 80   | 63  | 9.5  | x | B            | 3.2         | -                                                                                    |                                                                                                                             |        |
| <b>12160-50.8R-13B</b>       | 12                                                                                | 160            | 165.3 | 50.8   | 100  | 63  | 9.5  | x | B            | 4.7         | -                                                                                    |                                                                                                                             |        |
|                              |                                                                                   |                |       |        |      |     |      |   |              |             |                                                                                      |                                                                                                                             |        |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation    | Screw      | Wrench |  |  |  |
|----------------|------------|--------|--|--|--|
|                |            |        |  |  |  |
| <b>TFM75SN</b> | TS 40B100I | T-T15  |  |  |  |
|                |            |        |  |  |  |
|                |            |        |  |  |  |
|                |            |        |  |  |  |





► Metric bore cutter is available upon request

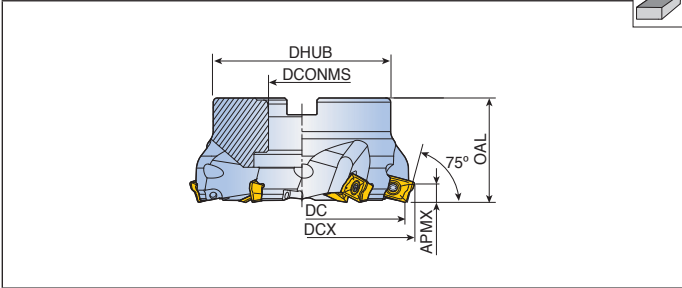
► The shim screw wrench T-T15<sup>(1)</sup> shall be ordered separately



TFM75AP-17



Face mills



| Designation |  | Dimension (mm) |     |        |       |     |      |     | Arbor style |  Kg | Mounting bolt | Insert                                                                                                                              |
|-------------|-----------------------------------------------------------------------------------|----------------|-----|--------|-------|-----|------|-----|-------------|--------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------|
|             |                                                                                   | DC             | DCX | DCONMS | DHUB  | OAL | APMX |     |             |                                                                                      |               |                                                                                                                                     |
| TFM75AP     | 580-27R-17                                                                        | 5              | 80  | 87.82  | 27    | 58  | 50   | 3.9 | A           | 0.8                                                                                  | SH M12x35     | APKT 1705<br>PER-M<br>APKT 1705<br>PER-EM<br> E269 |
|             | 6100-32R-17                                                                       | 6              | 100 | 107.82 | 32    | 85  | 50   | 3.9 | B           | 1.3                                                                                  | -             |                                                                                                                                     |
|             | 7125-40R-17                                                                       | 7              | 125 | 132.82 | 40    | 85  | 63   | 3.9 | B           | 3.5                                                                                  | -             |                                                                                                                                     |
| TFM75AP     | 580-25.4R-17                                                                      | 5              | 80  | 87.82  | 25.4  | 70  | 50   | 3.9 | A           | 0.8                                                                                  | SH M12x35     |  E269                                              |
|             | 6100-31.75R-17                                                                    | 6              | 100 | 107.82 | 31.75 | 80  | 50   | 3.9 | B           | 1.3                                                                                  | -             |                                                                                                                                     |
|             | 7125-38.1R-17                                                                     | 7              | 125 | 132.82 | 38.1  | 80  | 63   | 3.9 | B           | 3.5                                                                                  | -             |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |
|             |                                                                                   |                |     |        |       |     |      |     |             |                                                                                      |               |                                                                                                                                     |

► Cutter for the other corner of APKT inserts

Spare parts

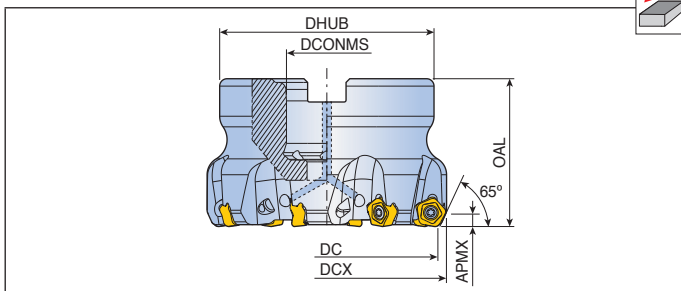
| Designation       | Screw        | Wrench |  |  |  |
|-------------------|--------------|--------|--|--|--|
|                   |              |        |  |  |  |
| <b>TFM75AP-17</b> | TS 40120I/HG | T-T15  |  |  |  |
|                   |              |        |  |  |  |
|                   |              |        |  |  |  |
|                   |              |        |  |  |  |

E352-E325

E326-E327

E328





► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

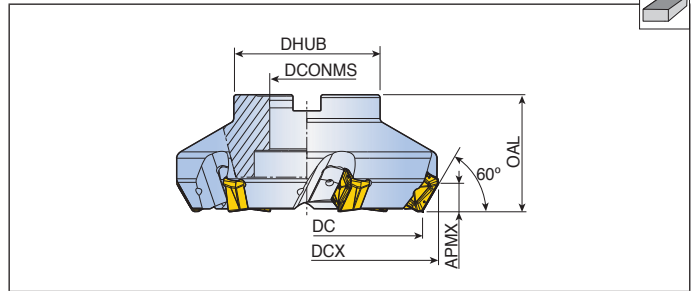
| Designation       | Screw                                                                               | Wrench                                                                              |                                                                                     | Wrench handle                                                                       |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                   |  |  |  |  |  |
| <b>TFM65PT-05</b> | TS 25D060/HG-P                                                                      | TD 7P                                                                               | -                                                                                   |                                                                                     |  |
| <b>TFM65PT-10</b> | TS 50D130/HG-P                                                                      | -                                                                                   | TBLD T20P-W6                                                                        | SW6-T                                                                               |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



# LM60SC-21



## Face mills



| Designation                 |    | Dimension (mm) |       |        |      |     |      | Arbor style | Kg   | Insert               |
|-----------------------------|----|----------------|-------|--------|------|-----|------|-------------|------|----------------------|
|                             |    | DC             | DCX   | DCONMS | DHUB | OAL | APMX |             |      |                      |
| <b>LM60SC 5125-40R-21</b>   | 5  | 125            | 141.2 | 40     | 85   | 63  | 13.0 | B           | 4.1  | SCKN 2107...<br>E296 |
| <b>8160-40R-21</b>          | 8  | 160            | 176.1 | 40     | 110  | 63  | 13.0 | C           | 6.5  |                      |
| <b>10160-40R-21</b>         | 10 | 160            | 176.1 | 40     | 110  | 63  | 13.0 | C           | 6.4  |                      |
| <b>10200-60R-21</b>         | 10 | 200            | 216.1 | 60     | 130  | 80  | 13.0 | C           | 11.8 |                      |
| <b>12200-60R-21</b>         | 12 | 200            | 216.1 | 60     | 130  | 80  | 13.0 | C           | 11.8 |                      |
| <b>12250-60R-21</b>         | 12 | 250            | 266   | 60     | 160  | 80  | 13.0 | C           | 19.2 |                      |
| <b>14250-60R-21</b>         | 14 | 250            | 266   | 60     | 160  | 80  | 13.0 | C           | 19.1 |                      |
| <b>16250-60R-21</b>         | 16 | 250            | 266   | 60     | 160  | 80  | 13.0 | C           | 19.1 |                      |
| <b>12315-60R-21</b>         | 12 | 315            | 331   | 60     | 220  | 80  | 13.0 | D           | 25.0 |                      |
| <b>16315-60R-21</b>         | 16 | 315            | 331   | 60     | 220  | 80  | 13.0 | D           | 25.0 |                      |
| <b>LM60SC 5125-38.1R-21</b> | 5  | 125            | 141.2 | 38.1   | 80   | 63  | 13.0 | B           | 4.1  |                      |
| <b>10160-50.8R-21</b>       | 10 | 160            | 176.1 | 50.8   | 100  | 63  | 13.0 | B           | 6.4  |                      |
| <b>10200-47.625R-21</b>     | 10 | 200            | 216.1 | 47.625 | 130  | 80  | 13.0 | C           | 11.8 |                      |
| <b>12250-47.625R-21</b>     | 12 | 250            | 266   | 47.625 | 160  | 80  | 13.0 | C           | 19.2 |                      |
| <b>16250-47.625R-21</b>     | 16 | 250            | 266   | 47.625 | 160  | 80  | 13.0 | C           | 19.1 |                      |
|                             |    |                |       |        |      |     |      |             |      |                      |
|                             |    |                |       |        |      |     |      |             |      |                      |
|                             |    |                |       |        |      |     |      |             |      |                      |
|                             |    |                |       |        |      |     |      |             |      |                      |
|                             |    |                |       |        |      |     |      |             |      |                      |
|                             |    |                |       |        |      |     |      |             |      |                      |

## Spare parts

| Designation      | Shim        | Shim screw    | Wedge     | Wedge screw | Wrench |       |
|------------------|-------------|---------------|-----------|-------------|--------|-------|
|                  |             |               |           |             |        |       |
| <b>LM60SC-21</b> | TSSC 21R-ST | TS 50C130I/HG | WSC 8R-21 | TS 80200W   | T-W 4  | T-T20 |
|                  |             |               |           |             |        |       |
|                  |             |               |           |             |        |       |
|                  |             |               |           |             |        |       |

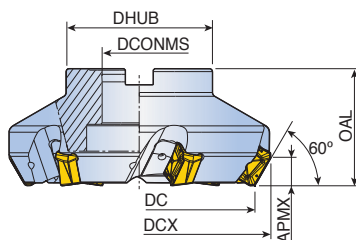


► The shim screw wrench<sup>(1)</sup> shall be ordered separately

# LM60SC-27



## Face mills

[illegible]

## Spare parts

| Designation      | Shim                                                                                | Shim screw                                                                          | Wedge                                                                               | Wedge screw                                                                         | Wrench                                                                              |                                                                                                    | Wrench handle                                                                                      |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
|                  |  |  |  |  |  |  <sup>(1)</sup> |  <sup>(2)</sup> |
| <b>LM60SC-27</b> | TSSC 27R-ST                                                                         | TS 60A130I                                                                          | WSC 8R                                                                              | TS 80200W                                                                           | T-W 4                                                                               | BLD T25                                                                                            | SW6-T                                                                                              |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                                    |                                                                                                    |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                                    |                                                                                                    |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                                    |                                                                                                    |

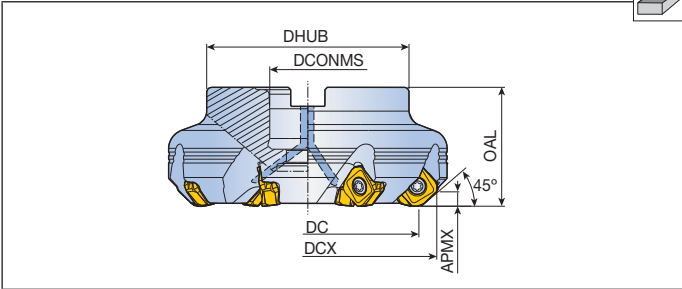
► The wrench<sup>(1)</sup> & wrench handle<sup>(2)</sup> shall be ordered separately



# 8D-TF45-11



## Face mills



| Designation        |    | Dimension (mm) |     |        |      |     |      | Coolant hole | Arbor type | Kg  | Mounting bolt | Insert    |
|--------------------|----|----------------|-----|--------|------|-----|------|--------------|------------|-----|---------------|-----------|
|                    |    | DC             | DCX | DCONMS | DHUB | OAL | APMX |              |            |     |               |           |
| 8D-TF45-440-16R-11 | 4  | 40             | 51  | 16     | 38   | 40  | 4.2  | ●            | A          | 0.4 | SH M8x25      | SQKU      |
| 640-16R-11         | 6  | 40             | 51  | 16     | 38   | 40  | 4.2  | ●            | A          | 0.4 | SH M8x25      | 1105      |
| 650-22R-11         | 6  | 50             | 61  | 22     | 45   | 40  | 4.2  | ●            | A          | 0.5 | LH M10x25     | E306-E307 |
| 850-22R-11         | 8  | 50             | 61  | 22     | 45   | 40  | 4.2  | ●            | A          | 0.5 | LH M10x25     |           |
| 763-22R-11         | 7  | 63             | 74  | 22     | 47   | 50  | 4.2  | ●            | A          | 1.0 | SH M10x30     |           |
| 1063-22R-11        | 10 | 63             | 74  | 22     | 47   | 50  | 4.2  | ●            | A          | 1.0 | SH M10x30     |           |
| 480-27R-11         | 4  | 80             | 91  | 27     | 70   | 50  | 4.2  | ●            | A          | 1.4 | LH M12x30     | E306-E307 |
| 880-27R-11         | 8  | 80             | 91  | 27     | 70   | 50  | 4.2  | ●            | A          | 1.6 | LH M12x30     |           |
| 1280-27R-11        | 12 | 80             | 91  | 27     | 70   | 50  | 4.2  | ●            | A          | 1.6 | LH M12x30     |           |
| 5100-32R-11        | 5  | 100            | 111 | 32     | 85   | 50  | 4.2  | ●            | A          | 2.2 | LH M16x35     |           |
| 9100-32R-11        | 9  | 100            | 111 | 32     | 85   | 50  | 4.2  | ●            | A          | 2.4 | LH M16x35     | E306-E307 |
| 14100-32R-11       | 14 | 100            | 111 | 32     | 85   | 50  | 4.2  | ●            | A          | 2.5 | LH M16x35     |           |
| 8125-40R-11        | 8  | 125            | 136 | 40     | 85   | 63  | 4.2  | ●            | A          | 4.1 | SH M20x40     |           |
| 12125-40R-11       | 12 | 125            | 136 | 40     | 85   | 63  | 4.2  | ●            | A          | 4.0 | SH M20x40     |           |
| 18125-40R-11       | 18 | 125            | 136 | 40     | 85   | 63  | 4.2  | ●            | A          | 4.1 | SH M20x40     | E306-E307 |
| 10160-40R-11       | 10 | 160            | 171 | 40     | 110  | 63  | 4.2  | x            | C          | 5.7 | -             |           |
| 16160-40R-11       | 16 | 160            | 171 | 40     | 110  | 63  | 4.2  | x            | C          | 5.6 | -             |           |
| 24160-40R-11       | 24 | 160            | 171 | 40     | 110  | 63  | 4.2  | x            | C          | 5.6 | -             |           |
|                    |    |                |     |        |      |     |      |              |            |     |               |           |
|                    |    |                |     |        |      |     |      |              |            |     |               |           |
|                    |    |                |     |        |      |     |      |              |            |     |               |           |

- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ Certain assembly dimensions differ slightly between carbide and ceramic inserts (e.g., DC, APMX)

## Spare parts

| Designation | Screw      | Wrench      | Wrench handle |  |  |
|-------------|------------|-------------|---------------|--|--|
|             |            |             |               |  |  |
| 8D-TF45-11  | TS 40A115I | TBLD T15-W6 | SW6-T         |  |  |
|             |            |             |               |  |  |
|             |            |             |               |  |  |
|             |            |             |               |  |  |
|             |            |             |               |  |  |

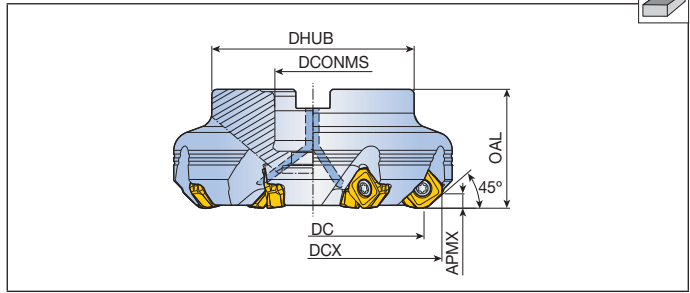
E352-E325

E326-E327

E328

# 8D-TF45-14

## Face mills



| Designation               |    | Dimension (mm) |       |        |      |     |      | Coolant hole | Arbor type | Kg  | Mounting bolt | Insert        |
|---------------------------|----|----------------|-------|--------|------|-----|------|--------------|------------|-----|---------------|---------------|
|                           |    | DC             | DCX   | DCONMS | DHUB | OAL | APMX |              |            |     |               |               |
| <b>8D-TF45-450-22R-14</b> | 4  | 50             | 65.5  | 22     | 45   | 40  | 6    | ●            | A          | 0.6 | LH M10x25     | SQKU<br>1406  |
| <b>650-22R-14</b>         | 6  | 50             | 65.5  | 22     | 45   | 40  | 6    | ●            | A          | 0.6 | LH M10x25     |               |
| <b>663-22R-14</b>         | 6  | 63             | 78.5  | 22     | 47   | 50  | 6    | ●            | A          | 1.1 | SH M10x30     |               |
| <b>863-22R-14</b>         | 8  | 63             | 78.5  | 22     | 47   | 50  | 6    | ●            | A          | 1.0 | SH M10x30     | E306-<br>E307 |
| <b>480-27R-14</b>         | 4  | 80             | 95.5  | 27     | 70   | 50  | 6    | ●            | A          | 1.4 | LH M12x30     |               |
| <b>780-27R-14</b>         | 7  | 80             | 95.5  | 27     | 70   | 50  | 6    | ●            | A          | 1.7 | LH M12x30     |               |
| <b>1080-27R-14</b>        | 10 | 80             | 95.5  | 27     | 70   | 50  | 6    | ●            | A          | 1.7 | LH M12x30     |               |
| <b>5100-32R-14</b>        | 5  | 100            | 115.5 | 32     | 85   | 50  | 6    | ●            | A          | 2.2 | LH M16x35     |               |
| <b>8100-32R-14</b>        | 8  | 100            | 115.5 | 32     | 85   | 50  | 6    | ●            | A          | 2.6 | LH M16x35     |               |
| <b>12100-32R-14</b>       | 12 | 100            | 115.5 | 32     | 85   | 50  | 6    | ●            | A          | 2.5 | LH M16x35     |               |
| <b>6125-40R-14</b>        | 6  | 125            | 140.5 | 40     | 85   | 63  | 6    | ●            | A          | 4.1 | SH M20x40     |               |
| <b>10125-40R-14</b>       | 10 | 125            | 140.5 | 40     | 85   | 63  | 6    | ●            | A          | 4.4 | SH M20x40     |               |
| <b>16125-40R-14</b>       | 16 | 125            | 140.5 | 40     | 85   | 63  | 6    | ●            | A          | 4.3 | SH M20x40     |               |
| <b>7160-40R-14</b>        | 7  | 160            | 175.5 | 40     | 110  | 63  | 6    | x            | C          | 5.6 | -             |               |
| <b>12160-40R-14</b>       | 12 | 160            | 175.5 | 40     | 110  | 63  | 6    | x            | C          | 5.9 | -             |               |
| <b>20160-40R-14</b>       | 20 | 160            | 175.5 | 40     | 110  | 63  | 6    | x            | C          | 5.9 | -             |               |
| <b>8200-60R-14</b>        | 8  | 200            | 215.5 | 60     | 130  | 63  | 6    | x            | C          | 8.0 | -             |               |
| <b>18200-60R-14</b>       | 18 | 200            | 215.5 | 60     | 130  | 63  | 6    | x            | C          | 8.4 | -             |               |
| <b>26200-60R-14</b>       | 26 | 200            | 215.5 | 60     | 130  | 63  | 6    | x            | C          | 8.3 | -             |               |

- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ Certain assembly dimensions differ slightly between carbide and ceramic inserts (e.g., DC, APMX)

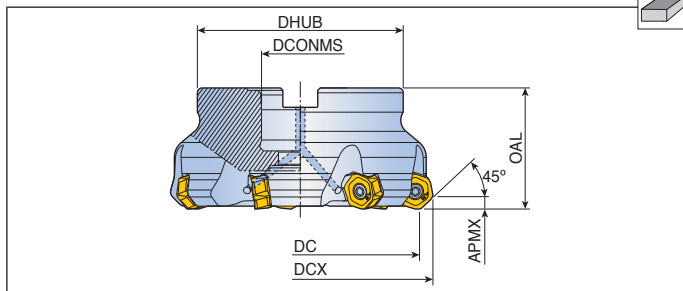
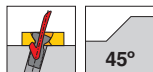
## Spare parts

| Designation       | Screw         | Wrench      | Wrench handle |  |  |
|-------------------|---------------|-------------|---------------|--|--|
|                   |               |             |               |  |  |
| <b>8D-TF45-14</b> | TS 50C130I/HG | TBLD T20-W6 | SW6-T         |  |  |
|                   |               |             |               |  |  |
|                   |               |             |               |  |  |
|                   |               |             |               |  |  |



# 12D-TF45-06

## Face mills



| Designation                |    | Dimension (mm) |       |        |      |     |      | Coolant hole | Arbor style | Kg  | Mounting bolt | Insert                     |
|----------------------------|----|----------------|-------|--------|------|-----|------|--------------|-------------|-----|---------------|----------------------------|
|                            |    | DC             | DCX   | DCONMS | DHUB | OAL | APMX |              |             |     |               |                            |
| <b>12D-TF45-440-16R-06</b> | 4  | 40             | 50.8  | 16     | 38   | 40  | 3.0  | ●            | A           | 0.3 | SH M8x25      | HXK(H)U<br>0605...<br>E283 |
| <b>450-22R-06</b>          | 4  | 50             | 60.8  | 22     | 45   | 40  | 3.0  | ●            | A           | 0.5 | LH M10x25     |                            |
| <b>650-22R-06</b>          | 6  | 50             | 60.8  | 22     | 45   | 40  | 3.0  | ●            | A           | 0.5 | LH M10x25     |                            |
| <b>563-22R-06</b>          | 5  | 63             | 73.8  | 22     | 47   | 40  | 3.0  | ●            | A           | 0.7 | LH M10x25     |                            |
| <b>763-22R-06</b>          | 7  | 63             | 73.8  | 22     | 47   | 40  | 3.0  | ●            | A           | 0.7 | LH M10x25     |                            |
| <b>480-27R-06</b>          | 4  | 80             | 90.8  | 27     | 70   | 50  | 3.0  | ●            | A           | 1.4 | SH M12x35     |                            |
| <b>680-27R-06</b>          | 6  | 80             | 90.8  | 27     | 70   | 50  | 3.0  | ●            | A           | 1.5 | SH M12x35     |                            |
| <b>1080-27R-06</b>         | 10 | 80             | 90.8  | 27     | 70   | 50  | 3.0  | ●            | A           | 1.5 | SH M12x35     |                            |
| <b>5100-32R-06</b>         | 5  | 100            | 110.8 | 32     | 85   | 50  | 3.0  | ●            | A           | 2.0 | LH M16x35     |                            |
| <b>7100-32R-06</b>         | 7  | 100            | 110.8 | 32     | 85   | 50  | 3.0  | ●            | A           | 2.2 | LH M16x35     |                            |
| <b>12100-32R-06</b>        | 12 | 100            | 110.8 | 32     | 85   | 50  | 3.0  | ●            | A           | 2.2 | LH M16x35     |                            |
| <b>6125-40R-06</b>         | 6  | 125            | 135.8 | 40     | 85   | 63  | 3.0  | ●            | A           | 3.5 | SH M20x40     |                            |
| <b>10125-40R-06</b>        | 10 | 125            | 135.8 | 40     | 85   | 63  | 3.0  | ●            | A           | 3.6 | SH M20x40     |                            |
| <b>16125-40R-06</b>        | 16 | 125            | 135.8 | 40     | 85   | 63  | 3.0  | ●            | A           | 3.6 | SH M20x40     |                            |
| <b>8160-40R-06</b>         | 8  | 160            | 170.8 | 40     | 110  | 63  | 3.0  | x            | C           | 4.7 | -             |                            |
| <b>12160-40R-06</b>        | 12 | 160            | 170.8 | 40     | 110  | 63  | 3.0  | x            | C           | 4.9 | -             |                            |
| <b>20160-40R-06</b>        | 20 | 160            | 170.8 | 40     | 110  | 63  | 3.0  | x            | C           | 4.9 | -             |                            |
|                            |    |                |       |        |      |     |      |              |             |     |               |                            |
|                            |    |                |       |        |      |     |      |              |             |     |               |                            |
|                            |    |                |       |        |      |     |      |              |             |     |               |                            |
|                            |    |                |       |        |      |     |      |              |             |     |               |                            |

- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ Certain assembly dimensions differ slightly between carbide and ceramic inserts (e.g., DC, APMX)

## Spare parts

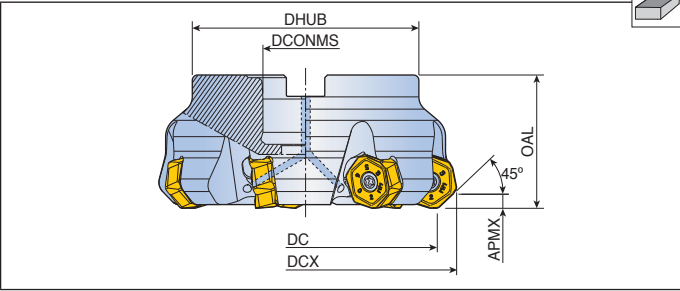
| Designation        | Screw      | Wrench      | Wrench handle |  |  |
|--------------------|------------|-------------|---------------|--|--|
|                    |            |             |               |  |  |
| <b>12D-TF45-06</b> | TS 40B100I | TBLD T15-W6 | SW6-T         |  |  |
|                    |            |             |               |  |  |
|                    |            |             |               |  |  |
|                    |            |             |               |  |  |



# 12D-TF45-10



## Face mills



| Designation         |  | Dimension (mm) |       |        |      |     |      | Coolant hole | Arbor style |  Kg | Mounting bolt | Insert                                                                                                            |
|---------------------|-----------------------------------------------------------------------------------|----------------|-------|--------|------|-----|------|--------------|-------------|--------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                   | DC             | DCX   | DCONMS | DHUB | OAL | APMX |              |             |                                                                                      |               |                                                                                                                   |
| 12D-TF45-563-22R-10 | 5                                                                                 | 63             | 77.5  | 22     | 47   | 50  | 5.0  | ●            | A           | 0.9                                                                                  | SH M10x30     | HXK(H)U<br>1007...<br><br>E283 |
| 763-22R-10          | 7                                                                                 | 63             | 77.5  | 22     | 47   | 50  | 5.0  | ●            | A           | 0.9                                                                                  | SH M10x30     |                                                                                                                   |
| 480-27R-10          | 4                                                                                 | 80             | 94.5  | 27     | 70   | 50  | 5.0  | ●            | A           | 1.5                                                                                  | SH M12x35     |                                                                                                                   |
| 680-27R-10          | 6                                                                                 | 80             | 94.5  | 27     | 70   | 50  | 5.0  | ●            | A           | 1.6                                                                                  | SH M12x35     | E283                                                                                                              |
| 980-27R-10          | 9                                                                                 | 80             | 94.5  | 27     | 70   | 50  | 5.0  | ●            | A           | 1.6                                                                                  | SH M12x35     |                                                                                                                   |
| 5100-32R-10         | 5                                                                                 | 100            | 114.5 | 32     | 85   | 50  | 5.0  | ●            | A           | 2.2                                                                                  | LH M16x35     |                                                                                                                   |
| 7100-32R-10         | 7                                                                                 | 100            | 114.5 | 32     | 85   | 50  | 5.0  | ●            | A           | 2.4                                                                                  | LH M16x35     |                                                                                                                   |
| 11100-32R-10        | 11                                                                                | 100            | 114.5 | 32     | 85   | 50  | 5.0  | ●            | A           | 2.4                                                                                  | LH M16x35     |                                                                                                                   |
| 8125-40R-10         | 8                                                                                 | 125            | 139.5 | 40     | 85   | 63  | 5.0  | ●            | A           | 4.1                                                                                  | SH M20x40     |                                                                                                                   |
| 10125-40R-10        | 10                                                                                | 125            | 139.5 | 40     | 85   | 63  | 5.0  | ●            | A           | 4.0                                                                                  | SH M20x40     |                                                                                                                   |
| 14125-40R-10        | 14                                                                                | 125            | 139.5 | 40     | 85   | 63  | 5.0  | ●            | A           | 4.0                                                                                  | SH M20x40     |                                                                                                                   |
| 6160-40R-10         | 6                                                                                 | 160            | 174.5 | 40     | 110  | 63  | 5.0  | x            | C           | 5.4                                                                                  | -             |                                                                                                                   |
| 10160-40R-10        | 10                                                                                | 160            | 174.5 | 40     | 110  | 63  | 5.0  | x            | C           | 5.6                                                                                  | -             |                                                                                                                   |
| 16160-40R-10        | 16                                                                                | 160            | 174.5 | 40     | 110  | 63  | 5.0  | x            | C           | 5.6                                                                                  | -             |                                                                                                                   |
| 14200-60R-10        | 14                                                                                | 200            | 214.5 | 60     | 130  | 63  | 5.0  | x            | C           | 7.9                                                                                  | -             |                                                                                                                   |
| 21200-60R-10        | 21                                                                                | 200            | 214.5 | 60     | 130  | 63  | 5.0  | x            | C           | 7.9                                                                                  | -             |                                                                                                                   |
| 16250-60R-10        | 16                                                                                | 250            | 264.5 | 60     | 160  | 63  | 5.0  | x            | C           | 12.4                                                                                 | -             |                                                                                                                   |
| 26250-60R-10        | 26                                                                                | 250            | 264.5 | 60     | 160  | 63  | 5.0  | x            | C           | 12.4                                                                                 | -             |                                                                                                                   |
|                     |                                                                                   |                |       |        |      |     |      |              |             |                                                                                      |               |                                                                                                                   |
|                     |                                                                                   |                |       |        |      |     |      |              |             |                                                                                      |               |                                                                                                                   |
|                     |                                                                                   |                |       |        |      |     |      |              |             |                                                                                      |               |                                                                                                                   |

- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ Certain assembly dimensions differ slightly between carbide and ceramic inserts (e.g., DC, APMX)

## Spare parts

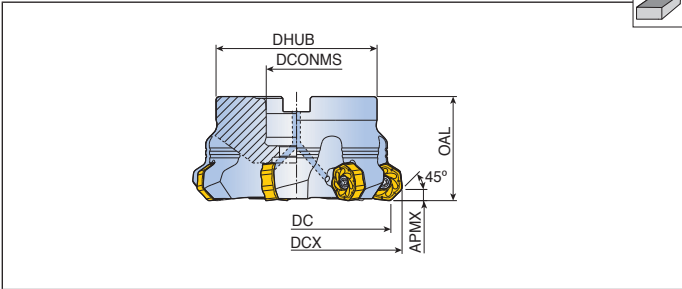
| Designation        | Screw         | Wrench      | Wrench handle |  |  |
|--------------------|---------------|-------------|---------------|--|--|
|                    |               |             |               |  |  |
| <b>12D-TF45-10</b> | TS 50C130I/HG | TBLD T20-W6 | SW6-T         |  |  |
|                    |               |             |               |  |  |
|                    |               |             |               |  |  |
|                    |               |             |               |  |  |



# 14D-F45XN-06



## Face mills



| Designation                   |  | Dimension (mm) |       |        |      |     |      |  | Arbor style |  Kg | Mounting bolt | Insert                                                                                                          |
|-------------------------------|-----------------------------------------------------------------------------------|----------------|-------|--------|------|-----|------|-----------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------|
|                               |                                                                                   | DC             | DCX   | DCONMS | DHUB | OAL | APMX |                                                                                   |             |                                                                                      |               |                                                                                                                 |
| <b>14D-F45XN 550-22R-06</b>   | 5                                                                                 | 50             | 59.1  | 22     | 45   | 40  | 3.5  | ●                                                                                 | A           | 0.4                                                                                  | LH M10x25     | XNM(H)U<br>0605...<br><br>E316 |
| <b>563-22R-06</b>             | 5                                                                                 | 63             | 72.1  | 22     | 47   | 50  | 3.5  | ●                                                                                 | A           | 0.8                                                                                  | SH M10x35     |                                                                                                                 |
| <b>763-22R-06</b>             | 7                                                                                 | 63             | 72.1  | 22     | 47   | 50  | 3.5  | ●                                                                                 | A           | 0.8                                                                                  | SH M10x35     |                                                                                                                 |
| <b>680-27R-06</b>             | 6                                                                                 | 80             | 89.1  | 27     | 70   | 50  | 3.5  | ●                                                                                 | A           | 1.4                                                                                  | SH M12x35     |                                                                                                                 |
| <b>980-27R-06</b>             | 9                                                                                 | 80             | 89.1  | 27     | 70   | 50  | 3.5  | ●                                                                                 | A           | 1.4                                                                                  | SH M12x35     |                                                                                                                 |
| <b>7100-32R-06</b>            | 7                                                                                 | 100            | 109.1 | 32     | 85   | 50  | 3.5  | ●                                                                                 | A           | 2.1                                                                                  | SH M16x35     |                                                                                                                 |
| <b>11100-32R-06</b>           | 11                                                                                | 100            | 109.1 | 32     | 85   | 50  | 3.5  | ●                                                                                 | A           | 2.1                                                                                  | SH M16x35     |                                                                                                                 |
| <b>10125-40R-06</b>           | 10                                                                                | 125            | 134.1 | 40     | 85   | 63  | 3.5  | ●                                                                                 | A           | 3.6                                                                                  | SH M20x40     |                                                                                                                 |
| <b>14125-40R-06</b>           | 14                                                                                | 125            | 134.1 | 40     | 85   | 63  | 3.5  | ●                                                                                 | A           | 3.6                                                                                  | SH M20x40     |                                                                                                                 |
| <b>12160-40R-06</b>           | 12                                                                                | 160            | 169.1 | 40     | 110  | 63  | 3.5  | x                                                                                 | C           | 4.7                                                                                  | -             |                                                                                                                 |
| <b>16160-40R-06</b>           | 16                                                                                | 160            | 169.1 | 40     | 110  | 63  | 3.5  | x                                                                                 | C           | 4.9                                                                                  | -             |                                                                                                                 |
| <b>18160-40R-06</b>           | 18                                                                                | 160            | 169.1 | 40     | 110  | 63  | 3.5  | x                                                                                 | C           | 5.0                                                                                  | -             |                                                                                                                 |
| <b>14D-F45XN 763-25.4R-06</b> | 7                                                                                 | 63             | 72.1  | 25.4   | 47   | 50  | 3.5  | ●                                                                                 | A           | 0.8                                                                                  | SH M12x30     |                                                                                                                 |
| <b>980-25.4R-06</b>           | 9                                                                                 | 80             | 89.1  | 25.4   | 70   | 50  | 3.5  | ●                                                                                 | A           | 1.4                                                                                  | SH M12x35     |                                                                                                                 |
| <b>11100-31.75R-06</b>        | 11                                                                                | 100            | 109.1 | 31.75  | 80   | 50  | 3.5  | ●                                                                                 | A           | 1.9                                                                                  | LH M16x35     |                                                                                                                 |
| <b>14125-38.1R-06</b>         | 14                                                                                | 125            | 134.1 | 38.1   | 80   | 63  | 3.5  | x                                                                                 | B           | 3.9                                                                                  | -             |                                                                                                                 |
|                               |                                                                                   |                |       |        |      |     |      |                                                                                   |             |                                                                                      | -             |                                                                                                                 |
|                               |                                                                                   |                |       |        |      |     |      |                                                                                   |             |                                                                                      |               |                                                                                                                 |
|                               |                                                                                   |                |       |        |      |     |      |                                                                                   |             |                                                                                      |               |                                                                                                                 |
|                               |                                                                                   |                |       |        |      |     |      |                                                                                   |             |                                                                                      |               |                                                                                                                 |
|                               |                                                                                   |                |       |        |      |     |      |                                                                                   |             |                                                                                      |               |                                                                                                                 |
|                               |                                                                                   |                |       |        |      |     |      |                                                                                   |             |                                                                                      |               |                                                                                                                 |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation         | Screw      | Wrench |  |  |  |
|---------------------|------------|--------|--|--|--|
|                     |            |        |  |  |  |
| <b>14D-F45XN-06</b> | TS 40B100I | T-T15  |  |  |  |
|                     |            |        |  |  |  |
|                     |            |        |  |  |  |
|                     |            |        |  |  |  |
|                     |            |        |  |  |  |

Cutting Condition  
E352-E325

Arbor Style  
E326-E327

Torque  
E328



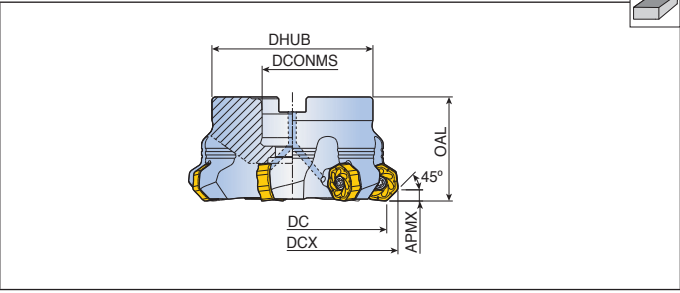
# 14D-F45XN-09



## Face mills



45°



| Designation                   |  | Dimension (mm) |      |        |      |     |      |  | Arbor style |  | Mounting bolt | Insert                                                                                                                                  |
|-------------------------------|-----------------------------------------------------------------------------------|----------------|------|--------|------|-----|------|-----------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|                               |                                                                                   | DC             | DCX  | DCONMS | DHUB | OAL | APMX |                                                                                   |             |                                                                                   |               |                                                                                                                                         |
| <b>14D-F45XN 563-22R-09</b>   | 5                                                                                 | 63             | 74.9 | 22     | 47   | 50  | 5.0  | ●                                                                                 | A           | 0.9                                                                               | SH M10x35     | <div>XNM(H)U</div> <div>0906...</div> <div>E317</div> |
| <b>663-22R-09</b>             | 6                                                                                 | 63             | 74.9 | 22     | 47   | 50  | 5.0  | ●                                                                                 | A           | 0.9                                                                               | SH M10x35     |                                                                                                                                         |
| <b>680-27R-09</b>             | 6                                                                                 | 80             | 91.9 | 27     | 70   | 50  | 5.0  | ●                                                                                 | A           | 1.4                                                                               | SH M12x35     |                                                                                                                                         |
| <b>780-27R-09</b>             | 7                                                                                 | 80             | 91.9 | 27     | 70   | 50  | 5.0  | ●                                                                                 | A           | 1.5                                                                               | SH M12x35     |                                                                                                                                         |
| <b>7100-32R-09</b>            | 7                                                                                 | 100            | 112  | 32     | 85   | 55  | 5.0  | ●                                                                                 | A           | 2.4                                                                               | SH M16x35     |                                                                                                                                         |
| <b>9100-32R-09</b>            | 9                                                                                 | 100            | 112  | 32     | 85   | 55  | 5.0  | ●                                                                                 | A           | 2.5                                                                               | SH M16x35     |                                                                                                                                         |
| <b>8125-40R-09</b>            | 8                                                                                 | 125            | 137  | 40     | 85   | 63  | 5.0  | ●                                                                                 | A           | 3.5                                                                               | SH M20x40     |                                                                                                                                         |
| <b>10125-40R-09</b>           | 10                                                                                | 125            | 137  | 40     | 85   | 63  | 5.0  | ●                                                                                 | A           | 3.6                                                                               | SH M20x40     |                                                                                                                                         |
| <b>12125-40R-09</b>           | 12                                                                                | 125            | 137  | 40     | 85   | 63  | 5.0  | ●                                                                                 | A           | 3.4                                                                               | SH M20x40     |                                                                                                                                         |
| <b>10160-40R-09</b>           | 10                                                                                | 160            | 172  | 40     | 110  | 63  | 5.0  | x                                                                                 | C           | 4.8                                                                               | -             |                                                                                                                                         |
| <b>12160-40R-09</b>           | 12                                                                                | 160            | 172  | 40     | 110  | 63  | 5.0  | x                                                                                 | C           | 4.8                                                                               | -             |                                                                                                                                         |
| <b>14160-40R-09</b>           | 14                                                                                | 160            | 172  | 40     | 110  | 63  | 5.0  | x                                                                                 | C           | 4.8                                                                               | -             |                                                                                                                                         |
| <b>12200-60R-09</b>           | 12                                                                                | 200            | 212  | 60     | 130  | 63  | 5.0  | x                                                                                 | C           | 6.8                                                                               | -             |                                                                                                                                         |
| <b>16200-60R-09</b>           | 16                                                                                | 200            | 212  | 60     | 130  | 63  | 5.0  | x                                                                                 | C           | 6.9                                                                               | -             |                                                                                                                                         |
| <b>16250-60R-09</b>           | 16                                                                                | 250            | 262  | 60     | 160  | 63  | 5.0  | x                                                                                 | C           | 11.5                                                                              | -             |                                                                                                                                         |
| <b>20250-60R-09</b>           | 20                                                                                | 250            | 262  | 60     | 160  | 63  | 5.0  | x                                                                                 | C           | 11.5                                                                              | -             |                                                                                                                                         |
| <b>14D-F45XN 680-25.4R-09</b> | 6                                                                                 | 80             | 91.9 | 25.4   | 70   | 50  | 5.0  | ●                                                                                 | A           | 1.4                                                                               | SH M12x35     |                                                                                                                                         |
| <b>7100-31.75R-09</b>         | 7                                                                                 | 100            | 112  | 31.75  | 80   | 55  | 5.0  | ●                                                                                 | A           | 2.4                                                                               | SH M16x35     |                                                                                                                                         |
| <b>8125-38.1R-09</b>          | 8                                                                                 | 125            | 137  | 38.1   | 80   | 63  | 5.0  | x                                                                                 | B           | 3.5                                                                               | -             |                                                                                                                                         |
| <b>10160-50.8R-09</b>         | 10                                                                                | 160            | 172  | 50.8   | 100  | 63  | 5.0  | x                                                                                 | B           | 4.8                                                                               | -             |                                                                                                                                         |
| <b>12200-47.625R-09</b>       | 12                                                                                | 200            | 212  | 47.625 | 130  | 63  | 5.0  | x                                                                                 | C           | 6.8                                                                               | -             |                                                                                                                                         |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

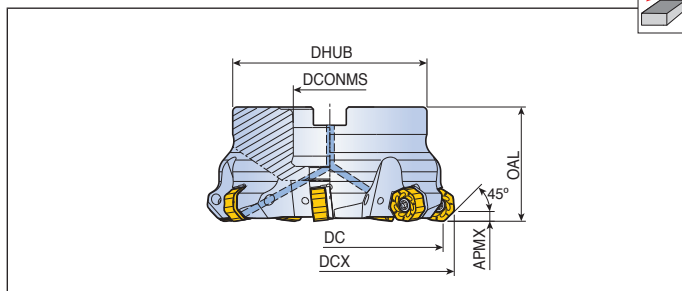
| Designation         | Screw         | Wrench |  |  |  |
|---------------------|---------------|--------|--|--|--|
|                     |               |        |  |  |  |
| <b>14D-F45XN-09</b> | TS 50C130I/HG | T-T20  |  |  |  |
|                     |               |        |  |  |  |
|                     |               |        |  |  |  |
|                     |               |        |  |  |  |

E352-E325

E326-E327

E328

# CHASE<sup>2</sup>HEPTA

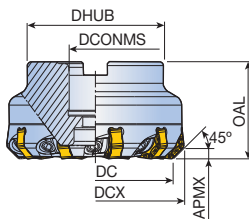


► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation          | Screw                                                                               | Shim                                                                                | Shim screw                                                                          | Wrench                                                                              | Wrench handle                                                                       |
|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                      |  |  |  |  |  |
| <b>14D-F45XNH-06</b> | TS 35C110I                                                                          | TSXN 06N                                                                            | TS 5035062S-B                                                                       | TBLD T15-W6                                                                         | SW6-T                                                                               |
| <b>14D-F45XNH-09</b> | TS 50C130I/HG                                                                       | TSXN 09N                                                                            | TS 8050110S                                                                         | TBLD T20-W6                                                                         | SW6-T                                                                               |
|                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



# CHASE 2 HEPTA

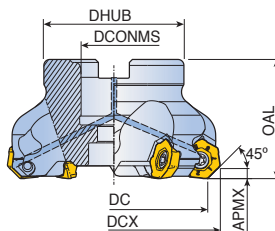


► Recommend to very stable machining condition at cast iron & steel

| Designation          | Wedge                                                                               | Wedge screw                                                                         | Wrench                                                                              |  |  |
|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                      |  |  |  |  |  |
| <b>14D-F45XNW-09</b> | WFZ 8H                                                                              | WS 8                                                                                | T-W 4                                                                               |  |  |
|                      |                                                                                     |                                                                                     |                                                                                     |  |  |
|                      |                                                                                     |                                                                                     |                                                                                     |  |  |
|                      |                                                                                     |                                                                                     |                                                                                     |  |  |



# CHASE HEPTA



► Mounting bolt with coolant through hole is available on request (ordering example: SH M8x1.25x30-C)

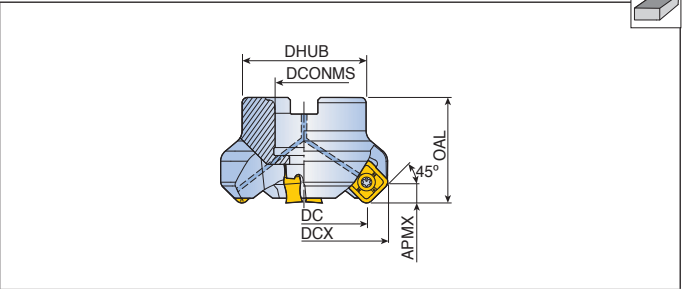
| Designation      | Screw                                                                               | Wrench                                                                              |  |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                  |  |  |  |  |  |
| <b>TS-F45-06</b> | TS 40093I/HG                                                                        | T-T15                                                                               |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |



# TFM45SN-13



Face mills

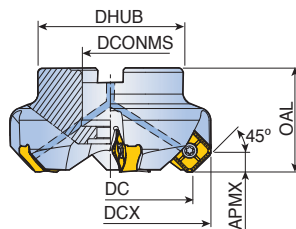


| Designation                  |  | Dimension (mm) |       |        |      |     |      | Coolant Arbor |       |  Kg | Mounting bolt | Insert                                                                             |
|------------------------------|-----------------------------------------------------------------------------------|----------------|-------|--------|------|-----|------|---------------|-------|--------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------|
|                              |                                                                                   | DC             | DCX   | DCONMS | DHUB | OAL | APMX | hole          | style |                                                                                      |               |                                                                                    |
| <b>TFM45SN 440-16R-13</b>    | 4                                                                                 | 40             | 54.7  | 16     | 38   | 40  | 7.0  | ●             | A     | 0.3                                                                                  | LH M10x25     |  |
| <b>450-22R-13</b>            | 4                                                                                 | 50             | 64.7  | 22     | 45   | 40  | 7.0  | ●             | A     | 0.5                                                                                  | LH M10x25     |                                                                                    |
| <b>650-22R-13</b>            | 6                                                                                 | 50             | 64.7  | 22     | 45   | 40  | 7.0  | ●             | A     | 0.5                                                                                  | LH M10x25     |                                                                                    |
| <b>663-22R-13</b>            | 6                                                                                 | 63             | 77.7  | 22     | 47   | 40  | 7.0  | ●             | A     | 0.7                                                                                  | LH M10x25     |                                                                                    |
| <b>863-22R-13</b>            | 8                                                                                 | 63             | 77.7  | 22     | 47   | 40  | 7.0  | ●             | A     | 0.7                                                                                  | LH M10x25     |                                                                                    |
| <b>480-27R-13B</b>           | 4                                                                                 | 80             | 94.8  | 27     | 70   | 50  | 7.0  | ●             | A     | 1.4                                                                                  | LH M12x30     |                                                                                    |
| <b>780-27R-13</b>            | 7                                                                                 | 80             | 94.8  | 27     | 70   | 50  | 7.0  | ●             | A     | 1.5                                                                                  | LH M12x30     |                                                                                    |
| <b>1080-27R-13</b>           | 10                                                                                | 80             | 94.8  | 27     | 70   | 50  | 7.0  | ●             | A     | 1.5                                                                                  | LH M12x30     |                                                                                    |
| <b>5100-32R-13B</b>          | 5                                                                                 | 100            | 114.8 | 32     | 85   | 50  | 7.0  | ●             | A     | 2.1                                                                                  | LH M16x35     |                                                                                    |
| <b>8100-32R-13</b>           | 8                                                                                 | 100            | 114.8 | 32     | 85   | 50  | 7.0  | ●             | A     | 2.2                                                                                  | LH M16x35     |                                                                                    |
| <b>12100-32R-13</b>          | 12                                                                                | 100            | 114.8 | 32     | 85   | 50  | 7.0  | ●             | A     | 2.2                                                                                  | LH M16x35     |                                                                                    |
| <b>6125-40R-13B</b>          | 6                                                                                 | 125            | 139.8 | 40     | 85   | 63  | 7.0  | ●             | A     | 3.8                                                                                  | SH M20x40     |                                                                                    |
| <b>10125-40R-13</b>          | 10                                                                                | 125            | 139.8 | 40     | 85   | 63  | 7.0  | ●             | A     | 3.8                                                                                  | SH M20x40     |                                                                                    |
| <b>16125-40R-13</b>          | 16                                                                                | 125            | 139.6 | 40     | 85   | 63  | 7.0  | ●             | A     | 3.8                                                                                  | SH M20x40     |                                                                                    |
| <b>8160-40R-13B</b>          | 8                                                                                 | 160            | 174.8 | 40     | 110  | 63  | 7.0  | x             | C     | 4.9                                                                                  | -             |                                                                                    |
| <b>12160-40R-13</b>          | 12                                                                                | 160            | 174.8 | 40     | 110  | 63  | 7.0  | x             | C     | 4.9                                                                                  | -             |                                                                                    |
| <b>20160-40R-13</b>          | 20                                                                                | 160            | 174.5 | 40     | 110  | 63  | 7.0  | x             | C     | 5.0                                                                                  | -             |                                                                                    |
| <b>10200-60R-13B</b>         | 10                                                                                | 200            | 214.8 | 60     | 130  | 63  | 7.0  | x             | C     | 6.5                                                                                  | -             |                                                                                    |
| <b>18200-60R-13</b>          | 18                                                                                | 200            | 214.8 | 60     | 130  | 63  | 7.0  | x             | C     | 6.6                                                                                  | -             |                                                                                    |
| <b>26200-60R-13</b>          | 26                                                                                | 200            | 214.3 | 60     | 130  | 63  | 7.0  | x             | C     | 7.0                                                                                  | -             |                                                                                    |
| <b>20250-60R-13</b>          | 20                                                                                | 250            | 264.8 | 60     | 160  | 63  | 7.0  | x             | C     | 12.9                                                                                 | -             |                                                                                    |
| <b>TFM45SN 480-25.4R-13B</b> | 4                                                                                 | 80             | 94.8  | 25.4   | 70   | 50  | 7.0  | ●             | A     | 1.4                                                                                  | LH M12x30     |                                                                                    |
| <b>5100-31.75R-13B</b>       | 5                                                                                 | 100            | 114.8 | 31.75  | 80   | 50  | 7.0  | x             | B     | 2.1                                                                                  | -             |                                                                                    |
| <b>6125-38.1R-13B</b>        | 6                                                                                 | 125            | 139.8 | 38.1   | 80   | 63  | 7.0  | x             | B     | 3.8                                                                                  | -             |                                                                                    |
| <b>10125-38.1R-13</b>        | 10                                                                                | 125            | 139.8 | 38.1   | 80   | 63  | 7.0  | x             | B     | 3.4                                                                                  | -             |                                                                                    |
| <b>8160-50.8R-13B</b>        | 8                                                                                 | 160            | 174.8 | 50.8   | 100  | 63  | 7.0  | x             | B     | 4.9                                                                                  | -             |                                                                                    |
| <b>12160-50.8R-13</b>        | 12                                                                                | 160            | 174.8 | 50.8   | 100  | 63  | 7.0  | x             | B     | 5.0                                                                                  | -             |                                                                                    |
| <b>10200-47.625R-13B</b>     | 10                                                                                | 200            | 214.8 | 47.625 | 130  | 63  | 7.0  | x             | C     | 6.5                                                                                  | -             |                                                                                    |
| <b>12250-47.625R-13B</b>     | 12                                                                                | 250            | 264.8 | 47.625 | 160  | 63  | 7.0  | x             | C     | 12.9                                                                                 | -             |                                                                                    |
|                              |                                                                                   |                |       |        |      |     |      |               |       |                                                                                      |               |                                                                                    |
|                              |                                                                                   |                |       |        |      |     |      |               |       |                                                                                      |               |                                                                                    |
|                              |                                                                                   |                |       |        |      |     |      |               |       |                                                                                      |               |                                                                                    |
|                              |                                                                                   |                |       |        |      |     |      |               |       |                                                                                      |               |                                                                                    |
|                              |                                                                                   |                |       |        |      |     |      |               |       |                                                                                      |               |                                                                                    |
|                              |                                                                                   |                |       |        |      |     |      |               |       |                                                                                      |               |                                                                                    |
|                              |                                                                                   |                |       |        |      |     |      |               |       |                                                                                      |               |                                                                                    |

► Mounting bolt with coolant through hole is available on request  
(ordering example: SH M10x1.5x30-C)



# CHASE 2 QUAD

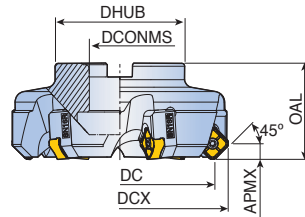
[illegible]

## Spare parts

| Designation        | Screw                                                                               | Wrench                                                                              |  |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                    |  |  |  |  |  |
| <b>TFM45SN-13</b>  | TS 40B100I                                                                          | T-T15                                                                               |  |  |  |
| <b>TFM45SNS-16</b> | TS 45120I                                                                           | T-T20                                                                               |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |



# CHASE 2 QUAD



## Spare parts

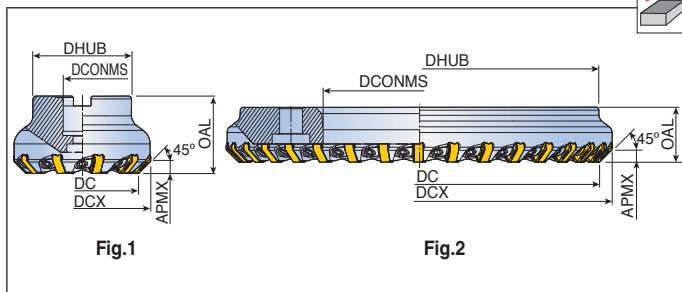
| Designation            | Screw                                                                               | Cartridge                                                                           | Cartridge screw                                                                     | Wrench                                                                              |  |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                        |  |  |  |  |  |
| <b>TFM45SNS-16B-CA</b> | TS 45120I                                                                           | TCT23-SN16R                                                                         | TS 60170I                                                                           | T-T20                                                                               |  |
|                        |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                        |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                        |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                        |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



# TFM45SNW-16/TQ45SNW-16

**CHASE2QUAD**

## Face mills



| Designation                 |    | Dimension (mm) |       |        |      |     |      | Fig. | Arbor style | Kg   | Mounting bolt | Insert               |
|-----------------------------|----|----------------|-------|--------|------|-----|------|------|-------------|------|---------------|----------------------|
|                             |    | DC             | DCX   | DCONMS | DHUB | OAL | APMX |      |             |      |               |                      |
| <b>TFM45SNW 1080-27R-16</b> | 10 | 80             | 98.2  | 27     | 70   | 55  | 8.8  | 1    | A           | 1.9  | LH M12x30     | SNHX 1606...<br>E302 |
| <b>14100-32R-16</b>         | 14 | 100            | 118.2 | 32     | 85   | 63  | 8.8  | 1    | A           | 3.2  | SH M16x35     |                      |
| <b>18125-40R-16</b>         | 18 | 125            | 143.2 | 40     | 85   | 63  | 8.8  | 1    | B           | 3.9  | -             |                      |
| <b>22160-40R-16</b>         | 22 | 160            | 178.2 | 40     | 110  | 63  | 8.8  | 1    | C           | 5.7  | -             |                      |
| <b>26200-60R-16</b>         | 26 | 200            | 218.2 | 60     | 130  | 63  | 8.8  | 1    | C           | 7.8  | -             |                      |
| <b>32250-60R-16</b>         | 32 | 250            | 268.2 | 60     | 160  | 63  | 8.8  | 1    | C           | 13.5 | -             |                      |

| Designation              |    | Dimension (mm) |       |        |      |     |      | Fig. | Kg   | Adapter   | Insert               |
|--------------------------|----|----------------|-------|--------|------|-----|------|------|------|-----------|----------------------|
|                          |    | DC             | DCX   | DCONMS | DHUB | OAL | APMX |      |      |           |                      |
| <b>TQ45SNW 26200R-16</b> | 26 | 200            | 218.2 | 63.5   | 200  | 38  | 8.8  | 2    | 6.3  | QA 08 K/M | SNHX 1606...<br>E302 |
| <b>34250R-16</b>         | 34 | 250            | 268.2 | 133.35 | 248  | 38  | 8.8  | 2    | 7.9  | QA 10 K/M |                      |
| <b>44315R-16</b>         | 44 | 315            | 333.2 | 146.05 | 313  | 38  | 8.8  | 2    | 13.2 | QA 12 K/M |                      |
| <b>50355R-16</b>         | 50 | 355            | 373.2 | 215.90 | 353  | 38  | 8.8  | 2    | 13.0 | QA 14 K/M |                      |
|                          |    |                |       |        |      |     |      |      |      |           |                      |
|                          |    |                |       |        |      |     |      |      |      |           |                      |
|                          |    |                |       |        |      |     |      |      |      |           |                      |
|                          |    |                |       |        |      |     |      |      |      |           |                      |
|                          |    |                |       |        |      |     |      |      |      |           |                      |
|                          |    |                |       |        |      |     |      |      |      |           |                      |

► Recommend to very stable machining condition at cast iron & steel

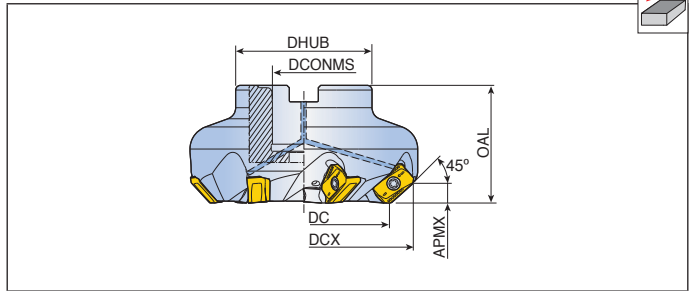
## Spare parts

| Designation     | Wedge     | Wedge screw | Wrench |  |  |
|-----------------|-----------|-------------|--------|--|--|
|                 |           |             |        |  |  |
| <b>TFM45SNW</b> | WFZ 8H-SN | WS 8        | T-W 4  |  |  |
| <b>TQ45SNW</b>  | WFZ 8H-SN | WS 8        | T-W 4  |  |  |
|                 |           |             |        |  |  |
|                 |           |             |        |  |  |
|                 |           |             |        |  |  |





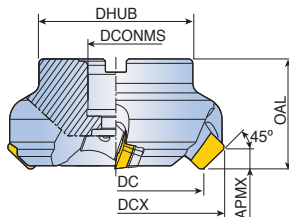
**CHASE2MILL**



- ▶ 90° Inserts can not be mounted
- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation    | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                |  |  |  |  |  |
| <b>TFM45AN</b> | TS 40120I                                                                           | T-T15                                                                               |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |





45°

► Metric bore cutter is available upon request

| Designation              | Carbide shim                                                                        | Wedge                                                                               | Shim screw                                                                          | Wedge screw                                                                         | Wrench                                                                              |                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                          |  |  |  |  |  |  |
| <b>LM45SD-12</b> (Ø80)   | TSSDSE 12N                                                                          | WPA 8                                                                               | TS 40B100I                                                                          | TS 80160W                                                                           | T-W 4                                                                               | T-T15                                                                               |
| <b>LM45SD-15</b> (Ø100-) | TSSDSE 15N                                                                          | WPA 8                                                                               | TS 40B100I                                                                          | TS 80200W                                                                           | T-W 4                                                                               | T-T15                                                                               |
|                          |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                          |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

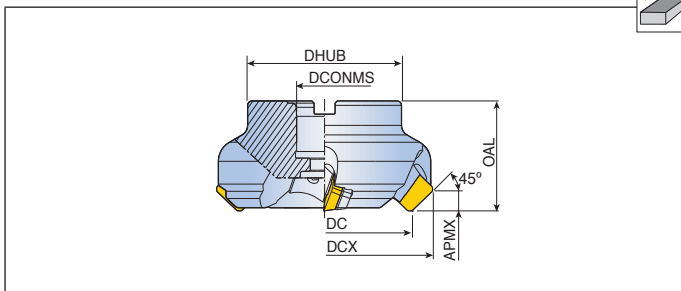


► The shim screw wrench T-T15<sup>(1)</sup> shall be ordered separately

# LM45SE-12/15



Face mills (Inch bore)



| Designation                |  | Dimension (mm) |       |        |      |     |      | Arbor style  | Kg   | Mounting bolt | Insert                                                                                                 |
|----------------------------|-----------------------------------------------------------------------------------|----------------|-------|--------|------|-----|------|-----------------------------------------------------------------------------------------------|------|---------------|--------------------------------------------------------------------------------------------------------|
|                            |                                                                                   | DC             | DCX   | DCONMS | DHUB | OAL | APMX |                                                                                               |      |               |                                                                                                        |
| <b>LM45SE 480-25.4R-12</b> | 4                                                                                 | 80             | 93.7  | 25.4   | 70   | 55  | 6.5  | A                                                                                             | 1.8  | LH M12x30     | SEKN 1203...<br> E297 |
| <b>5100-31.75R-12</b>      | 5                                                                                 | 100            | 113.6 | 31.75  | 80   | 60  | 6.5  | A                                                                                             | 2.8  | LH M16x35     |                                                                                                        |
| <b>6125-38.1R-12</b>       | 6                                                                                 | 125            | 138.6 | 38.1   | 80   | 63  | 6.5  | B                                                                                             | 3.4  | -             |                                                                                                        |
| <b>8160-50.8R-12</b>       | 8                                                                                 | 160            | 173.6 | 50.8   | 100  | 63  | 6.5  | B                                                                                             | 5.0  | -             |                                                                                                        |
| <b>10200-47.625R-12</b>    | 10                                                                                | 200            | 213.6 | 47.625 | 130  | 63  | 6.5  | C                                                                                             | 7.5  | -             |                                                                                                        |
| <b>12250-47.625R-12</b>    | 12                                                                                | 250            | 263.6 | 47.625 | 160  | 63  | 6.5  | C                                                                                             | 12.2 | -             |                                                                                                        |
| <b>LM45SE 480-25.4R-15</b> | 4                                                                                 | 80             | 97.8  | 25.4   | 70   | 55  | 8.7  | A                                                                                             | 1.8  | LH M12x30     | SEKN 1504...<br> E297 |
| <b>5100-31.75R-15</b>      | 5                                                                                 | 100            | 118   | 31.75  | 80   | 60  | 8.7  | A                                                                                             | 2.8  | LH M16x35     |                                                                                                        |
| <b>6125-38.1R-15</b>       | 6                                                                                 | 125            | 143   | 38.1   | 80   | 63  | 8.7  | B                                                                                             | 3.5  | -             |                                                                                                        |
| <b>8160-50.8R-15</b>       | 8                                                                                 | 160            | 178   | 50.8   | 100  | 63  | 8.7  | B                                                                                             | 5.7  | -             |                                                                                                        |
| <b>10200-47.625R-15</b>    | 10                                                                                | 200            | 218   | 47.625 | 130  | 63  | 8.7  | C                                                                                             | 7.8  | -             |                                                                                                        |
| <b>12250-47.625R-15</b>    | 12                                                                                | 250            | 268   | 47.625 | 160  | 63  | 8.7  | C                                                                                             | 12.8 | -             |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |
|                            |                                                                                   |                |       |        |      |     |      |                                                                                               |      |               |                                                                                                        |

► Metric bore cutter is available upon request

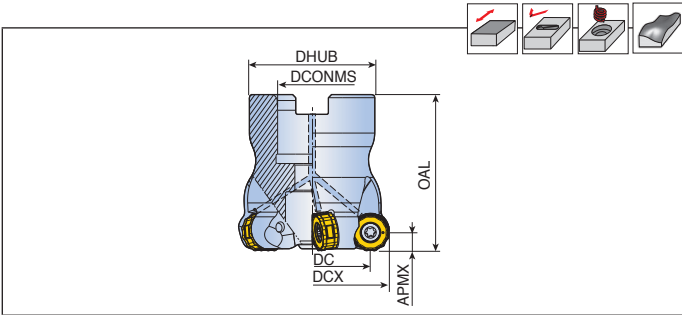
## Spare parts

| Designation      | Carbide shim | Wedge | Shim screw | Wedge screw              | Wrench |                |
|------------------|--------------|-------|------------|--------------------------|--------|----------------|
|                  |              |       |            | <sup>(1)</sup>           |        | <sup>(2)</sup> |
| <b>LM45SE-12</b> | TSSDSE 12N   | WPA 8 | TS 40B100I | TS 80200W                | T-W 4  | T-T15          |
| <b>LM45SE-15</b> | TSSDSE 15N   | WPA 8 | TS 40B100I | TS 80160W <sup>(1)</sup> | T-W 4  | T-T15          |
|                  |              |       |            |                          |        |                |
|                  |              |       |            |                          |        |                |
|                  |              |       |            |                          |        |                |



- <sup>(1)</sup> TS 80160W is for D80 cutter
- The shim screw wrench T-T15<sup>(2)</sup> shall be ordered separately

Face mills



| Designation       |   | Dimension (mm) |    |        |      |     |      | Coolant hole | Arbor style | Kg  | Mounting bolt | Insert               |
|-------------------|---|----------------|----|--------|------|-----|------|--------------|-------------|-----|---------------|----------------------|
|                   |   | DCX            | DC | DCONMS | DHUB | OAL | APMX |              |             |     |               |                      |
| TFMRNS 432-16R-10 | 4 | 32             | 22 | 16     | 30   | 40  | 5.0  | ●            | E           | 0.1 | KTB 32B       | RNMU 1004...<br>E292 |
| 433-16R-10        | 4 | 33             | 23 | 16     | 30   | 40  | 5.0  | ●            | E           | 0.1 | KTB 32B       |                      |
| 540-16R-10        | 5 | 40             | 30 | 16     | 38   | 40  | 5.0  | ●            | A           | 0.2 | SH M8x30      |                      |
| 650-22R-10        | 6 | 50             | 40 | 22     | 45   | 50  | 5.0  | ●            | A           | 0.4 | SH M10x30     |                      |
| 652-22R-10        | 6 | 52             | 42 | 22     | 45   | 50  | 5.0  | ●            | A           | 0.4 | SH M10x30     |                      |
| 763-22R-10        | 7 | 63             | 53 | 22     | 47   | 50  | 5.0  | ●            | A           | 0.7 | SH M10x30     | RNMU 1205...<br>E292 |
| TFMRNS 440-16R-12 | 4 | 40             | 28 | 16     | 38   | 40  | 6.0  | ●            | A           | 0.2 | SH M8x30      |                      |
| 450-22R-12        | 4 | 50             | 38 | 22     | 45   | 50  | 6.0  | ●            | A           | 0.3 | SH M10x30     |                      |
| 550-22R-12        | 5 | 50             | 40 | 22     | 45   | 50  | 6.0  | ●            | A           | 0.3 | SH M10x30     |                      |
| 552-22R-12        | 5 | 52             | 40 | 22     | 45   | 50  | 6.0  | ●            | A           | 0.4 | SH M10x30     |                      |
| 563-22R-12        | 5 | 63             | 51 | 22     | 47   | 50  | 6.0  | ●            | A           | 0.6 | SH M10x30     |                      |
| 663-22R-12        | 6 | 63             | 51 | 22     | 47   | 50  | 6.0  | ●            | A           | 0.6 | SH M10x30     |                      |
| 666-27R-12        | 6 | 66             | 54 | 27     | 58   | 50  | 6.0  | ●            | A           | 0.6 | SH M12x35     |                      |
| 680-27R-12        | 6 | 80             | 68 | 27     | 58   | 50  | 6.0  | ●            | A           | 1.1 | SH M12x35     |                      |
| 780-27R-12        | 7 | 80             | 68 | 27     | 58   | 50  | 6.0  | ●            | A           | 1.0 | SH M12x35     |                      |
| 7100-32R-12       | 7 | 100            | 88 | 32     | 66   | 50  | 6.0  | ●            | A           | 1.5 | LH M16x35     |                      |
| 8100-32R-12       | 8 | 100            | 88 | 32     | 66   | 50  | 6.0  | ●            | A           | 1.5 | LH M16x35     |                      |
|                   |   |                |    |        |      |     |      |              |             |     |               |                      |
|                   |   |                |    |        |      |     |      |              |             |     |               |                      |
|                   |   |                |    |        |      |     |      |              |             |     |               |                      |
|                   |   |                |    |        |      |     |      |              |             |     |               |                      |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

Spare parts

| Designation | Screw        | Wrench |  |  |  |
|-------------|--------------|--------|--|--|--|
|             |              |        |  |  |  |
| TFMRNS-10   | TS 35085I/HG | T-T15  |  |  |  |
| TFMRNS-12   | TS 40G110I   | T-T15  |  |  |  |
|             |              |        |  |  |  |
|             |              |        |  |  |  |
|             |              |        |  |  |  |

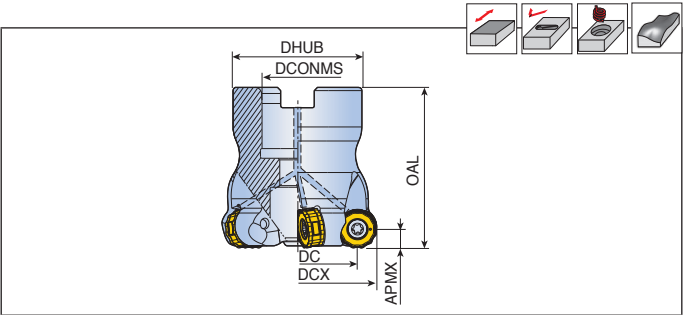
E352-E325

E326-E327

E328

E401-E402

## Face mills



| Designation              |    | Dimension (mm) |     |        |      |     |      | Coolant hole | Arbor style | Kg  | Mounting bolt | Insert               |
|--------------------------|----|----------------|-----|--------|------|-----|------|--------------|-------------|-----|---------------|----------------------|
|                          |    | DCX            | DC  | DCONMS | DHUB | OAL | APMX |              |             |     |               |                      |
| <b>TFMRNS 350-16R-16</b> | 3  | 50             | 34  | 16     | 38   | 50  | 8.0  | ●            | A           | 0.2 | SH M8x30      | RNMU 1606...<br>E292 |
| <b>450-16R-16</b>        | 4  | 50             | 34  | 16     | 38   | 50  | 8.0  | ●            | A           | 0.2 | SH M8x30      |                      |
| <b>452-22R-16</b>        | 4  | 52             | 36  | 22     | 45   | 50  | 8.0  | ●            | A           | 0.3 | SH M10x30     |                      |
| <b>463-22R-16</b>        | 4  | 63             | 47  | 22     | 47   | 50  | 8.0  | ●            | A           | 0.5 | SH M10x30     |                      |
| <b>566-27R-16</b>        | 5  | 66             | 50  | 27     | 58   | 50  | 8.0  | ●            | A           | 0.6 | LH M12x30     |                      |
| <b>580-27R-16</b>        | 5  | 80             | 64  | 27     | 58   | 50  | 8.0  | ●            | A           | 0.9 | LH M12x30     |                      |
| <b>680-27R-16</b>        | 6  | 80             | 64  | 27     | 58   | 50  | 8.0  | ●            | A           | 0.8 | LH M12x30     |                      |
| <b>6100-32R-16</b>       | 6  | 100            | 84  | 32     | 66   | 50  | 8.0  | ●            | A           | 1.7 | LH M16x35     |                      |
| <b>7125-40R-16</b>       | 7  | 125            | 109 | 40     | 85   | 63  | 8.0  | ●            | A           | 3.0 | SH M20x40     |                      |
| <b>8125-40R-16</b>       | 8  | 125            | 109 | 40     | 85   | 63  | 8.0  | ●            | A           | 2.9 | SH M20x40     |                      |
| <b>9160-40R-16</b>       | 9  | 160            | 144 | 40     | 110  | 63  | 8.0  | x            | C           | 3.8 | -             |                      |
| <b>10200-60R-16</b>      | 10 | 200            | 184 | 60     | 130  | 63  | 8.0  | x            | C           | 5.6 | -             |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |
|                          |    |                |     |        |      |     |      |              |             |     |               |                      |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation      | Screw         | Wrench |  |  |  |
|------------------|---------------|--------|--|--|--|
|                  |               |        |  |  |  |
| <b>TFMRNS-16</b> | TS 50A1211/HG | T-T20  |  |  |  |
|                  |               |        |  |  |  |
|                  |               |        |  |  |  |
|                  |               |        |  |  |  |
|                  |               |        |  |  |  |

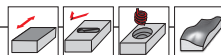
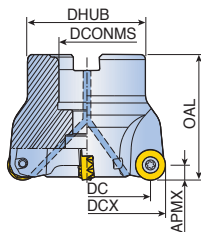
E352-E325

E326-E327

E328

E401-E402

## Face mills

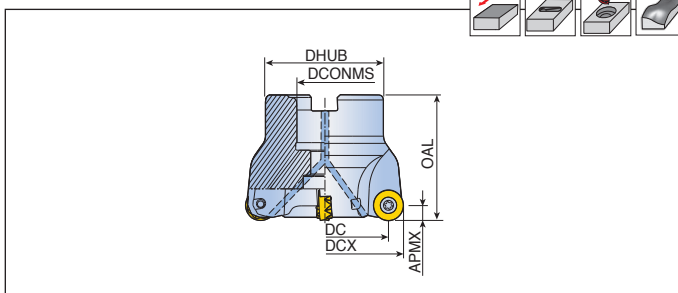


| Designation             |  | Dimension (mm) |     |        |      |     |      | Coolant hole | Arbor style |  Kg | Mounting bolt | Insert                                                                                                         |           |
|-------------------------|-----------------------------------------------------------------------------------|----------------|-----|--------|------|-----|------|--------------|-------------|--------------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------|-----------|
|                         |                                                                                   | DCX            | DC  | DCONMS | DHUB | OAL | APMX |              |             |                                                                                      |               |                                                                                                                |           |
| <b>TFMRY 532-16R-08</b> | 5                                                                                 | 32             | 24  | 16     | 30   | 40  | 4.0  | ●            | A           | 0.12                                                                                 | SH M8x30      | RYM(H)X 0803...<br> E293-E294 |           |
|                         | <b>640-16R-08</b>                                                                 | 6              | 40  | 32     | 16   | 38  | 40   | 4.0          | ●           | A                                                                                    | 0.22          |                                                                                                                | SH M8x30  |
| <b>TFMRY 432-16R-10</b> | 4                                                                                 | 32             | 22  | 16     | 30   | 40  | 5.0  | ●            | A           | 0.12                                                                                 | SH M8x30      | RYM(H)X 1004...<br> E293-E294 |           |
|                         | <b>540-16R-10</b>                                                                 | 5              | 40  | 30     | 16   | 38  | 40   | 5.0          | ●           | A                                                                                    | 0.22          |                                                                                                                | SH M8x30  |
|                         | <b>640-16R-10</b>                                                                 | 6              | 40  | 30     | 16   | 38  | 40   | 5.0          | ●           | A                                                                                    | 0.23          |                                                                                                                | SH M8x30  |
|                         | <b>650-22R-10</b>                                                                 | 6              | 50  | 40     | 22   | 45  | 50   | 5.0          | ●           | A                                                                                    | 0.33          |                                                                                                                | SH M10x30 |
|                         | <b>652-22R-10</b>                                                                 | 6              | 52  | 42     | 22   | 45  | 50   | 5.0          | ●           | A                                                                                    | 0.36          |                                                                                                                | SH M10x30 |
|                         | <b>763-22R-10</b>                                                                 | 7              | 63  | 53     | 22   | 47  | 50   | 5.0          | ●           | A                                                                                    | 0.57          |                                                                                                                | SH M10x30 |
|                         | <b>766-27R-10</b>                                                                 | 7              | 66  | 56     | 27   | 58  | 50   | 5.0          | ●           | A                                                                                    | 0.68          |                                                                                                                | LH M12x30 |
| <b>TFMRY 332-16R-12</b> | 3                                                                                 | 32             | 20  | 16     | 30   | 50  | 6.0  | ●            | E           | 0.12                                                                                 | KTB 32B       | RYM(H)X 1205...<br> E293-E294 |           |
|                         | <b>440-16R-12</b>                                                                 | 4              | 40  | 28     | 16   | 38  | 40   | 6.0          | ●           | A                                                                                    | 0.15          |                                                                                                                | SH M8x30  |
|                         | <b>442-16R-12</b>                                                                 | 4              | 42  | 30     | 16   | 38  | 40   | 6.0          | ●           | A                                                                                    | 0.21          |                                                                                                                | SH M8x30  |
|                         | <b>450-22R-12</b>                                                                 | 4              | 50  | 38     | 22   | 45  | 50   | 6.0          | ●           | A                                                                                    | 0.33          |                                                                                                                | SH M10x30 |
|                         | <b>550-22R-12</b>                                                                 | 5              | 50  | 38     | 22   | 45  | 50   | 6.0          | ●           | A                                                                                    | 0.33          |                                                                                                                | SH M10x30 |
|                         | <b>552-22R-12</b>                                                                 | 5              | 52  | 40     | 22   | 45  | 50   | 6.0          | ●           | A                                                                                    | 0.34          |                                                                                                                | SH M10x30 |
|                         | <b>463-22R-12</b>                                                                 | 4              | 63  | 51     | 22   | 47  | 50   | 6.0          | ●           | A                                                                                    | 0.57          |                                                                                                                | SH M10x30 |
|                         | <b>563-22R-12</b>                                                                 | 5              | 63  | 51     | 22   | 47  | 50   | 6.0          | ●           | A                                                                                    | 0.58          |                                                                                                                | SH M10x30 |
|                         | <b>663-22R-12</b>                                                                 | 6              | 63  | 51     | 22   | 47  | 50   | 6.0          | ●           | A                                                                                    | 0.58          |                                                                                                                | SH M10x30 |
|                         | <b>763-22R-12</b>                                                                 | 7              | 63  | 51     | 22   | 47  | 50   | 6.0          | ●           | A                                                                                    | 0.71          |                                                                                                                | SH M10x30 |
|                         | <b>666-27R-12</b>                                                                 | 6              | 66  | 54     | 27   | 58  | 50   | 6.0          | ●           | A                                                                                    | 0.62          |                                                                                                                | LH M12x30 |
|                         | <b>766-27R-12</b>                                                                 | 7              | 66  | 54     | 27   | 58  | 50   | 6.0          | ●           | A                                                                                    | 0.62          |                                                                                                                | LH M12x30 |
|                         | <b>680-27R-12</b>                                                                 | 6              | 80  | 68     | 27   | 58  | 50   | 6.0          | ●           | A                                                                                    | 0.90          |                                                                                                                | LH M12x30 |
|                         | <b>780-27R-12</b>                                                                 | 7              | 80  | 68     | 27   | 58  | 50   | 6.0          | ●           | A                                                                                    | 0.92          |                                                                                                                | LH M12x30 |
|                         | <b>880-27R-12</b>                                                                 | 8              | 80  | 68     | 27   | 58  | 50   | 6.0          | ●           | A                                                                                    | 0.98          |                                                                                                                | LH M12x30 |
|                         | <b>7100-32R-12</b>                                                                | 7              | 100 | 88     | 32   | 66  | 50   | 6.0          | ●           | A                                                                                    | 1.29          |                                                                                                                | LH M16x35 |
|                         | <b>8100-32R-12</b>                                                                | 8              | 100 | 88     | 32   | 66  | 50   | 6.0          | ●           | A                                                                                    | 1.37          |                                                                                                                | LH M16x35 |
|                         | <b>8125-40R-12</b>                                                                | 8              | 125 | 113    | 40   | 85  | 63   | 6.0          | ●           | A                                                                                    | 3.00          |                                                                                                                | SH M20x40 |
|                         | <b>9125-40R-12</b>                                                                | 9              | 125 | 113    | 40   | 85  | 63   | 6.0          | ●           | A                                                                                    | 2.99          |                                                                                                                | SH M20x40 |
|                         |                                                                                   |                |     |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |           |
|                         |                                                                                   |                |     |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |           |
|                         |                                                                                   |                |     |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |           |
|                         |                                                                                   |                |     |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |           |
|                         |                                                                                   |                |     |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |           |
|                         |                                                                                   |                |     |        |      |     |      |              |             |                                                                                      |               |                                                                                                                |           |



► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Face mills



| Designation               |   | Dimension (mm) |     |        |      |     |      | Coolant hole | Arbor style | Kg  | Mounting bolt | Insert                                                                                                               |
|---------------------------|---|----------------|-----|--------|------|-----|------|--------------|-------------|-----|---------------|----------------------------------------------------------------------------------------------------------------------|
|                           |   | DCX            | DC  | DCONMS | DHUB | OAL | APMX |              |             |     |               |                                                                                                                      |
| <b>TFMRY 350-16R-16</b>   | 3 | 50             | 34  | 16     | 38   | 50  | 8.0  | ●            | A           | 0.3 | SH M8x35      | RYM(H)X<br>1606...<br><br>E293-E294 |
| <b>450-16R-16</b>         | 4 | 50             | 34  | 16     | 38   | 50  | 8.0  | ●            | A           | 0.3 | SH M8x35      |                                                                                                                      |
| <b>450-22R-16</b>         | 4 | 50             | 34  | 22     | 45   | 50  | 8.0  | ●            | A           | 0.3 | SH M10x30     |                                                                                                                      |
| <b>452-22R-16</b>         | 4 | 52             | 36  | 22     | 45   | 50  | 8.0  | ●            | A           | 0.3 | SH M10x30     |                                                                                                                      |
| <b>463-22R-16</b>         | 4 | 63             | 47  | 22     | 47   | 50  | 8.0  | ●            | A           | 0.5 | SH M10x30     |                                                                                                                      |
| <b>463H-22R-16*</b>       | 4 | 63             | 47  | 22     | 47   | 50  | 8.0  | ●            | A           | 0.5 | SH M10x30     |                                                                                                                      |
| <b>566-27R-16</b>         | 5 | 66             | 50  | 27     | 58   | 50  | 8.0  | ●            | A           | 0.6 | LH M12x30     |                                                                                                                      |
| <b>580-27R-16</b>         | 5 | 80             | 64  | 27     | 58   | 50  | 8.0  | ●            | A           | 0.8 | LH M12x30     |                                                                                                                      |
| <b>580H-27R-16*</b>       | 5 | 80             | 64  | 27     | 58   | 50  | 8.0  | ●            | A           | 0.8 | LH M12x30     |                                                                                                                      |
| <b>680-27R-16</b>         | 6 | 80             | 64  | 27     | 58   | 50  | 8.0  | ●            | A           | 0.8 | LH M12x30     |                                                                                                                      |
| <b>6100-32R-16</b>        | 6 | 100            | 84  | 32     | 66   | 50  | 8.0  | ●            | A           | 1.2 | LH M16x35     |                                                                                                                      |
| <b>6100H-32R-16*</b>      | 6 | 100            | 84  | 32     | 66   | 50  | 8.0  | ●            | A           | 1.2 | LH M16x35     |                                                                                                                      |
| <b>7125-40R-16</b>        | 7 | 125            | 109 | 40     | 85   | 63  | 8.0  | ●            | A           | 2.7 | SH M20x40     |                                                                                                                      |
| <b>7125H-40R-16*</b>      | 7 | 125            | 109 | 40     | 85   | 63  | 8.0  | ●            | A           | 2.6 | SH M20x40     |                                                                                                                      |
| <b>8125-40R-16</b>        | 8 | 125            | 109 | 40     | 85   | 63  | 8.0  | ●            | A           | 2.7 | SH M20x40     |                                                                                                                      |
| <b>8160H-40R-16*</b>      | 8 | 160            | 144 | 40     | 110  | 63  | 8.0  | x            | C           | 3.3 | -             |                                                                                                                      |
| <b>TFMRY 580-25.4R-16</b> | 5 | 80             | 64  | 25.4   | 70   | 50  | 8.0  | ●            | A           | 1.0 | SH M12x35     |                                                                                                                      |
|                           |   |                |     |        |      |     |      |              |             |     |               |                                                                                                                      |
|                           |   |                |     |        |      |     |      |              |             |     |               |                                                                                                                      |
|                           |   |                |     |        |      |     |      |              |             |     |               |                                                                                                                      |

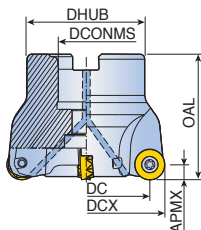
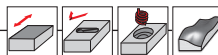
► \*: Carbide shim type

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation         | Shim                                                                                | Shim screw                                                                          | Screw                                                                               | Wrench                                                                              |                                                                                     |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |  |  |  |  |  |
| <b>TFMRY-08</b>     | -                                                                                   | -                                                                                   | TS 30A60I/HG                                                                        | TD 9                                                                                | -                                                                                   |
| <b>TFMRY-10</b>     | -                                                                                   | -                                                                                   | TS 35085/HG                                                                         | -                                                                                   | T-T15                                                                               |
| <b>TFMRY-12</b>     | -                                                                                   | -                                                                                   | TS 40093I                                                                           | -                                                                                   | T-T15                                                                               |
| <b>TFMRY-16</b>     | -                                                                                   | -                                                                                   | TS 50115I                                                                           | -                                                                                   | T-T20                                                                               |
| <b>TFMRY...H-16</b> | TSRY 16NS                                                                           | TS 8050088S                                                                         | TS 50A140I                                                                          | -                                                                                   | T-T20                                                                               |

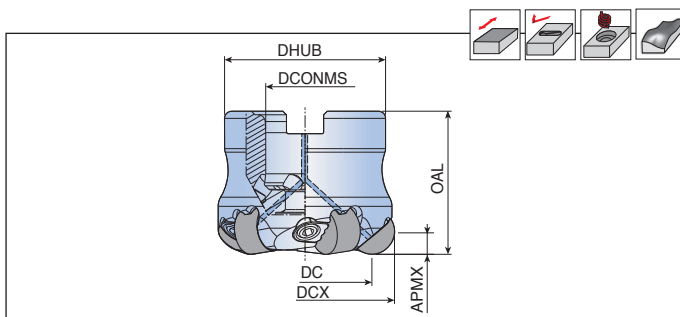
|                                                                                                 |                                                                                                  |                                                                                             |                                                                                                  |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <br>E352-E325 | <br>E326-E327 | <br>E328 | <br>E403-E405 |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|



|                                                                                                                              |                                                                                                                         |                                                                                                               |                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <p>Cutting Condition</p>  <p>E352-E325</p> | <p>Arbor Style</p>  <p>E326-E327</p> | <p>Torque</p>  <p>E328</p> | <p>Ramping Data</p>  <p>E403-E405</p> |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|



## Face mills

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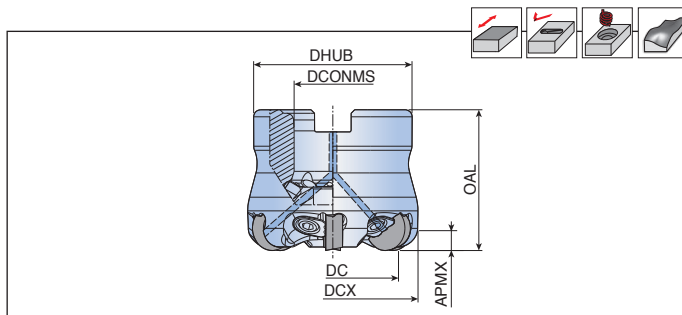
- ▶ Mounting bolt with air through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ <sup>(1)</sup> Use only air (Coolant is prohibited)

## Spare parts

| Designation     | Wedge                                                                               | Screw                                                                               | Wrench                                                                              |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                 |  |  |  |  |  |
| <b>TFMRN-12</b> | WFZ 6-C                                                                             | WS 6                                                                                | T-W 3                                                                               |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |



## Face mills

[illegible]

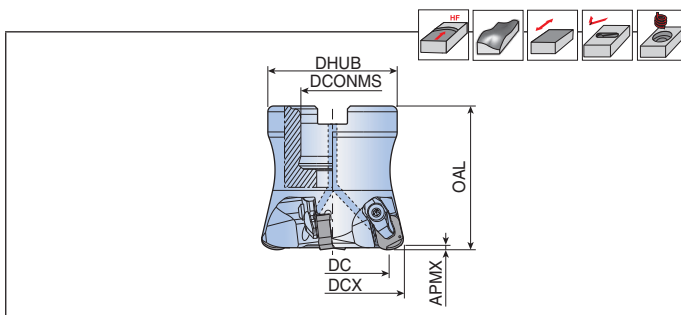
- ▶ Mounting bolt with air through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ <sup>(1)</sup> Use only air (Coolant is prohibited)

| Designation     | Wedge                                                                               | Screw                                                                               | Wrench                                                                              |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                 |  |  |  |  |  |
| <b>TFMRP-12</b> | WFZ 6-C                                                                             | WS 6                                                                                | T-W 3                                                                               |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |



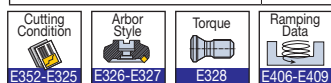


**CERAMICSPEED**  
HARDWARE & EXOTIC MATERIALS

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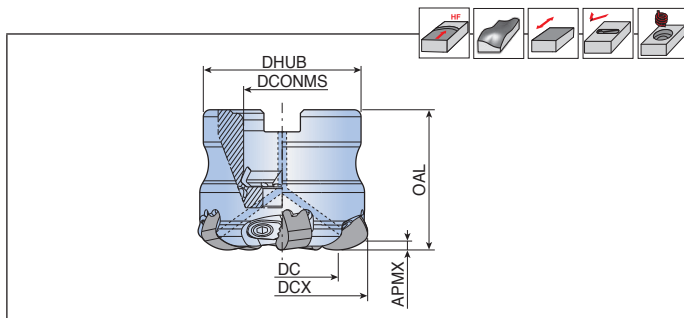
- ▶ Mounting bolt with air through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ <sup>(1)</sup> Use only air (Coolant is prohibited)

| Designation       | Clamp                                                                               | Screw                                                                               | Snap ring                                                                           | Wrench                                                                              |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                   |  |  |  |  |  |
| <b>TFMBN-09CH</b> | CCL-3S                                                                              | CLS-35A120/HG                                                                       | CSR 1.25                                                                            | L-W 2                                                                               |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



# TFMBN-12

## High feed face mills

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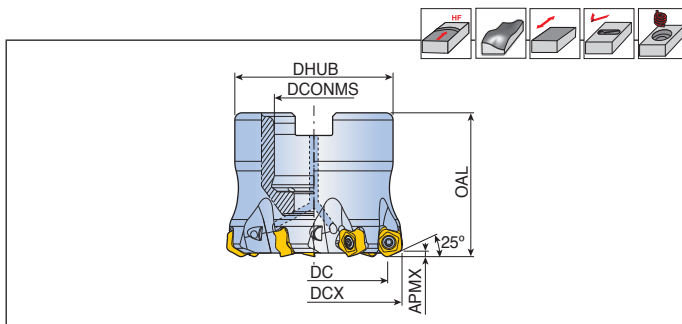
- ▶ Mounting bolt with air through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ <sup>(1)</sup> Use only air (Coolant is prohibited)

## Spare parts

| Designation     | Wedge                                                                               | Screw                                                                               | Wrench                                                                              |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                 |  |  |  |  |  |
| <b>TFMBN-12</b> | WFZ 6-C                                                                             | WS 6                                                                                | T-W 3                                                                               |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |



## High feed face mills



| Designation      |  | Dimension (mm) |       |        |      |     |      | Coolant<br>hole | Arbor<br>style |  Kg | Mounting<br>bolt | Insert                                                                                                  |           |
|------------------|-----------------------------------------------------------------------------------|----------------|-------|--------|------|-----|------|-----------------|----------------|--------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------|-----------|
|                  |                                                                                   | DCX            | DC    | DCONMS | DHUB | OAL | APMX |                 |                |                                                                                      |                  |                                                                                                         |           |
| TFMPT 640-16R-05 | 6                                                                                 | 40             | 31.8  | 16     | 38   | 40  | 1.5  | ●               | A              | 0.3                                                                                  | SH M8x25         | PTKU 0503...<br> E290 |           |
|                  | 750-22R-05                                                                        | 7              | 50    | 41.8   | 22   | 45  | 40   | 1.5             | ●              | A                                                                                    | 0.4              |                                                                                                         | LH M10x25 |
|                  | 752-22R-05                                                                        | 7              | 52    | 43.8   | 22   | 45  | 40   | 1.5             | ●              | A                                                                                    | 0.3              |                                                                                                         | LH M10x25 |
|                  | 863-22R-05                                                                        | 8              | 63    | 54.8   | 22   | 58  | 50   | 1.5             | ●              | A                                                                                    | 0.8              |                                                                                                         | SH M10x30 |
|                  | 866-27R-05                                                                        | 8              | 66    | 57.8   | 27   | 58  | 50   | 1.5             | ●              | A                                                                                    | 0.7              |                                                                                                         | SH M12x35 |
| TFMPT 450-22R-10 | 4                                                                                 | 50             | 33.4  | 22     | 45   | 40  | 3.0  | ●               | E              | 0.3                                                                                  | TCS10-40         | PTKU 1006...<br> E290 |           |
|                  | 563-22R-10                                                                        | 5              | 63    | 46.4   | 22   | 58  | 50   | 3.0             | ●              | A                                                                                    | 0.8              |                                                                                                         | SH M10x30 |
|                  | 566-22R-10                                                                        | 5              | 66    | 49.4   | 22   | 58  | 50   | 3.0             | ●              | A                                                                                    | 0.8              |                                                                                                         | SH M10x30 |
|                  | 680-27R-10                                                                        | 6              | 80    | 63.4   | 27   | 70  | 60   | 3.0             | ●              | A                                                                                    | 1.4              |                                                                                                         | SH M12x30 |
|                  | 8100-32R-10                                                                       | 8              | 100   | 83.4   | 32   | 85  | 60   | 3.0             | ●              | A                                                                                    | 2.3              |                                                                                                         | SH M16x35 |
|                  | 9125-32R-10                                                                       | 9              | 125   | 108.4  | 32   | 85  | 60   | 3.0             | ●              | A                                                                                    | 3.1              |                                                                                                         | SH M16x35 |
|                  | 10160-40R-10                                                                      | 10             | 160   | 143.4  | 40   | 110 | 60   | 3.0             | x              | C                                                                                    | 4.1              |                                                                                                         | -         |
|                  | 12200-60R-10                                                                      | 12             | 200   | 183.4  | 60   | 130 | 60   | 3.0             | x              | C                                                                                    | 5.7              |                                                                                                         | -         |
|                  | TFMPT 680-25.4R-10                                                                | 6              | 80    | 63.4   | 25.4 | 70  | 60   | 3.0             | ●              | A                                                                                    | 1.5              |                                                                                                         | SH M12x35 |
| 8100-31.75R-10   | 8                                                                                 | 100            | 83.4  | 31.75  | 80   | 60  | 3.0  | x               | B              | 2.0                                                                                  | -                |                                                                                                         |           |
| 9125-38.1R-10    | 9                                                                                 | 125            | 108.4 | 38.1   | 80   | 60  | 3.0  | x               | B              | 2.6                                                                                  | -                |                                                                                                         |           |
| 10160-50.8R-10   | 10                                                                                | 160            | 143.4 | 50.8   | 100  | 60  | 3.0  | x               | B              | 4.2                                                                                  | -                |                                                                                                         |           |
|                  |                                                                                   |                |       |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                         |           |
|                  |                                                                                   |                |       |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                         |           |
|                  |                                                                                   |                |       |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                         |           |
|                  |                                                                                   |                |       |        |      |     |      |                 |                |                                                                                      |                  |                                                                                                         |           |

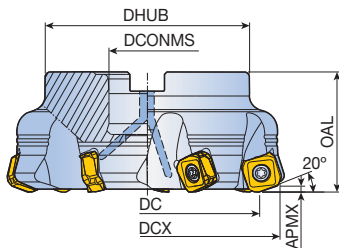
► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation     | Screw          | Wrench |              | Wrench handle |  |
|-----------------|----------------|--------|--------------|---------------|--|
|                 |                |        |              |               |  |
| <b>TFMPT-05</b> | TS 25D060/HG-P | TD7P   | -            | -             |  |
| <b>TFMPT-10</b> | TS 50D130/HG-P | -      | TBLD T20P-W6 | SW6-T         |  |
|                 |                |        |              |               |  |
|                 |                |        |              |               |  |

|           |           |      |           |
|-----------|-----------|------|-----------|
|           |           |      |           |
| E352-E325 | E326-E327 | E328 | E386-E387 |

**CHASE & FEED**  
RACING & HIGH FEED



► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

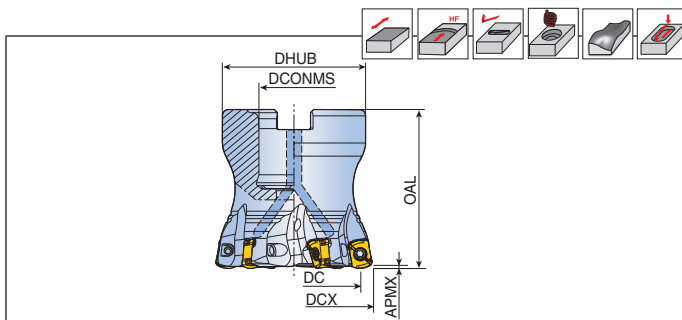
| Designation       | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                   |  |  |  |  |  |
| <b>8D-TF20-11</b> | TS 40A115I                                                                          | TBLD T15-W6                                                                         | SW6-T                                                                               |  |  |
| <b>8D-TF20-14</b> | TS 50C130I/HG                                                                       | TBLD T20-W6                                                                         | SW6-T                                                                               |  |  |
|                   |                                                                                     |                                                                                     |                                                                                     |  |  |
|                   |                                                                                     |                                                                                     |                                                                                     |  |  |



# TFMBLV-06

High feed face mills

WIN4FEED



| Designation              |  | Dimension (mm) |    |        |      |     |      | Coolant hole | Arbor type |  Kg | Mounting bolt | Insert                                                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|----------------|----|--------|------|-----|------|--------------|------------|--------------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------|
|                          |                                                                                   | DCX            | DC | DCONMS | DHUB | OAL | APMX |              |            |                                                                                      |               |                                                                                                                            |
| <b>TFMBLV 432-16R-06</b> | 4                                                                                 | 32             | 24 | 16     | 30   | 40  | 1.0  | ●            | A          | 0.1                                                                                  | SH M8x25      | <div>BLMV 0603...</div> <div> E277</div> |
| <b>532-16R-06</b>        | 5                                                                                 | 32             | 24 | 16     | 30   | 40  | 1.0  | ●            | A          | 0.1                                                                                  | SH M8x26      |                                                                                                                            |
| <b>640-16R-06</b>        | 6                                                                                 | 40             | 32 | 16     | 38   | 40  | 1.0  | ●            | A          | 0.2                                                                                  | SH M8x25      |                                                                                                                            |
| <b>640-22R-06</b>        | 6                                                                                 | 40             | 32 | 22     | 38   | 40  | 1.0  | ●            | A          | 0.2                                                                                  | SH M10x30     |                                                                                                                            |
| <b>650-22R-06</b>        | 6                                                                                 | 50             | 42 | 22     | 45   | 50  | 1.0  | ●            | A          | 0.4                                                                                  | SH M10x30     |                                                                                                                            |
| <b>750-22R-06</b>        | 7                                                                                 | 50             | 42 | 22     | 45   | 50  | 1.0  | ●            | A          | 0.4                                                                                  | SH M10x30     |                                                                                                                            |
| <b>850-22R-06</b>        | 8                                                                                 | 50             | 42 | 22     | 45   | 50  | 1.0  | ●            | A          | 0.4                                                                                  | SH M10x30     |                                                                                                                            |
| <b>752-22R-06</b>        | 7                                                                                 | 52             | 44 | 22     | 45   | 40  | 1.0  | ●            | A          | 0.4                                                                                  | SH M10x30     |                                                                                                                            |
| <b>852-22R-06</b>        | 8                                                                                 | 52             | 44 | 22     | 45   | 40  | 1.0  | ●            | A          | 0.4                                                                                  | SH M10x30     |                                                                                                                            |
| <b>763-22R-06</b>        | 7                                                                                 | 63             | 55 | 22     | 48   | 50  | 1.0  | ●            | A          | 0.6                                                                                  | SH M10x30     |                                                                                                                            |
| <b>863-22R-06</b>        | 8                                                                                 | 63             | 55 | 22     | 48   | 50  | 1.0  | ●            | A          | 0.6                                                                                  | SH M10x30     |                                                                                                                            |
| <b>963-22R-06</b>        | 9                                                                                 | 63             | 55 | 22     | 48   | 50  | 1.0  | ●            | A          | 0.6                                                                                  | SH M10x30     |                                                                                                                            |
| <b>966-27R-06</b>        | 9                                                                                 | 66             | 58 | 27     | 58   | 50  | 1.0  | ●            | A          | 0.7                                                                                  | SH M12x30     |                                                                                                                            |
|                          |                                                                                   |                |    |        |      |     |      |              |            |                                                                                      |               |                                                                                                                            |
|                          |                                                                                   |                |    |        |      |     |      |              |            |                                                                                      |               |                                                                                                                            |
|                          |                                                                                   |                |    |        |      |     |      |              |            |                                                                                      |               |                                                                                                                            |
|                          |                                                                                   |                |    |        |      |     |      |              |            |                                                                                      |               |                                                                                                                            |
|                          |                                                                                   |                |    |        |      |     |      |              |            |                                                                                      |               |                                                                                                                            |
|                          |                                                                                   |                |    |        |      |     |      |              |            |                                                                                      |               |                                                                                                                            |
|                          |                                                                                   |                |    |        |      |     |      |              |            |                                                                                      |               |                                                                                                                            |

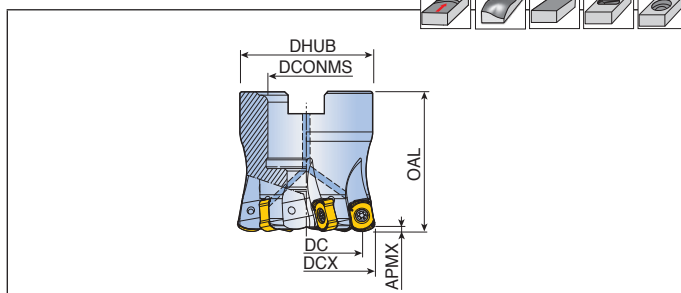
► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation            | Screw          | Wrench |  |  |  |
|------------------------|----------------|--------|--|--|--|
|                        |                |        |  |  |  |
| <b>TEBLV/TFMBLV-06</b> | TS 25064I/HG-P | TD 8P  |  |  |  |
|                        |                |        |  |  |  |
|                        |                |        |  |  |  |
|                        |                |        |  |  |  |

|           |           |      |      |
|-----------|-----------|------|------|
|           |           |      |      |
| E352-E325 | E326-E327 | E328 | E389 |

## High feed face mills



| Designation      |  | Dimension (mm) |      |        |      |     |      | Coolant hole | Arbor style |  Kg | Mounting bolt | Insert                                                                                                 |           |
|------------------|-----------------------------------------------------------------------------------|----------------|------|--------|------|-----|------|--------------|-------------|--------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------|-----------|
|                  |                                                                                   | DCX            | DC   | DCONMS | DHUB | OAL | APMX |              |             |                                                                                      |               |                                                                                                        |           |
| TFMBL 432-16R-06 | 4                                                                                 | 32             | 24.3 | 16     | 30   | 40  | 1.0  | ●            | A           | 0.1                                                                                  | SH M8x25      | BLMP 0603...<br> E275 |           |
|                  | 532-16R-06                                                                        | 5              | 32   | 24.3   | 16   | 30  | 40   | 1.0          | ●           | A                                                                                    | 0.1           |                                                                                                        | SH M8x25  |
|                  | 640-16R-06                                                                        | 6              | 40   | 32.2   | 16   | 38  | 40   | 1.0          | ●           | A                                                                                    | 0.2           |                                                                                                        | SH M8x25  |
|                  | 640-22R-06                                                                        | 6              | 40   | 32.2   | 22   | 38  | 40   | 1.0          | ●           | A                                                                                    | 0.2           |                                                                                                        | SH M10x30 |
|                  | 650-22R-06                                                                        | 6              | 50   | 42.2   | 22   | 45  | 50   | 1.0          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 750-22R-06                                                                        | 7              | 50   | 42.2   | 22   | 45  | 50   | 1.0          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 850-22R-06                                                                        | 8              | 50   | 42.2   | 22   | 45  | 50   | 1.0          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 752-22R-06                                                                        | 7              | 52   | 44.2   | 22   | 45  | 40   | 1.0          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 852-22R-06                                                                        | 8              | 52   | 44.2   | 22   | 45  | 40   | 1.0          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 763-22R-06                                                                        | 7              | 63   | 55.5   | 22   | 47  | 50   | 1.0          | ●           | A                                                                                    | 0.6           |                                                                                                        | SH M10x30 |
|                  | 863-22R-06                                                                        | 8              | 63   | 55.5   | 22   | 47  | 50   | 1.0          | ●           | A                                                                                    | 0.6           |                                                                                                        | SH M10x30 |
|                  | 963-22R-06                                                                        | 9              | 63   | 55.5   | 22   | 47  | 50   | 1.0          | ●           | A                                                                                    | 0.6           |                                                                                                        | SH M10x30 |
| 966-27R-06       | 9                                                                                 | 66             | 58.5 | 27     | 58   | 50  | 1.0  | ●            | A           | 0.7                                                                                  | SH M12x35     |                                                                                                        |           |
| TFMBL 432-16R-09 | 4                                                                                 | 32             | 21.6 | 16     | 30   | 40  | 1.5  | ●            | E           | 0.1                                                                                  | KT B 32B      | BLMP 0904...<br> E275 |           |
|                  | 440-16R-09                                                                        | 4              | 40   | 29.6   | 16   | 38  | 40   | 1.5          | ●           | A                                                                                    | 0.2           |                                                                                                        | SH M8x25  |
|                  | 540-16R-09                                                                        | 5              | 40   | 29.6   | 16   | 38  | 40   | 1.5          | ●           | A                                                                                    | 0.2           |                                                                                                        | SH M8x25  |
|                  | 550-22R-09                                                                        | 5              | 50   | 39.6   | 22   | 45  | 50   | 1.5          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 650-22R-09                                                                        | 6              | 50   | 39.6   | 22   | 45  | 50   | 1.5          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 750-22R-09                                                                        | 7              | 50   | 39.6   | 22   | 45  | 50   | 1.5          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 652-22R-09                                                                        | 6              | 52   | 41.6   | 22   | 45  | 40   | 1.5          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 752-22R-09                                                                        | 7              | 52   | 41.6   | 22   | 45  | 40   | 1.5          | ●           | A                                                                                    | 0.4           |                                                                                                        | SH M10x30 |
|                  | 663-22R-09                                                                        | 6              | 63   | 52.6   | 22   | 47  | 50   | 1.5          | ●           | A                                                                                    | 0.6           |                                                                                                        | SH M10x30 |
|                  | 763-22R-09                                                                        | 7              | 63   | 52.6   | 22   | 47  | 50   | 1.5          | ●           | A                                                                                    | 0.6           |                                                                                                        | SH M10x30 |
|                  | 863-22R-09                                                                        | 8              | 63   | 52.6   | 22   | 47  | 50   | 1.5          | ●           | A                                                                                    | 0.6           |                                                                                                        | SH M10x30 |
|                  | 766-27R-09                                                                        | 7              | 66   | 55.6   | 27   | 58  | 50   | 1.5          | ●           | A                                                                                    | 0.7           |                                                                                                        | SH M12x35 |
|                  | 866-27R-09                                                                        | 8              | 66   | 55.6   | 27   | 58  | 50   | 1.5          | ●           | A                                                                                    | 0.8           |                                                                                                        | SH M12x35 |
|                  | 780-27R-09                                                                        | 7              | 80   | 69.6   | 27   | 70  | 50   | 1.5          | ●           | A                                                                                    | 1.2           |                                                                                                        | SH M12x35 |
|                  | 880-27R-09                                                                        | 8              | 80   | 69.6   | 27   | 70  | 50   | 1.5          | ●           | A                                                                                    | 1.2           |                                                                                                        | SH M12x35 |
|                  | 980-27R-09                                                                        | 9              | 80   | 69.6   | 27   | 70  | 50   | 1.5          | ●           | A                                                                                    | 1.2           |                                                                                                        | SH M12x35 |
|                  | 1080-27R-09                                                                       | 10             | 80   | 69.6   | 27   | 70  | 50   | 1.5          | ●           | A                                                                                    | 1.2           |                                                                                                        | SH M12x35 |
|                  | 8100-32R-09                                                                       | 8              | 100  | 89.6   | 32   | 85  | 60   | 1.5          | ●           | A                                                                                    | 2.3           |                                                                                                        | SH M16x35 |
|                  | 9100-32R-09                                                                       | 9              | 100  | 89.6   | 32   | 85  | 60   | 1.5          | ●           | A                                                                                    | 2.3           |                                                                                                        | SH M16x35 |
|                  | 10100-32R-09                                                                      | 10             | 100  | 89.6   | 32   | 85  | 60   | 1.5          | ●           | A                                                                                    | 2.3           |                                                                                                        | SH M16x35 |
|                  | 11100-32R-09                                                                      | 11             | 100  | 89.6   | 32   | 85  | 60   | 1.5          | ●           | A                                                                                    | 2.3           |                                                                                                        | SH M16x35 |
|                  | 12100-32R-09                                                                      | 12             | 100  | 89.6   | 32   | 85  | 60   | 1.5          | ●           | A                                                                                    | 2.3           |                                                                                                        | SH M16x35 |
|                  | 12125-40R-09                                                                      | 12             | 125  | 114.6  | 40   | 85  | 60   | 1.5          | ●           | A                                                                                    | 2.7           |                                                                                                        | SH M20x40 |
|                  | 14125-40R-09                                                                      | 14             | 125  | 114.6  | 40   | 85  | 60   | 1.5          | ●           | A                                                                                    | 2.7           |                                                                                                        | SH M20x40 |

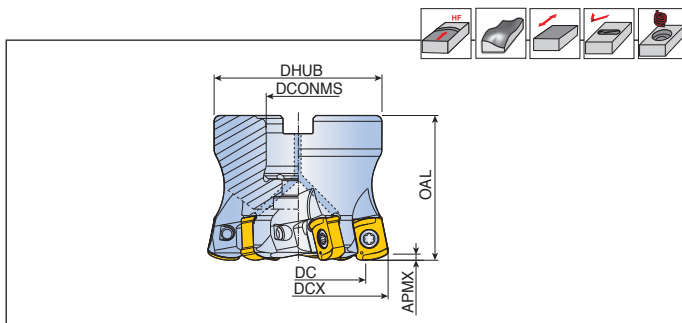




# TFMBL-11



## High feed face mills

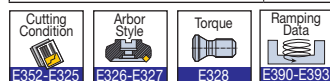


| Designation               |    | Dimension (mm) |       |        |      |     |      | Coolant hole | Arbor style | kg  | Mounting bolt | Insert               |
|---------------------------|----|----------------|-------|--------|------|-----|------|--------------|-------------|-----|---------------|----------------------|
|                           |    | DCX            | DC    | DCONMS | DHUB | OAL | APMX |              |             |     |               |                      |
| <b>TFMBL 440-16R-11</b>   | 4  | 40             | 24.4  | 16     | 30   | 40  | 2.0  | ●            | E           | 0.2 | KTB 32B       | BLMP 1105...<br>E275 |
| <b>450-22R-11</b>         | 4  | 50             | 34.4  | 22     | 45   | 40  | 2.0  | ●            | A           | 0.3 | LH M10x25     |                      |
| <b>550-22R-11</b>         | 5  | 50             | 34.4  | 22     | 45   | 40  | 2.0  | ●            | A           | 0.3 | LH M10x25     |                      |
| <b>552-22R-11</b>         | 5  | 52             | 36.4  | 22     | 45   | 40  | 2.0  | ●            | A           | 0.3 | LH M10x25     |                      |
| <b>563-22R-11</b>         | 5  | 63             | 48.4  | 22     | 58   | 50  | 2.0  | ●            | A           | 0.7 | SH M10x30     |                      |
| <b>663-22R-11</b>         | 6  | 63             | 48.4  | 22     | 58   | 50  | 2.0  | ●            | A           | 0.7 | SH M10x30     |                      |
| <b>666-22R-11</b>         | 6  | 66             | 50.3  | 22     | 58   | 50  | 2.0  | ●            | A           | 0.8 | SH M10x30     |                      |
| <b>666-27R-11</b>         | 6  | 66             | 50.3  | 27     | 58   | 50  | 2.0  | ●            | A           | 0.7 | SH M12x35     |                      |
| <b>680-27R-11</b>         | 6  | 80             | 64.3  | 27     | 70   | 60  | 2.0  | ●            | A           | 1.4 | SH M12x30     |                      |
| <b>780-27R-11</b>         | 7  | 80             | 64.3  | 27     | 70   | 60  | 2.0  | ●            | A           | 1.4 | SH M12x30     |                      |
| <b>6100-32R-11</b>        | 6  | 100            | 84.3  | 32     | 85   | 60  | 2.0  | ●            | A           | 2.2 | SH M16x35     |                      |
| <b>7100-32R-11</b>        | 7  | 100            | 84.3  | 32     | 85   | 60  | 2.0  | ●            | A           | 2.2 | SH M16x35     |                      |
| <b>8125-32R-11</b>        | 8  | 125            | 109.3 | 32     | 85   | 60  | 2.0  | ●            | A           | 2.5 | SH M20x40     |                      |
| <b>10125-40R-11</b>       | 10 | 125            | 109.3 | 40     | 85   | 60  | 2.0  | ●            | A           | 2.7 | SH M20x40     |                      |
| <b>10160-40R-11</b>       | 10 | 160            | 144.3 | 40     | 110  | 60  | 2.0  | x            | C           | 3.9 | -             |                      |
| <b>12200-60R-11</b>       | 12 | 200            | 184.3 | 60     | 130  | 60  | 2.0  | x            | C           | 5.8 | -             |                      |
| <b>TFMBL 680-25.4R-11</b> | 6  | 80             | 64.3  | 25.4   | 70   | 60  | 2.0  | ●            | A           | 1.4 | SH M12x35     |                      |
| <b>6100-31.75R-11</b>     | 6  | 100            | 84.3  | 31.75  | 80   | 60  | 2.0  | x            | B           | 1.8 | -             |                      |
|                           |    |                |       |        |      |     |      |              |             |     |               |                      |

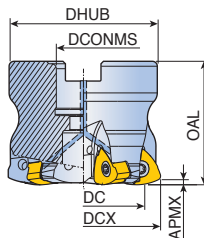
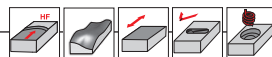
► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation     | Screw          | Wrench |             | Wrench handle |  |
|-----------------|----------------|--------|-------------|---------------|--|
|                 |                |        |             |               |  |
| <b>TFMBL-06</b> | TS 250641/HG-P | TD 8P  | -           | -             |  |
| <b>TFMBL-09</b> | TS 35A0881/HG  | TD 10P | -           | -             |  |
| <b>TFMBL-11</b> | TS 50A1211/HG  | -      | TBLD T20-W6 | SW6-T         |  |
|                 |                |        |             |               |  |
|                 |                |        |             |               |  |



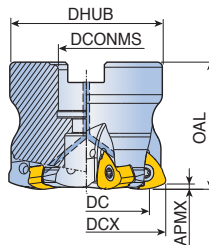
## High feed face mills



|                                                                                                                              |                                                                                                                         |                                                                                                               |                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <p>Cutting Condition</p>  <p>E352-E325</p> | <p>Arbor Style</p>  <p>E326-E327</p> | <p>Torque</p>  <p>E328</p> | <p>Ramping Data</p>  <p>E394</p> |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|

► Mounting bolt with coolant through hole is available on request  
(ordering example: SH M10x1.5x30-C)

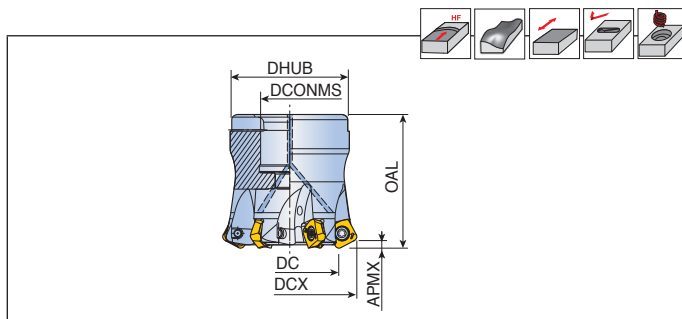
**CHASE2FEED**

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► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation     | Screw                                                                               | Wrench                                                                              |  |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                 |  |  |  |  |  |
| <b>TFMBL-13</b> | TS 50B106I/HG                                                                       | T-T20                                                                               |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |





| Designation             |   | Dimension (mm) |      |        |      |     |      | Coolant<br>hole | Arbor<br>style | Kg  | Mounting<br>bolt | Insert               |
|-------------------------|---|----------------|------|--------|------|-----|------|-----------------|----------------|-----|------------------|----------------------|
|                         |   | DCX            | DC   | DCONMS | DHUB | OAL | APMX |                 |                |     |                  |                      |
| <b>TFMSB 532-16R-06</b> | 5 | 32             | 21.7 | 16     | 30   | 40  | 1.0  | ●               | A              | 0.1 | SH M8x25         | SBMT 0603...<br>E295 |
| <b>640-16R-06</b>       | 6 | 40             | 29.7 | 16     | 38   | 40  | 1.0  | ●               | A              | 0.2 | SH M8x25         |                      |
| <b>750-22R-06</b>       | 7 | 50             | 39.7 | 22     | 45   | 50  | 1.0  | ●               | A              | 0.4 | SH M10x35        |                      |
| <b>863-22R-06</b>       | 8 | 63             | 52.7 | 22     | 47   | 50  | 1.0  | ●               | A              | 0.6 | SH M10x35        |                      |
| <b>TFMSB 432-16R-09</b> | 4 | 32             | 17.4 | 16     | 30   | 40  | 1.2  | ●               | E              | 0.1 | KTB 32B          | SBMT 0904...<br>E295 |
| <b>440-16R-09</b>       | 4 | 40             | 25.5 | 16     | 38   | 40  | 1.2  | ●               | A              | 0.2 | SH M8x25         |                      |
| <b>540-16R-09</b>       | 5 | 40             | 25.5 | 16     | 38   | 40  | 1.2  | ●               | A              | 0.2 | SH M8x25         |                      |
| <b>450-22R-09</b>       | 4 | 50             | 35.5 | 22     | 45   | 50  | 1.2  | ●               | A              | 0.4 | SH M10x30        |                      |
| <b>550-22R-09</b>       | 5 | 50             | 35.5 | 22     | 45   | 50  | 1.2  | ●               | A              | 0.4 | SH M10x30        |                      |
| <b>650-22R-09</b>       | 6 | 50             | 35.5 | 22     | 45   | 50  | 1.2  | ●               | A              | 0.4 | SH M10x30        |                      |
| <b>750-22R-09</b>       | 7 | 50             | 35.5 | 22     | 45   | 50  | 1.2  | ●               | A              | 0.4 | SH M10x30        |                      |
| <b>652-22R-09</b>       | 6 | 52             | 37.5 | 22     | 45   | 50  | 1.2  | ●               | A              | 0.4 | SH M10x30        |                      |
| <b>752-22R-09</b>       | 7 | 52             | 37.5 | 22     | 45   | 50  | 1.2  | ●               | A              | 0.4 | SH M10x30        |                      |
| <b>663-22R-09</b>       | 6 | 63             | 48.4 | 22     | 58   | 50  | 1.2  | ●               | A              | 0.8 | SH M10x30        |                      |
| <b>763-22R-09</b>       | 7 | 63             | 48.4 | 22     | 58   | 50  | 1.2  | ●               | A              | 0.8 | SH M10x30        |                      |
| <b>763-27R-09</b>       | 7 | 63             | 48.4 | 27     | 58   | 50  | 1.2  | ●               | A              | 0.7 | SH M12x35        |                      |
| <b>863-22R-09</b>       | 8 | 63             | 48.4 | 22     | 58   | 50  | 1.2  | ●               | A              | 0.8 | SH M10x30        |                      |
| <b>866-22R-09</b>       | 8 | 66             | 51.5 | 22     | 58   | 50  | 1.2  | ●               | A              | 0.8 | SH M10x30        |                      |
| <b>780-27R-09</b>       | 7 | 80             | 65.8 | 27     | 70   | 60  | 1.2  | ●               | A              | 1.4 | SH M12x35        |                      |
| <b>880-27R-09</b>       | 8 | 80             | 65.8 | 27     | 70   | 60  | 1.2  | ●               | A              | 1.4 | SH M12x35        |                      |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M8x1.25x25-C)

## Spare parts

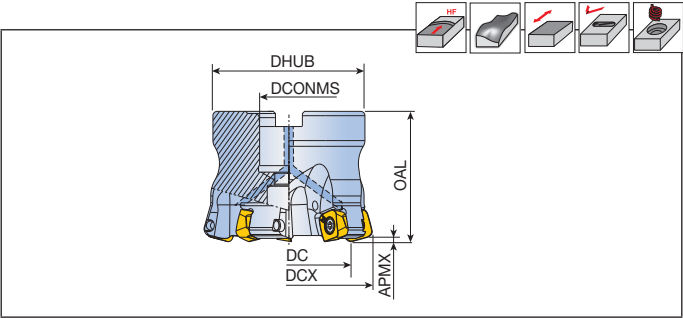
| Designation             | Screw          | Wrench |  |  |  |
|-------------------------|----------------|--------|--|--|--|
|                         |                |        |  |  |  |
| <b>TFMSB-06</b>         | TS 25064I/HG-P | TD 8P  |  |  |  |
| <b>TFMSB-09</b>         | TS 35A088I/HG  | TD 10P |  |  |  |
| <b>TFMSB 750-22R-09</b> | TS 35A070I/HG  | TD 10P |  |  |  |
| <b>TFMSB 752-22R-09</b> | TS 35A070I/HG  | TD 10P |  |  |  |



# TFMSB-13



High feed face mills



| Designation               |    | Dimension (mm) |       |        |      |     |      | Coolant hole | Arbor style | Kg  | Mounting bolt | Insert               |
|---------------------------|----|----------------|-------|--------|------|-----|------|--------------|-------------|-----|---------------|----------------------|
|                           |    | DCX            | DC    | DCONMS | DHUB | OAL | APMX |              |             |     |               |                      |
| <b>TFMSB 350-22R-13</b>   | 3  | 50             | 29.3  | 22     | 45   | 40  | 2.0  | ●            | A           | 0.3 | LH M10x25     | SBMT 1306...<br>E295 |
| <b>450-22R-13</b>         | 4  | 50             | 29.3  | 22     | 45   | 40  | 2.0  | ●            | A           | 0.2 | LH M10x25     |                      |
| <b>452-22R-13</b>         | 4  | 52             | 31.3  | 22     | 45   | 40  | 2.0  | ●            | A           | 0.3 | LH M10x25     |                      |
| <b>552-22R-13</b>         | 5  | 52             | 31.3  | 22     | 45   | 40  | 2.0  | ●            | A           | 0.2 | LH M10x25     |                      |
| <b>463-22R-13</b>         | 4  | 63             | 42.4  | 22     | 58   | 50  | 2.0  | ●            | A           | 0.6 | SH M10x30     |                      |
| <b>563-22R-13</b>         | 5  | 63             | 42.4  | 22     | 58   | 50  | 2.0  | ●            | A           | 0.5 | SH M10x30     |                      |
| <b>463-27R-13</b>         | 4  | 63             | 42.4  | 27     | 58   | 50  | 2.0  | ●            | A           | 0.5 | SH M12x35     |                      |
| <b>566-27R-13</b>         | 5  | 66             | 45.3  | 27     | 58   | 50  | 2.0  | ●            | A           | 0.6 | SH M12x35     |                      |
| <b>580-27R-13</b>         | 5  | 80             | 59.4  | 27     | 70   | 60  | 2.0  | ●            | A           | 1.3 | SH M12x35     |                      |
| <b>680-27R-13</b>         | 6  | 80             | 59.4  | 27     | 70   | 60  | 2.0  | ●            | A           | 1.3 | SH M12x35     |                      |
| <b>580-32R-13</b>         | 5  | 80             | 59.4  | 32     | 76   | 60  | 2.0  | ●            | A           | 1.3 | SH M16x35     |                      |
| <b>6100-32R-13</b>        | 6  | 100            | 79.4  | 32     | 76   | 60  | 2.0  | ●            | A           | 1.9 | SH M16x35     |                      |
| <b>7125-40R-13</b>        | 7  | 125            | 104.7 | 40     | 85   | 60  | 2.0  | ●            | A           | 2.5 | SH M20x40     |                      |
| <b>8160-40R-13</b>        | 8  | 160            | 139.4 | 40     | 110  | 60  | 2.0  | x            | C           | 3.5 | -             |                      |
| <b>9200-60R-13</b>        | 9  | 200            | 179.4 | 60     | 130  | 60  | 2.0  | x            | C           | 5.1 | -             |                      |
| <b>10250-60R-13</b>       | 10 | 250            | 229.4 | 60     | 160  | 60  | 2.0  | x            | C           | 9.1 | -             |                      |
| <b>TFMSB 463-25.4R-13</b> | 4  | 63             | 42.4  | 25.4   | 58   | 50  | 2.0  | ●            | A           | 0.5 | SH M12x35     |                      |
| <b>580-25.4R-13</b>       | 5  | 80             | 59.4  | 25.4   | 70   | 60  | 2.0  | ●            | A           | 1.3 | SH M12x35     |                      |
| <b>580-31.75R-13</b>      | 5  | 80             | 59.4  | 31.75  | 76   | 60  | 2.0  | ●            | A           | 1.3 | SH M16x35     |                      |
| <b>7125-38.1R-13</b>      | 7  | 125            | 104.7 | 38.1   | 80   | 60  | 2.0  | x            | B           | 2.2 | -             |                      |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation     | Screw     | Wrench |  |  |  |
|-----------------|-----------|--------|--|--|--|
|                 |           |        |  |  |  |
| <b>TFMSB-13</b> | TS 50115I | T-T20  |  |  |  |
|                 |           |        |  |  |  |
|                 |           |        |  |  |  |
|                 |           |        |  |  |  |

E352-E325

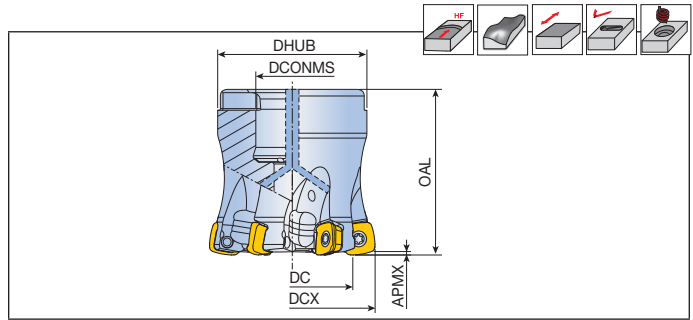
E326-E327

E328

E397

# TFMSR-07/10

High feed face mills



| Designation             |  | Dimension (mm) |      |        |      |     |      |  CoolantArbor style |   |     |  Kg | Mounting bolt                                                                                          | Insert |
|-------------------------|-----------------------------------------------------------------------------------|----------------|------|--------|------|-----|------|------------------------------------------------------------------------------------------------------|---|-----|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------|
|                         |                                                                                   | DCX            | DC   | DCONMS | DHUB | OAL | APMX | hole                                                                                                 |   |     |                                                                                      |                                                                                                        |        |
| <b>TFMSR 640-16R-07</b> | 6                                                                                 | 40             | 30.7 | 16     | 38   | 40  | 0.7  | ●                                                                                                    | A | 0.2 | SH M8x25                                                                             |  SRMT 0703...<br>E308 |        |
| <b>650-22R-07</b>       | 6                                                                                 | 50             | 40.7 | 22     | 45   | 50  | 0.7  | ●                                                                                                    | A | 0.4 | SH M10x30                                                                            |                                                                                                        |        |
| <b>750-22R-07</b>       | 7                                                                                 | 50             | 40.7 | 22     | 45   | 50  | 0.7  | ●                                                                                                    | A | 0.4 | SH M10x30                                                                            |                                                                                                        |        |
| <b>863-22R-07</b>       | 8                                                                                 | 63             | 53.7 | 22     | 47   | 50  | 0.7  | ●                                                                                                    | A | 0.6 | SH M10x30                                                                            |                                                                                                        |        |
| <b>TFMSR 540-16R-10</b> | 5                                                                                 | 40             | 26.5 | 16     | 38   | 40  | 1.0  | ●                                                                                                    | A | 0.2 | SH M8x40                                                                             |  SRMT 1004...<br>E308 |        |
| <b>550-22R-10</b>       | 5                                                                                 | 50             | 36.5 | 22     | 45   | 50  | 1.0  | ●                                                                                                    | A | 0.4 | SH M10x35                                                                            |                                                                                                        |        |
| <b>650-22R-10</b>       | 6                                                                                 | 50             | 36.5 | 22     | 45   | 50  | 1.0  | ●                                                                                                    | A | 0.4 | SH M10x35                                                                            |                                                                                                        |        |
| <b>652-22R-10</b>       | 6                                                                                 | 52             | 38.5 | 22     | 45   | 50  | 1.0  | ●                                                                                                    | A | 0.4 | SH M10x35                                                                            |                                                                                                        |        |
| <b>663-22R-10</b>       | 6                                                                                 | 63             | 49.4 | 22     | 58   | 50  | 1.0  | ●                                                                                                    | A | 0.7 | SH M10x30                                                                            |                                                                                                        |        |
| <b>763-22R-10</b>       | 7                                                                                 | 63             | 49.4 | 22     | 58   | 50  | 1.0  | ●                                                                                                    | A | 0.7 | SH M10x30                                                                            |                                                                                                        |        |
| <b>566-27R-10</b>       | 5                                                                                 | 66             | 52.4 | 27     | 58   | 50  | 1.0  | ●                                                                                                    | A | 0.7 | SH M12x35                                                                            |                                                                                                        |        |
| <b>766-27R-10</b>       | 7                                                                                 | 66             | 52.4 | 27     | 58   | 50  | 1.0  | ●                                                                                                    | A | 0.7 | SH M12x35                                                                            |                                                                                                        |        |
| <b>780-27R-10</b>       | 7                                                                                 | 80             | 66.4 | 27     | 70   | 60  | 1.0  | ●                                                                                                    | A | 1.3 | SH M12x35                                                                            |                                                                                                        |        |
| <b>880-27R-10</b>       | 8                                                                                 | 80             | 66.4 | 27     | 70   | 60  | 1.0  | ●                                                                                                    | A | 1.4 | SH M12x35                                                                            |                                                                                                        |        |
|                         |                                                                                   |                |      |        |      |     |      |                                                                                                      |   |     |                                                                                      |                                                                                                        |        |
|                         |                                                                                   |                |      |        |      |     |      |                                                                                                      |   |     |                                                                                      |                                                                                                        |        |
|                         |                                                                                   |                |      |        |      |     |      |                                                                                                      |   |     |                                                                                      |                                                                                                        |        |
|                         |                                                                                   |                |      |        |      |     |      |                                                                                                      |   |     |                                                                                      |                                                                                                        |        |
|                         |                                                                                   |                |      |        |      |     |      |                                                                                                      |   |     |                                                                                      |                                                                                                        |        |
|                         |                                                                                   |                |      |        |      |     |      |                                                                                                      |   |     |                                                                                      |                                                                                                        |        |
|                         |                                                                                   |                |      |        |      |     |      |                                                                                                      |   |     |                                                                                      |                                                                                                        |        |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

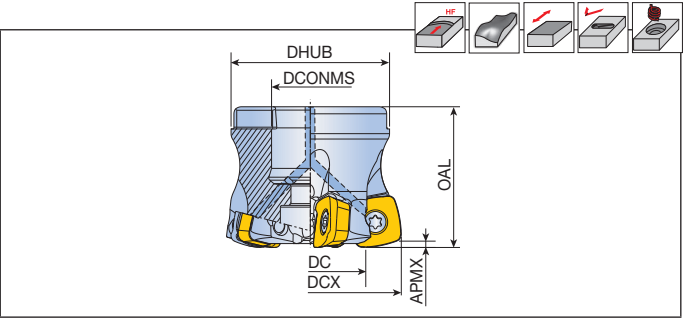
| Designation     | Screw          | Wrench |  |  |  |
|-----------------|----------------|--------|--|--|--|
|                 |                |        |  |  |  |
| <b>TFMSR-07</b> | TS 25064I/HG-P | TD 8P  |  |  |  |
| <b>TFMSR-10</b> | TS 35A088I/HG  | TD 10P |  |  |  |
|                 |                |        |  |  |  |
|                 |                |        |  |  |  |
|                 |                |        |  |  |  |



# TFMSR-14



High feed face mills



| Designation             |   | Dimension (mm) |       |        |      |     |      | Coolant<br>hole | Arbor<br>style | Kg  | Mounting<br>bolt | Insert               |
|-------------------------|---|----------------|-------|--------|------|-----|------|-----------------|----------------|-----|------------------|----------------------|
|                         |   | DCX            | DC    | DCONMS | DHUB | OAL | APMX |                 |                |     |                  |                      |
| <b>TFMSR 350-22R-14</b> | 3 | 50             | 29.8  | 22     | 45   | 40  | 2    | ●               | A              | 0.3 | LH M10X25        | SRMT 1406...<br>E308 |
| <b>450-22R-14</b>       | 4 | 50             | 29.8  | 22     | 45   | 40  | 2    | ●               | A              | 0.3 | LH M10X25        |                      |
| <b>452-22R-14</b>       | 4 | 52             | 31.6  | 22     | 45   | 40  | 2    | ●               | A              | 0.3 | LH M10X25        |                      |
| <b>552-22R-14</b>       | 5 | 52             | 31.7  | 22     | 45   | 40  | 2    | ●               | A              | 0.3 | LH M10X25        |                      |
| <b>463-22R-14</b>       | 4 | 63             | 42.6  | 22     | 58   | 50  | 2    | ●               | A              | 0.6 | SH M10X30        |                      |
| <b>563-22R-14</b>       | 5 | 63             | 42.6  | 22     | 58   | 50  | 2    | ●               | A              | 0.6 | SH M10X30        |                      |
| <b>566-27R-14</b>       | 5 | 66             | 45.6  | 27     | 58   | 50  | 2    | ●               | A              | 0.6 | SH M12X35        |                      |
| <b>580-27R-14</b>       | 5 | 80             | 59.6  | 27     | 70   | 60  | 2    | ●               | A              | 1.3 | SH M12X35        |                      |
| <b>580-32R-14</b>       | 5 | 80             | 59.6  | 32     | 76   | 60  | 2    | ●               | A              | 1.3 | SH M16X35        |                      |
| <b>780-27R-14</b>       | 7 | 80             | 59.6  | 27     | 70   | 60  | 2    | ●               | A              | 1.3 | SH M12X35        |                      |
| <b>880-32R-14</b>       | 8 | 80             | 59.9  | 32     | 76   | 60  | 2    | ●               | A              | 1.3 | SH M16X35        |                      |
| <b>6100-32R-14</b>      | 6 | 100            | 79.6  | 32     | 85   | 60  | 2    | ●               | A              | 1.9 | SH M16X35        |                      |
| <b>8100-32R-14</b>      | 8 | 100            | 79.6  | 32     | 85   | 60  | 2    | ●               | A              | 1.9 | SH M16X35        |                      |
| <b>7125-40R-14</b>      | 7 | 125            | 104.6 | 40     | 85   | 60  | 2    | ●               | A              | 2.4 | SH M20X40        |                      |
| <b>8160-40R-14</b>      | 8 | 160            | 139.6 | 40     | 110  | 60  | 2    | x               | C              | 3.6 | -                |                      |
| <b>9200-60R-14</b>      | 9 | 200            | 179.6 | 60     | 130  | 60  | 2    | x               | C              | 4.9 | -                |                      |
|                         |   |                |       |        |      |     |      |                 |                |     |                  |                      |
|                         |   |                |       |        |      |     |      |                 |                |     |                  |                      |
|                         |   |                |       |        |      |     |      |                 |                |     |                  |                      |
|                         |   |                |       |        |      |     |      |                 |                |     |                  |                      |
|                         |   |                |       |        |      |     |      |                 |                |     |                  |                      |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

| Designation     | Screw     | Wrench |  |  |  |
|-----------------|-----------|--------|--|--|--|
|                 |           |        |  |  |  |
| <b>TFMSR-14</b> | TS 50115I | T-T20  |  |  |  |
|                 |           |        |  |  |  |
|                 |           |        |  |  |  |
|                 |           |        |  |  |  |
|                 |           |        |  |  |  |

Cutting Condition  
E352-E325

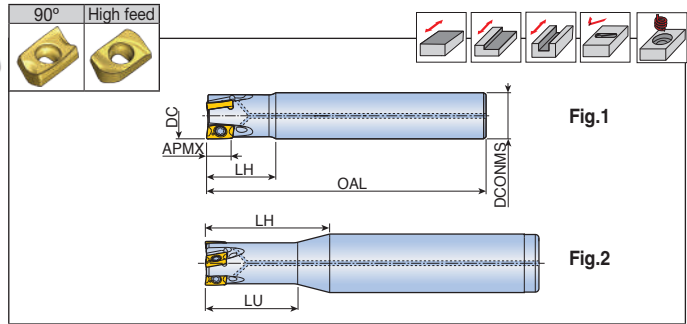
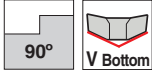
Arbor Style  
E326-E327

Torque  
E328

Ramping Data  
E400

# 2S-TE90CV-05

## End mills

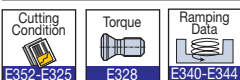


| Designation                |   | Dimension (mm) |        |     |    |    |      | Coolant hole | Fig. | Insert                  |
|----------------------------|---|----------------|--------|-----|----|----|------|--------------|------|-------------------------|
|                            |   | DC             | DCONMS | OAL | LH | LU | APMX |              |      |                         |
| <b>2S-TE90CV-106-06-05</b> | 1 | 6              | 6      | 60  | 12 | -  | 5.0  | ●            | 1    | CVK(H)T 0502...<br>E281 |
| <b>106-06-05-L50</b>       | 1 | 6              | 6      | 50  | 10 | -  | 5.0  | ●            | 1    |                         |
| <b>208-07-05</b>           | 2 | 8              | 7      | 80  | 12 | -  | 5.0  | ●            | 1    |                         |
| <b>208-08-05</b>           | 2 | 8              | 8      | 80  | 12 | -  | 5.0  | ●            | 1    |                         |
| <b>208-08-05-L50</b>       | 2 | 8              | 8      | 50  | 10 | -  | 5.0  | ●            | 1    |                         |
| <b>208-12-05</b>           | 2 | 8              | 12     | 80  | 25 | 18 | 5.0  | ●            | 2    |                         |
| <b>209-08-05</b>           | 2 | 9              | 8      | 80  | 12 | -  | 5.0  | ●            | 1    |                         |
| <b>210-10-05</b>           | 2 | 10             | 10     | 80  | 15 | -  | 5.0  | ●            | 1    |                         |
| <b>212-12-05</b>           | 2 | 12             | 12     | 80  | 15 | -  | 5.0  | ●            | 1    |                         |
| <b>310-09-05</b>           | 3 | 10             | 9      | 80  | 12 | -  | 5.0  | ●            | 1    |                         |
| <b>310-10-05</b>           | 3 | 10             | 10     | 80  | 15 | -  | 5.0  | ●            | 1    |                         |
| <b>310-10-05-L55</b>       | 3 | 10             | 10     | 55  | 12 | -  | 5.0  | ●            | 1    |                         |
| <b>310-16-05-L90</b>       | 3 | 10             | 16     | 90  | 34 | 22 | 5.0  | ●            | 2    |                         |
| <b>311-10-05</b>           | 3 | 11             | 10     | 80  | 12 | -  | 5.0  | ●            | 1    |                         |
| <b>312-12-05</b>           | 3 | 12             | 12     | 80  | 15 | -  | 5.0  | ●            | 1    |                         |
| <b>412-11-05</b>           | 4 | 12             | 11     | 80  | 12 | -  | 5.0  | ●            | 1    |                         |
| <b>412-12-05</b>           | 4 | 12             | 12     | 80  | 15 | -  | 5.0  | ●            | 1    |                         |
| <b>412-12-05-L60</b>       | 4 | 12             | 12     | 60  | 14 | -  | 5.0  | ●            | 1    |                         |
| <b>412-16-05-L100</b>      | 4 | 12             | 16     | 100 | 34 | 26 | 5.0  | ●            | 2    |                         |
| <b>413-12-05</b>           | 4 | 13             | 12     | 80  | 12 | -  | 5.0  | ●            | 1    |                         |
| <b>414-12-05</b>           | 4 | 14             | 12     | 80  | 10 | -  | 5.0  | ●            | 1    |                         |
| <b>514-14-05-L90</b>       | 5 | 14             | 14     | 90  | 15 | -  | 5.0  | ●            | 1    |                         |

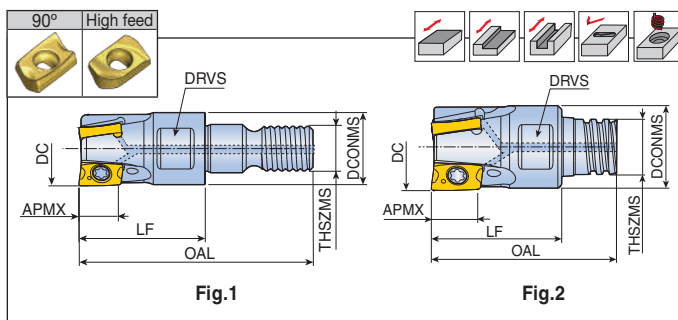
► Cutter body for 'HF' insert should be modified with body corner radius 1.8 mm

## Spare parts

| Designation         | Screw         | Wrench |  |  |  |
|---------------------|---------------|--------|--|--|--|
|                     |               |        |  |  |  |
| <b>2S-TE90CV-05</b> | TS 18033/HG-P | T 6P   |  |  |  |
|                     |               |        |  |  |  |
|                     |               |        |  |  |  |
|                     |               |        |  |  |  |

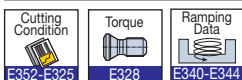






- ▶ Cutter body for '-HF' insert should be modified with body corner radius 1.8 mm
- ▶ Matched with T-FLEXTEC holder (Fig.1) & MAXI-RUSH holder (Fig.2)

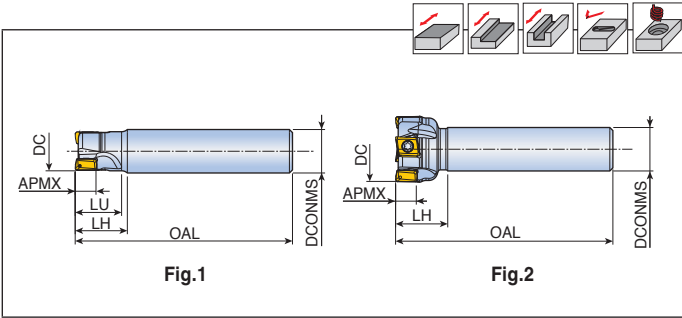
| Designation         | Screw                                                                               | Wrench                                                                              |  |  |  |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                     |  |  |  |  |  |
| <b>2S-TE90CV-05</b> | TS 18033/HG-P                                                                       | T 6P                                                                                |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |



4T-MTE90-05



End mills



| Designation         |   | Dimension (mm) |        |     |    |    |      | Fig. | Insert               |
|---------------------|---|----------------|--------|-----|----|----|------|------|----------------------|
|                     |   | DC             | DCONMS | OAL | LU | LH | APMX |      |                      |
| 4T-MTE90- 210-10-05 | 2 | 10             | 10     | 50  | 10 | 12 | 4.6  | 1    | LPHU 0502...<br>E284 |
| 212-10-05           | 2 | 12             | 10     | 50  | -  | 12 | 4.6  | 2    |                      |
| 314-10-05           | 3 | 14             | 10     | 50  | -  | 12 | 4.6  | 2    |                      |
| 416-10-05           | 4 | 16             | 10     | 50  | -  | 12 | 4.6  | 2    |                      |
| 420-10-05           | 4 | 20             | 10     | 50  | -  | 12 | 4.6  | 2    |                      |
| 520-12-05           | 5 | 20             | 12     | 60  | -  | 12 | 4.6  | 2    |                      |
| 430-10-05           | 4 | 30             | 10     | 50  | -  | 12 | 4.6  | 2    |                      |
| 630-12-05           | 6 | 30             | 12     | 60  | -  | 12 | 4.6  | 2    |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |
|                     |   |                |        |     |    |    |      |      |                      |

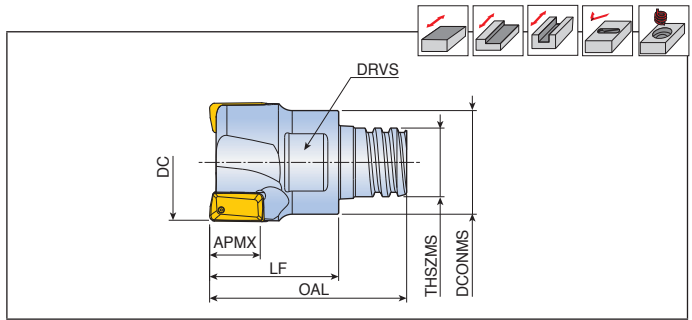
Spare parts

| Designation        | Screw         | Wrench |  |  |  |
|--------------------|---------------|--------|--|--|--|
|                    |               |        |  |  |  |
| 4T-MTE90-05 (Ø10)  | TS 18041/SG-P | T 6P   |  |  |  |
| 4T-MTE90-05 (Ø12-) | TS 18049/HG-P | T 6P   |  |  |  |
|                    |               |        |  |  |  |
|                    |               |        |  |  |  |
|                    |               |        |  |  |  |

E352-E325

E328

E345

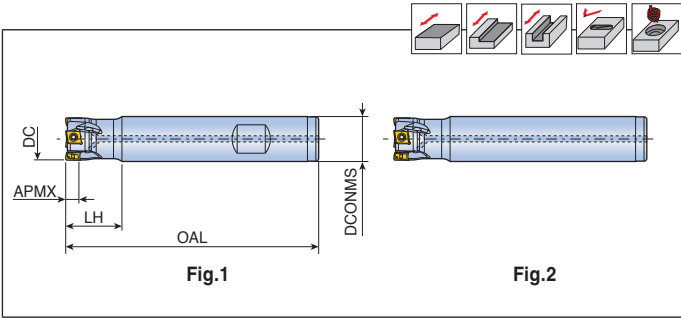


► Matched with MAXI-RUSH holder

| Designation                 | Screw                                                                               | Wrench                                                                              |  |  |  |
|-----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                             |  |  |  |  |  |
| <b>4T-MTE90-S-05</b> (Ø10)  | TS 18041I/SG-P                                                                      | T 6P                                                                                |  |  |  |
| <b>4T-MTE90-S-05</b> (Ø12-) | TS 18049/HG-P                                                                       | T 6P                                                                                |  |  |  |
|                             |                                                                                     |                                                                                     |  |  |  |



End mills



| Designation         |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                  |
|---------------------|---|----------------|--------|-----|----|------|--------------|------|-------------------------|
|                     |   | DC             | DCONMS | OAL | LH | APMX |              |      |                         |
| 4T-TE90- 210-10-05  | 2 | 10             | 10     | 80  | 15 | 4.6  | ●            | 2    | LPK(H)U 0502...<br>E284 |
| 211-10-05           | 2 | 11             | 10     | 80  | 15 | 4.6  | ●            | 2    |                         |
| 212-12-05           | 2 | 12             | 12     | 80  | 15 | 4.6  | ●            | 2    |                         |
| 312-12-05           | 3 | 12             | 12     | 80  | 15 | 4.6  | ●            | 2    |                         |
| 313-12-05           | 3 | 13             | 12     | 80  | 15 | 4.6  | ●            | 2    |                         |
| 316-W16-05          | 3 | 16             | 16     | 90  | 20 | 4.6  | ●            | 1    |                         |
| 416-W16-05          | 4 | 16             | 16     | 90  | 20 | 4.6  | ●            | 1    |                         |
| 420-W20-05          | 4 | 20             | 20     | 100 | 25 | 4.6  | ●            | 1    |                         |
| 520-W20-05          | 5 | 20             | 20     | 100 | 25 | 4.6  | ●            | 1    |                         |
| 625-W25-05          | 6 | 25             | 25     | 110 | 30 | 4.6  | ●            | 1    |                         |
| 832-W25-05          | 8 | 32             | 25     | 110 | 20 | 4.6  | ●            | 1    |                         |
| 4T-TE90- 220-W20-09 | 2 | 20             | 20     | 100 | 30 | 8.3  | ●            | 1    | LPK(H)U 0904...<br>E284 |
| 220-20-09-L170      | 2 | 20             | 20     | 170 | 30 | 8.3  | ●            | 2    |                         |
| 320-W20-09          | 3 | 20             | 20     | 100 | 30 | 8.3  | ●            | 1    |                         |
| 325-W25-09          | 3 | 25             | 25     | 100 | 30 | 8.3  | ●            | 1    |                         |
| 325-25-09-L200      | 3 | 25             | 25     | 200 | 30 | 8.3  | ●            | 2    |                         |
| 425-W25-09          | 4 | 25             | 25     | 100 | 30 | 8.3  | ●            | 1    |                         |
| 425-25-09-L120      | 4 | 25             | 25     | 120 | 30 | 8.3  | ●            | 2    |                         |
| 332-W32-09          | 3 | 32             | 32     | 110 | 35 | 8.3  | ●            | 1    |                         |
| 332-32-09-L210      | 3 | 32             | 32     | 210 | 35 | 8.3  | ●            | 2    |                         |
| 532-W32-09          | 5 | 32             | 32     | 110 | 35 | 8.3  | ●            | 1    |                         |
| 532-32-09-L130      | 5 | 32             | 32     | 130 | 35 | 8.3  | ●            | 2    |                         |
| 440-W32-09          | 4 | 40             | 32     | 115 | 30 | 8.3  | ●            | 1    |                         |
| 440-32-09-L150      | 4 | 40             | 32     | 150 | 30 | 8.3  | ●            | 2    |                         |
| 640-W32-09          | 6 | 40             | 32     | 115 | 30 | 8.3  | ●            | 1    |                         |

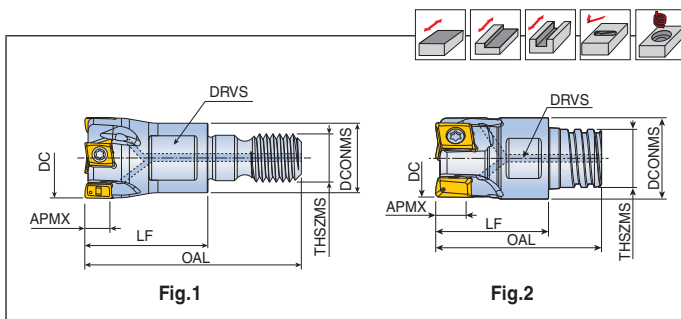
Spare parts

| Designation          | Screw         | Wrench |              | Wrench handle |  |
|----------------------|---------------|--------|--------------|---------------|--|
|                      |               |        |              |               |  |
| 4T-TE90-05 (Ø10,Ø11) | TS 18041/SG-P | T 6P   | -            | -             |  |
| 4T-TE90-05 (Ø12-)    | TS 18049/HG-P | T 6P   | -            | -             |  |
| 4T-TE90-09           | TS 30D082-P   | -      | TBLD T08P-W4 | THND 4W       |  |
|                      |               |        |              |               |  |

Cutting Condition  
E352-E325

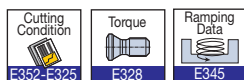
Torque  
E328

Ramping Data  
E345



► Matched with T-FLEXTEC holder(Fig.1) & MAXI-RUSH holder(Fig.2)

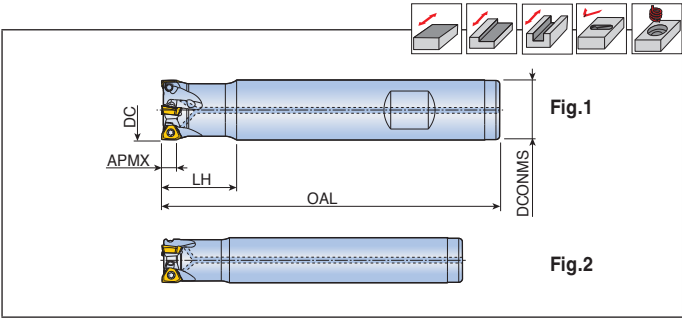
| Designation                 | Screw                                                                               | Wrench                                                                              |                                                                                     | Wrench handle                                                                       |  |
|-----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                             |  |  |  |  |  |
| <b>4T-TE90-05</b> (Ø10,Ø11) | TS 18041/SG-P                                                                       | T 6P                                                                                | -                                                                                   | -                                                                                   |  |
| <b>4T-TE90-05</b> (Ø12-)    | TS 18049/HG-P                                                                       | T 6P                                                                                | -                                                                                   | -                                                                                   |  |
| <b>4T-TE90-09</b>           | TS 30D082-P                                                                         | -                                                                                   | TBLD T08P-W4                                                                        | THND 4W                                                                             |  |
|                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



# 3P-TE90-04



End mills



| Designation       |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert               |
|-------------------|---|----------------|--------|-----|----|------|--------------|------|----------------------|
|                   |   | DC             | DCONMS | OAL | LH | APMX |              |      |                      |
| 3P-TE90-108-08-04 | 1 | 8              | 8      | 80  | 17 | 3.5  | ●            | 2    | 3PKT 0402...<br>E256 |
| 210-10-04         | 2 | 10             | 10     | 80  | 17 | 3.5  | ●            | 2    |                      |
| 210-09-04-L       | 2 | 10             | 9      | 120 | 10 | 3.5  | ●            | 2    |                      |
| 211-10-04         | 2 | 11             | 10     | 80  | 11 | 3.5  | ●            | 2    |                      |
| 212-11-04-L       | 2 | 12             | 11     | 120 | 11 | 3.5  | ●            | 2    |                      |
| 212-12-04         | 2 | 12             | 12     | 80  | 18 | 3.5  | ●            | 2    |                      |
| 212-12-04-L       | 2 | 12             | 12     | 120 | 18 | 3.5  | ●            | 2    |                      |
| 312-12-04         | 3 | 12             | 12     | 80  | 18 | 3.5  | ●            | 2    |                      |
| 313-12-04         | 3 | 13             | 12     | 90  | 11 | 3.5  | ●            | 2    |                      |
| 314-12-04         | 3 | 14             | 12     | 90  | 12 | 3.5  | ●            | 2    |                      |
| 316-16-04         | 3 | 16             | 16     | 110 | 20 | 3.5  | ●            | 2    |                      |
| 416-W16-04        | 4 | 16             | 16     | 90  | 20 | 3.5  | ●            | 1    |                      |
|                   |   |                |        |     |    |      |              |      |                      |
|                   |   |                |        |     |    |      |              |      |                      |
|                   |   |                |        |     |    |      |              |      |                      |
|                   |   |                |        |     |    |      |              |      |                      |
|                   |   |                |        |     |    |      |              |      |                      |
|                   |   |                |        |     |    |      |              |      |                      |
|                   |   |                |        |     |    |      |              |      |                      |
|                   |   |                |        |     |    |      |              |      |                      |
|                   |   |                |        |     |    |      |              |      |                      |

## Spare parts

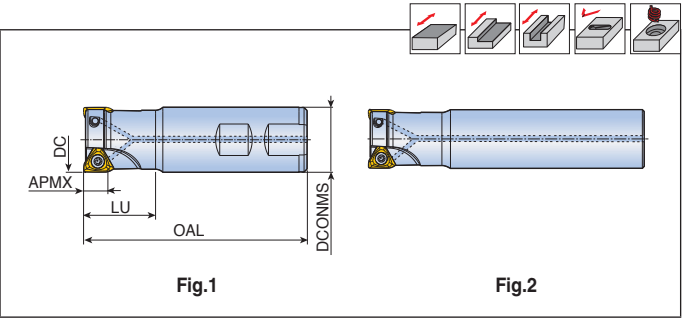
| Designation       | Screw         | Wrench |  |  |  |
|-------------------|---------------|--------|--|--|--|
|                   |               |        |  |  |  |
| 3P-TE90-04 (Ø8)   | TS 18033/HG-P | TD 6P  |  |  |  |
| 3P-TE90-04 (Ø10-) | TS 18041I/HG  | TD 6P  |  |  |  |
|                   |               |        |  |  |  |
|                   |               |        |  |  |  |



# 3P TE90-06



End mills



| Designation            |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                  |
|------------------------|---|----------------|--------|-----|----|------|--------------|------|-------------------------|
|                        |   | DC             | DCONMS | OAL | LU | APMX |              |      |                         |
| 3P TE90- 112-12-06-L80 | 1 | 12             | 12     | 80  | 20 | 4.7  | ●            | 2    | 3PK(H)T 0603...<br>E256 |
| 114-12-06-L80          | 1 | 14             | 12     | 80  | 20 | 4.7  | ●            | 2    |                         |
| 216-W16-06             | 2 | 16             | 16     | 90  | 25 | 4.7  | ●            | 1    |                         |
| 216-16-06-L110         | 2 | 16             | 16     | 110 | 25 | 4.7  | ●            | 2    |                         |
| 216-16-06-L150         | 2 | 16             | 16     | 150 | 25 | 4.7  | ●            | 2    |                         |
| 316-16-06-L110         | 3 | 16             | 16     | 110 | 25 | 4.7  | ●            | 2    |                         |
| 217-16-06-L200         | 2 | 17             | 16     | 200 | 25 | 4.7  | ●            | 2    |                         |
| 317-16-06-L110         | 3 | 17             | 16     | 110 | 25 | 4.7  | ●            | 2    |                         |
| 318-W16-06             | 3 | 18             | 16     | 90  | 25 | 4.7  | ●            | 1    |                         |
| 318-16-06-L150         | 3 | 18             | 16     | 150 | 25 | 4.7  | ●            | 2    |                         |
| 319-16-06-L150         | 3 | 19             | 16     | 150 | 25 | 4.7  | ●            | 2    |                         |
| 320-W20-06             | 3 | 20             | 20     | 105 | 25 | 4.7  | ●            | 1    |                         |
| 320-20-06-L160         | 3 | 20             | 20     | 160 | 25 | 4.7  | ●            | 2    |                         |
| 420-W20-06             | 4 | 20             | 20     | 105 | 25 | 4.7  | ●            | 1    |                         |
| 420-19-06-L160         | 4 | 20             | 19     | 160 | 25 | 4.7  | ●            | 2    |                         |
| 421-20-06-L160         | 4 | 21             | 20     | 160 | 25 | 4.7  | ●            | 2    |                         |
| 422-W20-06             | 4 | 22             | 20     | 110 | 25 | 4.7  | ●            | 1    |                         |
| 425-W20-06             | 4 | 25             | 20     | 115 | 25 | 4.7  | ●            | 1    |                         |
| 525-W20-06             | 5 | 25             | 20     | 115 | 25 | 4.7  | ●            | 1    |                         |
| 525-W25-06             | 5 | 25             | 25     | 115 | 25 | 4.7  | ●            | 1    |                         |
| 630-W25-06             | 6 | 30             | 25     | 130 | 30 | 4.7  | ●            | 1    |                         |
| 632-W25-06             | 6 | 32             | 25     | 130 | 30 | 4.7  | ●            | 1    |                         |
| 732-W25-06             | 7 | 32             | 25     | 130 | 30 | 4.7  | ●            | 1    |                         |
| 840-W32-06             | 8 | 40             | 32     | 130 | 30 | 4.7  | ●            | 1    |                         |

## Spare parts

| Designation | Screw          | Wrench |  |  |  |
|-------------|----------------|--------|--|--|--|
|             |                |        |  |  |  |
| 3P TE90-06  | TS 20043I/HG-P | TD 6P  |  |  |  |
|             |                |        |  |  |  |
|             |                |        |  |  |  |
|             |                |        |  |  |  |

Cutting Condition  
E352-E325

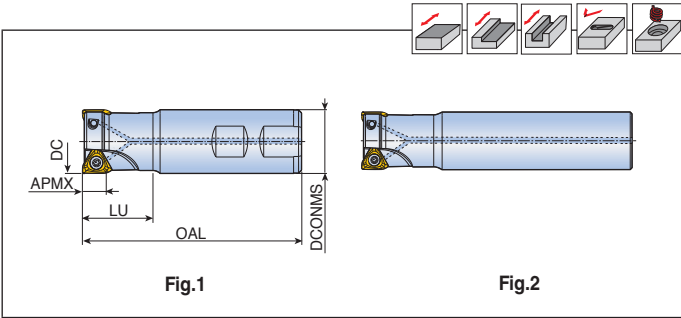
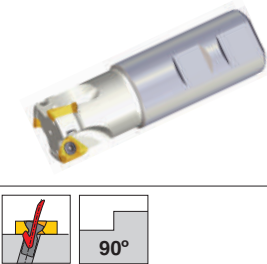
Torque  
E328

Ramping Data  
E347-E349

# 3P TE90-10



## End mills



| Designation            |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                  |
|------------------------|---|----------------|--------|-----|----|------|--------------|------|-------------------------|
|                        |   | DC             | DCONMS | OAL | LU | APMX |              |      |                         |
| 3P TE90-116-16-10-L150 | 1 | 16             | 16     | 150 | 25 | 7.0  | ●            | 2    | 3PK(H)T 1004...<br>E256 |
| 116-W16-10             | 1 | 16             | 16     | 90  | 20 | 7.0  | ●            | 1    |                         |
| 220-W20-10             | 2 | 20             | 20     | 90  | 25 | 7.0  | ●            | 1    |                         |
| 220-19-10-L170         | 2 | 20             | 19     | 170 | 30 | 7.0  | ●            | 2    |                         |
| 220-20-10-L170         | 2 | 20             | 20     | 170 | 40 | 7.0  | ●            | 2    |                         |
| 221-20-10-L200         | 2 | 21             | 20     | 200 | 30 | 7.0  | ●            | 2    |                         |
| 221-20-10-L250-C       | 2 | 21             | 20     | 250 | 40 | 7.0  | ●            | 2    |                         |
| 222-W20-10             | 2 | 22             | 20     | 100 | 25 | 7.0  | ●            | 1    |                         |
| 225-25-10-L210         | 2 | 25             | 25     | 210 | 40 | 7.0  | ●            | 2    |                         |
| 325-W20-10             | 3 | 25             | 20     | 100 | 30 | 7.0  | ●            | 1    |                         |
| 325-W25-10             | 3 | 25             | 25     | 100 | 30 | 7.0  | ●            | 1    |                         |
| 325-24-10-L210         | 3 | 25             | 24     | 210 | 35 | 7.0  | ●            | 2    |                         |
| 325-25-10-L210         | 3 | 25             | 25     | 210 | 40 | 7.0  | ●            | 2    |                         |
| 226-25-10-L250         | 2 | 26             | 25     | 250 | 30 | 7.0  | ●            | 2    |                         |
| 330-W25-10             | 3 | 30             | 25     | 110 | 35 | 7.0  | ●            | 1    |                         |
| 232-W25-10             | 2 | 32             | 25     | 110 | 35 | 7.0  | ●            | 1    |                         |
| 332-W25-10             | 3 | 32             | 25     | 110 | 35 | 7.0  | ●            | 1    |                         |
| 333-32-10-L250         | 3 | 33             | 32     | 250 | 35 | 7.0  | ●            | 2    |                         |
| 333-32-10-L300-C       | 3 | 33             | 32     | 300 | 60 | 7.0  | ●            | 2    |                         |
| 432-W32-10             | 4 | 32             | 32     | 110 | 40 | 7.0  | ●            | 1    |                         |
| 440-32-10-L200         | 4 | 40             | 32     | 200 | 40 | 7.0  | ●            | 2    |                         |
| 532-W32-10             | 5 | 32             | 32     | 110 | 40 | 7.0  | ●            | 1    |                         |
| 540-W32-10             | 5 | 40             | 32     | 115 | 40 | 7.0  | ●            | 1    |                         |
| 640-W32-10             | 6 | 40             | 32     | 115 | 40 | 7.0  | ●            | 1    |                         |

## Spare parts

| Designation | Screw         | Wrench |  |  |  |
|-------------|---------------|--------|--|--|--|
|             |               |        |  |  |  |
| 3P TE90-10  | TS 25C065I/HG | TD 8   |  |  |  |
|             |               |        |  |  |  |
|             |               |        |  |  |  |
|             |               |        |  |  |  |





# 3P TE90-15/19



## End mills

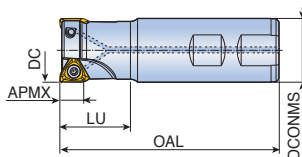
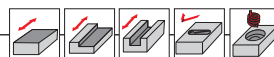


Fig.1



Fig.2

| Designation                    |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                       |
|--------------------------------|---|----------------|--------|-----|----|------|--------------|------|------------------------------|
|                                |   | DC             | DCONMS | OAL | LU | APMX |              |      |                              |
| <b>3P TE90- 232-W32-15</b>     | 2 | 32             | 32     | 110 | 40 | 11.0 | ●            | 1    | 3PK(H)T 1505...<br>E256-E257 |
| <b>232-32-15-L250</b>          | 2 | 32             | 32     | 250 | 60 | 11.0 | ●            | 2    |                              |
| <b>332-W25-15</b>              | 3 | 32             | 25     | 100 | 40 | 11.0 | ●            | 1    |                              |
| <b>332-W25-15-L155</b>         | 3 | 32             | 25     | 155 | 35 | 11.0 | ●            | 2    |                              |
| <b>332-W32-15</b>              | 3 | 32             | 32     | 110 | 40 | 11.0 | ●            | 1    |                              |
| <b>332-32-15-L150</b>          | 3 | 32             | 32     | 150 | 40 | 11.0 | ●            | 2    |                              |
| <b>332-32-15-L250</b>          | 3 | 32             | 32     | 250 | 60 | 11.0 | ●            | 2    |                              |
| <b>233-32-15-L200</b>          | 2 | 33             | 32     | 200 | 40 | 11.0 | ●            | 2    |                              |
| <b>233-32-15-L250</b>          | 2 | 33             | 32     | 250 | 40 | 11.0 | ●            | 2    |                              |
| <b>335-W32-15</b>              | 3 | 35             | 32     | 110 | 40 | 11.0 | ●            | 1    |                              |
| <b>340-W32-15</b>              | 3 | 40             | 32     | 110 | 40 | 11.0 | ●            | 1    |                              |
| <b>340-32-15-L200</b>          | 3 | 40             | 32     | 200 | 40 | 11.0 | ●            | 2    |                              |
| <b>440-W32-15</b>              | 4 | 40             | 32     | 110 | 40 | 11.0 | ●            | 1    | 3PK(H)T 1906...<br>E256-E257 |
| <b>3P TE90- 240-32-19-L250</b> | 2 | 40             | 32     | 250 | 45 | 15.0 | ●            | 2    |                              |
| <b>340-W32-19</b>              | 3 | 40             | 32     | 115 | 45 | 15.0 | ●            | 1    |                              |
| <b>340-32-19-L200</b>          | 3 | 40             | 32     | 200 | 45 | 15.0 | ●            | 2    |                              |
| <b>450-W32-19</b>              | 4 | 50             | 32     | 115 | 45 | 15.0 | ●            | 1    |                              |
|                                |   |                |        |     |    |      |              |      |                              |
|                                |   |                |        |     |    |      |              |      |                              |
|                                |   |                |        |     |    |      |              |      |                              |
|                                |   |                |        |     |    |      |              |      |                              |

## Spare parts

| Designation       | Screw      | Wrench |       |  |  |
|-------------------|------------|--------|-------|--|--|
|                   |            |        |       |  |  |
| <b>3P TE90-15</b> | TS 40B100I | TD 15  | -     |  |  |
| <b>3P TE90-19</b> | TS 45120I  | -      | T-T20 |  |  |
|                   |            |        |       |  |  |
|                   |            |        |       |  |  |



E352-E325



E328

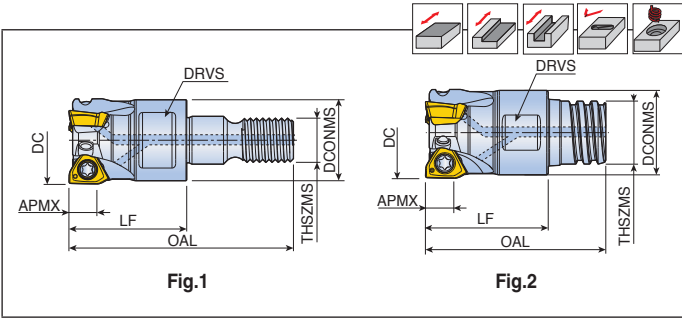


E347-E349

# 3P-TE90-M(S)-04/06



## Modular heads

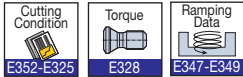


| Designation         |   | Dimension (mm) |        |    |      |        |      |      | Coolant hole | Fig. | Insert          |
|---------------------|---|----------------|--------|----|------|--------|------|------|--------------|------|-----------------|
|                     |   | DC             | DCONMS | LF | OAL  | THSZMS | APMX | DRVS |              |      |                 |
| 3P-TE90-210-M06-04  | 2 | 10             | 9.7    | 17 | 31.5 | M06    | 3.5  | 8    | ●            | 1    | 3PKT 0402...    |
| 312-M06-04          | 3 | 12             | 11     | 17 | 31.5 | M06    | 3.5  | 8    | ●            | 1    | E256            |
| 416-M06-04          | 4 | 16             | 13     | 23 | 40.5 | M08    | 3.5  | 10   | ●            | 1    |                 |
| 3P-TE90-210-S06-04  | 2 | 10             | 9.6    | 15 | 21.3 | S06    | 3.5  | 8    | ●            | 2    |                 |
| 312-S08-04          | 3 | 12             | 11.5   | 16 | 23.5 | S08    | 3.5  | 10   | ●            | 2    |                 |
| 416-S10-04          | 4 | 16             | 15.2   | 20 | 31.3 | S10    | 3.5  | 13   | ●            | 2    |                 |
| 3P TE90- 216-M08-06 | 2 | 16             | 13     | 23 | 40.5 | M08    | 4.7  | 10   | ●            | 1    | 3PK(H)T 0603... |
| 217-M08-06          | 2 | 17             | 13     | 23 | 40.5 | M08    | 4.7  | 10   | ●            | 1    | E256            |
| 320-M10-06          | 3 | 20             | 18     | 35 | 55   | M10    | 4.7  | 15   | ●            | 1    |                 |
| 420-M10-06          | 4 | 20             | 18     | 35 | 55   | M10    | 4.7  | 15   | ●            | 1    |                 |
| 425-M12-06          | 4 | 25             | 21     | 35 | 57   | M12    | 4.7  | 17   | ●            | 1    |                 |
| 525-M12-06          | 5 | 25             | 21     | 35 | 57   | M12    | 4.7  | 17   | ●            | 1    |                 |
| 632-M16-06          | 6 | 32             | 29     | 43 | 68   | M16    | 4.7  | 25   | ●            | 1    |                 |
| 732-M16-06          | 7 | 32             | 29     | 43 | 68   | M16    | 4.7  | 25   | ●            | 1    |                 |
| 735-M16-06          | 7 | 35             | 29     | 43 | 68   | M16    | 4.7  | 25   | ●            | 1    |                 |
|                     |   |                |        |    |      |        |      |      |              |      |                 |
|                     |   |                |        |    |      |        |      |      |              |      |                 |
|                     |   |                |        |    |      |        |      |      |              |      |                 |
|                     |   |                |        |    |      |        |      |      |              |      |                 |
|                     |   |                |        |    |      |        |      |      |              |      |                 |
|                     |   |                |        |    |      |        |      |      |              |      |                 |

► Matched with T-FLEXTEC holder(Fig.1) & MAXI-RUSH holder(Fig.2)

## Spare parts

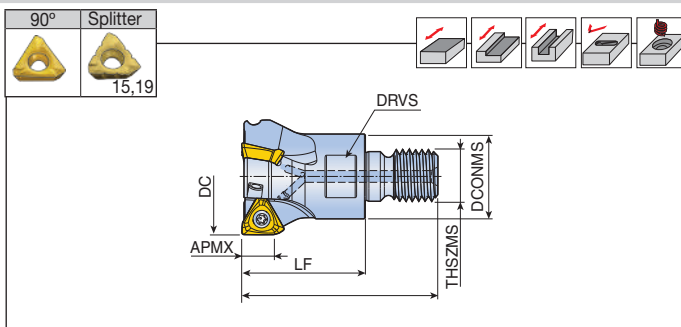
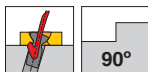
| Designation       | Screw         | Wrench |  |  |  |
|-------------------|---------------|--------|--|--|--|
|                   |               |        |  |  |  |
| 3P-TE90-04 (Ø8)   | TS 18033/HG-P | TD 6P  |  |  |  |
| 3P-TE90-04 (Ø10-) | TS 18041/HG   | TD 6P  |  |  |  |
| 3P TE90-06        | TS 20043/HG-P | TD 6P  |  |  |  |
|                   |               |        |  |  |  |
|                   |               |        |  |  |  |



# 3P TE90-M-10/15/19



## Modular heads

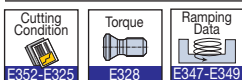


| Designation               |  | Dimension (mm) |        |    |     |        |      |      | Coolant hole | Insert                                                                                                         |
|---------------------------|-----------------------------------------------------------------------------------|----------------|--------|----|-----|--------|------|------|--------------|----------------------------------------------------------------------------------------------------------------|
|                           |                                                                                   | DC             | DCONMS | LF | OAL | THSZMS | APMX | DRVS |              |                                                                                                                |
| <b>3P TE90-220-M10-10</b> | 2                                                                                 | 20             | 18     | 35 | 55  | M10    | 7.0  | 15   | ●            | 3PK(H)T 1004...<br> E256      |
| <b>221-M10-10</b>         | 2                                                                                 | 21             | 18     | 35 | 55  | M10    | 7.0  | 15   | ●            |                                                                                                                |
| <b>325-M12-10</b>         | 3                                                                                 | 25             | 21     | 35 | 57  | M12    | 7.0  | 17   | ●            |                                                                                                                |
| <b>326-M12-10</b>         | 3                                                                                 | 26             | 21     | 35 | 57  | M12    | 7.0  | 17   | ●            |                                                                                                                |
| <b>432-M16-10</b>         | 4                                                                                 | 32             | 29     | 43 | 68  | M16    | 7.0  | 25   | ●            |                                                                                                                |
| <b>532-M16-10</b>         | 5                                                                                 | 32             | 29     | 43 | 68  | M16    | 7.0  | 25   | ●            |                                                                                                                |
| <b>535-M16-10</b>         | 5                                                                                 | 35             | 29     | 43 | 68  | M16    | 7.0  | 25   | ●            |                                                                                                                |
| <b>540-M16-10</b>         | 5                                                                                 | 40             | 29     | 43 | 68  | M16    | 7.0  | 25   | ●            |                                                                                                                |
| <b>640-M16-10</b>         | 6                                                                                 | 40             | 29     | 43 | 68  | M16    | 7.0  | 25   | ●            |                                                                                                                |
| <b>642-M16-10</b>         | 6                                                                                 | 42             | 29     | 43 | 68  | M16    | 7.0  | 25   | ●            |                                                                                                                |
| <b>3P TE90-232-M16-15</b> | 2                                                                                 | 32             | 29     | 43 | 68  | M16    | 11.0 | 25   | ●            | 3PK(H)T 1505...<br> E256-E257 |
| <b>233-M16-15</b>         | 2                                                                                 | 33             | 29     | 43 | 68  | M16    | 11.0 | 25   | ●            |                                                                                                                |
| <b>332-M16-15</b>         | 3                                                                                 | 32             | 29     | 43 | 68  | M16    | 11.0 | 25   | ●            |                                                                                                                |
| <b>340-M16-15</b>         | 3                                                                                 | 40             | 29     | 43 | 68  | M16    | 11.0 | 25   | ●            |                                                                                                                |
| <b>440-M16-15</b>         | 4                                                                                 | 40             | 29     | 43 | 68  | M16    | 11.0 | 25   | ●            |                                                                                                                |
| <b>3P TE90-340-M16-19</b> | 3                                                                                 | 40             | 29     | 43 | 68  | M16    | 15.0 | 25   | ●            | 3PK(H)T 1906...<br> E256-E257 |
|                           |                                                                                   |                |        |    |     |        |      |      |              |                                                                                                                |
|                           |                                                                                   |                |        |    |     |        |      |      |              |                                                                                                                |
|                           |                                                                                   |                |        |    |     |        |      |      |              |                                                                                                                |
|                           |                                                                                   |                |        |    |     |        |      |      |              |                                                                                                                |
|                           |                                                                                   |                |        |    |     |        |      |      |              |                                                                                                                |
|                           |                                                                                   |                |        |    |     |        |      |      |              |                                                                                                                |

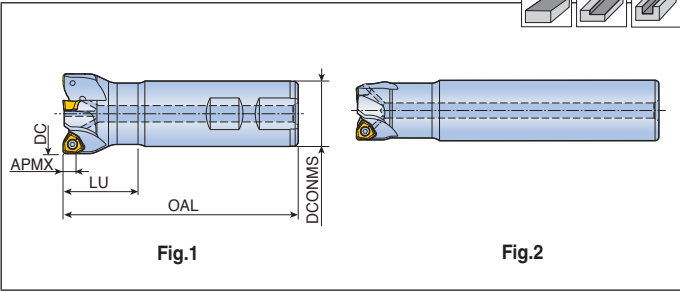
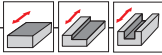
► Matched with T-FLEXTEC holder

## Spare parts

| Designation       | Screw        | Wrench |       |  |  |
|-------------------|--------------|--------|-------|--|--|
|                   |              |        |       |  |  |
| <b>3P TE90-10</b> | TS 25C065/HG | TD 8   | -     |  |  |
| <b>3P TE90-15</b> | TS 40B100I   | TD 15  | -     |  |  |
| <b>3P TE90-19</b> | TS 45120I    | -      | T-T20 |  |  |
|                   |              |        |       |  |  |
|                   |              |        |       |  |  |



## End Mills



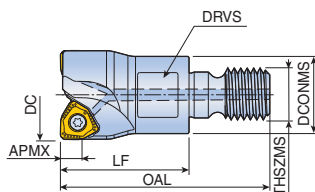
| Designation               |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                |
|---------------------------|---|----------------|--------|-----|----|------|--------------|------|-----------------------|
|                           |   | DC             | DCONMS | OAL | LU | APMX |              |      |                       |
| <b>6N TE90-320-W20-04</b> | 3 | 20             | 20     | 90  | 30 | 4.1  | ●            | 1    | 6N KU 0403...<br>E263 |
| <b>320-20-04-L160</b>     | 3 | 20             | 20     | 160 | 30 | 4.1  | ●            | 2    |                       |
| <b>425-25-04-L170</b>     | 4 | 25             | 25     | 170 | 30 | 4.1  | ●            | 2    |                       |
| <b>525-W25-04</b>         | 5 | 25             | 25     | 100 | 35 | 4.1  | ●            | 1    |                       |
| <b>332-W32-04</b>         | 3 | 32             | 32     | 110 | 43 | 4.1  | ●            | 1    |                       |
| <b>532-32-04-L200</b>     | 5 | 32             | 32     | 200 | 40 | 4.1  | ●            | 2    |                       |
| <b>632-W32-04</b>         | 6 | 32             | 32     | 110 | 40 | 4.1  | ●            | 1    |                       |
| <b>440-W32-04</b>         | 4 | 40             | 32     | 110 | 43 | 4.1  | ●            | 1    | 6N GU 0604...<br>E262 |
| <b>6N TE90-225-W25-06</b> | 2 | 25             | 25     | 100 | 30 | 6.2  | ●            | 1    |                       |
| <b>225-25-06-L150</b>     | 2 | 25             | 25     | 150 | 30 | 6.2  | ●            | 2    |                       |
| <b>232-W32-06</b>         | 2 | 32             | 32     | 110 | 40 | 6.2  | ●            | 1    |                       |
| <b>232-32-06-L160</b>     | 2 | 32             | 32     | 160 | 40 | 6.2  | ●            | 2    |                       |
| <b>332-W32-06</b>         | 3 | 32             | 32     | 110 | 40 | 6.2  | ●            | 1    |                       |
| <b>332-32-06-L160</b>     | 3 | 32             | 32     | 160 | 40 | 6.2  | ●            | 2    |                       |
| <b>332-32-06-L200</b>     | 3 | 32             | 32     | 200 | 44 | 6.2  | ●            | 2    |                       |
| <b>340-W32-06</b>         | 3 | 40             | 32     | 115 | 40 | 6.2  | ●            | 1    |                       |
| <b>340-32-06-L200</b>     | 3 | 40             | 32     | 200 | 40 | 6.2  | ●            | 2    |                       |
| <b>440-W32-06</b>         | 4 | 40             | 32     | 115 | 40 | 6.2  | ●            | 1    | 6N GU 0905...<br>E262 |
| <b>6N TE90-232-W32-09</b> | 2 | 32             | 32     | 110 | 40 | 9.2  | ●            | 1    |                       |
| <b>232-32-09-L160</b>     | 2 | 32             | 32     | 160 | 60 | 9.2  | ●            | 2    |                       |
| <b>340-W32-09</b>         | 3 | 40             | 32     | 120 | 40 | 9.2  | ●            | 1    |                       |
| <b>340-32-09-L200</b>     | 3 | 40             | 32     | 200 | 40 | 9.2  | ●            | 2    |                       |
| <b>440-W32-09</b>         | 4 | 40             | 32     | 120 | 40 | 9.2  | ●            | 1    |                       |

## Spare parts

| Designation       | Screw        | Wrench |  |  |  |
|-------------------|--------------|--------|--|--|--|
|                   |              |        |  |  |  |
| <b>6N TE90-04</b> | TS 25064I    | TD 8   |  |  |  |
| <b>6N TE90-06</b> | TS 30085I/HG | TD 9   |  |  |  |
| <b>6N TE90-09</b> | TS 40B100I   | TD15   |  |  |  |
|                   |              |        |  |  |  |
|                   |              |        |  |  |  |



# MILL 2 RUSH



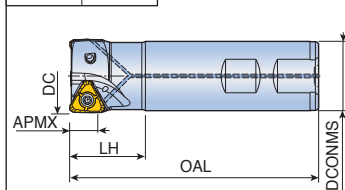
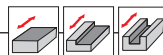
► Matched with T-FLEXTEC holder

| Designation       | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                   |  |  |  |  |  |
| <b>6N TE90-04</b> | TS 25064I                                                                           | TD 8                                                                                |  |  |  |
| <b>6N TE90-06</b> | TS 30085I/HG                                                                        | TD 9                                                                                |  |  |  |
| <b>6N TE90-09</b> | TS 40B100I                                                                          | TD15                                                                                |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |



# MILL 2 RUSH

| 90°                                                                               | Splitter                                                                          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |



Technical drawing of a DRVS (Direct Drive Valve Solenoid) showing dimensions and components. The drawing includes labels for DC, APMX, LF, OAL, DRVS, THSZMS, DCONMS, and DCONMS.

**Fig.2**

[illegible]

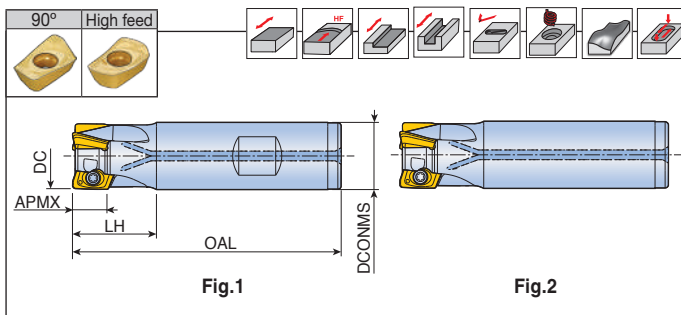
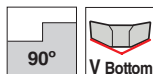
## Spare parts

| Designation        | Screw                                                                               | Wrench                                                                              |  |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                    |  |  |  |  |  |
| <b>SCRM90TN-18</b> | TS 40B100I                                                                          | T-T15                                                                               |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |



# TE90AV-10

## End mills

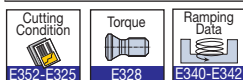


| Designation                |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                                           |
|----------------------------|---|----------------|--------|-----|----|------|--------------|------|--------------------------------------------------|
|                            |   | DC             | DCONMS | OAL | LH | APMX |              |      |                                                  |
| <b>TE90AV- 216-15-10-L</b> | 2 | 16             | 15     | 170 | 30 | 10   | ●            | 2    | AVKT 10-M/EL<br>AVKT 10-HF<br>AVCT 10-AL<br>E274 |
| <b>216-16-10-L</b>         | 2 | 16             | 16     | 145 | 30 | 10   | ●            | 2    |                                                  |
| <b>216-16-10-L200</b>      | 2 | 16             | 16     | 200 | 30 | 10   | ●            | 2    |                                                  |
| <b>216-W16-10</b>          | 2 | 16             | 16     | 75  | 20 | 10   | ●            | 1    |                                                  |
| <b>217-16-10-L</b>         | 2 | 17             | 16     | 180 | 25 | 10   | ●            | 2    |                                                  |
| <b>217-16-10-L200</b>      | 2 | 17             | 16     | 200 | 42 | 10   | ●            | 2    |                                                  |
| <b>218-W16-10</b>          | 2 | 18             | 16     | 90  | 25 | 10   | ●            | 1    |                                                  |
| <b>220-19-10-L</b>         | 2 | 20             | 19     | 170 | 25 | 10   | ●            | 2    |                                                  |
| <b>320-20-10-L120</b>      | 3 | 20             | 20     | 120 | 40 | 10   | ●            | 2    |                                                  |
| <b>320-W20-10</b>          | 3 | 20             | 20     | 80  | 25 | 10   | ●            | 1    |                                                  |
| <b>322-W20-10</b>          | 3 | 22             | 20     | 110 | 30 | 10   | ●            | 1    |                                                  |
| <b>225-25-10-L</b>         | 2 | 25             | 25     | 210 | 40 | 10   | ●            | 2    |                                                  |
| <b>325-W25-10</b>          | 3 | 25             | 25     | 90  | 30 | 10   | ●            | 1    |                                                  |
| <b>425-W20-10</b>          | 4 | 25             | 20     | 110 | 30 | 10   | ●            | 1    |                                                  |
| <b>425-W25-10</b>          | 4 | 25             | 25     | 90  | 30 | 10   | ●            | 1    |                                                  |
| <b>226-25-10-L</b>         | 2 | 26             | 25     | 250 | 28 | 10   | ●            | 2    |                                                  |
| <b>430-W25-10</b>          | 4 | 30             | 25     | 130 | 30 | 10   | ●            | 1    |                                                  |
| <b>432-W25-10</b>          | 4 | 32             | 25     | 130 | 32 | 10   | ●            | 1    |                                                  |
| <b>532-W32-10</b>          | 5 | 32             | 32     | 100 | 35 | 10   | ●            | 1    |                                                  |
| <b>533-32-10-L</b>         | 5 | 33             | 32     | 250 | 40 | 10   | ●            | 2    |                                                  |
| <b>540-W32-10</b>          | 5 | 40             | 32     | 130 | 32 | 10   | ●            | 1    |                                                  |

- ▶ When using the 'AVKT 1004R-HF' insert, the cutter body needs to be modified to a corner radius of 3.0 mm
- ▶ For "AVKT 10" inserts with a corner radius larger than 1.6 mm ( $RE > 1.6$  mm), modify the cutter body corner radius as follows:  $R = RE + 0.2$  mm

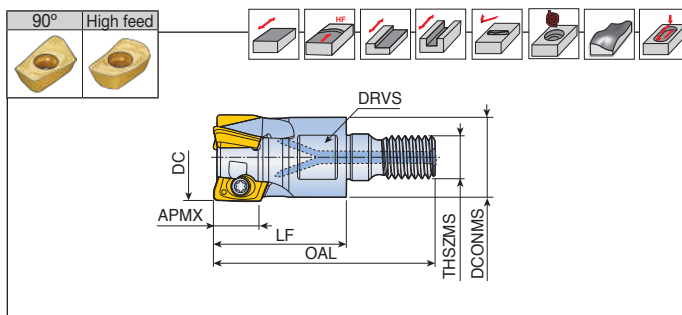
## Spare parts

| Designation      | Screw          | Wrench |  |  |  |
|------------------|----------------|--------|--|--|--|
|                  |                |        |  |  |  |
| <b>TE90AV-10</b> | TS 30B062/HG-P | TD 8P  |  |  |  |
|                  |                |        |  |  |  |
|                  |                |        |  |  |  |
|                  |                |        |  |  |  |





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ADVANCED MACHINING



- When using the 'AVKT 1004R-HF' insert, the cutter body needs to be modified to a corner radius of 3.0 mm
- For "AVKT 10" inserts with a corner radius larger than 1.6 mm ( $R_E > 1.6$  mm), modify the cutter body corner radius as follows:  $R = R_E + 0.2$  mm
- Matched with T-FLEXTEC holder

| Designation        | Screw                                                                               | Wrench                                                                              |  |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                    |  |  |  |  |  |
| <b>TE90AV-M-10</b> | TS 30B062/HG-P                                                                      | TD 8P                                                                               |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |

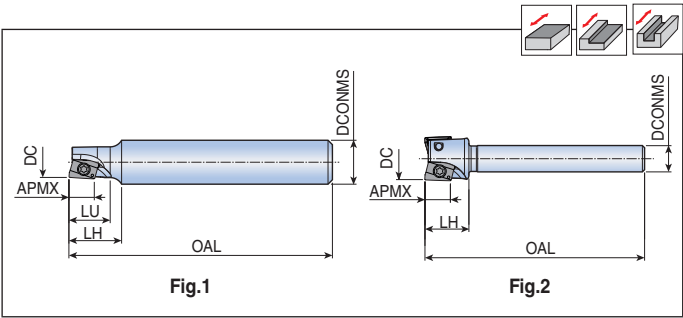




# MTE90AX-06-L



End mills



| Designation           |   | Dimension (mm) |        |     |    |    |      | Fig. | Insert               |
|-----------------------|---|----------------|--------|-----|----|----|------|------|----------------------|
|                       |   | DC             | DCONMS | OAL | LU | LH | APMX |      |                      |
| MTE90AX 108-10-06-L60 | 1 | 8              | 10     | 60  | 9  | 12 | 5.5  | 1    | AXCT 06-L...<br>E272 |
| 210-05-06-L40         | 2 | 10             | 5      | 40  | -  | 10 | 5.5  | 2    |                      |
| 210-06-06-L50         | 2 | 10             | 6      | 50  | -  | 10 | 5.5  | 2    |                      |
| 210-07-06-L50         | 2 | 10             | 7      | 50  | -  | 10 | 5.5  | 2    |                      |
| 210-10-06-L50         | 2 | 10             | 10     | 50  | 10 | 12 | 5.5  | 1    |                      |
| 212-10-06-L50         | 2 | 12             | 10     | 50  | -  | 10 | 5.5  | 2    |                      |
| 214-10-06-L50         | 2 | 14             | 10     | 50  | -  | 10 | 5.5  | 2    |                      |
| 315-05-06-L40         | 3 | 15             | 5      | 40  | -  | 10 | 5.5  | 2    |                      |
| 316-07-06-L50         | 3 | 16             | 7      | 50  | -  | 10 | 5.5  | 2    |                      |
| 316-10-06-L50         | 3 | 16             | 10     | 50  | -  | 10 | 5.5  | 2    |                      |
| 320-07-06-L50         | 3 | 20             | 7      | 50  | -  | 10 | 5.5  | 2    |                      |
| 320-10-06-L50         | 3 | 20             | 10     | 50  | -  | 10 | 5.5  | 2    |                      |
| 326-10-06-L50         | 3 | 26             | 10     | 50  | -  | 10 | 5.5  | 2    |                      |
| 530-10-06-L50         | 5 | 30             | 10     | 50  | -  | 10 | 5.5  | 2    |                      |
|                       |   |                |        |     |    |    |      |      |                      |
|                       |   |                |        |     |    |    |      |      |                      |
|                       |   |                |        |     |    |    |      |      |                      |
|                       |   |                |        |     |    |    |      |      |                      |
|                       |   |                |        |     |    |    |      |      |                      |
|                       |   |                |        |     |    |    |      |      |                      |
|                       |   |                |        |     |    |    |      |      |                      |

► For “AXMT 06” inserts with a corner radius larger than 1.0 mm (RE > 1.0 mm), modify the cutter body corner radius as follows: R = RE - 0.1 mm

## Spare parts

| Designation  | Screw        | Wrench |  |  |  |
|--------------|--------------|--------|--|--|--|
|              |              |        |  |  |  |
| MTE90AX-06-L | TS 18041I/HG | TD 6P  |  |  |  |
|              |              |        |  |  |  |
|              |              |        |  |  |  |
|              |              |        |  |  |  |
|              |              |        |  |  |  |

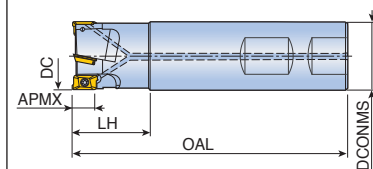
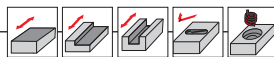
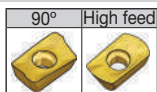
Cutting Condition

E352-E325

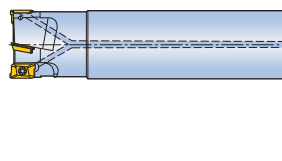
Torque

E328

**CHASE MILL**



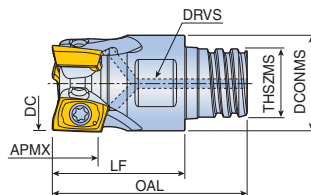
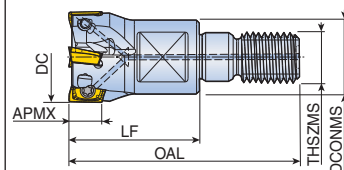
**Fig.1**



**Fig.2**

|                                                                                                                             |                                                                                                               |                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|  <p>Cutting Condition</p> <p>E352-E325</p> |  <p>Torque</p> <p>E328</p> |  <p>Ramping Data</p> <p>E372-E378</p> |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|

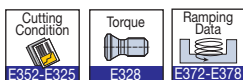
**CHASE MILL**



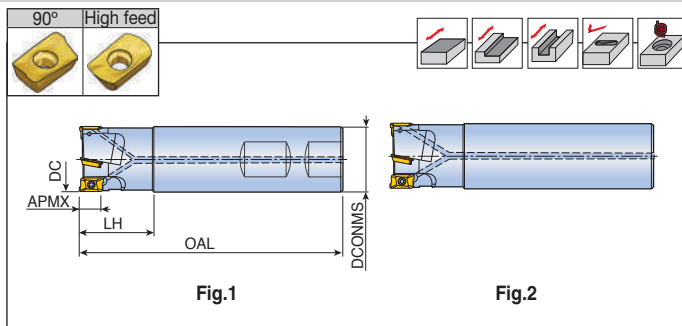
**Fig.2**

- Matched with T-FLEXTEC holder(Fig.1) & MAXI-RUSH holder(Fig.2)
- For "AXMT 06" inserts with a corner radius larger than 1.0 mm ( $R_E > 1.0$  mm), modify the cutter body corner radius as follows:  $R = R_E - 0.1$  mm

| Designation      | Screw                                                                               | Wrench                                                                              |  |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                  |  |  |  |  |  |
| <b>TE90AX-06</b> | TS 18041I/HG                                                                        | TD 6P                                                                               |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |

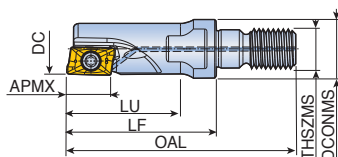
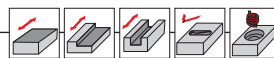


**CHASE MILL**



|                                                                                                                             |                                                                                                               |                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <p>Cutting Condition</p>  <p>E352-E325</p> | <p>Torque</p>  <p>E328</p> | <p>Ramping Data</p>  <p>E372-E378</p> |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|

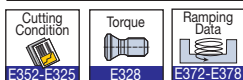
**CHASE MILL**



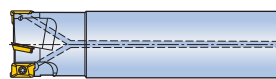
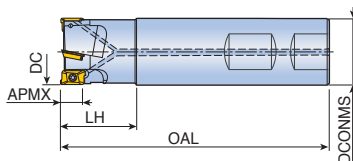
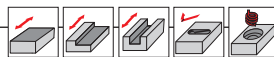
**Fig.2**

- ▶ Matched with T-FLEXTEC holder
- ▶ For “APKT 09” inserts with a corner radius larger than 2.0 mm ( $R_E > 2.0$  mm), modify the cutter body corner radius as follows:  $R = R_E - 0.2$  mm

| Designation         | Screw                                                                               | Wrench                                                                              |  |  |  |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                     |  |  |  |  |  |
| <b>2S-TE90AP-09</b> | TS 25055I/HG                                                                        | TD 8                                                                                |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |



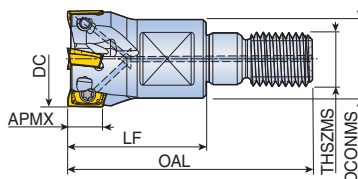
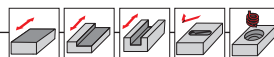
**CHASE MILL**



**Fig.2**

|                                                                                                                             |                                                                                                               |                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <p>Cutting Condition</p>  <p>E352-E325</p> | <p>Torque</p>  <p>E328</p> | <p>Ramping Data</p>  <p>E372-E378</p> |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|

**CHASE MILL**



- ▶ Matched with T-FLEXTEC holder
- ▶ For “APKT 12” inserts with a corner radius larger than 1.6 mm ( $R_E > 1.6$  mm), modify the cutter body corner radius as follows:  $R = R_E - 0.5$  mm

| Designation                | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                            |  |  |  |  |  |
| <b>TE90AP-12</b> (Ø16-Ø26) | TS 35A070I/HG                                                                       | TD 10P                                                                              |  |  |  |
| <b>TE90AP-12</b> (Ø32-)    | TS 35A088I/HG                                                                       | TD 10P                                                                              |  |  |  |
|                            |                                                                                     |                                                                                     |  |  |  |
|                            |                                                                                     |                                                                                     |  |  |  |



# TE90AP-17



## End mills

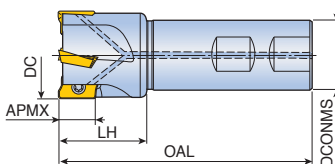
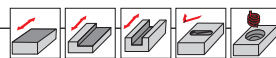


Fig.1

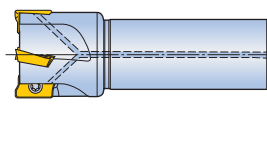


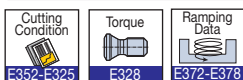
Fig.2

| Designation                |   | Dimension (mm) |        |     |    |      |   | Coolant hole | Fig. | Insert                       |
|----------------------------|---|----------------|--------|-----|----|------|---|--------------|------|------------------------------|
|                            |   | DC             | DCONMS | OAL | LH | APMX |   |              |      |                              |
| <b>TE90AP 120-W20-17-C</b> | 1 | 20             | 20     | 90  | 32 | 16.1 | ● |              | 1    | APK(C)T 1705...<br>E268-E269 |
| <b>225-24-17-L</b>         | 2 | 25             | 24     | 210 | 40 | 16.1 | x |              | 2    |                              |
| <b>225-W25-17-C</b>        | 2 | 25             | 25     | 100 | 39 | 16.1 | ● |              | 1    |                              |
| <b>225-25-17-L</b>         | 2 | 25             | 25     | 210 | 40 | 16.1 | x |              | 2    |                              |
| <b>226-25-17-L200</b>      | 2 | 26             | 25     | 200 | 40 | 16.1 | ● |              | 2    |                              |
| <b>226-25-17-L250</b>      | 2 | 26             | 25     | 250 | 40 | 16.1 | ● |              | 2    |                              |
| <b>232-32-17-L</b>         | 2 | 32             | 32     | 250 | 65 | 16.1 | x |              | 2    |                              |
| <b>233-32-17-L250</b>      | 2 | 33             | 32     | 250 | 40 | 16.1 | ● |              | 2    |                              |
| <b>233-32-17-L300</b>      | 2 | 33             | 32     | 300 | 40 | 16.1 | ● |              | 2    |                              |
| <b>332-W32-17-C</b>        | 3 | 32             | 32     | 110 | 40 | 16.1 | ● |              | 1    |                              |
| <b>332-32-17-L</b>         | 3 | 32             | 32     | 200 | 65 | 16.1 | x |              | 2    |                              |
| <b>332-32-17-L-C</b>       | 3 | 32             | 32     | 200 | 65 | 16.1 | ● |              | 2    |                              |
| <b>333-32-17-L200</b>      | 3 | 33             | 32     | 200 | 55 | 16.1 | ● |              | 2    |                              |
| <b>333-32-17-L250</b>      | 3 | 33             | 32     | 250 | 55 | 16.1 | ● |              | 2    |                              |
| <b>335-32-17-L-C</b>       | 3 | 35             | 32     | 200 | 55 | 16.1 | ● |              | 2    |                              |
| <b>240-32-17-L</b>         | 2 | 40             | 32     | 250 | 57 | 16.1 | x |              | 2    |                              |
| <b>340-W32-17</b>          | 3 | 40             | 32     | 110 | 40 | 16.1 | x |              | 1    |                              |
| <b>340-32-17-L</b>         | 3 | 40             | 32     | 200 | 54 | 16.1 | x |              | 2    |                              |
| <b>440-W32-17-C</b>        | 4 | 40             | 32     | 115 | 45 | 16.1 | ● |              | 1    |                              |
| <b>440-32-17-L</b>         | 4 | 40             | 32     | 200 | 57 | 16.1 | x |              | 2    |                              |

► For "APKT 17" inserts with a corner radius larger than 1.6 mm ( $RE > 1.6$  mm), modify the cutter body corner radius as follows:  $R = RE - 0.8$  mm

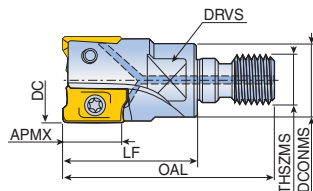
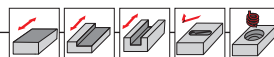
## Spare parts

| Designation                | Screw        | Wrench |  |  |  |
|----------------------------|--------------|--------|--|--|--|
|                            |              |        |  |  |  |
| <b>TE90AP-17 (Ø20-Ø25)</b> | TS 40085I/HG | TD 15  |  |  |  |
| <b>TE90AP-17 (Ø26-Ø63)</b> | TS 40093I/HG | TD 15  |  |  |  |
|                            |              |        |  |  |  |
|                            |              |        |  |  |  |



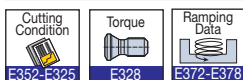


**CHASE MILL**

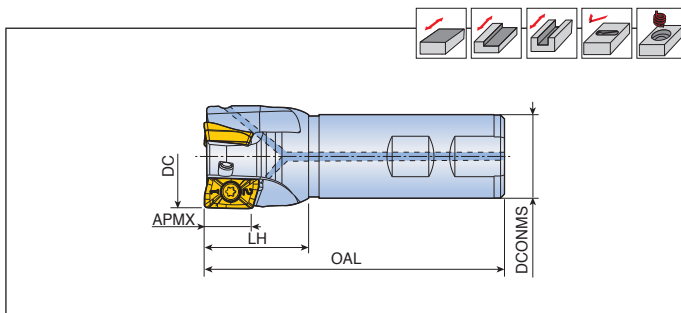


- ▶ Matched with T-FLEXTEC holder
- ▶ For “APKT 17” inserts with a corner radius larger than 1.6 mm ( $R_E > 1.6$  mm), modify the cutter body corner radius as follows:  $R = R_E - 0.8$  mm

| Designation                | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                            |  |  |  |  |  |
| <b>TE90AP-17</b> (Ø20-Ø25) | TS 40085I/HG                                                                        | TD 15                                                                               |  |  |  |
| <b>TE90AP-17</b> (Ø26-)    | TS 40093I/HG                                                                        | TD 15                                                                               |  |  |  |
|                            |                                                                                     |                                                                                     |  |  |  |
|                            |                                                                                     |                                                                                     |  |  |  |
|                            |                                                                                     |                                                                                     |  |  |  |

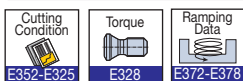


## End mills

[illegible]

## Spare parts

| Designation         | Screw                                                                               | Wrench                                                                              |  |  |  |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                     |  |  |  |  |  |
| <b>2S-TE90AP-19</b> | TS 50115I                                                                           | TD 20                                                                               |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |



# TE90AN-11/16



## End mills

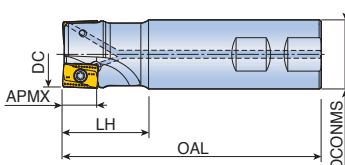
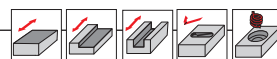


Fig.1

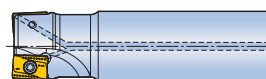
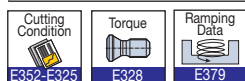


Fig.2

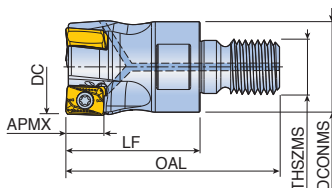
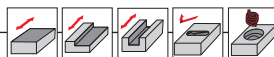
| Designation               |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                  |
|---------------------------|---|----------------|--------|-----|----|------|--------------|------|-------------------------|
|                           |   | DC             | DCONMS | OAL | LH | APMX |              |      |                         |
| <b>TE90AN 225-24-11-L</b> | 2 | 25             | 24     | 200 | 40 | 11.0 | ●            | 2    | ANM(H)X 1106...<br>E265 |
| <b>225-W25-11</b>         | 2 | 25             | 25     | 100 | 40 | 11.0 | ●            | 1    |                         |
| <b>225-25-11-L</b>        | 2 | 25             | 25     | 200 | 40 | 11.0 | ●            | 2    |                         |
| <b>226-25-11-L</b>        | 2 | 26             | 25     | 200 | 40 | 11.0 | ●            | 2    |                         |
| <b>332-W32-11</b>         | 3 | 32             | 32     | 110 | 40 | 11.0 | ●            | 1    |                         |
| <b>332-32-11-L</b>        | 3 | 32             | 32     | 200 | 40 | 11.0 | ●            | 2    |                         |
| <b>233-32-11-L</b>        | 2 | 33             | 32     | 250 | 40 | 11.0 | ●            | 2    |                         |
| <b>333-32-11-L</b>        | 3 | 33             | 32     | 200 | 40 | 11.0 | ●            | 2    |                         |
| <b>340-32-11-L</b>        | 3 | 40             | 32     | 250 | 40 | 11.0 | ●            | 2    |                         |
| <b>440-W32-11</b>         | 4 | 40             | 32     | 115 | 40 | 11.0 | ●            | 1    |                         |
| <b>440-32-11-L</b>        | 4 | 40             | 32     | 200 | 40 | 11.0 | ●            | 2    | ANM(H)X 1607...<br>E265 |
| <b>TE90AN 232-W32-16</b>  | 2 | 32             | 32     | 110 | 30 | 15.0 | ●            | 1    |                         |
| <b>232-32-16</b>          | 2 | 32             | 32     | 150 | 45 | 15.0 | ●            | 2    |                         |
| <b>232-32-16-L250</b>     | 2 | 32             | 32     | 250 | 40 | 15.0 | ●            | 2    |                         |
| <b>233-32-16-L200</b>     | 2 | 33             | 32     | 200 | 55 | 15.0 | ●            | 2    |                         |
| <b>340-W32-16</b>         | 3 | 40             | 32     | 115 | 35 | 15.0 | ●            | 1    |                         |
| <b>340-32-16</b>          | 3 | 40             | 32     | 150 | 45 | 15.0 | ●            | 2    |                         |
| <b>340-32-16-L250</b>     | 3 | 40             | 32     | 250 | 45 | 15.0 | ●            | 2    |                         |
| <b>450-32-16</b>          | 4 | 50             | 32     | 150 | 50 | 15.0 | ●            | 2    |                         |
|                           |   |                |        |     |    |      |              |      |                         |

## Spare parts

| Designation      | Screw         | Wrench |  |  |  |
|------------------|---------------|--------|--|--|--|
|                  |               |        |  |  |  |
| <b>TE90AN-11</b> | TS 35A088I/HG | TD 10P |  |  |  |
| <b>TE90AN-16</b> | TS 40120I     | TD 15  |  |  |  |
|                  |               |        |  |  |  |
|                  |               |        |  |  |  |
|                  |               |        |  |  |  |



# CHASE 2 MILL

[illegible]

## Spare parts

| Designation      | Screw                                                                               | Wrench                                                                              |  |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                  |  |  |  |  |  |
| <b>TE90AN-11</b> | TS 35A088I/HG                                                                       | TD 10P                                                                              |  |  |  |
| <b>TE90AN-16</b> | TS 40120I                                                                           | TD 15                                                                               |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |



# 4N TE90-04



End mills

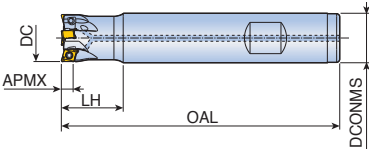
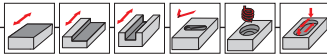
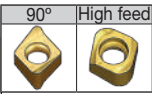


Fig.1

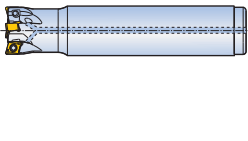


Fig.2

| Designation              |    | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                    |
|--------------------------|----|----------------|--------|-----|----|------|--------------|------|---------------------------|
|                          |    | DC             | DCONMS | OAL | LH | APMX |              |      |                           |
| <b>4N TE90-108-08-04</b> | 1  | 8              | 8      | 80  | 17 | 3.5  | ●            | 2    | 4NKT 0402...<br>E258-E260 |
| <b>210-10-04</b>         | 2  | 10             | 10     | 80  | 17 | 3.5  | ●            | 2    |                           |
| <b>210-10-04-L55</b>     | 2  | 10             | 10     | 55  | 12 | 3.5  | ●            | 2    |                           |
| <b>211-10-04</b>         | 2  | 11             | 10     | 80  | 17 | 3.5  | ●            | 2    |                           |
| <b>212-12-04</b>         | 2  | 12             | 12     | 80  | 18 | 3.5  | ●            | 2    |                           |
| <b>312-12-04</b>         | 3  | 12             | 12     | 80  | 18 | 3.5  | ●            | 2    |                           |
| <b>312-12-04-L60</b>     | 3  | 12             | 12     | 60  | 14 | 3.5  | ●            | 2    |                           |
| <b>313-12-04</b>         | 3  | 13             | 12     | 90  | 20 | 3.5  | ●            | 2    |                           |
| <b>316-16-04</b>         | 3  | 16             | 16     | 90  | 20 | 3.5  | ●            | 2    |                           |
| <b>416-W16-04</b>        | 4  | 16             | 16     | 90  | 20 | 3.5  | ●            | 1    |                           |
| <b>416-W16-04-L68</b>    | 4  | 16             | 16     | 68  | 18 | 3.5  | ●            | 1    |                           |
| <b>417-16-04</b>         | 4  | 17             | 16     | 90  | 20 | 3.5  | ●            | 2    |                           |
| <b>420-20-04-L</b>       | 4  | 20             | 20     | 160 | 25 | 3.5  | ●            | 2    |                           |
| <b>520-W20-04</b>        | 5  | 20             | 20     | 105 | 25 | 3.5  | ●            | 1    |                           |
| <b>520-W20-04-L75</b>    | 5  | 20             | 20     | 75  | 22 | 3.5  | ●            | 1    |                           |
| <b>725-W25-04</b>        | 7  | 25             | 25     | 120 | 30 | 3.5  | ●            | 1    |                           |
| <b>832-W25-04</b>        | 8  | 32             | 25     | 130 | 35 | 3.5  | ●            | 1    |                           |
| <b>1040-W32-04</b>       | 10 | 40             | 32     | 140 | 40 | 3.5  | ●            | 1    |                           |
|                          |    |                |        |     |    |      |              |      |                           |
|                          |    |                |        |     |    |      |              |      |                           |
|                          |    |                |        |     |    |      |              |      |                           |

▶ Cutter body for '4NKT 040212R-HF' insert should be modified with body corner radius 1.2 mm

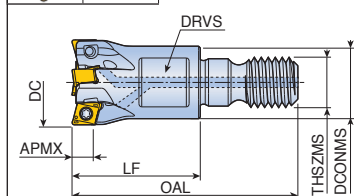
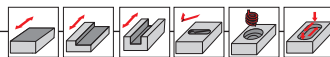
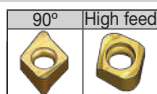
## Spare parts

| Designation       | Screw        | Wrench |  |  |  |
|-------------------|--------------|--------|--|--|--|
|                   |              |        |  |  |  |
| <b>4N TE90-04</b> | TS 18041I/HG | TD 6P  |  |  |  |
|                   |              |        |  |  |  |
|                   |              |        |  |  |  |
|                   |              |        |  |  |  |

E352-E325

E328

E350-E371



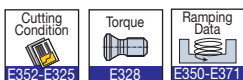
Technical drawing of a DC motor with the following dimensions and labels:

- DRVS**: Drive shaft
- DC**: Direct Current
- APMX**: Armature pin diameter
- LF**: Length of frame
- OAL**: Overall length
- THSMS**: Threaded shaft diameter
- DCONMS**: Drive shaft diameter

**Fig.2**

- ▶ Cutter body for '4NK1 040212R-HF' insert should be modified with body corner radius 1.2 mm
- ▶ Matched with T-FLEXTEC holder(Fig.1) & MAXI-RUSH holder(Fig.2)

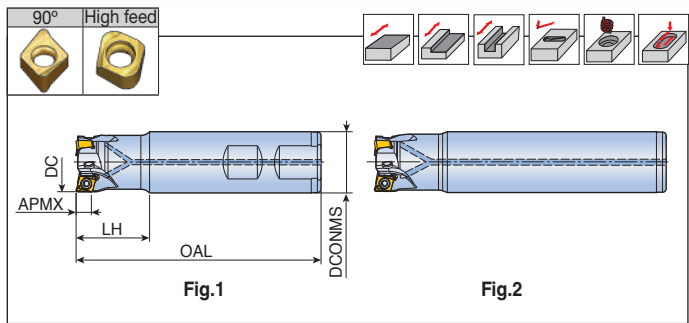
| Designation       | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                   |  |  |  |  |  |
| <b>4N TE90-04</b> | TS 18041/HG                                                                         | TD 6P                                                                               |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |



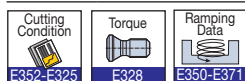
# 4N TE90-06



## End mills



| Designation                   |   | Dimension (mm) |        |     |    |      | Coolant hole | Fig. | Insert                         |
|-------------------------------|---|----------------|--------|-----|----|------|--------------|------|--------------------------------|
|                               |   | DC             | DCONMS | OAL | LH | APMX |              |      |                                |
| <b>4N TE90-216-15-06-L150</b> | 2 | 16             | 15     | 150 | 25 | 6.0  | ●            | 2    | 4NK(H)T 0603.....<br>E258-E260 |
| <b>216-W16-06</b>             | 2 | 16             | 16     | 90  | 25 | 6.0  | ●            | 1    |                                |
| <b>216-16-06-L100</b>         | 2 | 16             | 16     | 100 | 25 | 6.0  | ●            | 2    |                                |
| <b>216-16-06-L150</b>         | 2 | 16             | 16     | 150 | 25 | 6.0  | ●            | 2    |                                |
| <b>217-16-06</b>              | 2 | 17             | 16     | 90  | 25 | 6.0  | ●            | 2    |                                |
| <b>217-16-06-L200</b>         | 2 | 17             | 16     | 200 | 25 | 6.0  | ●            | 2    |                                |
| <b>218-W16-06</b>             | 2 | 18             | 16     | 90  | 25 | 6.0  | ●            | 1    |                                |
| <b>218-16-06-L150</b>         | 2 | 18             | 16     | 150 | 25 | 6.0  | ●            | 2    |                                |
| <b>220-19-06-L160</b>         | 2 | 20             | 19     | 160 | 25 | 6.0  | ●            | 2    |                                |
| <b>220-W20-06</b>             | 2 | 20             | 20     | 90  | 25 | 6.0  | ●            | 1    |                                |
| <b>220-20-06-L110</b>         | 2 | 20             | 20     | 110 | 25 | 6.0  | ●            | 2    |                                |
| <b>220-20-06-L160</b>         | 2 | 20             | 20     | 160 | 25 | 6.0  | ●            | 2    |                                |
| <b>320-W20-06</b>             | 3 | 20             | 20     | 90  | 25 | 6.0  | ●            | 1    |                                |
| <b>320-20-06-L110</b>         | 3 | 20             | 20     | 110 | 25 | 6.0  | ●            | 2    |                                |
| <b>221-20-06-L200</b>         | 2 | 21             | 20     | 200 | 25 | 6.0  | ●            | 2    |                                |
| <b>325-W25-06</b>             | 3 | 25             | 25     | 100 | 30 | 6.0  | ●            | 1    |                                |
| <b>325-25-06-L120</b>         | 3 | 25             | 25     | 120 | 30 | 6.0  | ●            | 2    |                                |
| <b>325-25-06-L200</b>         | 3 | 25             | 25     | 200 | 30 | 6.0  | ●            | 2    |                                |
| <b>326-25-06-L200</b>         | 3 | 26             | 25     | 200 | 30 | 6.0  | ●            | 2    |                                |
| <b>425-W25-06</b>             | 4 | 25             | 25     | 100 | 30 | 6.0  | ●            | 1    |                                |
| <b>425-25-06-L120</b>         | 4 | 25             | 25     | 120 | 30 | 6.0  | ●            | 2    |                                |
| <b>432-W32-06</b>             | 4 | 32             | 32     | 110 | 35 | 6.0  | ●            | 1    |                                |
| <b>432-32-06-L130</b>         | 4 | 32             | 32     | 130 | 35 | 6.0  | ●            | 2    |                                |
| <b>432-32-06-L210</b>         | 4 | 32             | 32     | 210 | 35 | 6.0  | ●            | 2    |                                |
| <b>433-32-06-L220</b>         | 4 | 33             | 32     | 220 | 35 | 6.0  | ●            | 2    |                                |
| <b>532-W32-06</b>             | 5 | 32             | 32     | 110 | 35 | 6.0  | ●            | 1    |                                |
| <b>532-32-06-L130</b>         | 5 | 32             | 32     | 130 | 35 | 6.0  | ●            | 2    |                                |
| <b>540-W32-06</b>             | 5 | 40             | 32     | 110 | 40 | 6.0  | ●            | 1    |                                |
| <b>540-32-06-L150</b>         | 5 | 40             | 32     | 150 | 40 | 6.0  | ●            | 2    |                                |
| <b>540-32-06-L250</b>         | 5 | 40             | 32     | 250 | 40 | 6.0  | ●            | 2    |                                |
| <b>640-W32-06</b>             | 6 | 40             | 32     | 110 | 35 | 6.0  | ●            | 1    |                                |
| <b>640-32-06-L150</b>         | 6 | 40             | 32     | 150 | 35 | 6.0  | ●            | 2    |                                |
|                               |   |                |        |     |    |      |              |      |                                |
|                               |   |                |        |     |    |      |              |      |                                |
|                               |   |                |        |     |    |      |              |      |                                |

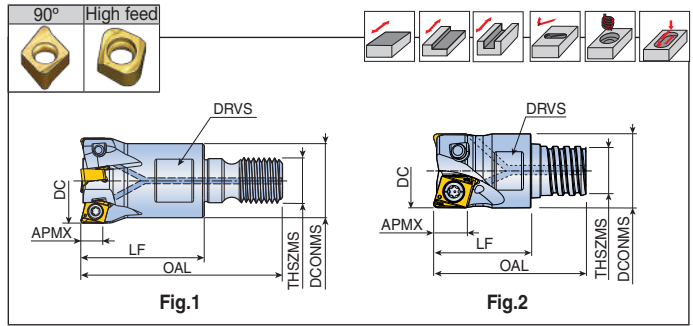


► Cutter body for '4NKT 060320R-HF' and '4NHT 060320R-F' inserts should be modified with body corner radius 2.0 mm

# 4N TE90-M(S)-06



## Modular heads



| Designation         |  | Dimension (mm) |        |    |      |        |      |      |    | Coolant hole | Fig. | Insert                                                                                                         |
|---------------------|-----------------------------------------------------------------------------------|----------------|--------|----|------|--------|------|------|----|--------------|------|----------------------------------------------------------------------------------------------------------------|
|                     |                                                                                   | DC             | DCONMS | LF | OAL  | THSZMS | APMX | DRVS |    |              |      |                                                                                                                |
| 4N TE90- 216-M08-06 | 216-M08-06                                                                        | 2              | 16     | 13 | 23   | 40.5   | M08  | 6.0  | 10 | ●            | 1    | 4NK(H)T 0603...<br> E258-E260 |
|                     | 217-M08-06                                                                        | 2              | 17     | 13 | 23   | 40.5   | M08  | 6.0  | 10 | ●            | 1    |                                                                                                                |
|                     | 220-M10-06                                                                        | 2              | 20     | 18 | 35   | 55     | M10  | 6.0  | 15 | ●            | 1    |                                                                                                                |
|                     | 320-M10-06                                                                        | 3              | 20     | 18 | 35   | 55     | M10  | 6.0  | 15 | ●            | 1    |                                                                                                                |
|                     | 321-M10-06                                                                        | 3              | 21     | 18 | 35   | 55     | M10  | 6.0  | 15 | ●            | 1    |                                                                                                                |
|                     | 325-M12-06                                                                        | 3              | 25     | 21 | 35   | 57     | M12  | 6.0  | 17 | ●            | 1    |                                                                                                                |
|                     | 425-M12-06                                                                        | 4              | 25     | 21 | 35   | 57     | M12  | 6.0  | 17 | ●            | 1    |                                                                                                                |
|                     | 426-M12-06                                                                        | 4              | 26     | 21 | 35   | 57     | M12  | 6.0  | 17 | ●            | 1    |                                                                                                                |
|                     | 432-M16-06                                                                        | 4              | 32     | 29 | 43   | 68     | M16  | 6.0  | 25 | ●            | 1    |                                                                                                                |
|                     | 532-M16-06                                                                        | 5              | 32     | 29 | 43   | 68     | M16  | 6.0  | 25 | ●            | 1    |                                                                                                                |
|                     | 533-M16-06                                                                        | 5              | 33     | 29 | 43   | 68     | M16  | 6.0  | 25 | ●            | 1    |                                                                                                                |
|                     | 535-M16-06                                                                        | 5              | 35     | 29 | 43   | 68     | M16  | 6.0  | 25 | ●            | 1    |                                                                                                                |
|                     | 540-M16-06                                                                        | 5              | 40     | 29 | 43   | 68     | M16  | 6.0  | 25 | ●            | 1    |                                                                                                                |
|                     | 640-M16-06                                                                        | 6              | 40     | 29 | 43   | 68     | M16  | 6.0  | 25 | ●            | 1    |                                                                                                                |
| 642-M16-06          | 6                                                                                 | 42             | 29     | 43 | 68   | M16    | 6.0  | 25   | ●  | 1            |      |                                                                                                                |
| 4N TE90- 216-S10-06 | 2                                                                                 | 16             | 15.2   | 20 | 31.3 | S10    | 6.0  | 8    | ●  | 2            |      |                                                                                                                |
|                     |                                                                                   |                |        |    |      |        |      |      |    |              |      |                                                                                                                |
|                     |                                                                                   |                |        |    |      |        |      |      |    |              |      |                                                                                                                |
|                     |                                                                                   |                |        |    |      |        |      |      |    |              |      |                                                                                                                |
|                     |                                                                                   |                |        |    |      |        |      |      |    |              |      |                                                                                                                |
|                     |                                                                                   |                |        |    |      |        |      |      |    |              |      |                                                                                                                |

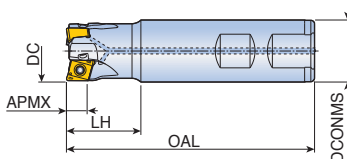
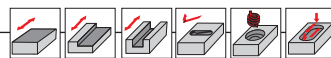
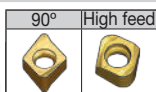
- Cutter body for '4NKT 060320R-HF' and '4NHT 060320R-F' inserts should be modified with body corner radius 2.0 mm
- Matched with T-FLEXTEC holder(Fig.1) & MAXI-RUSH holder(Fig.2)

## Spare parts

| Designation | Screw        | Wrench |  |  |  |
|-------------|--------------|--------|--|--|--|
|             |              |        |  |  |  |
| 4N TE90-06  | TS 30B068/HG | TD 8   |  |  |  |
|             |              |        |  |  |  |
|             |              |        |  |  |  |
|             |              |        |  |  |  |
|             |              |        |  |  |  |







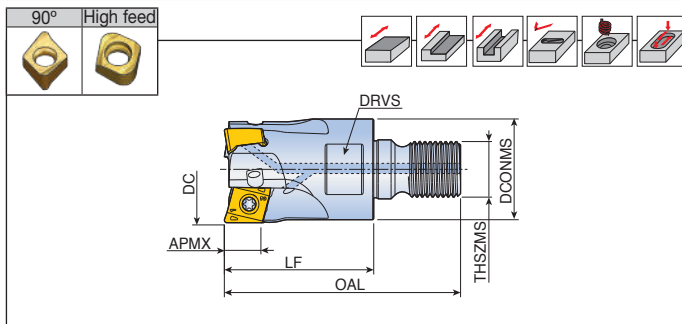
**Fig.1**



**Fig.2**

|                                                                                                                              |                                                                                                               |                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <p>Cutting Condition</p>  <p>E352-E325</p> | <p>Torque</p>  <p>E328</p> | <p>Ramping Data</p>  <p>E350-E371</p> |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|

- ▶ Cutter body for '4NKT 090432R-HF' insert should be modified with body corner radius 3.2mm
- ▶ Cutter body for '4NKT 110640R-HF' insert should be modified with body corner radius 4.0 mm
- ▶ Cutter body for '4NKT 140750R-HF' insert should be modified with body corner radius 5.0 mm



- ▶ Cutter body for '4NKT 090432R-HF' insert should be modified with body corner radius 3.2 mm
- ▶ Cutter body for '4NKT 110640R-HF' insert should be modified with body corner radius 4.0 mm
- ▶ Cutter body for '4NKT 140750R-HF' insert should be modified with body corner radius 5.0 mm
- ▶ Matched with T-FLEXTEC holder

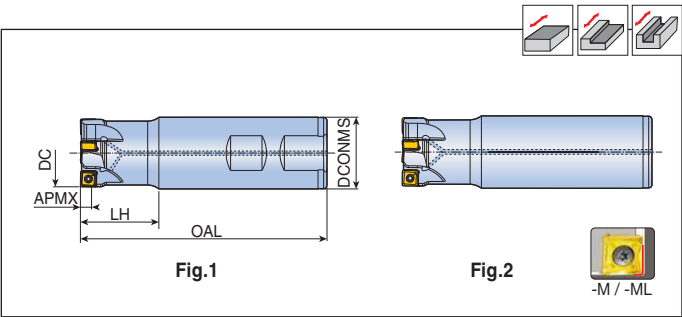
| Designation       | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                   |  |  |  |  |  |
| <b>4N TE90-09</b> | TS 35A088/HG                                                                        | TBLD T10P-W6                                                                        | THND 6W                                                                             |  |  |
| <b>4N TE90-11</b> | TS 40093/HG                                                                         | TBLD T15-W6                                                                         | THND 6W                                                                             |  |  |
| <b>4N TE90-14</b> | TS 50A121/HG                                                                        | TBLD T20-W6                                                                         | THND 6W                                                                             |  |  |
|                   |                                                                                     |                                                                                     |                                                                                     |  |  |
|                   |                                                                                     |                                                                                     |                                                                                     |  |  |



# 8D-TE90-07



End mills

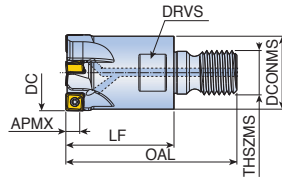
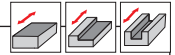


| Designation                |   | Dimension (mm) |        |    |     |      | Coolant hole | Fig. | Insert               |
|----------------------------|---|----------------|--------|----|-----|------|--------------|------|----------------------|
|                            |   | DC             | DCONMS | LH | OAL | APMX |              |      |                      |
| <b>8D-TE90- 216-W16-07</b> | 2 | 16             | 16     | 20 | 90  | 5.0  | ●            | 1    | SQKU 0703...<br>E305 |
| <b>216-16-07-L110</b>      | 2 | 16             | 16     | 20 | 110 | 5.0  | ●            | 2    |                      |
| <b>217-16-07-L110</b>      | 2 | 17             | 16     | 20 | 110 | 5.0  | ●            | 2    |                      |
| <b>220-W20-07</b>          | 2 | 20             | 20     | 25 | 90  | 5.0  | ●            | 1    |                      |
| <b>220-20-07-L160</b>      | 2 | 20             | 20     | 25 | 160 | 5.0  | ●            | 2    |                      |
| <b>320-W20-07</b>          | 3 | 20             | 20     | 25 | 90  | 5.0  | ●            | 1    |                      |
| <b>221-20-07-L160</b>      | 2 | 21             | 20     | 25 | 160 | 5.0  | ●            | 2    |                      |
| <b>325-W25-07</b>          | 3 | 25             | 25     | 30 | 100 | 5.0  | ●            | 1    |                      |
| <b>325-25-07-L160</b>      | 3 | 25             | 25     | 30 | 160 | 5.0  | ●            | 2    |                      |
| <b>425-W25-07</b>          | 4 | 25             | 25     | 30 | 100 | 5.0  | ●            | 1    |                      |
| <b>326-25-07-L160</b>      | 3 | 26             | 25     | 30 | 160 | 5.0  | ●            | 2    |                      |
| <b>432-W32-07</b>          | 4 | 32             | 32     | 35 | 110 | 5.0  | ●            | 1    |                      |
| <b>432-32-07-L200</b>      | 4 | 32             | 32     | 35 | 200 | 5.0  | ●            | 2    |                      |
| <b>632-W32-07</b>          | 6 | 32             | 32     | 35 | 110 | 5.0  | ●            | 1    |                      |
| <b>433-32-07-L200</b>      | 4 | 33             | 32     | 35 | 200 | 5.0  | ●            | 2    |                      |
| <b>540-W32-07</b>          | 5 | 40             | 32     | 40 | 110 | 5.0  | ●            | 1    |                      |
| <b>840-W32-07</b>          | 8 | 40             | 32     | 40 | 110 | 5.0  | ●            | 1    |                      |
|                            |   |                |        |    |     |      |              |      |                      |
|                            |   |                |        |    |     |      |              |      |                      |
|                            |   |                |        |    |     |      |              |      |                      |
|                            |   |                |        |    |     |      |              |      |                      |

## Spare parts

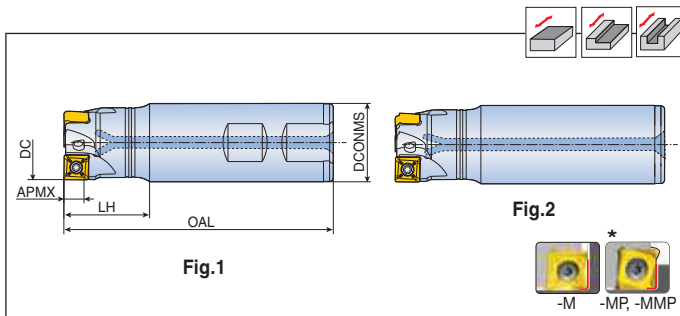
| Designation       | Screw          | Wrench |  |  |  |
|-------------------|----------------|--------|--|--|--|
|                   |                |        |  |  |  |
| <b>8D-TE90-07</b> | TS 25D060/HG-P | TD 7P  |  |  |  |
|                   |                |        |  |  |  |
|                   |                |        |  |  |  |
|                   |                |        |  |  |  |
|                   |                |        |  |  |  |





|                                                                                                                             |                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <p>Cutting Condition</p>  <p>E352-E325</p> | <p>Torque</p>  <p>E328</p> |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|

**CHASE 8 MILL**

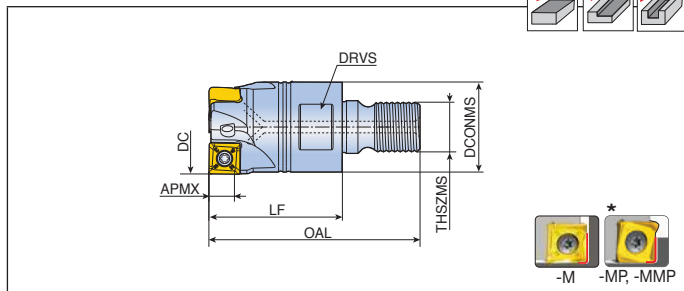


- ▶ \*:Multi-Step milling is not recommended over the APMX
- ▶ \*\*:When applying SQHU insert, APMX is 6.5 / 8.0 mm

| Designation       | Screw                                                                               | Wrench                                                                              |                                                                                     | Wrench handle                                                                       |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                   |  |  |  |  |  |
| <b>8D-TE90-10</b> | TS 35A088/HG                                                                        | TD 10P                                                                              | -                                                                                   | -                                                                                   |  |
| <b>8D-TE90-12</b> | TS 40M100/HG                                                                        | -                                                                                   | TBLD T20P-W6                                                                        | SW6-T                                                                               |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



**CHASE 8 MILL**  
90° FACING & SHOULDERING

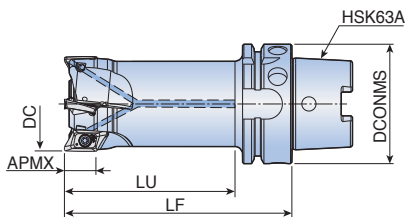


►\*:Multi-Step milling is not recommended over the APMX ►\*\*:When applying SQHU insert, APMX is 6.5 mm  
► Matched with T-FLEXTEC holder

| Designation         | Screw                                                                               | Wrench                                                                              |  |  |  |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                     |  |  |  |  |  |
| <b>8D-TE90-M-10</b> | TS 35A088I/HG                                                                       | TD 10P                                                                              |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |
|                     |                                                                                     |                                                                                     |  |  |  |



# CHASE ALU

[illegible]

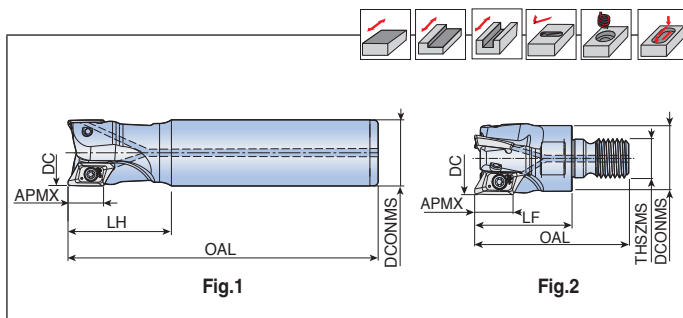
## Spare parts

| Designation             | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                         |  |  |  |  |  |
| <b>TE90XE-16</b> (Ø25)  | TS 40085I/HG                                                                        | T-T15                                                                               |  |  |  |
| <b>TE90XE-16</b> (Ø32-) | TS 40093I/HG                                                                        | T-T15                                                                               |  |  |  |
|                         |                                                                                     |                                                                                     |  |  |  |
|                         |                                                                                     |                                                                                     |  |  |  |



# TE90XEV-16/22

## End mills & Modular heads



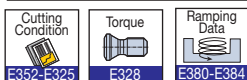
| Designation    |                       |   | Dimension (mm) |        |     |        |    |     |      | Coolant hole | Fig. | Max RPM | Insert               |
|----------------|-----------------------|---|----------------|--------|-----|--------|----|-----|------|--------------|------|---------|----------------------|
|                |                       |   | DC             | DCONMS | OAL | THSZMS | LF | LH  | APMX |              |      |         |                      |
| <b>TE90XEV</b> | <b>225-25-16</b>      | 2 | 25             | 25     | 125 | -      | -  | 55  | 16   | ●            | 1    | 52,000  | XEVT 1605...<br>E315 |
|                | <b>225-25-16-L170</b> | 2 | 25             | 25     | 170 | -      | -  | 70  | 16   | ●            | 1    | 52,000  |                      |
|                | <b>232-32-16</b>      | 2 | 32             | 32     | 150 | -      | -  | 50  | 16   | ●            | 1    | 46,000  |                      |
|                | <b>232-32-16-L200</b> | 2 | 32             | 32     | 200 | -      | -  | 80  | 16   | ●            | 1    | 46,000  |                      |
|                | <b>332-32-16</b>      | 3 | 32             | 32     | 150 | -      | -  | 50  | 16   | ●            | 1    | 46,000  |                      |
|                | <b>332-32-16-L200</b> | 3 | 32             | 32     | 200 | -      | -  | 80  | 16   | ●            | 1    | 46,000  |                      |
|                | <b>340-32-16</b>      | 3 | 40             | 32     | 170 | -      | -  | 55  | 16   | ●            | 1    | 41,200  |                      |
|                | <b>340-32-16-L250</b> | 3 | 40             | 32     | 250 | -      | -  | 55  | 16   | ●            | 1    | 41,200  |                      |
| <b>TE90XEV</b> | <b>225-M12-16</b>     | 2 | 25             | 21     | 65  | M12    | 43 | -   | 16   | ●            | 2    | 52,000  | XEVT 2206...<br>E315 |
|                | <b>232-M16-16</b>     | 2 | 32             | 29     | 68  | M16    | 43 | -   | 16   | ●            | 2    | 46,000  |                      |
|                | <b>332-M16-16</b>     | 3 | 32             | 29     | 68  | M16    | 43 | -   | 16   | ●            | 2    | 46,000  |                      |
|                | <b>340-M16-16</b>     | 3 | 40             | 29     | 68  | M16    | 43 | -   | 16   | ●            | 2    | 41,200  |                      |
| <b>TE90XEV</b> | <b>232-32-22</b>      | 2 | 32             | 32     | 160 | -      | -  | 100 | 21   | ●            | 1    | 37,500  | XEVT 2206...<br>E315 |
|                | <b>340-40-22</b>      | 3 | 40             | 40     | 160 | -      | -  | 80  | 21   | ●            | 1    | 35,100  |                      |
|                |                       |   |                |        |     |        |    |     |      |              |      |         |                      |
|                |                       |   |                |        |     |        |    |     |      |              |      |         |                      |
|                |                       |   |                |        |     |        |    |     |      |              |      |         |                      |
|                |                       |   |                |        |     |        |    |     |      |              |      |         |                      |

► Matched with T-FLEXTEC holder(Fig.2)

► For "XEVT" inserts with a corner radius larger than 3.2 mm (RE > 3.2 mm), modify the cutter body corner radius as follows: R = RE - 0.3 mm

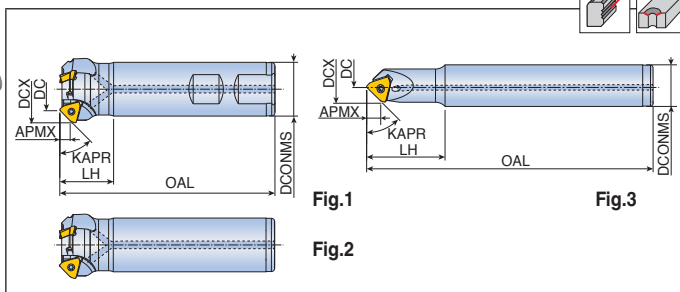
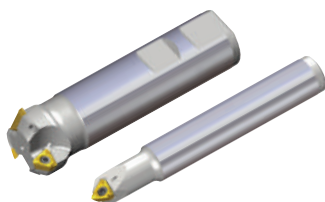
## Spare parts

| Designation             | Screw        | Wrench |  |  |  |
|-------------------------|--------------|--------|--|--|--|
|                         |              |        |  |  |  |
| <b>TE90XEV-16 (Ø25)</b> | TS 40085I/HG | T-T 15 |  |  |  |
| <b>TE90XEV-16 (Ø32)</b> | TS 40093I/HG | T-T 15 |  |  |  |
| <b>TE90XEV-22 (Ø32)</b> | TS 50105I    | T-T 20 |  |  |  |
| <b>TE90XEV-22 (Ø40)</b> | TS 50115I    | T-T 20 |  |  |  |





### End mills for chamfering

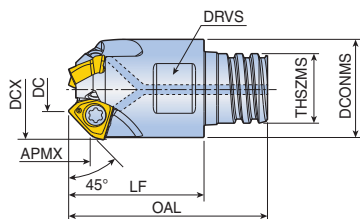


► Coolant through type

| Designation      | Screw                                                                               | Wrench                                                                              |  |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                  |  |  |  |  |  |
| <b>3P-TCF-06</b> | TS 20043I/HG-P                                                                      | TD 6P                                                                               |  |  |  |
| <b>3P-TCF-10</b> | TS 25C065I/HG                                                                       | TD 8                                                                                |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |



**MILL RUSH**  
PULPITIVE DRY BALL



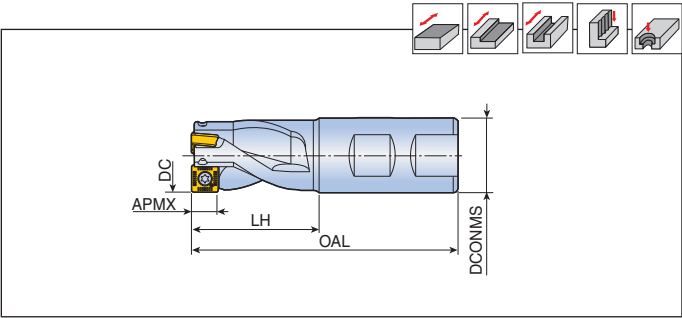
45°

- ▶ Matched with MAXI-RUSH holder
- ▶ Coolant through type

| Designation        | Screw                                                                               | Wrench                                                                              |  |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                    |  |  |  |  |  |
| <b>3P-TCF-S-04</b> | TS 18033/HG-P                                                                       | TD 6P                                                                               |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |



End mills



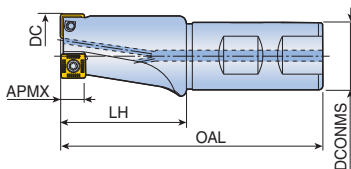
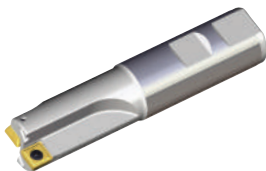
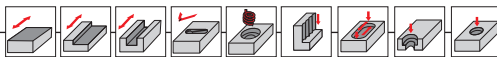
| Designation           |   | Dimension (mm) |        |     |    |      | Insert             |
|-----------------------|---|----------------|--------|-----|----|------|--------------------|
|                       |   | DC             | DCONMS | OAL | LH | APMX |                    |
| <b>TSF 112-W16-06</b> | 1 | 12             | 16     | 80  | 27 | 5.6  | XOMT 0602...       |
| <b>216-W20-06</b>     | 2 | 16             | 20     | 90  | 27 | 5.6  | E303               |
| <b>320-W20-06</b>     | 3 | 20             | 20     | 100 | 25 | 5.6  |                    |
| <b>TSF 222-W25-09</b> | 2 | 22             | 25     | 100 | 40 | 9.0  | SPMG(T) 0904...-EM |
| <b>225-W25-09</b>     | 2 | 25             | 25     | 100 | 40 | 9.0  | E303               |
| <b>TSF 332-W32-11</b> | 3 | 32             | 32     | 115 | 55 | 10.7 | SPMG(T) 1104...-EM |
| <b>440-W32-11</b>     | 4 | 40             | 32     | 125 | 55 | 10.7 | E303               |
| <b>TSF 445-W32-14</b> | 4 | 45             | 32     | 130 | 70 | 13.4 | SPMG(T) 1405...-EM |
| <b>450-W32-14</b>     | 4 | 50             | 32     | 140 | 80 | 13.4 | E303               |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |
|                       |   |                |        |     |    |      |                    |

Spare parts

| Designation          | Screw         | Wrench |  |  |  |
|----------------------|---------------|--------|--|--|--|
|                      |               |        |  |  |  |
| <b>TSF (Ø12)</b>     | TS 22046I     | TD 7   |  |  |  |
| <b>TSF (Ø16-Ø20)</b> | TS 22052I/HG  | TD 7   |  |  |  |
| <b>TSF (Ø22-Ø25)</b> | TS 35088I     | TD 10  |  |  |  |
| <b>TSF (Ø32-Ø40)</b> | TS 40093I     | TD 15  |  |  |  |
| <b>TSF (Ø45-Ø50)</b> | TS 50A121I/HG | TD 20  |  |  |  |

Cutting Condition  
E352-E325

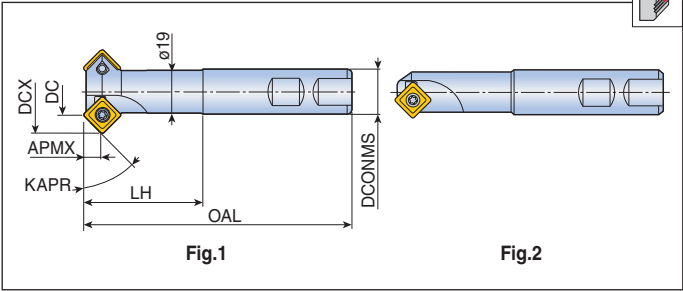
Torque  
E328

[illegible]

| Designation          | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                      |  |  |  |  |  |
| <b>TDM</b> (Ø12)     | TS 22046I                                                                           | TD 7                                                                                |  |  |  |
| <b>TDM</b> (Ø16-Ø22) | TS 22052I/HG                                                                        | TD 7                                                                                |  |  |  |
| <b>TDM</b> (Ø25-Ø28) | TS 35088I                                                                           | TD 10                                                                               |  |  |  |
| <b>TDM</b> (Ø32-Ø40) | TS 40093I                                                                           | TD 15                                                                               |  |  |  |
| <b>TDM</b> (Ø45-Ø50) | TS 50A121I/HG                                                                       | TD 20                                                                               |  |  |  |



End mills



| Designation  |   | Dimension (mm) |      |    |        |     |    |      | Fig. | Application range(mm) | Insert                    |
|--------------|---|----------------|------|----|--------|-----|----|------|------|-----------------------|---------------------------|
|              |   | KAPR           | DCX  | DC | DCONMS | OAL | LH | APMX |      |                       |                           |
| TCF15 D25-11 | 2 | 75°            | 30.5 | 25 | 20     | 120 | 40 | 10.1 | 1    | Ø26.3-Ø30.0           | SPMT(G) 1104...EM<br>E303 |
| 30 D25-11    | 2 | 60°            | 35.5 | 25 | 20     | 120 | 40 | 8.9  | 1    | Ø26.3-Ø34.0           |                           |
| 45 D07-11    | 1 | 45°            | 21.5 | 7  | 20     | 120 | 40 | 7.2  | 2    | Ø8.3-Ø20.9            |                           |
| 45 D19-11    | 2 | 45°            | 33.4 | 19 | 20     | 120 | 40 | 7.2  | 1    | Ø20.3-Ø32.9           |                           |
| 45 D25-11    | 3 | 45°            | 39.4 | 25 | 20     | 120 | 40 | 7.2  | 1    | Ø26.3-Ø38.9           |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |
|              |   |                |      |    |        |     |    |      |      |                       |                           |

Spare parts

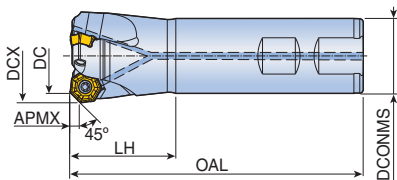
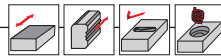
| Designation | Screw     | Wrench |  |  |  |
|-------------|-----------|--------|--|--|--|
|             |           |        |  |  |  |
| TCF-11      | TS 40093I | TD 15  |  |  |  |
|             |           |        |  |  |  |
|             |           |        |  |  |  |
|             |           |        |  |  |  |

Cutting Condition  
E352-E325

Torque  
E328

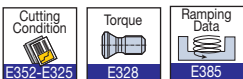
**7S-E45-06**

## End mills

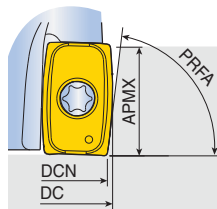
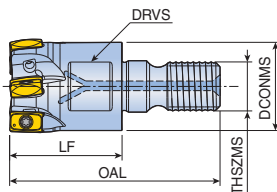
[illegible]

## Spare parts

| Designation             | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                         |  |  |  |  |  |
| <b>7S-E45-06</b> (-Ø40) | TS 40085/HG                                                                         | TD 15                                                                               |  |  |  |
| <b>7S-E45-06</b> (Ø50)  | TS 40093/HG                                                                         | TD 15                                                                               |  |  |  |
|                         |                                                                                     |                                                                                     |  |  |  |
|                         |                                                                                     |                                                                                     |  |  |  |
|                         |                                                                                     |                                                                                     |  |  |  |



# SPEED BARREL

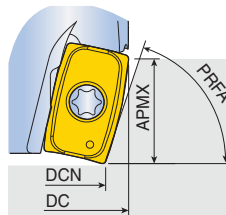
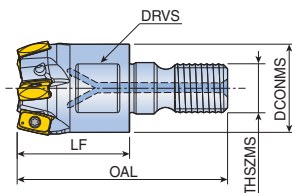


► Matched with T-FLEXTEC holder

| Designation       | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                   |  |  |  |  |  |
| <b>TBR90-M-06</b> | TS 18041I/HG                                                                        | TD 6P                                                                               |  |  |  |
| <b>TBR90-M-12</b> | TS 30B068I/HG                                                                       | TD 8                                                                                |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |



**SPEED BARREL**



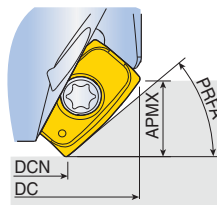
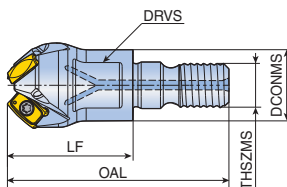
► Matched with T-FLEXTEC holder

| Designation       | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                   |  |  |  |  |  |
| <b>TBR75-M-06</b> | TS 18041I/HG                                                                        | TD 6P                                                                               |  |  |  |
| <b>TBR75-M-12</b> | TS 30B068I/HG                                                                       | TD 8                                                                                |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |





**SPEED BARREL**

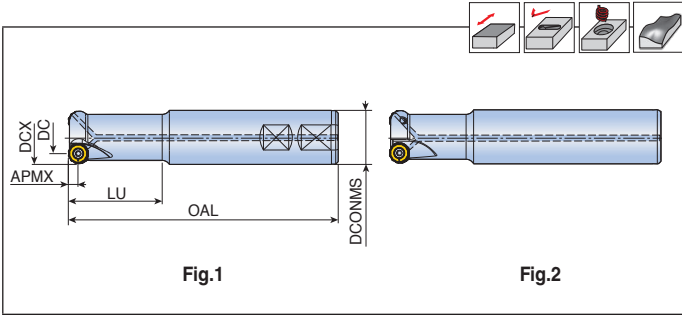
[illegible]

## Spare parts

| Designation       | Screw                                                                               | Wrench                                                                              |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                   |  |  |  |  |  |
| <b>TBR45-M-06</b> | TS 18041I/HG                                                                        | TD 6P                                                                               |  |  |  |
| <b>TBR45-M-12</b> | TS 30B068I/HG                                                                       | TD 8                                                                                |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |
|                   |                                                                                     |                                                                                     |  |  |  |



End mills



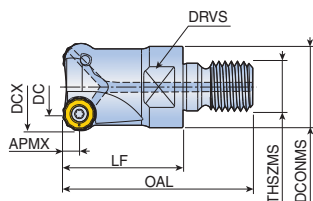
| Designation           |   | Dimension (mm) |    |        |     |     |      | Coolant hole | Fig. | Insert           |
|-----------------------|---|----------------|----|--------|-----|-----|------|--------------|------|------------------|
|                       |   | DCX            | DC | DCONMS | OAL | LU  | APMX |              |      |                  |
| TERNS 225-25-10-L160  | 2 | 25             | 15 | 25     | 160 | 60  | 5.0  | ●            | 2    | RNMU 1004...<br> |
| 225-32-10-L250        | 2 | 25             | 15 | 32     | 250 | 40  | 5.0  | ●            | 2    |                  |
| 325-25-10-L160        | 3 | 25             | 15 | 25     | 160 | 60  | 5.0  | ●            | 2    |                  |
| 226-25-10-L200        | 2 | 26             | 16 | 25     | 200 | 80  | 5.0  | ●            | 2    |                  |
| 332-32-10-L180        | 3 | 32             | 22 | 32     | 180 | 70  | 5.0  | ●            | 2    |                  |
| 332-32-10-L250        | 3 | 32             | 22 | 32     | 250 | 100 | 5.0  | ●            | 2    |                  |
| 432-32-10-L180        | 4 | 32             | 22 | 32     | 180 | 70  | 5.0  | ●            | 2    |                  |
| 432-32-10-L250        | 4 | 32             | 22 | 32     | 250 | 100 | 5.0  | ●            | 2    |                  |
| 433-32-10-L200        | 4 | 33             | 23 | 32     | 200 | 80  | 5.0  | ●            | 2    |                  |
| 433-32-10-L250        | 4 | 33             | 23 | 32     | 250 | 100 | 5.0  | ●            | 2    |                  |
| TERNS 232-32-12-L150  | 2 | 32             | 20 | 32     | 150 | 50  | 6.0  | ●            | 2    | RNMU 1205...<br> |
| 232-32-12-L200        | 2 | 32             | 20 | 32     | 200 | 60  | 6.0  | ●            | 2    |                  |
| 232-32-12-L           | 2 | 32             | 20 | 32     | 250 | 50  | 6.0  | ●            | 2    |                  |
| 332-W32-12            | 3 | 32             | 20 | 32     | 160 | 60  | 6.0  | ●            | 1    |                  |
| 332-32-12-L200        | 3 | 32             | 20 | 32     | 200 | 70  | 6.0  | ●            | 2    |                  |
| 332-32-12-L250        | 3 | 32             | 20 | 32     | 250 | 60  | 6.0  | ●            | 2    |                  |
| 233-32-12-L200        | 2 | 33             | 21 | 32     | 200 | 50  | 6.0  | ●            | 2    |                  |
| 233-32-12-L250        | 2 | 33             | 21 | 32     | 250 | 50  | 6.0  | ●            | 2    |                  |
| 333-32-12-L200        | 3 | 33             | 21 | 32     | 200 | 70  | 6.0  | ●            | 2    |                  |
| 333-32-12-L250        | 3 | 33             | 21 | 32     | 250 | 60  | 6.0  | ●            | 2    |                  |
| 340-W32-12            | 3 | 40             | 28 | 32     | 160 | 50  | 6.0  | ●            | 1    |                  |
| 340-32-12-L250        | 3 | 40             | 28 | 32     | 250 | 50  | 6.0  | ●            | 2    |                  |
| 440-W32-12            | 4 | 40             | 28 | 32     | 160 | 50  | 6.0  | ●            | 1    |                  |
| 440-32-12-L250        | 4 | 40             | 28 | 32     | 250 | 60  | 6.0  | ●            | 2    |                  |
| 450-32-12-L200        | 4 | 50             | 38 | 32     | 200 | 70  | 6.0  | ●            | 2    |                  |
| 550-32-12-L250        | 5 | 50             | 38 | 32     | 250 | 60  | 6.0  | ●            | 2    |                  |
| TERNS 240-W32-16-L160 | 2 | 40             | 24 | 32     | 160 | 50  | 6.0  | ●            | 1    | RNMU 1606...<br> |
| 240-32-16-L180        | 2 | 40             | 24 | 32     | 180 | 70  | 8.0  | ●            | 2    |                  |
| 240-32-16-L250        | 2 | 40             | 24 | 32     | 250 | 100 | 8.0  | ●            | 2    |                  |
| 340-32-16-L180        | 3 | 40             | 24 | 32     | 180 | 70  | 8.0  | ●            | 2    |                  |
| 340-32-16-L250        | 3 | 40             | 24 | 32     | 250 | 100 | 8.0  | ●            | 2    |                  |
|                       |   |                |    |        |     |     |      |              |      |                  |
|                       |   |                |    |        |     |     |      |              |      |                  |
|                       |   |                |    |        |     |     |      |              |      |                  |
|                       |   |                |    |        |     |     |      |              |      |                  |
|                       |   |                |    |        |     |     |      |              |      |                  |

Cutting Condition  
E352-E325

Torque  
E328

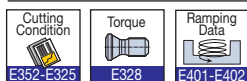
Ramping Data  
E401-E402

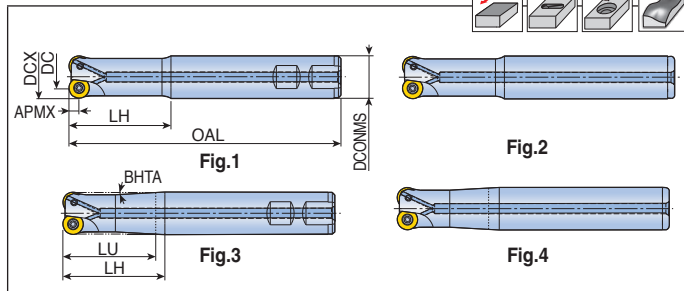
# CHASE 2 MOLD

[illegible]

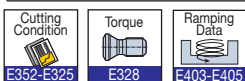
## Spare parts

| Designation     | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                 |  |  |  |  |  |
| <b>TERNS-10</b> | TS 35085I/HG                                                                        | TD 15                                                                               | -                                                                                   |  |  |
| <b>TERNS-12</b> | TS 40G110I                                                                          | -                                                                                   | T-T15                                                                               |  |  |
| <b>TERNS-16</b> | TS 50A121I/HG                                                                       | TD 20                                                                               | -                                                                                   |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |





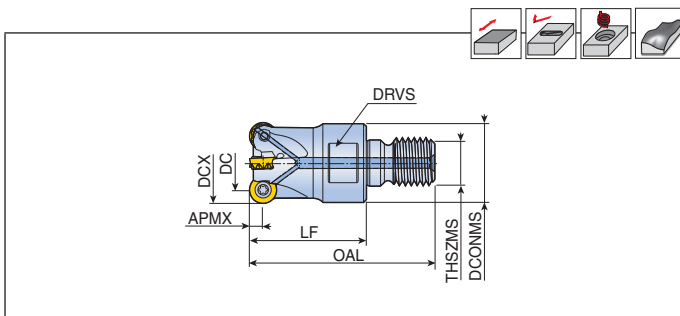
| Designation              |   | Dimension (mm) |    |        |     |    |    |      |      | Coolant hole | Fig. | Insert                        |
|--------------------------|---|----------------|----|--------|-----|----|----|------|------|--------------|------|-------------------------------|
|                          |   | DCX            | DC | DCONMS | OAL | LU | LH | BHTA | APMX |              |      |                               |
| <b>TERY 216-W20-08-L</b> | 2 | 16             | 8  | 20     | 110 | 45 | 55 | 4.1° | 4.0  | ●            | 3    | RYM(H)X 0803...<br>E293-E294  |
| <b>217-16-08-L130</b>    | 2 | 17             | 9  | 16     | 130 | -  | 30 | -    | 4.0  | ●            | 2    |                               |
| <b>218-16-08-L150</b>    | 2 | 18             | 10 | 16     | 150 | -  | 30 | -    | 4.0  | ●            | 2    |                               |
| <b>320-W20-08</b>        | 3 | 20             | 12 | 20     | 150 | -  | 43 | -    | 4.0  | ●            | 1    |                               |
| <b>320-20-08-L110</b>    | 3 | 20             | 12 | 20     | 110 | -  | 60 | -    | 4.0  | ●            | 2    |                               |
| <b>321-20-08-L150</b>    | 3 | 21             | 13 | 20     | 150 | -  | 40 | -    | 4.0  | ●            | 2    |                               |
| <b>425-W25-08</b>        | 4 | 25             | 17 | 25     | 150 | -  | 43 | -    | 4.0  | ●            | 1    |                               |
| <b>426-25-08-L150</b>    | 4 | 26             | 18 | 25     | 150 | -  | 40 | -    | 4.0  | ●            | 2    |                               |
| <b>532-W32-08</b>        | 5 | 32             | 24 | 32     | 160 | -  | 60 | -    | 4.0  | ●            | 1    | RYM(H)X 1004...<br>E293-E294  |
| <b>TERY 220-W20-10</b>   | 2 | 20             | 10 | 20     | 160 | -  | 60 | -    | 5.0  | ●            | 1    |                               |
| <b>220-25-10-L</b>       | 2 | 20             | 10 | 25     | 250 | 60 | 80 | 3.5° | 5.0  | ●            | 4    |                               |
| <b>221-20-10-L200</b>    | 2 | 21             | 11 | 20     | 200 | -  | 30 | -    | 5.0  | ●            | 2    |                               |
| <b>225-32-10-L</b>       | 2 | 25             | 15 | 32     | 250 | 53 | 80 | 5.0° | 5.0  | ●            | 4    |                               |
| <b>225-W25-10</b>        | 2 | 25             | 15 | 25     | 160 | -  | 60 | -    | 5.0  | ●            | 1    |                               |
| <b>325-W25-10</b>        | 3 | 25             | 15 | 25     | 160 | -  | 60 | -    | 5.0  | ●            | 1    |                               |
| <b>226-25-10-L200</b>    | 2 | 26             | 16 | 25     | 200 | -  | 30 | -    | 5.0  | ●            | 2    |                               |
| <b>326-25-10-L200</b>    | 3 | 26             | 16 | 25     | 200 | -  | 60 | -    | 5.0  | ●            | 2    | RYM(H)X 1205...<br>EE293-E294 |
| <b>432-W32-10</b>        | 4 | 32             | 22 | 32     | 160 | -  | 60 | -    | 5.0  | ●            | 1    |                               |
| <b>TERY 225-W25-12</b>   | 2 | 25             | 13 | 25     | 160 | -  | 60 | -    | 6.0  | ●            | 1    |                               |
| <b>226-25-12-L200</b>    | 2 | 26             | 14 | 25     | 200 | -  | 60 | -    | 6.0  | ●            | 2    |                               |
| <b>232-32-12-L</b>       | 2 | 32             | 20 | 32     | 250 | -  | 50 | -    | 6.0  | ●            | 2    |                               |
| <b>332-W32-12</b>        | 3 | 32             | 20 | 32     | 160 | -  | 64 | -    | 6.0  | ●            | 1    |                               |
| <b>332-W32-12-S</b>      | 3 | 32             | 20 | 32     | 105 | -  | 35 | -    | 6.0  | ●            | 1    |                               |
| <b>233-32-12-L250</b>    | 2 | 33             | 21 | 32     | 250 | -  | 40 | -    | 6.0  | ●            | 2    |                               |
| <b>333-32-12-L200</b>    | 3 | 33             | 21 | 32     | 200 | -  | 60 | -    | 6.0  | ●            | 2    | RYM(H)X 1606...<br>E293-E294  |
| <b>340-W32-12</b>        | 3 | 40             | 28 | 32     | 160 | -  | 50 | -    | 6.0  | ●            | 1    |                               |
| <b>340-W32-12-S</b>      | 3 | 40             | 28 | 32     | 105 | -  | 35 | -    | 6.0  | ●            | 1    |                               |
| <b>340-32-12-L250</b>    | 3 | 40             | 28 | 32     | 250 | -  | 50 | -    | 6.0  | ●            | 2    |                               |
| <b>440-W32-12</b>        | 4 | 40             | 28 | 32     | 150 | -  | 35 | -    | 6.0  | ●            | 1    |                               |
| <b>440-W32-12-S</b>      | 4 | 40             | 28 | 32     | 105 | -  | 35 | -    | 6.0  | ●            | 1    |                               |
| <b>TERY 240-W32-16</b>   | 2 | 40             | 24 | 32     | 160 | -  | 50 | -    | 8.0  | ●            | 1    |                               |
| <b>340-32-16-L250</b>    | 3 | 40             | 24 | 32     | 250 | -  | 50 | -    | 8.0  | ●            | 2    | RYM(H)X 2007...<br>E293-E294  |
| <b>TERY 350-32-20</b>    | 3 | 50             | 30 | 32     | 160 | -  | 50 | -    | 10.0 | ●            | 2    |                               |
| <b>350-40-20</b>         | 3 | 50             | 30 | 40     | 200 | -  | 60 | -    | 10.0 | ●            | 2    |                               |



# TERY-M-08/10



## Modular heads



| Designation            |   | Dimension (mm) |    |        |    |      |        |      |      | Coolant hole | Insert                       |
|------------------------|---|----------------|----|--------|----|------|--------|------|------|--------------|------------------------------|
|                        |   | DCX            | DC | DCONMS | LF | OAL  | THSZMS | APMX | DRVS |              |                              |
| <b>TERY 216-M08-08</b> | 2 | 16             | 8  | 13     | 23 | 40.5 | M08    | 4.0  | 10   | ●            | RYM(H)X 0803...<br>E293-E294 |
| <b>218-M08-08</b>      | 2 | 18             | 10 | 13     | 23 | 40.5 | M08    | 4.0  | 10   | ●            |                              |
| <b>220-M10-08</b>      | 2 | 20             | 12 | 18     | 30 | 50   | M10    | 4.0  | 15   | ●            |                              |
| <b>320-M10-08</b>      | 3 | 20             | 12 | 18     | 30 | 50   | M10    | 4.0  | 15   | ●            |                              |
| <b>425-M12-08</b>      | 4 | 25             | 17 | 21     | 35 | 57   | M12    | 4.0  | 17   | ●            |                              |
| <b>530-M16-08</b>      | 5 | 30             | 22 | 29     | 43 | 68   | M16    | 4.0  | 25   | ●            |                              |
| <b>532-M16-08</b>      | 5 | 32             | 24 | 29     | 43 | 68   | M16    | 4.0  | 25   | ●            |                              |
| <b>540-M16-08</b>      | 5 | 40             | 32 | 29     | 43 | 68   | M16    | 4.0  | 25   | ●            |                              |
| <b>640-M16-08</b>      | 6 | 40             | 32 | 29     | 43 | 68   | M16    | 4.0  | 25   | ●            | RYM(H)X 1004...<br>E293-E294 |
| <b>TERY 220-M10-10</b> | 2 | 20             | 10 | 18     | 30 | 50   | M10    | 5.0  | 15   | ●            |                              |
| <b>225-M12-10</b>      | 2 | 25             | 15 | 21     | 35 | 57   | M12    | 5.0  | 17   | ●            |                              |
| <b>325-M12-10</b>      | 3 | 25             | 15 | 21     | 35 | 57   | M12    | 5.0  | 17   | ●            |                              |
| <b>430-M16-10</b>      | 4 | 30             | 20 | 29     | 43 | 68   | M16    | 5.0  | 25   | ●            |                              |
| <b>432-M16-10</b>      | 4 | 32             | 22 | 29     | 43 | 68   | M16    | 5.0  | 25   | ●            |                              |
| <b>435-M16-10</b>      | 4 | 35             | 25 | 29     | 43 | 68   | M16    | 5.0  | 25   | ●            |                              |
| <b>542-M16-10</b>      | 5 | 42             | 32 | 29     | 43 | 68   | M16    | 5.0  | 25   | ●            |                              |
| <b>642-M16-10</b>      | 6 | 42             | 32 | 29     | 43 | 68   | M16    | 5.0  | 25   | ●            |                              |
|                        |   |                |    |        |    |      |        |      |      |              |                              |
|                        |   |                |    |        |    |      |        |      |      |              |                              |
|                        |   |                |    |        |    |      |        |      |      |              |                              |

► Matched with T-FLEXTEC holder

## Spare parts

| Designation    | Screw                                   | Wrench |  |  |  |
|----------------|-----------------------------------------|--------|--|--|--|
|                |                                         |        |  |  |  |
| <b>TERY-08</b> | TS 30A060I/HG                           | TD 9   |  |  |  |
| <b>TERY-10</b> | TS 35070I/HG(UnderØ21),<br>TS 35085I/HG | TD 15  |  |  |  |
| <b>TERY-12</b> | TS 40093I                               | TD 15  |  |  |  |
| <b>TERY-16</b> | TS 50115I                               | TD 20  |  |  |  |



E352-E325

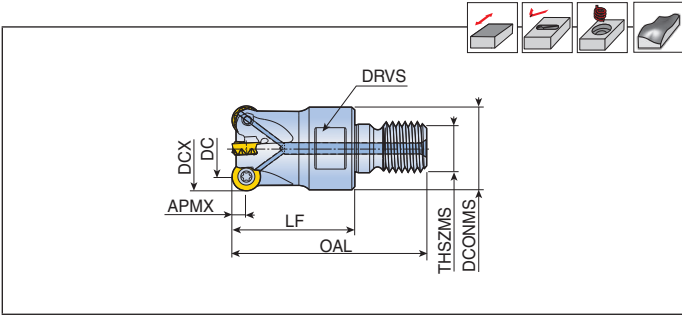
E328

E403-E405

TERY-M-12/16



Modular heads



| Designation     |   | Dimension (mm) |    |        |    |     |        |      |      | Coolant hole | Insert                       |
|-----------------|---|----------------|----|--------|----|-----|--------|------|------|--------------|------------------------------|
|                 |   | DCX            | DC | DCONMS | LF | OAL | THSZMS | APMX | DRVS |              |                              |
| TERY 225-M12-12 | 2 | 25             | 13 | 21     | 35 | 57  | M12    | 6.0  | 17   | ●            | RYM(H)X 1205...<br>E293-E294 |
| 232-M16-12      | 2 | 32             | 20 | 29     | 43 | 68  | M16    | 6.0  | 25   | ●            |                              |
| 332-M16-12      | 3 | 32             | 20 | 29     | 43 | 68  | M16    | 6.0  | 25   | ●            |                              |
| 335-M16-12      | 3 | 35             | 23 | 29     | 43 | 68  | M16    | 6.0  | 25   | ●            |                              |
| 340-M16-12      | 3 | 40             | 28 | 29     | 43 | 68  | M16    | 6.0  | 25   | ●            |                              |
| 440-M16-12      | 4 | 40             | 28 | 29     | 43 | 68  | M16    | 6.0  | 25   | ●            |                              |
| 442-M16-12      | 4 | 42             | 30 | 29     | 43 | 68  | M16    | 6.0  | 25   | ●            |                              |
| TERY 232-M16-16 | 2 | 32             | 16 | 29     | 43 | 68  | M16    | 8.0  | 25   | ●            | RYM(H)X 1606...<br>E293-E294 |
| 240-M16-16      | 2 | 40             | 24 | 29     | 43 | 68  | M16    | 8.0  | 25   | ●            |                              |
| 342-M16-16      | 3 | 42             | 26 | 29     | 43 | 68  | M16    | 8.0  | 25   | ●            |                              |
|                 |   |                |    |        |    |     |        |      |      |              |                              |
|                 |   |                |    |        |    |     |        |      |      |              |                              |
|                 |   |                |    |        |    |     |        |      |      |              |                              |
|                 |   |                |    |        |    |     |        |      |      |              |                              |

► Matched with T-FLEXTEC holder

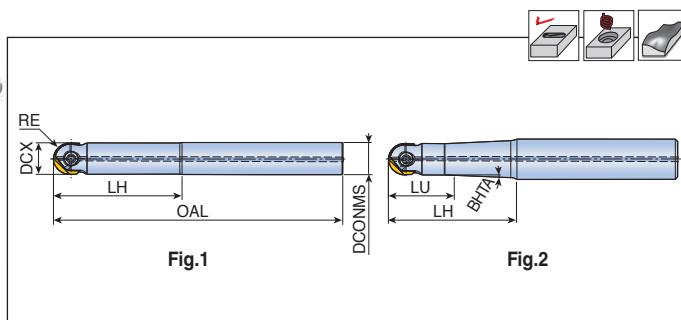
Spare parts

| Designation | Screw     | Wrench |  |  |  |
|-------------|-----------|--------|--|--|--|
|             |           |        |  |  |  |
| TERY-12     | TS 40093I | TD 15  |  |  |  |
| TERY-16     | TS 50115I | TD 20  |  |  |  |
|             |           |        |  |  |  |
|             |           |        |  |  |  |

Cutting Condition  
E352-E325

Torque  
E328

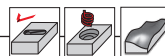
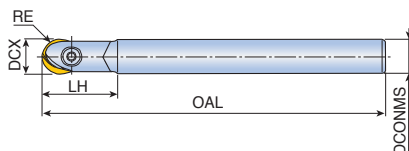
Ramping Data  
E403-E405



| Designation        | Dimension (mm) |      |        |     |     |    |      | Coolant hole | Fig. | Insert         |
|--------------------|----------------|------|--------|-----|-----|----|------|--------------|------|----------------|
|                    | DCX            | RE   | DCONMS | OAL | LH  | LU | BHTA |              |      |                |
| <b>TNF 060-10M</b> | 6              | 3    | 10     | 80  | 30  | 15 | 7.5° | ●            | 2    | NFB 060...     |
| <b>060-30-L80</b>  | 6              | 3    | 10     | 80  | 30  | -  | -    | ●            | 1    | NFR 060A...    |
| <b>080-08S</b>     | 8              | 4    | 8      | 90  | 20  | -  | -    | ●            | 1    | NFB 080...     |
| <b>080-12S</b>     | 8              | 4    | 12     | 100 | 20  | 10 | 9.5° | ●            | 2    | NFR 080A...    |
| <b>080-12M</b>     | 8              | 4    | 12     | 130 | 50  | 10 | 3°   | ●            | 2    | NFCB 080...    |
| <b>100-10S</b>     | 10             | 5    | 10     | 90  | 30  | -  | -    | ●            | 1    | NFB 100...     |
| <b>100-12S</b>     | 10             | 5    | 12     | 110 | 25  | 15 | 5°   | ●            | 2    | NFR 100A...    |
| <b>100-16M</b>     | 10             | 5    | 16     | 130 | 60  | 15 | 3.5° | ●            | 2    | NFR 110A...    |
| <b>120-12S</b>     | 12             | 6    | 12     | 110 | 30  | -  | -    | ●            | 1    | NFCB 100...    |
| <b>120-12M</b>     | 12             | 6    | 12     | 180 | 60  | -  | -    | ●            | 1    | NFB 120...     |
| <b>120-16M</b>     | 12             | 6    | 16     | 140 | 60  | 25 | 2.4° | ●            | 2    | NFR 120A...    |
| <b>120-20L</b>     | 12             | 6    | 20     | 180 | 80  | 40 | 5°   | ●            | 2    | NFL(C)B 120... |
| <b>160-16M</b>     | 16             | 8    | 16     | 130 | 40  | -  | -    | ●            | 1    | NFB 160...     |
| <b>160-16L</b>     | 16             | 8    | 16     | 200 | 100 | -  | -    | ●            | 1    | NFR 160A...    |
| <b>160-20M</b>     | 16             | 8    | 20     | 160 | 60  | 25 | 2.5° | ●            | 2    | NFR 170A...    |
| <b>160-25L</b>     | 16             | 8    | 25     | 220 | 100 | 55 | 5°   | ●            | 2    | NFL(C)B 160... |
| <b>200-20S</b>     | 20             | 10   | 20     | 110 | 40  | -  | -    | ●            | 1    | NFB 200...     |
| <b>200-20M</b>     | 20             | 10   | 20     | 150 | 50  | -  | -    | ●            | 1    | NFR 200A...    |
| <b>200-20L</b>     | 20             | 10   | 20     | 220 | 70  | -  | -    | ●            | 1    | NFR 210A...    |
| <b>200-25M</b>     | 20             | 10   | 25     | 180 | 80  | 40 | 2.5° | ●            | 2    | NFL(C)B 210... |
| <b>200-25L</b>     | 20             | 10   | 25     | 220 | 110 | 45 | 1.5° | ●            | 2    |                |
| <b>250-25S</b>     | 25             | 12.5 | 25     | 125 | 40  | -  | -    | ●            | 1    | NFB 250...     |
| <b>250-25M</b>     | 25             | 12.5 | 25     | 170 | 70  | -  | -    | ●            | 1    | NFR 250A...    |
| <b>250-32M</b>     | 25             | 12.5 | 32     | 200 | 90  | 32 | 3°   | ●            | 2    | NFR 260A...    |
| <b>250-32L</b>     | 25             | 12.5 | 32     | 250 | 130 | 40 | 1.5° | ●            | 2    | NFL(C)B 250... |
| <b>300-32S</b>     | 30             | 15   | 32     | 140 | 55  | -  | -    | ●            | 1    | NFB 300...     |
| <b>300-32M</b>     | 30             | 15   | 32     | 190 | 75  | -  | -    | ●            | 1    | NFB 320...     |
| <b>300-32L</b>     | 30             | 15   | 32     | 250 | 100 | 65 | 1°   | ●            | 2    | NFR 300A...    |
| <b>300-32XL</b>    | 30             | 15   | 32     | 300 | 150 | -  | -    | ●            | 1    | NFR 320A...    |
| <b>300-32-L220</b> | 30             | 15   | 32     | 220 | 100 | 55 | 1°   | ●            | 2    | NFL(C)B 300... |
| <b>320-32L</b>     | 32             | 16   | 32     | 250 | 60  | -  | -    | ●            | 1    | NFB 320...     |
|                    |                |      |        |     |     |    |      |              |      | NFR 320A...    |
|                    |                |      |        |     |     |    |      |              |      | E286-E289      |
|                    |                |      |        |     |     |    |      |              |      |                |
|                    |                |      |        |     |     |    |      |              |      |                |



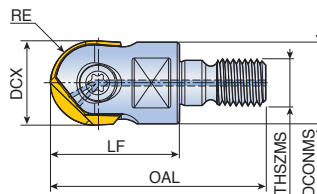
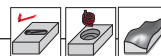
## End mills-carbide shank



| Designation              | Dimension (mm) |      |        |     |     | Insert         |
|--------------------------|----------------|------|--------|-----|-----|----------------|
|                          | DCX            | RE   | DCONMS | OAL | LH  |                |
| <b>TNF 060-06-CT-L60</b> | 6              | 3    | 6      | 60  | 15  | NFB 060...     |
| <b>060-06-CT-L80</b>     | 6              | 3    | 6      | 80  | 20  | NFR 060A...    |
| <b>060-06-CT-L92</b>     | 6              | 3    | 6      | 92  | 35  |                |
| <b>060-06-CT-L120</b>    | 6              | 3    | 6      | 120 | 65  |                |
| <b>060-06-CT-L140</b>    | 6              | 3    | 6      | 140 | 25  |                |
| <b>080-08-CT-L100</b>    | 8              | 4    | 8      | 100 | 30  | NFB 080...     |
| <b>080-10-CT-L140</b>    | 8              | 4    | 10     | 140 | 75  | NFR 080A...    |
| <b>080-08-CT-L160</b>    | 8              | 4    | 8      | 160 | 80  | NFCB 080...    |
| <b>100-10-CT-L100</b>    | 10             | 5    | 10     | 100 | 35  | NFB 100...     |
| <b>100-10-CT-L140</b>    | 10             | 5    | 10     | 140 | 75  | NFR 100A...    |
| <b>100-10-CT-L200</b>    | 10             | 5    | 10     | 200 | 70  | NFR 110A...    |
| <b>100-10-CT-L220</b>    | 10             | 5    | 10     | 220 | 140 | NFCB 110...    |
| <b>120-12-CT-L120</b>    | 12             | 6    | 12     | 120 | 50  | NFB 120...     |
| <b>120-12-CT-L160-S</b>  | 12             | 6    | 12     | 160 | 30  | NFR 120A...    |
| <b>120-12-CT-L160</b>    | 12             | 6    | 12     | 160 | 90  | NFR 130A...    |
| <b>120-12-CT-L200</b>    | 12             | 6    | 12     | 200 | 70  | NFL(C)B 120... |
| <b>120-12-CT-L220</b>    | 12             | 6    | 12     | 220 | 150 |                |
| <b>160-16-CT-L120</b>    | 16             | 8    | 16     | 120 | 60  | NFB 160...     |
| <b>160-16-CT-L160-S</b>  | 16             | 8    | 16     | 160 | 70  | NFR 160A...    |
| <b>160-16-CT-L160</b>    | 16             | 8    | 16     | 160 | 80  | NFR 170A...    |
| <b>160-16-CT-L200</b>    | 16             | 8    | 16     | 200 | 70  | NFL(C)B 160... |
| <b>160-16-CT-L220</b>    | 16             | 8    | 16     | 220 | 150 |                |
| <b>200-20-CT-L200</b>    | 20             | 10   | 20     | 200 | 70  | NFB 200...     |
| <b>200-20-CT-L110</b>    | 20             | 10   | 20     | 110 | 40  | NFR 200A...    |
| <b>200-20-CT-L220</b>    | 20             | 10   | 20     | 220 | 120 | NFR 210A...    |
| <b>200-20-CT-L300</b>    | 20             | 10   | 20     | 300 | 220 | NFL(C)B 200... |
| <b>250-25-CT-L200</b>    | 25             | 12.5 | 25     | 200 | 70  | NFB 250...     |
| <b>250-25-CT-L220-S</b>  | 25             | 12.5 | 25     | 220 | 80  | NFR 250A...    |
| <b>250-25-CT-L220</b>    | 25             | 12.5 | 25     | 220 | 120 | NFR 260A...    |
| <b>250-25-CT-L300</b>    | 25             | 12.5 | 25     | 300 | 220 | NFL(C)B 250... |
| <b>300-32-CT-L200</b>    | 30             | 15   | 32     | 200 | 70  | NFB 300...     |
| <b>300-32-CT-L250-S</b>  | 30             | 15   | 32     | 250 | 80  | NFB 320...     |
| <b>300-32-CT-L250</b>    | 30             | 15   | 32     | 250 | 150 | NFR 300A...    |
| <b>300-32-CT-L350-S</b>  | 30             | 15   | 32     | 350 | 80  | NFR 320A...    |
| <b>300-32-CT-L350</b>    | 30             | 15   | 32     | 350 | 230 | NFL(C)B 300... |
| <b>320-32-CT-L300</b>    | 32             | 16   | 32     | 300 | 220 | NFB 320...     |
|                          |                |      |        |     |     | NFR 320A...    |







| Designation        | Dimension (mm) |      |        |      |    |        | Coolant hole | Insert                                                            |
|--------------------|----------------|------|--------|------|----|--------|--------------|-------------------------------------------------------------------|
|                    | DCX            | RE   | DCONMS | OAL  | LF | THSZMS |              |                                                                   |
| <b>TNF 100-M06</b> | 10             | 5    | 9.7    | 34.5 | 20 | M06    | ●            | NFB 100...<br>NFR 100A...<br>NFR 110A...<br>NFCB 100...           |
| <b>120-M06</b>     | 12             | 6    | 11.5   | 37.5 | 23 | M06    | ●            | NFB 120...<br>NFR 120A...                                         |
| <b>120-M08</b>     | 12             | 6    | 13     | 40.5 | 23 | M08    | ●            | NFR 130A...<br>NFL(C)B 120...                                     |
| <b>160-M08</b>     | 16             | 8    | 13     | 47.5 | 30 | M08    | ●            | NFB 160...<br>NFR 160A...<br>NFR 170A...<br>NFL(C)B 160...        |
| <b>200-M10</b>     | 20             | 10   | 19     | 50   | 30 | M10    | ●            | NFB 200...<br>NFR 200A...<br>NFR 210A...<br>NFL(C)B 200...        |
| <b>250-M12</b>     | 25             | 12.5 | 24     | 57   | 35 | M12    | ●            | NFB 250...                                                        |
| <b>250-M16</b>     | 25             | 12.5 | 29     | 68   | 43 | M16    | ●            | NFR 250A...<br>NFR 260A...<br>NFL(C)B 250...                      |
| <b>300-M16</b>     | 30             | 15   | 29     | 68   | 43 | M16    | ●            | NFB 300... NFB 320...<br>NFR 300A...NFR 320A...<br>NFL(C)B 300... |
| <b>320-M16</b>     | 32             | 16   | 29.5   | 68   | 43 | M16    | ●            | NFB 320...<br>NFR 320A...                                         |

► Matched with T-FLEXTEC holder

## Spare parts

| Designation             | Screw      | Wrench |       |            | Wrench handle |  |
|-------------------------|------------|--------|-------|------------|---------------|--|
|                         |            |        |       |            |               |  |
| <b>TNF 060</b>          | TS 20F060A | TD 6   | -     | -          | -             |  |
| <b>TNF 080</b>          | TS 25F080A | TD 8   | -     | -          | -             |  |
| <b>TNF 100</b>          | TS 30F100A | TD 10  | -     | -          | -             |  |
| <b>TNF 120</b>          | TS 40F120A | TD 15  | -     | -          | -             |  |
| <b>TNF 160</b>          | TS 50F160A | -      | T-T20 | -          | -             |  |
| <b>TNF 200</b>          | TS 60F200A | -      | -     | BLD T25/M7 | SW6-T         |  |
| <b>TNF 250</b>          | TS 70F250A | -      | -     | BLD T25/M7 | SW6-T         |  |
| <b>TNF 300, TNF 320</b> | TS 80F300A | -      | T-T30 | -          | -             |  |



## End mills

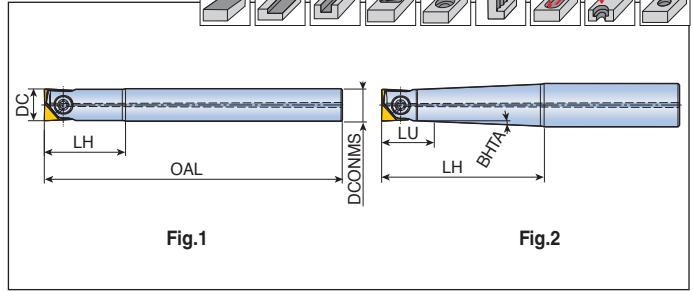
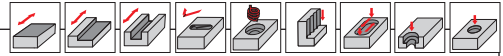


Fig.1

Fig.2

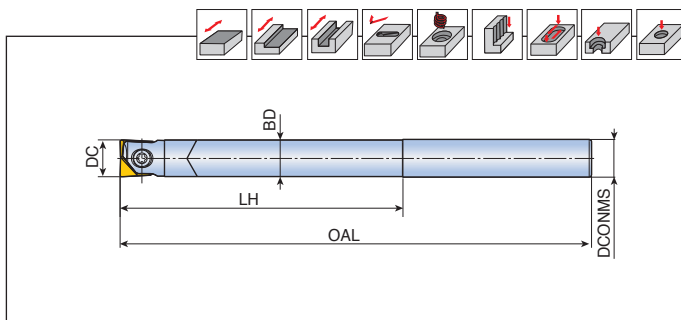
| Designation         | Dimension (mm) |        |     |     |    |      | Coolant hole | Fig. | Insert      |
|---------------------|----------------|--------|-----|-----|----|------|--------------|------|-------------|
|                     | DC             | DCONMS | OAL | LH  | LU | BHTA |              |      |             |
| <b>TNFR 060-10M</b> | 6              | 10     | 80  | 30  | 15 | 9°   | ●            | 2    | NFR 060A... |
| <b>080-12S</b>      | 8              | 12     | 100 | 22  | 10 | 9°   | ●            | 2    | NFR 080A... |
| <b>080-12M</b>      | 8              | 12     | 130 | 50  | 10 | 2.8° | ●            | 2    |             |
| <b>100-12S</b>      | 10             | 12     | 110 | 25  | 15 | 5°   | ●            | 2    | NFR 100A... |
| <b>100-16M</b>      | 10             | 16     | 150 | 50  | 15 | 3.5° | ●            | 2    | NFR 110A... |
| <b>120-12S</b>      | 12             | 12     | 110 | 30  | -  | -    | ●            | 1    | NFR 120A... |
| <b>120-16M</b>      | 12             | 16     | 160 | 60  | 18 | 2.5° | ●            | 2    | NFR 130A... |
| <b>160-16S</b>      | 16             | 16     | 130 | 50  | -  | -    | ●            | 1    | NFR 160A... |
| <b>160-16M</b>      | 16             | 16     | 170 | 70  | -  | -    | ●            | 1    | NFR 170A... |
| <b>160-16L</b>      | 16             | 16     | 200 | 100 | -  | -    | ●            | 1    |             |
| <b>200-20S</b>      | 20             | 20     | 140 | 60  | -  | -    | ●            | 1    | NFR 200A... |
| <b>200-20M</b>      | 20             | 20     | 180 | 80  | -  | -    | ●            | 1    | NFR 210A... |
| <b>200-20L</b>      | 20             | 20     | 250 | 120 | -  | -    | ●            | 1    |             |
| <b>250-25S</b>      | 25             | 25     | 150 | 70  | -  | -    | ●            | 1    | NFR 250A... |
| <b>250-25M</b>      | 25             | 25     | 200 | 100 | -  | -    | ●            | 1    | NFR 260A... |
| <b>250-25L</b>      | 25             | 25     | 250 | 120 | -  | -    | ●            | 1    |             |
| <b>300-32S</b>      | 30             | 32     | 140 | 55  | -  | -    | ●            | 1    | NFR 300A    |
| <b>300-32M</b>      | 30             | 32     | 190 | 75  | -  | -    | ●            | 1    | NFR 320A    |
| <b>300-32L</b>      | 30             | 32     | 250 | 100 | 65 | 1°   | ●            | 2    |             |
| <b>320-32L</b>      | 32             | 32     | 250 | 60  | -  | -    | ●            | 1    | NFR 320A    |
|                     |                |        |     |     |    |      |              |      | E288-E289   |

## Spare parts

| Designation               | Screw      | Wrench |       |            | Wrench handle |  |
|---------------------------|------------|--------|-------|------------|---------------|--|
|                           |            |        |       |            |               |  |
| <b>TNFR 060</b>           | TS 20F060A | TD 6   | -     | -          | -             |  |
| <b>TNFR 080</b>           | TS 25F080A | TD 8   | -     | -          | -             |  |
| <b>TNFR 100</b>           | TS 30F100A | TD 10  | -     | -          | -             |  |
| <b>TNFR 120</b>           | TS 40F120A | TD 15  | -     | -          | -             |  |
| <b>TNFR 160</b>           | TS 50F160A | -      | T-T20 | -          | -             |  |
| <b>TNFR 200</b>           | TS 60F200A | -      | -     | BLD T25/M7 | SW6-T         |  |
| <b>TNFR 250</b>           | TS 70F250A | -      | -     | BLD T25/M7 | SW6-T         |  |
| <b>TNFR 300, TNFR 320</b> | TS 80F300A | -      | T-T30 | -          | -             |  |



## End mills-carbide shank



| Designation               | Dimension (mm) |        |      |     |     | Insert      |
|---------------------------|----------------|--------|------|-----|-----|-------------|
|                           | DC             | DCONMS | BD   | OAL | LH  |             |
| <b>TNFR 060-06-CT-L60</b> | 6              | 6      | 5.8  | 60  | 15  | NFR 060A... |
| <b>060-06-CT-L80</b>      | 6              | 6      | 5.8  | 80  | 20  |             |
| <b>080-08-CT-L140</b>     | 8              | 8      | 7.8  | 140 | 75  | NFR 080A... |
| <b>100-10-CT-L140</b>     | 10             | 10     | 9.7  | 140 | 75  | NFR 100A... |
|                           |                |        |      |     |     | NFR 110A... |
| <b>120-12-CT-L160</b>     | 12             | 12     | 11.7 | 160 | 95  | NFR 120A... |
|                           |                |        |      |     |     | NFR 130A... |
| <b>160-16-CT-L200</b>     | 16             | 16     | 15.5 | 200 | 120 | NFR 160A... |
|                           |                |        |      |     |     | NFR 170A... |
| <b>200-20-CT-L250</b>     | 20             | 20     | 19.5 | 250 | 160 | NFR 200A... |
|                           |                |        |      |     |     | NFR 210A... |
| <b>250-25-CT-L300</b>     | 25             | 25     | 24.5 | 300 | 200 | NFR 250A... |
|                           |                |        |      |     |     | NFR 260A... |
| <b>300-32-CT-L350</b>     | 30             | 32     | 29.5 | 350 | 230 | NFR 300A... |
|                           |                |        |      |     |     | NFR 320A... |
| <b>320-32-CT-L350</b>     | 32             | 32     | 31.5 | 350 | 230 | NFR 320A... |
|                           |                |        |      |     |     | E288-E289   |
|                           |                |        |      |     |     |             |
|                           |                |        |      |     |     |             |
|                           |                |        |      |     |     |             |
|                           |                |        |      |     |     |             |

## Spare parts

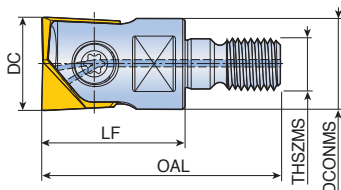
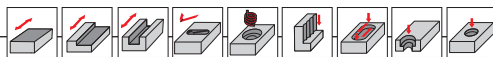
| Designation               | Screw      | Wrench |       |            | Wrench handle |  |
|---------------------------|------------|--------|-------|------------|---------------|--|
|                           |            |        |       |            |               |  |
| <b>TNFR 060</b>           | TS 20F060A | TD 6   | -     | -          | -             |  |
| <b>TNFR 080</b>           | TS 25F080A | TD 8   | -     | -          | -             |  |
| <b>TNFR 100</b>           | TS 30F100A | TD 10  | -     | -          | -             |  |
| <b>TNFR 120</b>           | TS 40F120A | TD 15  | -     | -          | -             |  |
| <b>TNFR 160</b>           | TS 50F160A | -      | T-T20 | -          | -             |  |
| <b>TNFR 200</b>           | TS 60F200A | -      | -     | BLD T25/M7 | SW6-T         |  |
| <b>TNFR 250</b>           | TS 70F250A | -      | -     | BLD T25/M7 | SW6-T         |  |
| <b>TNFR 300, TNFR 320</b> | TS 80F300A | -      | T-T30 | -          | -             |  |



## TNFR-M



## Modular heads

[illegible]

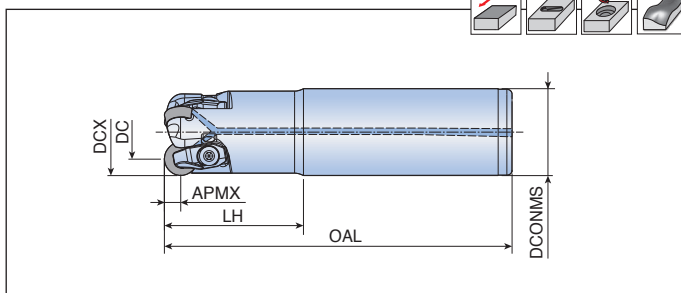
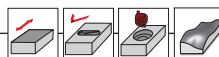
► Matched with T-FLEXTEC holder

## Spare parts

| Designation               | Screw                                                                               | Wrench                                                                              |                                                                                     |                                                                                     | Wrench handle                                                                       |  |
|---------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                           |  |  |  |  |  |  |
| <b>TNFR 100</b>           | TS 30F100A                                                                          | TD 10                                                                               | -                                                                                   | -                                                                                   | -                                                                                   |  |
| <b>TNFR 120</b>           | TS 40F120A                                                                          | TD 15                                                                               | -                                                                                   | -                                                                                   | -                                                                                   |  |
| <b>TNFR 160</b>           | TS 50F160A                                                                          | -                                                                                   | T-T20                                                                               | -                                                                                   | -                                                                                   |  |
| <b>TNFR 200</b>           | TS 60F200A                                                                          | -                                                                                   | -                                                                                   | BLD T25/M7                                                                          | SW6-T                                                                               |  |
| <b>TNFR 250</b>           | TS 70F250A                                                                          | -                                                                                   | -                                                                                   | BLD T25/M7                                                                          | SW6-T                                                                               |  |
| <b>TNFR 300, TNFR 320</b> | TS 80F300A                                                                          | -                                                                                   | T-T30                                                                               | -                                                                                   | -                                                                                   |  |
|                           |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



## End mills

[illegible]

► <sup>(1)</sup> Use only air (Coolant is prohibited)

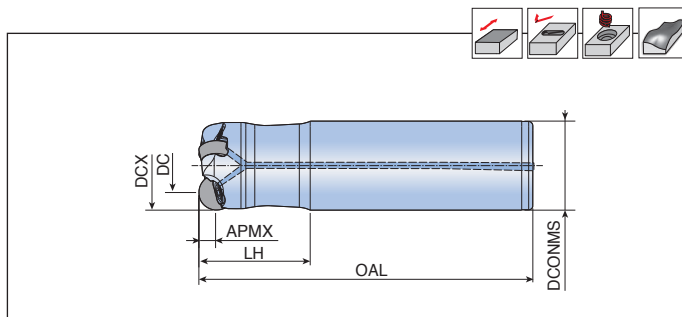
## Spare parts

| Designation    | Clamp                                                                               | Screw                                                                               | Snap ring                                                                           | Wrench                                                                              |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                |  |  |  |  |  |
| <b>TERP-09</b> | CCL-3S-F                                                                            | CLS-35A120                                                                          | CSR 1.25                                                                            | L-W 2                                                                               |  |
|                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



# TERP-12

## End mills

[illegible]

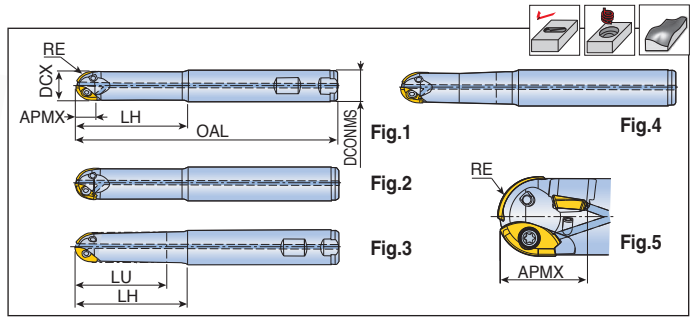
► <sup>(1)</sup> Use only air (Coolant is prohibited)

## Spare parts

| Designation    | Clamp                                                                               | Screw                                                                               | Wrench                                                                              |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                |  |  |  |  |  |
| <b>TERP-12</b> | WFZ 6-C                                                                             | WS 6                                                                                | T-W 3                                                                               |  |  |
|                |                                                                                     |                                                                                     |                                                                                     |  |  |
|                |                                                                                     |                                                                                     |                                                                                     |  |  |
|                |                                                                                     |                                                                                     |                                                                                     |  |  |



## End mills



| Designation              | Dimension (mm) |      |        |     |      |       |      |   | Coolant hole | Fig. | Insert         |   |           |   |
|--------------------------|----------------|------|--------|-----|------|-------|------|---|--------------|------|----------------|---|-----------|---|
|                          | DCX            | RE   | DCONMS | OAL | LU   | LH    | APMX |   |              |      | Ball           |   | Periphery |   |
| <b>2F 16-11-W20-L120</b> | 16             | 8    | 20     | 120 | 35.5 | 60    | 11.8 | ● | 3            |      | 2FB160<br>E254 | 2 | -         | - |
| <b>16-11-20-L130</b>     | 16             | 8    | 20     | 130 | 45.9 | 60    | 11.8 | ● | 4            |      |                | 2 | -         | - |
| <b>16-11-20-L200</b>     | 16             | 8    | 20     | 200 | 45.9 | 60    | 11.8 | ● | 4            |      |                | 2 | -         | - |
| <b>16-20-W20-L120-P</b>  | 16             | 8    | 20     | 120 | 41.8 | 60    | 20.5 | X | 5            |      |                | 2 | APKT 09T3 | 1 |
| <b>16-20-25-L200-P</b>   | 16             | 8    | 25     | 200 | 43.4 | 65    | 20.5 | X | 5            |      |                | 2 | E266      | 1 |
| <b>20-13-W25-L105</b>    | 20             | 10   | 25     | 105 | -    | 45    | 13.6 | ● | 1            |      | 2FB200<br>E254 | 2 | -         | - |
| <b>20-13-W25-L150</b>    | 20             | 10   | 25     | 150 | 45.7 | 65    | 13.6 | ● | 3            |      |                | 2 | -         | - |
| <b>20-13-20-L220</b>     | 20             | 10   | 20     | 220 | -    | 70    | 13.6 | ● | 2            |      |                | 2 | -         | - |
| <b>20-13-25-L160</b>     | 20             | 10   | 25     | 160 | 58.4 | 75    | 13.6 | ● | 4            |      |                | 2 | -         | - |
| <b>20-13-25-L220</b>     | 20             | 10   | 25     | 220 | 65.7 | 85    | 13.6 | ● | 4            |      |                | 2 | -         | - |
| <b>20-22-25-L125-P</b>   | 20             | 10   | 25     | 125 | 45.7 | 65    | 22.3 | ● | 5            |      | 2FB250<br>E254 | 2 | APKT 09T3 | 1 |
| <b>20-22-25-L200-P</b>   | 20             | 10   | 25     | 200 | 74.3 | 90    | 22.3 | ● | 5            |      |                | 2 | E266      | 1 |
| <b>20-22-32-L250-P</b>   | 20             | 10   | 32     | 250 | 72.3 | 100   | 22.3 | ● | 5            |      |                | 2 | E266      | 1 |
| <b>25-17-W25-L150</b>    | 25             | 12.5 | 25     | 150 | -    | 60    | 17.7 | ● | 1            |      |                | 2 | -         | - |
| <b>25-17-32-L150</b>     | 25             | 12.5 | 32     | 150 | 55.7 | 75    | 17.7 | ● | 4            |      |                | 2 | -         | - |
| <b>25-17-32-L200</b>     | 25             | 12.5 | 32     | 200 | 61.6 | 85    | 17.7 | ● | 4            |      | 2FB300<br>E254 | 2 | -         | - |
| <b>25-17-32-L300</b>     | 25             | 12.5 | 32     | 300 | 80   | 120   | 17.7 | ● | 4            |      |                | 2 | -         | - |
| <b>25-35-25-L200-P</b>   | 25             | 12.5 | 25     | 200 | -    | 87.5  | 35.1 | ● | 5            |      |                | 2 | -         | - |
| <b>25-35-32-L200-P</b>   | 25             | 12.5 | 32     | 200 | -    | 100   | 35.1 | ● | 5            |      |                | 2 | APKT 09T3 | 2 |
| <b>25-35-32-L250-P</b>   | 25             | 12.5 | 32     | 250 | -    | 110   | 35.1 | ● | 5            |      |                | 2 | E266      | 2 |
| <b>25-43-32-L300-P</b>   | 25             | 12.5 | 32     | 300 | -    | 120   | 43.7 | ● | 5            |      |                | 2 | -         | 3 |
| <b>30-20-W32-L180</b>    | 30             | 15   | 32     | 180 | -    | 86.1  | 20.0 | ● | 1            |      | 2FB320<br>E254 | 2 | -         | - |
| <b>30-20-30-L250</b>     | 30             | 15   | 30     | 250 | -    | 104.6 | 20.0 | ● | 2            |      |                | 2 | -         | - |
| <b>30-20-32-L200</b>     | 30             | 15   | 32     | 200 | -    | 86.1  | 20.0 | ● | 2            |      |                | 2 | -         | - |
| <b>30-20-32-L300</b>     | 30             | 15   | 32     | 300 | -    | 126.1 | 20.0 | ● | 2            |      |                | 2 | -         | - |
| <b>30-43-32-L160-P</b>   | 30             | 15   | 32     | 160 | -    | 66    | 43.7 | ● | 5            |      |                | 2 | -         | - |
| <b>30-43-32-L200-P</b>   | 30             | 15   | 32     | 200 | -    | 85.6  | 43.7 | ● | 5            |      | 2FB320<br>E254 | 2 | APKT 1204 | 2 |
| <b>30-43-32-L250-P</b>   | 30             | 15   | 32     | 250 | -    | 125.6 | 43.7 | ● | 5            |      |                | 2 | E267      | 2 |
| <b>30-51-32-L300-P</b>   | 30             | 15   | 32     | 300 | -    | 146   | 55.3 | ● | 5            |      |                | 2 | -         | 3 |
| <b>32-21-W32-L200</b>    | 32             | 16   | 32     | 200 | -    | 100   | 21.4 | ● | 1            |      |                | 2 | -         | - |
| <b>32-21-32-L180</b>     | 32             | 16   | 32     | 180 | -    | 100   | 21.4 | ● | 2            |      |                | 2 | -         | - |
| <b>32-21-32-L300</b>     | 32             | 16   | 32     | 300 | -    | 130   | 21.4 | ● | 2            |      | 2FB320<br>E254 | 2 | -         | - |
| <b>32-44-32-L160-P</b>   | 32             | 16   | 32     | 160 | -    | 66.4  | 44.7 | ● | 5            |      |                | 2 | -         | 2 |
| <b>32-44-32-L200-P</b>   | 32             | 16   | 32     | 200 | -    | 83.7  | 44.7 | ● | 5            |      |                | 2 | APKT 1204 | 2 |
| <b>32-44-32-L250-P</b>   | 32             | 16   | 32     | 250 | -    | 123.7 | 44.7 | ● | 5            |      |                | 2 | E267      | 2 |
| <b>32-44-32-L300-P</b>   | 32             | 16   | 32     | 300 | -    | 143.7 | 44.7 | ● | 5            |      |                | 2 | -         | 2 |



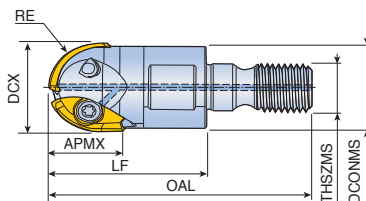
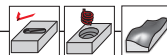
E352-E325

E328

## 2F-M



## Modular heads

[illegible]

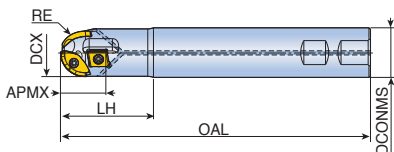
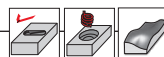
► Matched with T-FLEXTEC holder

## Spare parts

| Designation             | Screw                                                                               |               | Wrench                                                                              |           |  |
|-------------------------|-------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------|-----------|--|
|                         |  |               |  |           |  |
|                         | Ball                                                                                | Periphery     | Ball                                                                                | Periphery |  |
| <b>2FB160/APKT 09T3</b> | TS 25064I                                                                           | TS 25055I/HG  | TD 8                                                                                | TD 8      |  |
| <b>2FB200/APKT 09T3</b> | TS 30085I/HG                                                                        | TS 25055I/HG  | TD 9                                                                                | TD 8      |  |
| <b>2FB250/APKT 09T3</b> | TS 35085I/HG                                                                        | TS 25055I/HG  | TD 15                                                                               | TD 8      |  |
| <b>2FB300/APKT 1204</b> | TS 40A100I                                                                          | TS 35A088I/HG | TD 15                                                                               | TD 10P    |  |
| <b>2FB320/APKT 1204</b> | TS 40A115I                                                                          | TS 35A088I/HG | TD 15                                                                               | TD 10P    |  |







**Fig.1**



**Fig.2**

[illegible]

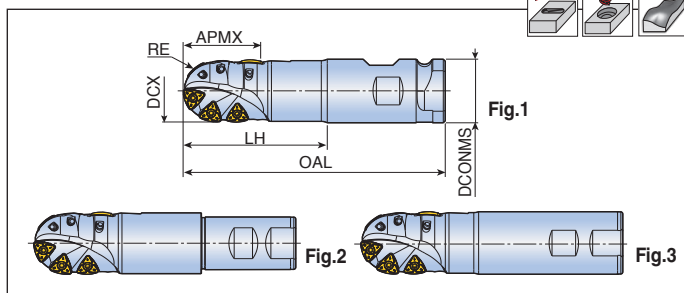
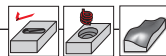
- ▶ When machining over 'APMX', please calculate  $Z=1$
- ▶ Coolant through type

## Spare parts

| Designation  | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|--------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|              |  |  |  |  |  |
| <b>3F 32</b> | TS 40093I                                                                           | TD 15                                                                               | -                                                                                   |  |  |
| <b>3F 50</b> | TS 50115I                                                                           | -                                                                                   | T-T20                                                                               |  |  |
|              |                                                                                     |                                                                                     |                                                                                     |  |  |
|              |                                                                                     |                                                                                     |                                                                                     |  |  |



## End mills

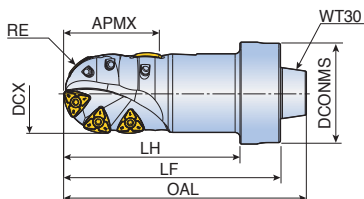
[illegible]

## Spare parts

| Designation   | Screw                                                                               | Wrench                                                                              |  |  |  |
|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|               |  |  |  |  |  |
| <b>TDB50X</b> | TS50B106I/HG                                                                        | T-T20                                                                               |  |  |  |
|               |                                                                                     |                                                                                     |  |  |  |
|               |                                                                                     |                                                                                     |  |  |  |
|               |                                                                                     |                                                                                     |  |  |  |



# CHASE 2 BALL

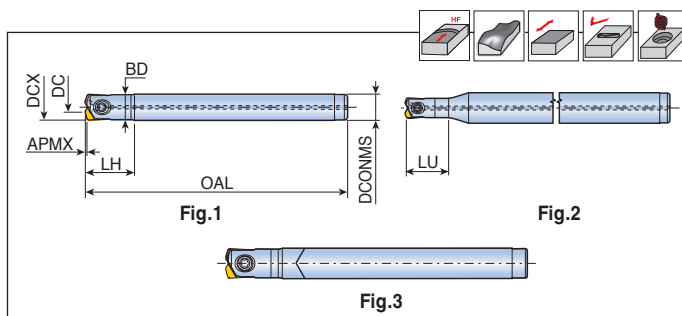


## Spare parts

| Designation      | Screw                                                                               | Wrench                                                                              |  |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                  |  |  |  |  |  |
| <b>TDB50X-WT</b> | TS50B106I/HG                                                                        | T-T20                                                                               |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |
|                  |                                                                                     |                                                                                     |  |  |  |

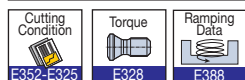


## High feed end mills

[illegible]

## Spare parts

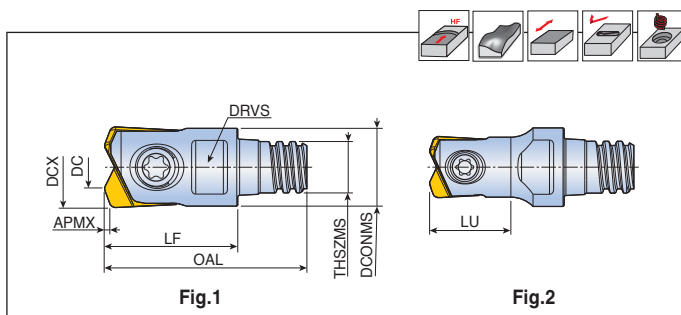
| Designation     | Screw                                                                               | Wrench                                                                              |                                                                                     | Wrench handle                                                                       |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                 |  |  |  |  |  |
| <b>THFN 060</b> | TS 20F060A                                                                          | TD 6                                                                                | -                                                                                   | -                                                                                   |  |
| <b>THFN 080</b> | TS 25F080A                                                                          | -                                                                                   | TBLD T08-W4                                                                         | THND 4W                                                                             |  |
|                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



## THFN-S



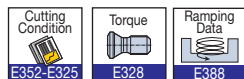
## High feed modular heads

[illegible]

► Matched with MAXI-RUSH holder

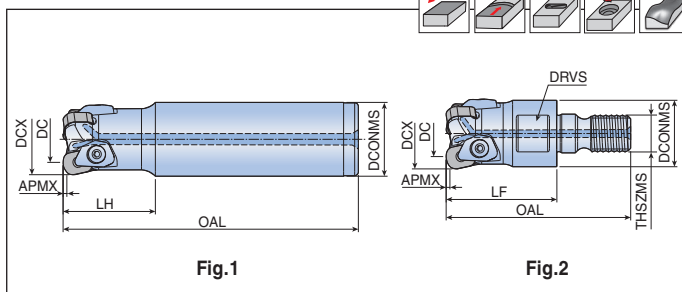
## Spare parts

| Designation     | Screw                                                                               | Wrench                                                                              |                                                                                     | Wrench handle                                                                       |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                 |  |  |  |  |  |
| <b>THFN 060</b> | TS 20F060A                                                                          | TD 6                                                                                | -                                                                                   | -                                                                                   |  |
| <b>THFN 080</b> | TS 25F080A                                                                          | -                                                                                   | TBLD T08-W4                                                                         | THND 4W                                                                             |  |
|                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



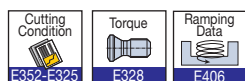


**CERAMICSPEED**  
HARDPART & EXOTIC MATERIALS

[illegible]

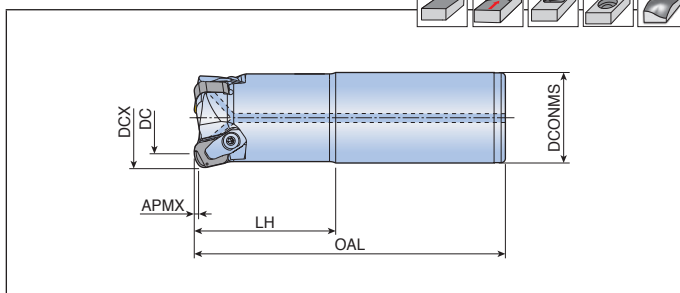
- ▶ Matched with T-FLEXTEC holder(Fig.2)
- ▶ <sup>(1)</sup> Use only air (coolant is prohibited)

| Designation      | Clamp                                                                               | Screw                                                                               | Snap ring                                                                           | Wrench                                                                              |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                  |  |  |  |  |  |
| <b>TEBN-06CH</b> | CCL-2S                                                                              | CLS-25A080/HG                                                                       | CSR M2.5                                                                            | L-W 1.5                                                                             |  |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



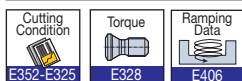


**CERAMICSPEED**  
HARDWARE & EXOTIC MATERIALS

[illegible]

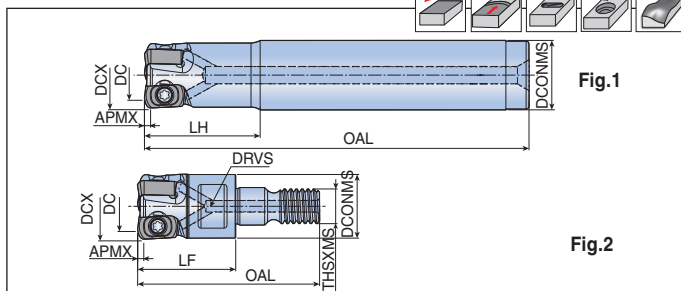
## Spare parts

| Designation      | Clamp                                                                               | Screw                                                                               | Snap ring                                                                           | Wrench                                                                              |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                  |  |  |  |  |  |
| <b>TEBN-09CH</b> | CCL-3S                                                                              | CLS-35A120/HG                                                                       | CSR 1.25                                                                            | L-W 2                                                                               |  |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



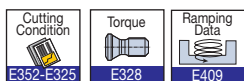


**CERAMICSPEED**  
HARDPART & EXOTIC MATERIALS

[illegible]

- ▶ Matched with T-FLEXTEC holder(Fig.2)
- ▶ <sup>(1)</sup> Use only air (coolant is prohibited)

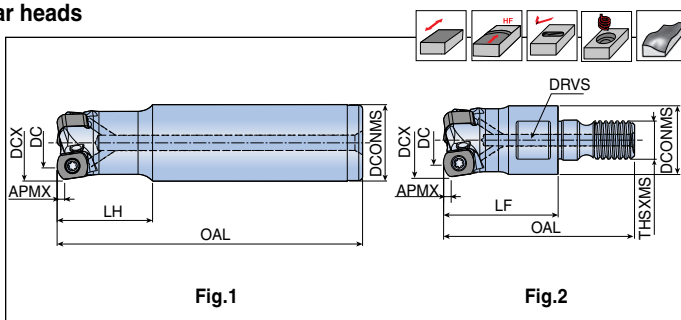
| Designation     | Screw                                                                               | Wrench                                                                              |  |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                 |  |  |  |  |  |
| <b>TEBCS-04</b> | TS 18049/HG-P                                                                       | T 6P                                                                                |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |





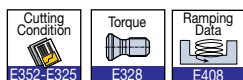


CeramicSpeed

[illegible]

- ▶ Matched with T-FLEXTEC holder(Fig.2)
- ▶ <sup>(1)</sup> Use only air (coolant is prohibited)

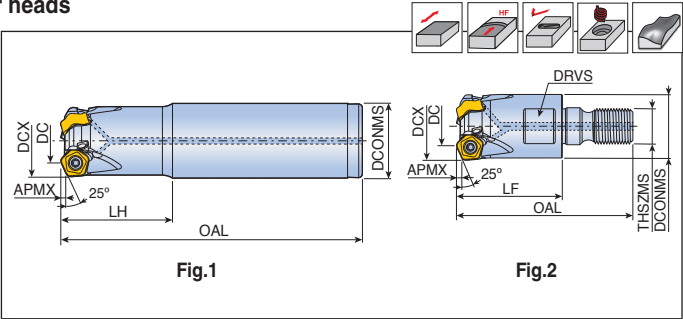
| Designation     | Screw                                                                               | Wrench                                                                              |  |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                 |  |  |  |  |  |
| <b>TEBNS-06</b> | TS 25064I/HG-P                                                                      | TD 8P                                                                               |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |



# TEPT-05/10



## High feed end mills & modular heads

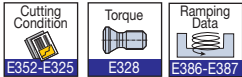


| Designation                |  | Dimension (mm) |      |        |    |     |        |    |      |      |   | Coolant hole | Fig.                                                                                                   | Insert |
|----------------------------|-----------------------------------------------------------------------------------|----------------|------|--------|----|-----|--------|----|------|------|---|--------------|--------------------------------------------------------------------------------------------------------|--------|
|                            |                                                                                   | DCX            | DC   | DCONMS | LF | OAL | THSZMS | LH | DRVS | APMX |   |              |                                                                                                        |        |
| <b>TEPT 320-20-05-L150</b> | 3                                                                                 | 20             | 11.9 | 20     | -  | 150 | -      | 50 | -    | 1.5  | ● | 1            | PTKU 0503...<br> E290 |        |
| <b>425-25-05-L150</b>      | 4                                                                                 | 25             | 16.8 | 25     | -  | 150 | -      | 50 | -    | 1.5  | ● | 1            |                                                                                                        |        |
| <b>426-25-05-L200</b>      | 4                                                                                 | 26             | 17.8 | 25     | -  | 200 | -      | 30 | -    | 1.5  | ● | 1            |                                                                                                        |        |
| <b>532-32-05-L200</b>      | 5                                                                                 | 32             | 23.8 | 32     | -  | 200 | -      | 50 | -    | 1.5  | ● | 1            |                                                                                                        |        |
| <b>533-32-05-L200</b>      | 5                                                                                 | 33             | 24.8 | 32     | -  | 200 | -      | 30 | -    | 1.5  | ● | 1            |                                                                                                        |        |
| <b>640-32-05-L200</b>      | 6                                                                                 | 40             | 31.8 | 32     | -  | 200 | -      | 30 | -    | 1.5  | ● | 1            |                                                                                                        |        |
| <b>TEPT 320-M10-05</b>     | 3                                                                                 | 20             | 11.9 | 18     | 30 | 50  | M10    | -  | 15   | 1.5  | ● | 2            | PTKU 1006...<br> E290 |        |
| <b>425-M12-05</b>          | 4                                                                                 | 25             | 16.8 | 21     | 35 | 57  | M12    | -  | 17   | 1.5  | ● | 2            |                                                                                                        |        |
| <b>532-M16-05</b>          | 5                                                                                 | 32             | 23.8 | 29     | 43 | 68  | M16    | -  | 25   | 1.5  | ● | 2            |                                                                                                        |        |
| <b>640-M16-05</b>          | 6                                                                                 | 40             | 31.8 | 29     | 43 | 68  | M16    | -  | 25   | 1.5  | ● | 2            |                                                                                                        |        |
| <b>TEPT 340-32-10-L200</b> | 3                                                                                 | 40             | 23.5 | 32     | -  | 200 | -      | 40 | -    | 3.0  | ● | 1            | PTKU 1006...<br> E290 |        |
| <b>TEPT 340-M16-10</b>     | 3                                                                                 | 40             | 23.5 | 29     | 43 | 68  | M16    | -  | 25   | 3.0  | ● | 2            |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |    |     |        |    |      |      |   |              |                                                                                                        |        |

► Matched with T-FLEXTEC holder(Fig.2)

## Spare parts

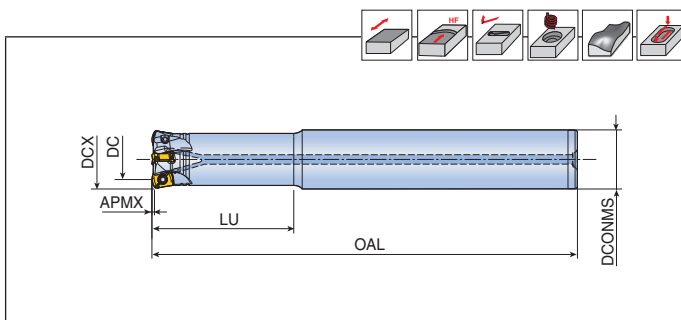
| Designation    | Screw          | Wrench |              | Wrench handle |  |
|----------------|----------------|--------|--------------|---------------|--|
|                |                |        |              |               |  |
| <b>TEPT-05</b> | TS 25D060/HG-P | TD 7P  | -            | -             |  |
| <b>TEPT-10</b> | TS 50D130/HG-P | -      | TBLD T20P-W6 | THND 6W       |  |
|                |                |        |              |               |  |
|                |                |        |              |               |  |



# TEBLV-06

End mills

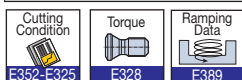
WIN4FEED



| Designation                 |   | Dimension (mm) |      |        |     |    |      | Coolant hole | Insert               |
|-----------------------------|---|----------------|------|--------|-----|----|------|--------------|----------------------|
|                             |   | DCX            | DC   | DCONMS | OAL | LU | APMX |              |                      |
| <b>TEBLV 216-15-06-L150</b> | 2 | 16             | 9.1  | 15     | 150 | 40 | 0.7  | ●            | BLMV 0603...<br>E277 |
| <b>216-16-06-L100</b>       | 2 | 16             | 9.1  | 16     | 100 | 30 | 0.7  | ●            |                      |
| <b>216-16-06-L150</b>       | 2 | 16             | 9.1  | 16     | 150 | 40 | 0.7  | ●            |                      |
| <b>217-16-06-L100</b>       | 2 | 17             | 10.1 | 16     | 100 | 30 | 0.7  | ●            |                      |
| <b>217-16-06-L150</b>       | 2 | 17             | 10.1 | 16     | 150 | 40 | 0.7  | ●            |                      |
| <b>217-16-06-L200</b>       | 2 | 17             | 10.1 | 16     | 200 | 20 | 0.7  | ●            |                      |
| <b>218-16-06-L150</b>       | 2 | 18             | 11.2 | 16     | 150 | 25 | 0.7  | ●            |                      |
| <b>220-20-06-L200</b>       | 2 | 20             | 12   | 20     | 200 | 80 | 1.0  | ●            |                      |
| <b>320-19-06-L180</b>       | 3 | 20             | 12   | 19     | 180 | 80 | 1.0  | ●            |                      |
| <b>320-20-06-L130</b>       | 3 | 20             | 12   | 20     | 130 | 50 | 1.0  | ●            |                      |
| <b>320-20-06-L160</b>       | 3 | 20             | 12   | 20     | 160 | 80 | 1.0  | ●            |                      |
| <b>420-20-06-L130</b>       | 4 | 20             | 12   | 20     | 130 | 50 | 1.0  | ●            |                      |
| <b>321-20-06-L150</b>       | 3 | 21             | 13   | 20     | 150 | 20 | 1.0  | ●            |                      |
| <b>321-20-06-L200</b>       | 3 | 21             | 13   | 20     | 200 | 20 | 1.0  | ●            |                      |
| <b>321-20-06-L250</b>       | 3 | 21             | 13   | 20     | 250 | 20 | 1.0  | ●            |                      |
| <b>325-25-06-L220</b>       | 3 | 25             | 17   | 25     | 220 | 50 | 1.0  | ●            |                      |
| <b>425-24-06-L180</b>       | 4 | 25             | 17   | 24     | 180 | 60 | 1.0  | ●            |                      |
| <b>425-25-06-L140</b>       | 4 | 25             | 17   | 25     | 140 | 60 | 1.0  | ●            |                      |
| <b>425-25-06-L180</b>       | 4 | 25             | 17   | 25     | 180 | 60 | 1.0  | ●            |                      |
| <b>425-25-06-L250</b>       | 4 | 25             | 17   | 25     | 250 | 40 | 1.0  | ●            |                      |
| <b>525-25-06-L140</b>       | 5 | 25             | 17   | 25     | 140 | 60 | 1.0  | ●            |                      |
| <b>326-25-06-L200</b>       | 3 | 26             | 18   | 25     | 200 | 30 | 1.0  | ●            |                      |

## Spare parts

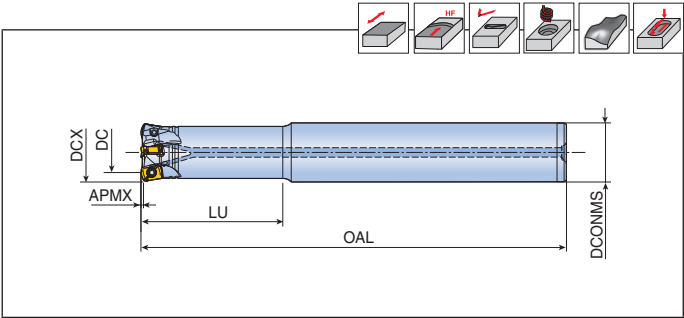
| Designation     | Screw          | Wrench |  |  |  |
|-----------------|----------------|--------|--|--|--|
|                 |                |        |  |  |  |
| <b>TEBLV-06</b> | TS 25064I/HG-P | TD 8P  |  |  |  |
|                 |                |        |  |  |  |
|                 |                |        |  |  |  |
|                 |                |        |  |  |  |



# TEBLV-06



End mills



| Designation                 |   | Dimension (mm) |    |        |     |     |      | Coolant hole | Insert                      |
|-----------------------------|---|----------------|----|--------|-----|-----|------|--------------|-----------------------------|
|                             |   | DCX            | DC | DCONMS | OAL | LU  | APMX |              |                             |
| <b>TEBLV 326-25-06-L250</b> | 3 | 26             | 18 | 25     | 250 | 30  | 1.0  | ●            | BLMV 0603...<br><b>E277</b> |
| <b>426-25-06-L150</b>       | 4 | 26             | 18 | 25     | 150 | 30  | 1.0  | ●            |                             |
| <b>426-25-06-L200</b>       | 4 | 26             | 18 | 25     | 200 | 30  | 1.0  | ●            |                             |
| <b>426-25-06-L250</b>       | 4 | 26             | 18 | 25     | 250 | 30  | 1.0  | ●            |                             |
| <b>530-32-06-L150</b>       | 5 | 30             | 22 | 32     | 150 | 70  | 1.0  | ●            |                             |
| <b>530-32-06-L200</b>       | 5 | 30             | 22 | 32     | 200 | 120 | 1.0  | ●            |                             |
| <b>432-32-06-L150</b>       | 4 | 32             | 24 | 32     | 150 | 70  | 1.0  | ●            |                             |
| <b>532-32-06-L150</b>       | 5 | 32             | 24 | 32     | 150 | 70  | 1.0  | ●            |                             |
| <b>532-32-06-L200</b>       | 5 | 32             | 24 | 32     | 200 | 120 | 1.0  | ●            |                             |
| <b>433-32-06-L220</b>       | 4 | 33             | 25 | 32     | 220 | 40  | 1.0  | ●            |                             |
| <b>433-32-06-L300</b>       | 4 | 33             | 25 | 32     | 300 | 50  | 1.0  | ●            |                             |
| <b>533-32-06-L150</b>       | 5 | 33             | 25 | 32     | 150 | 30  | 1.0  | ●            |                             |
| <b>533-32-06-L200</b>       | 5 | 33             | 25 | 32     | 200 | 40  | 1.0  | ●            |                             |
| <b>533-32-06-L250</b>       | 5 | 33             | 25 | 32     | 250 | 40  | 1.0  | ●            |                             |
| <b>435-32-06-L200</b>       | 4 | 35             | 27 | 32     | 200 | 50  | 1.0  | ●            |                             |
| <b>435-32-06-L300</b>       | 4 | 35             | 27 | 32     | 300 | 50  | 1.0  | ●            |                             |
| <b>535-32-06-L200</b>       | 5 | 35             | 27 | 32     | 200 | 50  | 1.0  | ●            |                             |
| <b>535-32-06-L300</b>       | 5 | 35             | 27 | 32     | 300 | 50  | 1.0  | ●            |                             |
| <b>540-32-06-L220</b>       | 5 | 40             | 32 | 32     | 220 | 40  | 1.0  | ●            |                             |
| <b>640-32-06-L150</b>       | 6 | 40             | 32 | 32     | 150 | 40  | 1.0  | ●            |                             |
| <b>640-32-06-L220</b>       | 6 | 40             | 32 | 32     | 220 | 40  | 1.0  | ●            |                             |
| <b>640-32-06-L250</b>       | 6 | 40             | 32 | 32     | 250 | 40  | 1.0  | ●            |                             |

## Spare parts

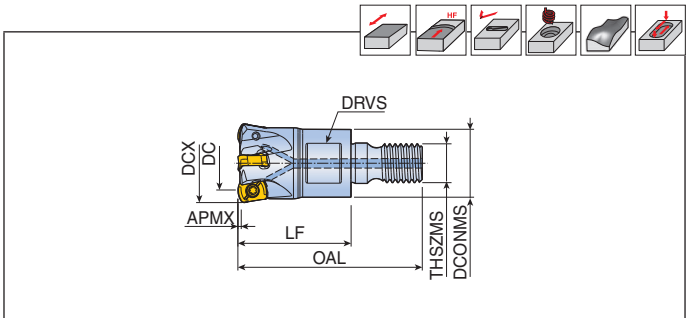
| Designation     | Screw          | Wrench |  |  |  |
|-----------------|----------------|--------|--|--|--|
|                 |                |        |  |  |  |
| <b>TEBLV-06</b> | TS 25064I/HG-P | TD 8P  |  |  |  |
|                 |                |        |  |  |  |
|                 |                |        |  |  |  |
|                 |                |        |  |  |  |



# TEBLV-M-06



## Modular heads



| Designation |  | Dimension (mm) |    |        |    |     |        |      |      |     | Coolant hole | Insert                                                                                                  |
|-------------|-----------------------------------------------------------------------------------|----------------|----|--------|----|-----|--------|------|------|-----|--------------|---------------------------------------------------------------------------------------------------------|
|             |                                                                                   | DCX            | DC | DCONMS | LF | OAL | THSZMS | DRVS | APMX |     |              |                                                                                                         |
| TEBLV       | 216-M08-06                                                                        | 2              | 16 | 9.1    | 13 | 25  | 42.5   | M08  | 10   | 0.7 | ●            | BLMV 0603...<br> E277 |
|             | 217-M08-06                                                                        | 2              | 17 | 10.1   | 13 | 25  | 42.5   | M08  | 10   | 0.7 | ●            |                                                                                                         |
|             | 218-M08-06                                                                        | 2              | 18 | 11.2   | 13 | 25  | 42.5   | M08  | 10   | 0.7 | ●            |                                                                                                         |
|             | 220-M10-06                                                                        | 2              | 20 | 12     | 18 | 30  | 50     | M10  | 15   | 1.0 | ●            |                                                                                                         |
|             | 320-M10-06                                                                        | 3              | 20 | 12     | 18 | 30  | 50     | M10  | 15   | 1.0 | ●            |                                                                                                         |
|             | 321-M10-06                                                                        | 3              | 21 | 13     | 18 | 30  | 50     | M10  | 15   | 1.0 | ●            |                                                                                                         |
|             | 322-M10-06                                                                        | 3              | 22 | 14     | 18 | 30  | 50     | M10  | 15   | 1.0 | ●            |                                                                                                         |
|             | 325-M12-06                                                                        | 3              | 25 | 17     | 21 | 35  | 57     | M12  | 17   | 1.0 | ●            |                                                                                                         |
|             | 425-M12-06                                                                        | 4              | 25 | 17     | 21 | 35  | 57     | M12  | 17   | 1.0 | ●            |                                                                                                         |
|             | 326-M12-06                                                                        | 3              | 26 | 18     | 21 | 35  | 57     | M12  | 17   | 1.0 | ●            |                                                                                                         |
|             | 426-M12-06                                                                        | 4              | 26 | 18     | 21 | 35  | 57     | M12  | 17   | 1.0 | ●            |                                                                                                         |
|             | 530-M16-06                                                                        | 5              | 30 | 22     | 29 | 40  | 65     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 432-M16-06                                                                        | 4              | 32 | 24     | 29 | 40  | 65     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 532-M16-06                                                                        | 5              | 32 | 24     | 29 | 40  | 65     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 433-M16-06                                                                        | 4              | 33 | 25     | 29 | 40  | 65     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 533-M16-06                                                                        | 5              | 33 | 25     | 29 | 40  | 65     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 435-M16-06                                                                        | 4              | 35 | 27     | 29 | 43  | 68     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 535-M16-06                                                                        | 5              | 35 | 27     | 29 | 43  | 68     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 640-M16-06                                                                        | 6              | 40 | 32     | 29 | 43  | 68     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 542-M16-06                                                                        | 5              | 42 | 34     | 29 | 43  | 68     | M16  | 25   | 1.0 | ●            |                                                                                                         |
|             | 642-M16-06                                                                        | 6              | 42 | 34     | 29 | 43  | 68     | M16  | 25   | 1.0 | ●            |                                                                                                         |

► Matched with T-FLEXTEC holder

## Spare parts

| Designation       | Screw          | Wrench |  |  |  |
|-------------------|----------------|--------|--|--|--|
|                   |                |        |  |  |  |
| <b>TEBLV-M-06</b> | TS 25064I/HG-P | TD 8P  |  |  |  |
|                   |                |        |  |  |  |
|                   |                |        |  |  |  |
|                   |                |        |  |  |  |

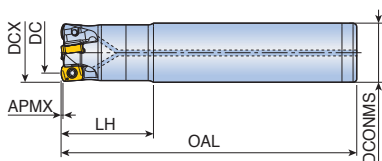
Cutting Condition
   
E352-E325

Torque
   
E328

Ramping Data
   
E389

# TEBL-04

## High feed end mills

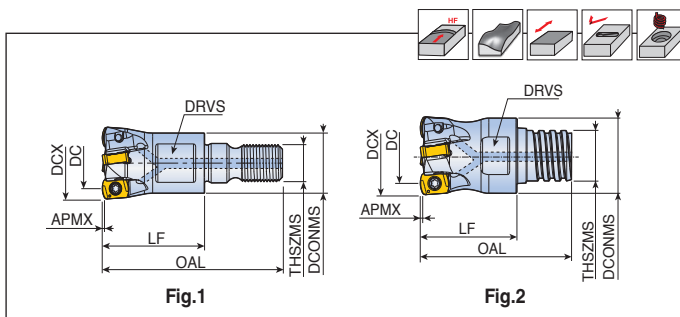
[illegible]

## Spare parts

| Designation    | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                |  |  |  |  |  |
| <b>TEBL-04</b> | TS 18041I/HG                                                                        | T 6P                                                                                |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |

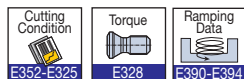


**CHASE4FEED**  
HIGH FEED MILL

[illegible]

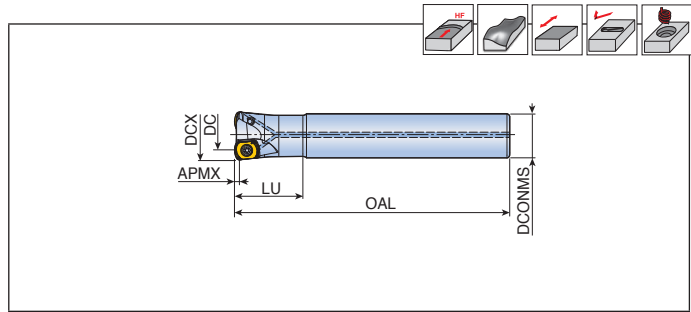
## Spare parts

| Designation    | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                |  |  |  |  |  |
| <b>TEBL-04</b> | TS 180411/HG                                                                        | T 6P                                                                                |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |



# TEBL-06

## High feed end mills



| Designation                |   | Dimension (mm) |      |        |     |     |      | Coolant hole | Insert               |
|----------------------------|---|----------------|------|--------|-----|-----|------|--------------|----------------------|
|                            |   | DCX            | DC   | DCONMS | OAL | LU  | APMX |              |                      |
| <b>TEBL 216-15-06-L150</b> | 2 | 16             | 9.4  | 15     | 150 | 40  | 0.7  | ●            | BLMP 0603...<br>E275 |
| <b>216-16-06</b>           | 2 | 16             | 9.4  | 16     | 150 | 40  | 0.7  | ●            |                      |
| <b>216-16-06-S</b>         | 2 | 16             | 9.4  | 16     | 100 | 30  | 0.7  | ●            |                      |
| <b>217-16-06</b>           | 2 | 17             | 10.1 | 16     | 150 | 40  | 0.7  | ●            |                      |
| <b>217-16-06-S</b>         | 2 | 17             | 10.1 | 16     | 100 | 30  | 0.7  | ●            |                      |
| <b>217-16-06-L200</b>      | 2 | 17             | 10.1 | 16     | 200 | 20  | 0.7  | ●            |                      |
| <b>218-16-06</b>           | 2 | 18             | 11.1 | 16     | 150 | 25  | 0.7  | ●            |                      |
| <b>220-20-06-L200</b>      | 2 | 20             | 12.4 | 20     | 200 | 80  | 1.0  | ●            |                      |
| <b>320-19-06-L180</b>      | 3 | 20             | 12.4 | 19     | 180 | 80  | 1.0  | ●            |                      |
| <b>320-20-06</b>           | 3 | 20             | 12.4 | 20     | 160 | 80  | 1.0  | ●            |                      |
| <b>320-20-06-S</b>         | 3 | 20             | 12.4 | 20     | 130 | 50  | 1.0  | ●            |                      |
| <b>420-20-06-S</b>         | 4 | 20             | 12.4 | 20     | 130 | 50  | 1.0  | ●            |                      |
| <b>321-20-06-S</b>         | 3 | 21             | 13.4 | 20     | 150 | 20  | 1.0  | ●            |                      |
| <b>321-20-06-L200</b>      | 3 | 21             | 13.4 | 20     | 200 | 20  | 1.0  | ●            |                      |
| <b>325-25-06-L220</b>      | 3 | 25             | 17.3 | 25     | 220 | 50  | 1.0  | ●            |                      |
| <b>425-24-06-L180</b>      | 4 | 25             | 17.3 | 24     | 180 | 60  | 1.0  | ●            |                      |
| <b>425-25-06</b>           | 4 | 25             | 17.3 | 25     | 180 | 60  | 1.0  | ●            |                      |
| <b>425-25-06-S</b>         | 4 | 25             | 17.3 | 25     | 140 | 60  | 1.0  | ●            |                      |
| <b>525-25-06-S</b>         | 5 | 25             | 17.3 | 25     | 140 | 60  | 1.0  | ●            |                      |
| <b>425-25-06-L250</b>      | 4 | 25             | 17.3 | 25     | 250 | 40  | 1.0  | ●            |                      |
| <b>326-25-06-L200</b>      | 3 | 26             | 18.3 | 25     | 200 | 30  | 1.0  | ●            |                      |
| <b>326-25-06-L250</b>      | 3 | 26             | 18.3 | 25     | 250 | 30  | 1.0  | ●            |                      |
| <b>426-25-06-S</b>         | 4 | 26             | 18.3 | 25     | 150 | 30  | 1.0  | ●            |                      |
| <b>426-25-06-L200</b>      | 4 | 26             | 18.3 | 25     | 200 | 30  | 1.0  | ●            |                      |
| <b>426-25-06-L250</b>      | 4 | 26             | 18.3 | 25     | 250 | 30  | 1.0  | ●            |                      |
| <b>530-32-06-S</b>         | 5 | 30             | 22.3 | 32     | 150 | 70  | 1.0  | ●            |                      |
| <b>530-32-06-L200</b>      | 5 | 30             | 22.3 | 32     | 200 | 120 | 1.0  | ●            |                      |
| <b>432-32-06-S</b>         | 4 | 32             | 24.3 | 32     | 150 | 70  | 1.0  | ●            |                      |
| <b>532-32-06-S</b>         | 5 | 32             | 24.3 | 32     | 150 | 70  | 1.0  | ●            |                      |
| <b>532-32-06-L200</b>      | 5 | 32             | 24.3 | 32     | 200 | 120 | 1.0  | ●            |                      |
| <b>433-32-06-L220</b>      | 4 | 33             | 25.3 | 32     | 220 | 40  | 1.0  | ●            |                      |
| <b>433-32-06-L300</b>      | 4 | 33             | 25.3 | 32     | 300 | 50  | 1.0  | ●            |                      |
| <b>533-32-06-S</b>         | 5 | 33             | 25.3 | 32     | 150 | 30  | 1.0  | ●            |                      |
| <b>533-32-06-L200</b>      | 5 | 33             | 25.3 | 32     | 200 | 40  | 1.0  | ●            |                      |
| <b>533-32-06-L250</b>      | 5 | 33             | 25.3 | 32     | 250 | 40  | 1.0  | ●            |                      |



E352-E325



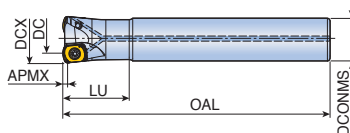
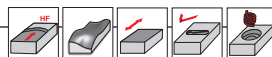
E328



E390-E394

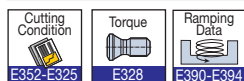


## High feed end mills



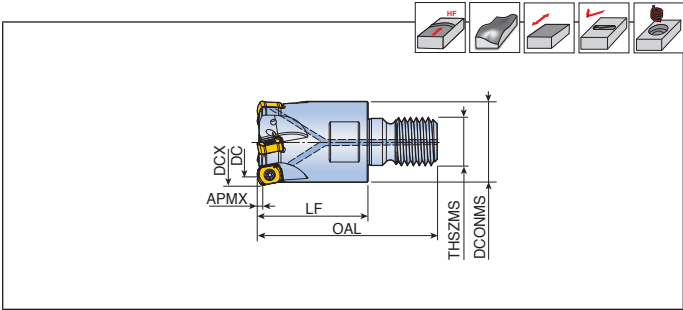
## Spare parts

| Designation    | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                |  |  |  |  |  |
| <b>TEBL-06</b> | TS 25064I/HG-P                                                                      | TD 8P                                                                               |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |
|                |                                                                                     |                                                                                     |  |  |  |



TEBL-M-06

High feed modular heads



| Designation     |  | Dimension (mm) |      |        |    |      |        |      | Coolant hole | Insert                                                                                                                    |
|-----------------|-----------------------------------------------------------------------------------|----------------|------|--------|----|------|--------|------|--------------|---------------------------------------------------------------------------------------------------------------------------|
|                 |                                                                                   | DCX            | DC   | DCONMS | LF | OAL  | THSZMS | APMX |              |                                                                                                                           |
| TEBL 216-M08-06 | 2                                                                                 | 16             | 9.4  | 13     | 25 | 42.5 | M08    | 0.7  | ●            | <div>BLMP 0603...</div> <div> E275</div> |
| 217-M08-06      | 2                                                                                 | 17             | 10.1 | 13     | 25 | 42.5 | M08    | 0.7  | ●            |                                                                                                                           |
| 218-M08-06      | 2                                                                                 | 18             | 11.1 | 13     | 25 | 42.5 | M08    | 0.7  | ●            |                                                                                                                           |
| 220-M10-06      | 2                                                                                 | 20             | 12.4 | 18     | 30 | 50   | M10    | 1.0  | ●            |                                                                                                                           |
| 320-M10-06      | 3                                                                                 | 20             | 12.4 | 18     | 30 | 50   | M10    | 1.0  | ●            |                                                                                                                           |
| 321-M10-06      | 3                                                                                 | 21             | 13.4 | 18     | 30 | 50   | M10    | 1.0  | ●            |                                                                                                                           |
| 322-M10-06      | 3                                                                                 | 22             | 14.4 | 18     | 30 | 50   | M10    | 1.0  | ●            |                                                                                                                           |
| 325-M12-06      | 3                                                                                 | 25             | 17.3 | 21     | 35 | 57   | M12    | 1.0  | ●            |                                                                                                                           |
| 425-M12-06      | 4                                                                                 | 25             | 17.3 | 21     | 35 | 57   | M12    | 1.0  | ●            |                                                                                                                           |
| 326-M12-06      | 3                                                                                 | 26             | 18.3 | 21     | 35 | 57   | M12    | 1.0  | ●            |                                                                                                                           |
| 426-M12-06      | 4                                                                                 | 26             | 18.3 | 21     | 35 | 57   | M12    | 1.0  | ●            |                                                                                                                           |
| 530-M16-06      | 5                                                                                 | 30             | 22.3 | 29     | 40 | 65   | M16    | 1.0  | ●            |                                                                                                                           |
| 432-M16-06      | 4                                                                                 | 32             | 24.3 | 29     | 40 | 65   | M16    | 1.0  | ●            |                                                                                                                           |
| 532-M16-06      | 5                                                                                 | 32             | 24.3 | 29     | 40 | 65   | M16    | 1.0  | ●            |                                                                                                                           |
| 433-M16-06      | 4                                                                                 | 33             | 25.3 | 29     | 40 | 65   | M16    | 1.0  | ●            |                                                                                                                           |
| 533-M16-06      | 5                                                                                 | 33             | 25.3 | 29     | 40 | 65   | M16    | 1.0  | ●            |                                                                                                                           |
| 435-M16-06      | 4                                                                                 | 35             | 27.3 | 29     | 43 | 68   | M16    | 1.0  | ●            |                                                                                                                           |
| 535-M16-06      | 5                                                                                 | 35             | 27.3 | 29     | 43 | 68   | M16    | 1.0  | ●            |                                                                                                                           |
| 640-M16-06      | 6                                                                                 | 40             | 32.2 | 29     | 43 | 68   | M16    | 1.0  | ●            |                                                                                                                           |
| 542-M16-06      | 5                                                                                 | 42             | 34.2 | 29     | 43 | 68   | M16    | 1.0  | ●            |                                                                                                                           |
| 642-M16-06      | 6                                                                                 | 42             | 34.2 | 29     | 43 | 68   | M16    | 1.0  | ●            |                                                                                                                           |

► Matched with T-FLEXTEC holder

Spare parts

| Designation | Screw          | Wrench |  |  |  |
|-------------|----------------|--------|--|--|--|
|             |                |        |  |  |  |
| TEBL-06     | TS 250641/HG-P | TD 8P  |  |  |  |
|             |                |        |  |  |  |
|             |                |        |  |  |  |
|             |                |        |  |  |  |

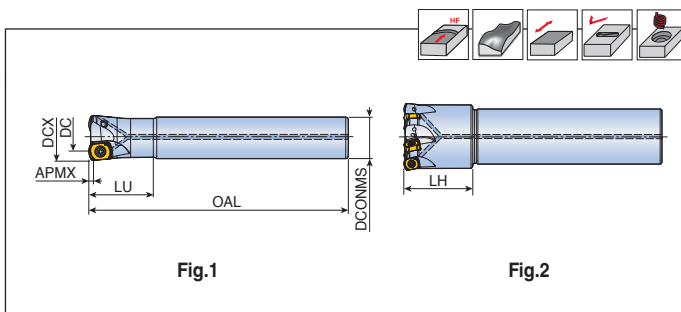
E352-E325

E328

E390-E394

# TEBL-09

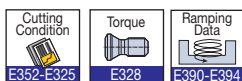
## High feed end mills



| Designation                |   | Dimension (mm) |      |        |     |     |    |      | Coolant hole | Fig. | Insert               |
|----------------------------|---|----------------|------|--------|-----|-----|----|------|--------------|------|----------------------|
|                            |   | DCX            | DC   | DCONMS | OAL | LU  | LH | APMX |              |      |                      |
| <b>TEBL 225-25-09-L150</b> | 2 | 25             | 14.7 | 25     | 150 | 70  | -  | 1.5  | ●            | 1    | BLMP 0904...<br>E275 |
| <b>225-25-09-L200</b>      | 2 | 25             | 14.7 | 25     | 200 | 100 | -  | 1.5  | ●            | 1    |                      |
| <b>325-25-09-L150</b>      | 3 | 25             | 14.7 | 25     | 150 | 70  | -  | 1.5  | ●            | 1    |                      |
| <b>325-25-09-L200</b>      | 3 | 25             | 14.7 | 25     | 200 | 110 | -  | 1.5  | ●            | 1    |                      |
| <b>326-25-09-L150</b>      | 3 | 26             | 15.7 | 25     | 150 | 30  | -  | 1.5  | ●            | 1    |                      |
| <b>326-25-09-L220</b>      | 3 | 26             | 15.7 | 25     | 220 | 30  | -  | 1.5  | ●            | 1    |                      |
| <b>330-32-09-L160</b>      | 3 | 30             | 19.6 | 32     | 160 | 70  | -  | 1.5  | ●            | 1    |                      |
| <b>330-32-09-L220</b>      | 3 | 30             | 19.6 | 32     | 220 | 120 | -  | 1.5  | ●            | 1    |                      |
| <b>332-32-09-L160</b>      | 3 | 32             | 21.6 | 32     | 160 | 70  | -  | 1.5  | ●            | 1    |                      |
| <b>332-32-09-L220</b>      | 3 | 32             | 21.6 | 32     | 220 | 120 | -  | 1.5  | ●            | 1    |                      |
| <b>432-32-09-L160</b>      | 4 | 32             | 21.6 | 32     | 160 | 70  | -  | 1.5  | ●            | 1    |                      |
| <b>432-32-09-L220</b>      | 4 | 32             | 21.6 | 32     | 220 | 120 | -  | 1.5  | ●            | 1    |                      |
| <b>433-32-09-L180</b>      | 4 | 33             | 22.6 | 32     | 180 | 30  | -  | 1.5  | ●            | 1    |                      |
| <b>433-32-09-L250</b>      | 4 | 33             | 22.6 | 32     | 250 | 30  | -  | 1.5  | ●            | 1    |                      |
| <b>440-32-09-L180</b>      | 4 | 40             | 29.6 | 32     | 180 | -   | 40 | 1.5  | ●            | 2    |                      |
| <b>440-32-09-L250</b>      | 4 | 40             | 29.6 | 32     | 250 | -   | 40 | 1.5  | ●            | 2    |                      |
| <b>540-32-09-L180</b>      | 5 | 40             | 29.6 | 32     | 180 | -   | 40 | 1.5  | ●            | 2    |                      |
| <b>540-32-09-L250</b>      | 5 | 40             | 29.6 | 32     | 250 | -   | 40 | 1.5  | ●            | 2    |                      |
|                            |   |                |      |        |     |     |    |      |              |      |                      |
|                            |   |                |      |        |     |     |    |      |              |      |                      |

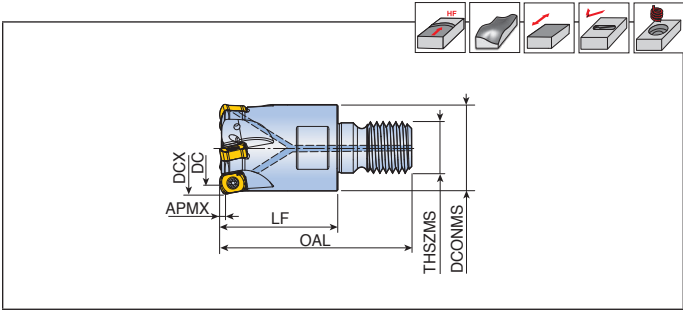
## Spare parts

| Designation    | Screw        | Wrench |  |  |  |
|----------------|--------------|--------|--|--|--|
|                |              |        |  |  |  |
| <b>TEBL-09</b> | TS 35A088/HG | TD 10P |  |  |  |
|                |              |        |  |  |  |
|                |              |        |  |  |  |
|                |              |        |  |  |  |



TEBL-M-09

High feed modular heads



| Designation     |   | Dimension (mm) |      |        |    |     |        |      | Coolant hole | Insert               |
|-----------------|---|----------------|------|--------|----|-----|--------|------|--------------|----------------------|
|                 |   | DCX            | DC   | DCONMS | LF | OAL | THSZMS | APMX |              |                      |
| TEBL 225-M12-09 | 2 | 25             | 14.7 | 21     | 35 | 57  | M12    | 1.5  | ●            | BLMP 0904...<br>E275 |
| 325-M12-09      | 3 | 25             | 14.7 | 21     | 35 | 57  | M12    | 1.5  | ●            |                      |
| 326-M12-09      | 3 | 26             | 15.7 | 21     | 35 | 57  | M12    | 1.5  | ●            |                      |
| 330-M16-09      | 3 | 30             | 19.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 332-M16-09      | 3 | 32             | 21.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 432-M16-09      | 4 | 32             | 21.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 433-M16-09      | 4 | 33             | 22.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 335-M16-09      | 3 | 35             | 24.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 435-M16-09      | 4 | 35             | 24.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 440-M16-09      | 4 | 40             | 29.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 540-M16-09      | 5 | 40             | 29.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 342-M16-09      | 3 | 42             | 31.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
| 542-M16-09      | 5 | 42             | 31.6 | 29     | 43 | 68  | M16    | 1.5  | ●            |                      |
|                 |   |                |      |        |    |     |        |      |              |                      |
|                 |   |                |      |        |    |     |        |      |              |                      |
|                 |   |                |      |        |    |     |        |      |              |                      |
|                 |   |                |      |        |    |     |        |      |              |                      |
|                 |   |                |      |        |    |     |        |      |              |                      |
|                 |   |                |      |        |    |     |        |      |              |                      |
|                 |   |                |      |        |    |     |        |      |              |                      |

► Matched with T-FLEXTEC holder

Spare parts

| Designation | Screw         | Wrench |  |  |  |
|-------------|---------------|--------|--|--|--|
|             |               |        |  |  |  |
| TEBL-09     | TS 35A088I/HG | TD 10P |  |  |  |
|             |               |        |  |  |  |
|             |               |        |  |  |  |
|             |               |        |  |  |  |

E352-E325

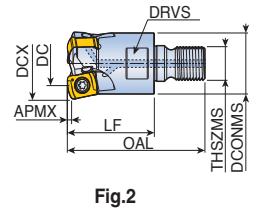
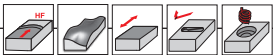
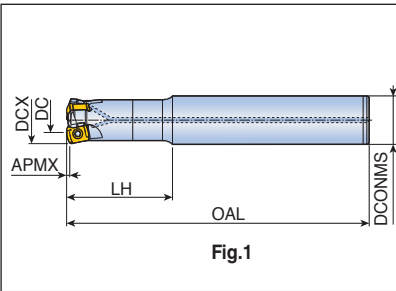
E328

E390-E394

# TEBL-11



High feed end mills & modular heads



| Designation                |  | Dimension (mm) |      |        |     |        |    |    |      |      |   | Coolant hole | Fig.                                                                               | Insert |
|----------------------------|-----------------------------------------------------------------------------------|----------------|------|--------|-----|--------|----|----|------|------|---|--------------|------------------------------------------------------------------------------------|--------|
|                            |                                                                                   | DCX            | DC   | DCONMS | OAL | THSZMS | LH | LF | APMX | DRVS |   |              |                                                                                    |        |
| <b>TEBL 230-32-11-L150</b> | 2                                                                                 | 30             | 14.7 | 32     | 150 | -      | 70 | -  | 2.0  | -    | ● | 1            |  |        |
| <b>232-32-11-L150</b>      | 2                                                                                 | 32             | 16.6 | 32     | 150 | -      | 70 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>232-32-11-L200</b>      | 2                                                                                 | 32             | 16.6 | 32     | 200 | -      | 70 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>332-32-11-L200</b>      | 3                                                                                 | 32             | 16.6 | 32     | 200 | -      | 70 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>233-32-11-L200</b>      | 2                                                                                 | 33             | 17.6 | 32     | 200 | -      | 40 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>233-32-11-L250</b>      | 2                                                                                 | 33             | 17.6 | 32     | 250 | -      | 50 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>333-32-11-L250</b>      | 3                                                                                 | 33             | 17.6 | 32     | 250 | -      | 50 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>335-32-11-L200</b>      | 3                                                                                 | 35             | 19.5 | 32     | 200 | -      | 40 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>340-32-11-L150</b>      | 3                                                                                 | 40             | 24.4 | 32     | 150 | -      | 40 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>340-32-11-L200</b>      | 3                                                                                 | 40             | 24.4 | 32     | 200 | -      | 40 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>440-32-11-L200</b>      | 4                                                                                 | 40             | 24.4 | 32     | 200 | -      | 40 | -  | 2.0  | -    | ● | 1            |                                                                                    |        |
| <b>TEBL 230-M16-11</b>     | 2                                                                                 | 30             | 14.7 | 29     | 68  | M16    | -  | 43 | 2.0  | 25   | ● | 2            |                                                                                    |        |
| <b>232-M16-11</b>          | 2                                                                                 | 32             | 16.6 | 29     | 68  | M16    | -  | 43 | 2.0  | 25   | ● | 2            |                                                                                    |        |
| <b>233-M16-11</b>          | 2                                                                                 | 33             | 17.6 | 29     | 68  | M16    | -  | 43 | 2.0  | 25   | ● | 2            |                                                                                    |        |
| <b>335-M16-11</b>          | 3                                                                                 | 35             | 19.5 | 29     | 68  | M16    | -  | 43 | 2.0  | 25   | ● | 2            |                                                                                    |        |
| <b>340-M16-11</b>          | 3                                                                                 | 40             | 24.4 | 29     | 68  | M16    | -  | 43 | 2.0  | 25   | ● | 2            |                                                                                    |        |
| <b>342-M16-11</b>          | 3                                                                                 | 42             | 26.4 | 29     | 68  | M16    | -  | 43 | 2.0  | 25   | ● | 2            |                                                                                    |        |
|                            |                                                                                   |                |      |        |     |        |    |    |      |      |   |              |                                                                                    |        |
|                            |                                                                                   |                |      |        |     |        |    |    |      |      |   |              |                                                                                    |        |
|                            |                                                                                   |                |      |        |     |        |    |    |      |      |   |              |                                                                                    |        |
|                            |                                                                                   |                |      |        |     |        |    |    |      |      |   |              |                                                                                    |        |

► Matched with T-FLEXTEC holder(Fig.2)

## Spare parts

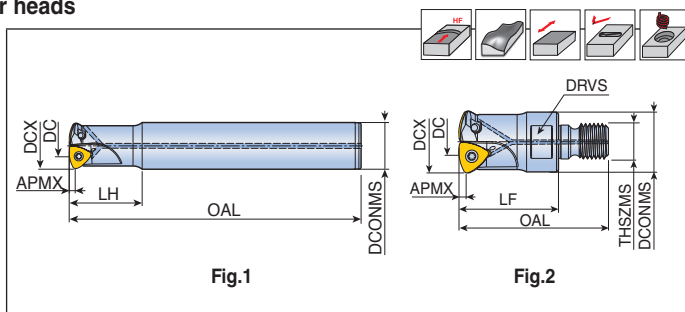
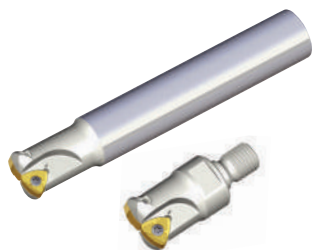
| Designation    | Screw         | Wrench      | Wrench handle |  |  |
|----------------|---------------|-------------|---------------|--|--|
|                |               |             |               |  |  |
| <b>TEBL-11</b> | TS 50A1211/HG | TBLD T20-W6 | THND 6W       |  |  |
|                |               |             |               |  |  |
|                |               |             |               |  |  |
|                |               |             |               |  |  |



# TEBL-13



## High feed end mills & Modular heads

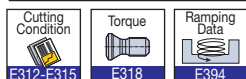


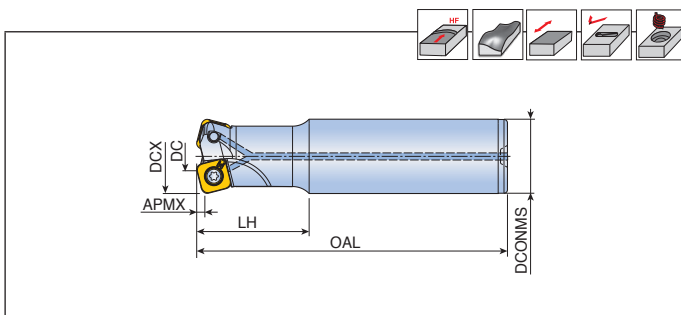
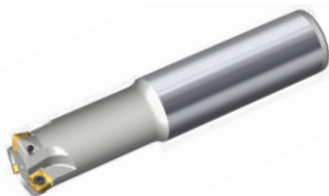
| Designation                |  | Dimension (mm) |      |        |     |        |     |    |      |      |   | Coolant hole | Fig.                                                                                                   | Insert |
|----------------------------|-----------------------------------------------------------------------------------|----------------|------|--------|-----|--------|-----|----|------|------|---|--------------|--------------------------------------------------------------------------------------------------------|--------|
|                            |                                                                                   | DCX            | DC   | DCONMS | OAL | THSZMS | LH  | LF | APMX | DRVS |   |              |                                                                                                        |        |
| <b>TEBL 232-32-13-L150</b> | 2                                                                                 | 32             | 12.9 | 32     | 150 | -      | 50  | -  | 2.0  | -    | ● | 1            | BLMP 1306...<br> E276 |        |
| <b>232-32-13-L200</b>      | 2                                                                                 | 32             | 12.9 | 32     | 200 | -      | 80  | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>232-32-13-L</b>         | 2                                                                                 | 32             | 12.9 | 32     | 200 | -      | 120 | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>233-32-13-L200</b>      | 2                                                                                 | 33             | 14.3 | 32     | 200 | -      | 50  | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>233-32-13-L250</b>      | 2                                                                                 | 33             | 14.3 | 32     | 250 | -      | 50  | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>235-32-13-L200</b>      | 2                                                                                 | 35             | 16.1 | 32     | 200 | -      | 30  | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>240-42-13-XL</b>        | 2                                                                                 | 40             | 20.7 | 42     | 300 | -      | 120 | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>340-32-13-L150</b>      | 3                                                                                 | 40             | 20.7 | 32     | 150 | -      | 40  | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>340-32-13-L200</b>      | 3                                                                                 | 40             | 20.7 | 32     | 200 | -      | 70  | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>340-42-13-S</b>         | 3                                                                                 | 40             | 20.7 | 42     | 150 | -      | 70  | -  | 2.0  | -    | ● | 1            |                                                                                                        |        |
| <b>TEBL 232-M16-13</b>     | 2                                                                                 | 32             | 12.9 | 30     | 75  | M16    | -   | 50 | 2.0  | 25   | ● | 2            |                                                                                                        |        |
| <b>233-M16-13</b>          | 2                                                                                 | 33             | 14.3 | 30     | 75  | M16    | -   | 50 | 2.0  | 25   | ● | 2            |                                                                                                        |        |
| <b>235-M16-13</b>          | 2                                                                                 | 35             | 16.1 | 30     | 75  | M16    | -   | 50 | 2.0  | 25   | ● | 2            |                                                                                                        |        |
| <b>340-M16-13</b>          | 3                                                                                 | 40             | 20.7 | 30     | 75  | M16    | -   | 50 | 2.0  | 25   | ● | 2            |                                                                                                        |        |
| <b>342-M16-13</b>          | 3                                                                                 | 42             | 22.6 | 30     | 75  | M16    | -   | 50 | 2.0  | 25   | ● | 2            |                                                                                                        |        |
|                            |                                                                                   |                |      |        |     |        |     |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |     |        |     |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |     |        |     |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |     |        |     |    |      |      |   |              |                                                                                                        |        |
|                            |                                                                                   |                |      |        |     |        |     |    |      |      |   |              |                                                                                                        |        |

► Matched with T-FLEXTEC holder(Fig.2)

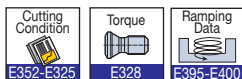
## Spare parts

| Designation    | Screw        | Wrench |  |  |  |
|----------------|--------------|--------|--|--|--|
|                |              |        |  |  |  |
| <b>TEBL-13</b> | TS50B106I/HG | T-T20  |  |  |  |
|                |              |        |  |  |  |
|                |              |        |  |  |  |
|                |              |        |  |  |  |

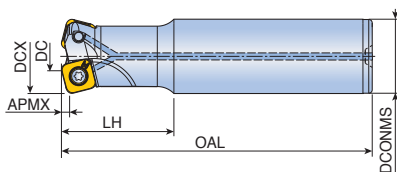
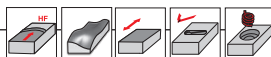
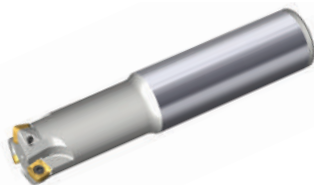




| Designation                |   | Dimension (mm) |      |        |     |    |      | Coolant hole | Insert               |
|----------------------------|---|----------------|------|--------|-----|----|------|--------------|----------------------|
|                            |   | DCX            | DC   | DCONMS | OAL | LH | APMX |              |                      |
| <b>TESB 216-16-06-L150</b> | 2 | 16             | 5.9  | 16     | 150 | 40 | 1.0  | ●            | SBMT 0603...<br>E295 |
| <b>217-16-06-L200</b>      | 2 | 17             | 6.8  | 16     | 200 | 20 | 1.0  | ●            |                      |
| <b>320-20-06-L160</b>      | 3 | 20             | 9.8  | 20     | 160 | 50 | 1.0  | ●            |                      |
| <b>420-20-06-L130</b>      | 4 | 20             | 9.8  | 20     | 130 | 50 | 1.0  | ●            |                      |
| <b>321-20-06-L200</b>      | 3 | 21             | 10.7 | 20     | 200 | 20 | 1.0  | ●            |                      |
| <b>425-25-06-L180</b>      | 4 | 25             | 14.8 | 25     | 180 | 60 | 1.0  | ●            |                      |
| <b>525-25-06-L140</b>      | 5 | 25             | 14.8 | 25     | 140 | 60 | 1.0  | ●            |                      |
| <b>532-32-06-L200</b>      | 5 | 32             | 21.8 | 32     | 200 | 80 | 1.0  | ●            | SBMT 0904...<br>E295 |
| <b>TESB 225-25-09-L150</b> | 2 | 25             | 10.8 | 25     | 150 | 70 | 1.2  | ●            |                      |
| <b>225-25-09-L200</b>      | 2 | 25             | 10.8 | 25     | 200 | 70 | 1.2  | ●            |                      |
| <b>325-25-09-L150</b>      | 3 | 25             | 10.8 | 25     | 150 | 70 | 1.2  | ●            |                      |
| <b>325-25-09-L200</b>      | 3 | 25             | 10.8 | 25     | 200 | 70 | 1.2  | ●            |                      |
| <b>226-25-09-L200</b>      | 2 | 26             | 11.7 | 25     | 200 | 30 | 1.2  | ●            |                      |
| <b>226-25-09-L250</b>      | 2 | 26             | 11.7 | 25     | 250 | 30 | 1.2  | ●            |                      |
| <b>326-25-09-L150</b>      | 3 | 26             | 11.7 | 25     | 150 | 30 | 1.2  | ●            |                      |
| <b>326-25-09-L200</b>      | 3 | 26             | 11.7 | 25     | 200 | 30 | 1.2  | ●            |                      |
| <b>326-25-09-L250</b>      | 3 | 26             | 11.7 | 25     | 250 | 30 | 1.2  | ●            |                      |
| <b>330-32-09-L200</b>      | 3 | 30             | 15.5 | 32     | 200 | 70 | 1.2  | ●            |                      |
| <b>332-32-09-L160</b>      | 3 | 32             | 17.4 | 32     | 160 | 70 | 1.2  | ●            |                      |
| <b>332-32-09-L200</b>      | 3 | 32             | 17.4 | 32     | 200 | 70 | 1.2  | ●            |                      |
| <b>332-32-09-L300</b>      | 3 | 32             | 17.4 | 32     | 300 | 70 | 1.2  | ●            |                      |
| <b>432-32-09-L160</b>      | 4 | 32             | 17.4 | 32     | 160 | 70 | 1.2  | ●            |                      |
| <b>432-32-09-L220</b>      | 4 | 32             | 17.4 | 32     | 220 | 70 | 1.2  | ●            |                      |
| <b>233-32-09-L250</b>      | 2 | 33             | 18.4 | 32     | 250 | 30 | 1.2  | ●            |                      |
| <b>333-32-09-L250</b>      | 3 | 33             | 18.4 | 32     | 250 | 30 | 1.2  | ●            |                      |
| <b>333-32-09-L300</b>      | 3 | 33             | 18.4 | 32     | 300 | 30 | 1.2  | ●            |                      |
| <b>433-32-09-L180</b>      | 4 | 33             | 18.4 | 32     | 180 | 30 | 1.2  | ●            |                      |
| <b>433-32-09-L250</b>      | 4 | 33             | 18.4 | 32     | 250 | 30 | 1.2  | ●            |                      |
| <b>335-32-09-L250</b>      | 3 | 35             | 20.4 | 32     | 250 | 30 | 1.2  | ●            |                      |
| <b>440-32-09-L250</b>      | 4 | 40             | 25.4 | 32     | 250 | 40 | 1.2  | ●            |                      |
| <b>440-32-09-L300</b>      | 4 | 40             | 25.4 | 32     | 300 | 40 | 1.2  | ●            |                      |
| <b>540-32-09-L180</b>      | 5 | 40             | 25.4 | 32     | 180 | 40 | 1.2  | ●            |                      |
| <b>540-32-09-L250</b>      | 5 | 40             | 25.4 | 32     | 250 | 40 | 1.2  | ●            |                      |
|                            |   |                |      |        |     |    |      |              |                      |
|                            |   |                |      |        |     |    |      |              |                      |



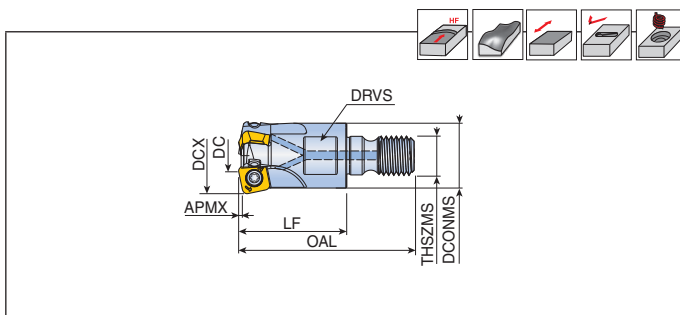
## High feed end mills



## Spare parts



## High feed modular heads

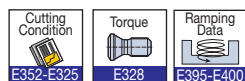


| Designation            |   | Dimension (mm) |      |        |    |      |        |      |      | Coolant hole | Insert       |
|------------------------|---|----------------|------|--------|----|------|--------|------|------|--------------|--------------|
|                        |   | DCX            | DC   | DCONMS | LF | OAL  | THSZMS | APMX | DRVS |              |              |
| <b>TESB 216-M08-06</b> | 2 | 16             | 5.9  | 13     | 25 | 42.5 | M08    | 1.0  | 10   | ●            | SBMT 0603... |
| <b>320-M10-06</b>      | 3 | 20             | 9.8  | 18     | 30 | 50   | M10    | 1.0  | 15   | ●            | E295         |
| <b>425-M12-06</b>      | 4 | 25             | 14.8 | 21     | 35 | 57   | M12    | 1.0  | 17   | ●            |              |
| <b>532-M16-06</b>      | 5 | 32             | 21.8 | 29     | 40 | 65   | M16    | 1.0  | 25   | ●            |              |
| <b>TESB 225-M12-09</b> | 2 | 25             | 10.8 | 21     | 35 | 57   | M12    | 1.2  | 17   | ●            | SBMT 0904... |
| <b>325-M12-09</b>      | 3 | 25             | 10.8 | 21     | 35 | 57   | M12    | 1.2  | 17   | ●            | E295         |
| <b>332-M16-09</b>      | 3 | 32             | 17.4 | 29     | 43 | 68   | M16    | 1.2  | 25   | ●            |              |
| <b>432-M16-09</b>      | 4 | 32             | 17.4 | 29     | 43 | 68   | M16    | 1.2  | 25   | ●            |              |
| <b>435-M16-09</b>      | 4 | 35             | 20.4 | 29     | 43 | 68   | M16    | 1.2  | 25   | ●            |              |
| <b>440-M16-09</b>      | 4 | 40             | 25.4 | 29     | 43 | 68   | M16    | 1.2  | 25   | ●            |              |
| <b>540-M16-09</b>      | 5 | 40             | 25.4 | 29     | 43 | 68   | M16    | 1.2  | 25   | ●            |              |
| <b>542-M16-09</b>      | 5 | 42             | 27.4 | 29     | 43 | 68   | M16    | 1.2  | 25   | ●            |              |
| <b>TESB 232-M16-13</b> | 2 | 32             | 11.6 | 29     | 50 | 75   | M16    | 2.0  | 25   | ●            | SBMT 1306... |
| <b>233-M16-13</b>      | 2 | 33             | 12.6 | 29     | 50 | 75   | M16    | 2.0  | 25   | ●            | E295         |
| <b>340-M16-13</b>      | 3 | 40             | 19.5 | 29     | 50 | 75   | M16    | 2.0  | 25   | ●            |              |
| <b>342-M16-13</b>      | 3 | 42             | 21.5 | 29     | 50 | 75   | M16    | 2.0  | 25   | ●            |              |
|                        |   |                |      |        |    |      |        |      |      |              |              |
|                        |   |                |      |        |    |      |        |      |      |              |              |
|                        |   |                |      |        |    |      |        |      |      |              |              |
|                        |   |                |      |        |    |      |        |      |      |              |              |
|                        |   |                |      |        |    |      |        |      |      |              |              |

► Matched with T-FLEXTEC holder

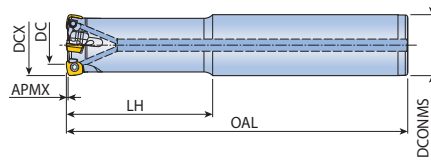
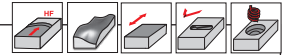
## Spare parts

| Designation    | Screw           | Wrench |       |  |  |
|----------------|-----------------|--------|-------|--|--|
|                |                 |        |       |  |  |
| <b>TESB-06</b> | TS 250648I/HG-P | TD 8P  | -     |  |  |
| <b>TESB-09</b> | TS 35A088I/HG   | TD 10P | -     |  |  |
| <b>TESB-13</b> | TS 50115I       | -      | T-T20 |  |  |
|                |                 |        |       |  |  |
|                |                 |        |       |  |  |

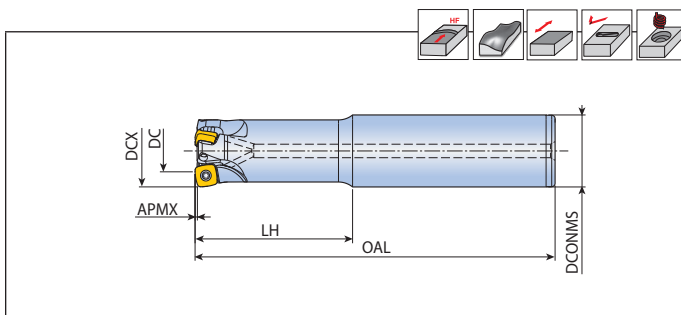


# TESR-07

## High feed end mills

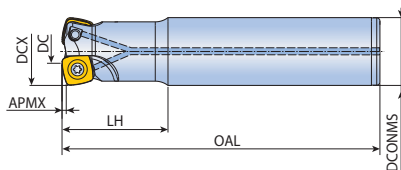
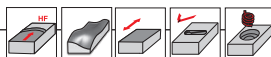
[illegible]

## High feed end mills

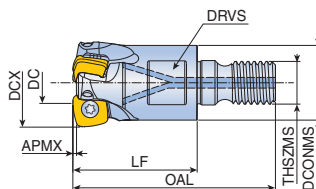


|                                                                                                                              |                                                                                                               |                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|  <p>Cutting Condition</p> <p>E352-E325</p> |  <p>Torque</p> <p>E328</p> |  <p>Ramping Data</p> <p>E395-E400</p> |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|

## High feed end mills

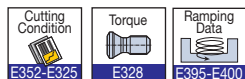


## Spare parts

[illegible]

## Spare parts

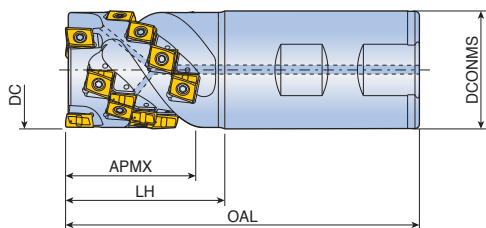
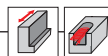
| Designation           | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|-----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                       |  |  |  |  |  |
| <b>TESR-07 (-Ø26)</b> | TS 25054I/HG-P                                                                      | TD 8P                                                                               | -                                                                                   |  |  |
| <b>TESR-07 (Ø32-)</b> | TS 25064I/HG-P                                                                      | TD 8P                                                                               | -                                                                                   |  |  |
| <b>TESR-10</b>        | TS 35A088I/HG                                                                       | TD 10P                                                                              | -                                                                                   |  |  |
| <b>TESR-14</b>        | TS 50115I                                                                           | -                                                                                   | T-T20                                                                               |  |  |
|                       |                                                                                     |                                                                                     |                                                                                     |  |  |



**4T-TEF-05/09**



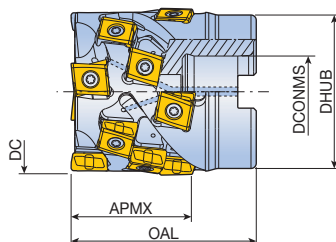
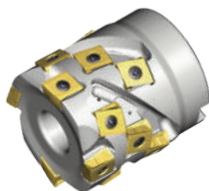
### Extended flute cutters

[illegible]

## Spare parts

| Designation      | Screw                                                                               | Wrench                                                                              |                                                                                     | Wrench handle                                                                       |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                  |  |  |  |  |  |
| <b>4T-TEF-05</b> | TS 18049/HG-P                                                                       | T 6P                                                                                | -                                                                                   | -                                                                                   |  |
| <b>4T-TEF-09</b> | TS 30D082-P                                                                         | -                                                                                   | TBLD T08P-W4                                                                        | THND 4W                                                                             |  |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



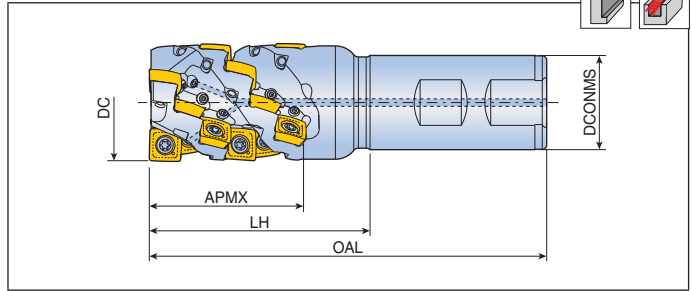


► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation      | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                  |  |  |  |  |  |
| <b>4T-TES-14</b> | TS 40G110I                                                                          | TBLD T15-W6                                                                         | SW6-T                                                                               |  |  |
|                  |                                                                                     |                                                                                     |                                                                                     |  |  |
|                  |                                                                                     |                                                                                     |                                                                                     |  |  |
|                  |                                                                                     |                                                                                     |                                                                                     |  |  |



**CHASE VQUAD**  
90° FACING & SHOULDERING



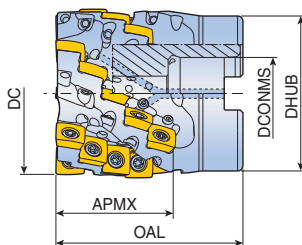
► Not recommended for slotting

| Designation              | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       | Coolant Nozzle                                                                      |  |
|--------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                          |  |  |  |  |  |
| <b>4S-TEF-09V</b> (-Ø32) | TS 35A070I/HG                                                                       | TBLD T10-W6                                                                         | THND 6W                                                                             | -                                                                                   |  |
| <b>4S-TEF-09V</b> (Ø40)  | TS 35A070I/HG                                                                       | TBLD T10-W6                                                                         | THND 6W                                                                             | SS 3003-06C                                                                         |  |
| <b>4S-TEF-11V</b>        | TS 40093I/HG                                                                        | TBLD T15-W6                                                                         | THND 6W                                                                             | SS 3003-06C                                                                         |  |
|                          |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |





**CHASE VQUAD**  
BOAT RACING & SHOULDERING

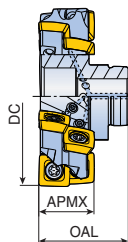


- ▶ Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- ▶ Not recommended for slotting

| Designation       | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       | Coolant Nozzle                                                                      |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                   |  |  |  |  |  |
| <b>4S-TES-09V</b> | TS 35A070I/HG                                                                       | TBLD T10P-W6                                                                        | SW6-T                                                                               | SS 3003-06C                                                                         |  |
| <b>4S-TES-11V</b> | TS 40093I/HG                                                                        | TBLD T15-W6                                                                         | SW6-T                                                                               | SS 3003-06C                                                                         |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



**CHASE VQUAD**  
RACING & SHOULDERING

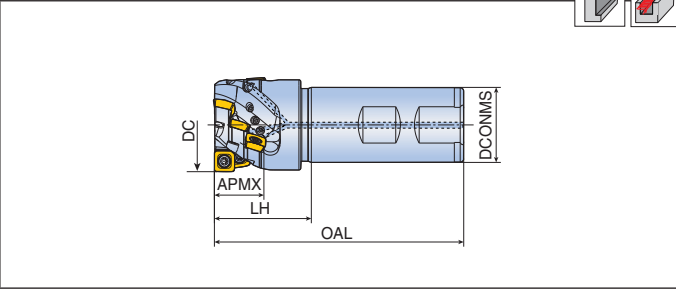
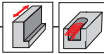


- ▶ Base unit ordered separately
- ▶ Not recommended for slotting

| Designation       | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       | Coolant Nozzle                                                                      |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                   |  |  |  |  |  |
| <b>4S-TFP-09V</b> | TS 35A070I/HG                                                                       | TBLD T10P-W6                                                                        | SW6-T                                                                               | SS 3003-06C                                                                         |  |
| <b>4S-TFP-11V</b> | TS 40093I/HG                                                                        | TBLD T15-W6                                                                         | SW6-T                                                                               | SS 3003-06C                                                                         |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |



## Base unit extended flute cutter



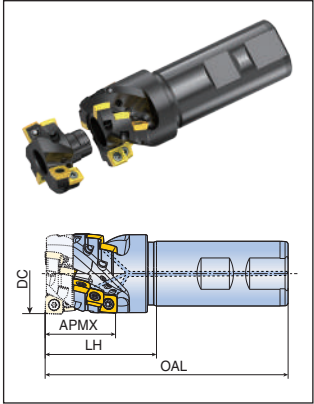
| Designation               |   | No. of insert | Dimension (mm) |        |       |      |      | Coolant hole | Kg  | Mounting bolt | Insert               |
|---------------------------|---|---------------|----------------|--------|-------|------|------|--------------|-----|---------------|----------------------|
|                           |   |               | DC             | DCONMS | OAL   | LH   | APMX |              |     |               |                      |
| 4S-TEF-D40B-21-W32-09V-3F | 3 | 9             | 40             | 32     | 106.4 | 41.4 | 21   | ●            | 0.6 | SH M8X45-C    | SVKT 0938...<br>E309 |
|                           |   |               |                |        |       |      |      |              |     |               |                      |
|                           |   |               |                |        |       |      |      |              |     |               |                      |
|                           |   |               |                |        |       |      |      |              |     |               |                      |
|                           |   |               |                |        |       |      |      |              |     |               |                      |
|                           |   |               |                |        |       |      |      |              |     |               |                      |

- Front head ordered seperately    ► Not recommended for slotting  
► Note: For bottom facing, both the front head and base unit must be connected.

## Spare parts

| Designation | Screw         | Wrench       | Wrench handle | Coolant Nozzle |  |
|-------------|---------------|--------------|---------------|----------------|--|
|             |               |              |               |                |  |
| 4S-TEF-09V  | TS 35A070I/HG | TBLD T10P-W6 | SW6-T         | SS 3003-06C    |  |
|             |               |              |               |                |  |

## Assembly



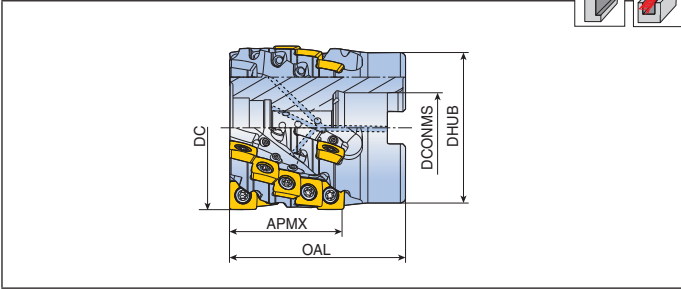
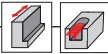
| Designation                    |   | No. of insert | Dimension (mm) |     |    |      |
|--------------------------------|---|---------------|----------------|-----|----|------|
|                                |   |               | DC             | OAL | LH | APMX |
| Head 4S-TFP-D40-14-09V-3F      | 3 | 15            | 40             | 120 | 55 | 34   |
| Base 4S-TEF-D40B-21-W32-09V-3F |   |               |                |     |    |      |
|                                |   |               |                |     |    |      |
|                                |   |               |                |     |    |      |
|                                |   |               |                |     |    |      |
|                                |   |               |                |     |    |      |
|                                |   |               |                |     |    |      |
|                                |   |               |                |     |    |      |
|                                |   |               |                |     |    |      |



# 4S-TES-B-09V/11V



## Base units for extended flute cutter



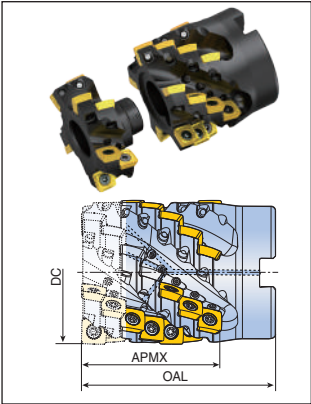
| Designation                      |  | No. of<br>insert | Dimension (mm) |        |      |      |      | Coolant<br>hole | Arbor<br>style |  kg | Mounting<br>bolt | Insert                                                                                 |
|----------------------------------|-----------------------------------------------------------------------------------|------------------|----------------|--------|------|------|------|-----------------|----------------|--------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------|
|                                  |                                                                                   |                  | DC             | DCONMS | DHUB | OAL  | APMX |                 |                |                                                                                      |                  |                                                                                        |
| <b>4S-TES-D40B-20-16R-09V-3F</b> | 3                                                                                 | 9                | 40             | 16     | 38   | 41.4 | 20   | ●               | A              | 0.2                                                                                  | SH M8X45-C       | SVKT                                                                                   |
| <b>D50B-27-22R-09V-5F</b>        | 5                                                                                 | 20               | 50             | 22     | 45   | 49.4 | 27   | ●               | A              | 0.4                                                                                  | LH M10X60-C      | 0938...                                                                                |
| <b>D63B-34-27R-09V-6F</b>        | 6                                                                                 | 30               | 63             | 27     | 58   | 56.4 | 34   | ●               | A              | 0.7                                                                                  | LH M12X70-C      |  E309 |
| <b>4S-TES-D50B-34-22R-11V-4F</b> | 4                                                                                 | 16               | 50             | 22     | 45   | 57.8 | 34   | ●               | A              | 0.5                                                                                  | SH M10X60-C      | SVK(H)T                                                                                |
| <b>D63B-43-27R-11V-5F</b>        | 5                                                                                 | 25               | 63             | 27     | 58   | 67.8 | 43   | ●               | A              | 1.0                                                                                  | SH M12X70-C      | 1145...                                                                                |
| <b>D80B-59-32R-11V-6F</b>        | 6                                                                                 | 42               | 80             | 32     | 76   | 82.8 | 59   | ●               | A              | 2.0                                                                                  | LH M16X80-C      |  E309 |
|                                  |                                                                                   |                  |                |        |      |      |      |                 |                |                                                                                      |                  |                                                                                        |

- ▶ Front head ordered separately
- ▶ Not recommended for slotting
- ▶ Note: For bottom facing, both the front head and base unit must be connected.

## Spare parts

| Designation         | Screw         | Wrench       | Wrench handle | Coolant Nozzle |  |
|---------------------|---------------|--------------|---------------|----------------|--|
| <b>4S-TES-B-09V</b> | TS 35A070I/HG | TBLD T10P-W6 | SW6-T         | SS 3003-06C    |  |
| <b>4S-TES-B-11V</b> | TS 40093I/HG  | TBLD T15-W6  | SW6-T         | SS 3003-06C    |  |

## Assembly

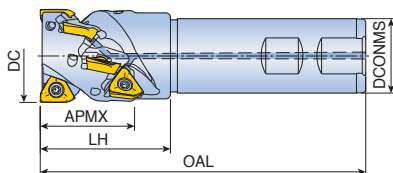
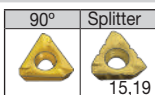


| Designation                           |   | No. of insert | Dimension (mm) |     |      |
|---------------------------------------|---|---------------|----------------|-----|------|
|                                       |   |               | DC             | OAL | APMX |
| Head <b>4S-TFP-D40-14-09V-3F</b>      | 3 | 15            | 40             | 55  | 34   |
| Base <b>4S-TES-D40B-20-16R-09V-3F</b> |   |               |                |     |      |
| Head <b>4S-TFP-D50-14-09V-5F</b>      | 5 | 30            | 50             | 63  | 41   |
| Base <b>4S-TES-D50B-27-22R-09V-5F</b> |   |               |                |     |      |
| Head <b>4S-TFP-D63-14-09V-6F</b>      | 6 | 42            | 63             | 70  | 48   |
| Base <b>4S-TES-D63B-34-27R-09V-6F</b> |   |               |                |     |      |
| Head <b>4S-TFP-D50-18-11V-4F</b>      | 4 | 24            | 50             | 75  | 52   |
| Base <b>4S-TES-D50B-34-22R-11V-4F</b> |   |               |                |     |      |
| Head <b>4S-TFP-D63-18-11V-5F</b>      | 5 | 35            | 63             | 85  | 60   |
| Base <b>4S-TES-D63B-43-27R-11V-5F</b> |   |               |                |     |      |
| Head <b>4S-TFP-D80-18-11V-6F</b>      | 6 | 54            | 80             | 100 | 76   |
| Base <b>4S-TES-D80B-59-32R-11V-6F</b> |   |               |                |     |      |



**MILL RUSH**

**Extended flute cutters**

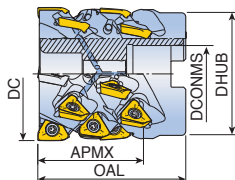
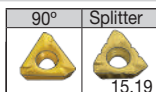


## Spare parts

| Designation      | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                  |  |  |  |  |  |
| <b>3P TEF-06</b> | TS 20043I/HG-P                                                                      | TD 6P                                                                               | -                                                                                   |  |  |
| <b>3P TEF-10</b> | TS 25C065I/HG                                                                       | TD 8                                                                                | -                                                                                   |  |  |
| <b>3P TEF-15</b> | TS 40B100I                                                                          | TD 15                                                                               | -                                                                                   |  |  |
| <b>3P TEF-19</b> | TS 45120I                                                                           | -                                                                                   | T-T20                                                                               |  |  |



**MILL RUSH**

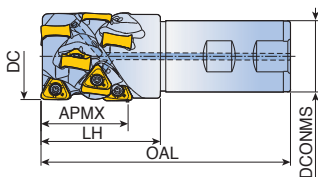
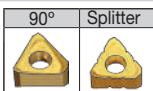
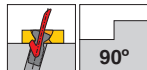
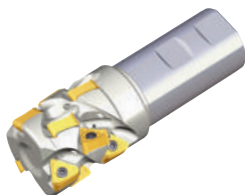


► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation      | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                  |  |  |  |  |  |
| <b>3P TES-10</b> | TS 25C065I/HG                                                                       | TD 8                                                                                | -                                                                                   |  |  |
| <b>3P TES-15</b> | TS 40B100I                                                                          | TD 15                                                                               | -                                                                                   |  |  |
| <b>3P TES-19</b> | TS 45I20I                                                                           | -                                                                                   | T-T20                                                                               |  |  |
|                  |                                                                                     |                                                                                     |                                                                                     |  |  |



### Extended flute cutters



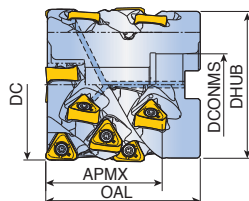
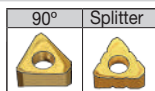
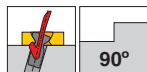
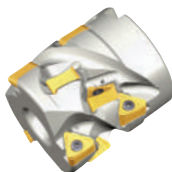
## Spare parts

| Designation     | Screw                                                                               | Wrench                                                                              |  |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                 |  |  |  |  |  |
| <b>TEF-TN18</b> | TS 40B100I                                                                          | T-T15                                                                               |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |



# TES-TN18

### Extended flute cutters

[illegible]

## Spare parts

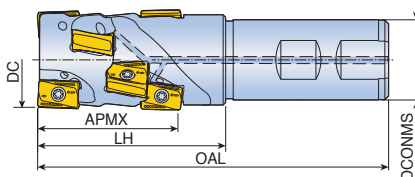
| Designation     | Screw                                                                               | Wrench                                                                              |  |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                 |  |  |  |  |  |
| <b>TES-TN18</b> | TS 40B100I                                                                          | T-T15                                                                               |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |





**CHASE2MILL**

| 90°                                                                               | Splitter                                                                          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |



## Spare parts

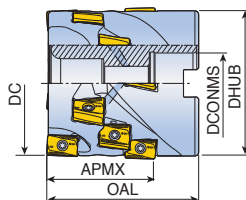
| Designation     | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                 |  |  |  |  |  |
| <b>TEF-AN11</b> | TS 35A088I/HG                                                                       | TD 10P                                                                              | -                                                                                   |  |  |
| <b>TEF-AN16</b> | TS 40120I/HG                                                                        | -                                                                                   | T-T15                                                                               |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |



# TES-AN11/16

CHASE2MILL

## Extended flute cutters



| Designation         |  | No. of insert | Dimension (mm) |        |      |      |      | Coolant hole  | Kg | Mounting bolt | Insert    |                                                                                                           |
|---------------------|-----------------------------------------------------------------------------------|---------------|----------------|--------|------|------|------|------------------------------------------------------------------------------------------------|----|---------------|-----------|-----------------------------------------------------------------------------------------------------------|
|                     |                                                                                   |               | DC             | DCONMS | DHUB | OAL  | APMX |                                                                                                |    |               |           |                                                                                                           |
| TES D50-40-22R-AN11 |                                                                                   | 3             | 12             | 50     | 22   | 45   | 60   | 40                                                                                             | ●  | 0.6           | SH M10x40 | ANM(H)X 1106...<br> E265 |
|                     | D50-40-22R-AN11-4F                                                                | 4             | 16             | 50     | 22   | 45   | 60   | 40                                                                                             | ●  | 0.6           | SH M10x40 |                                                                                                           |
|                     | D63-60-27R-AN11                                                                   | 4             | 24             | 63     | 27   | 60   | 80   | 60                                                                                             | ●  | 1.3           | SH M12x60 |                                                                                                           |
|                     | D80-60-32R-AN11-4F                                                                | 4             | 24             | 80     | 32   | 76   | 80   | 60                                                                                             | ●  | 2.2           | SH M16x60 |                                                                                                           |
|                     | D80-60-32R-AN11                                                                   | 5             | 30             | 80     | 32   | 76   | 80   | 60                                                                                             | ●  | 2.3           | SH M16x60 |                                                                                                           |
|                     | D80-60-32R-AN11-6F                                                                | 6             | 36             | 80     | 32   | 76   | 80   | 60                                                                                             | ●  | 2.4           | SH M16x60 |                                                                                                           |
| TES D50-42-22R-AN16 |                                                                                   | 2             | 6              | 50     | 22   | 47   | 65   | 42                                                                                             | ●  | 0.7           | SH M10x40 | ANM(H)X 1607...<br> E265 |
|                     | D63-42-27R-AN16                                                                   | 3             | 9              | 63     | 27   | 60.5 | 70   | 42                                                                                             | ●  | 1.1           | SH M12x50 |                                                                                                           |
|                     | D63-42-27R-AN16-4F                                                                | 4             | 12             | 63     | 27   | 60.5 | 70   | 42                                                                                             | ●  | 1.0           | SH M12x50 |                                                                                                           |
|                     | D63-56-27R-AN16-2F                                                                | 2             | 8              | 63     | 27   | 60.5 | 80   | 56                                                                                             | ●  | 1.2           | SH M12x50 |                                                                                                           |
|                     | D63-56-27R-AN16                                                                   | 3             | 12             | 63     | 27   | 60.5 | 80   | 56                                                                                             | ●  | 1.3           | SH M12x50 |                                                                                                           |
|                     | D63-56-27R-AN16-4F                                                                | 4             | 16             | 63     | 27   | 60.5 | 80   | 56                                                                                             | ●  | 1.2           | SH M12x50 |                                                                                                           |
|                     | D80-56-32R-AN16                                                                   | 4             | 16             | 80     | 32   | 76.5 | 80   | 56                                                                                             | ●  | 2.2           | SH M16x50 |                                                                                                           |
|                     | D100-69-40R-AN16-4F                                                               | 4             | 20             | 100    | 40   | 96.4 | 100  | 69                                                                                             | ●  | 4.1           | SH M20x60 |                                                                                                           |
|                     | D100-69-40R-AN16                                                                  | 5             | 25             | 100    | 40   | 96.4 | 100  | 69                                                                                             | ●  | 4.5           | SH M20x60 |                                                                                                           |
|                     | D100-69-40R-AN16-6F                                                               | 6             | 30             | 100    | 40   | 96.4 | 100  | 69                                                                                             | ●  | 4.0           | SH M20x60 |                                                                                                           |
|                     |                                                                                   |               |                |        |      |      |      |                                                                                                |    |               |           |                                                                                                           |
|                     |                                                                                   |               |                |        |      |      |      |                                                                                                |    |               |           |                                                                                                           |
|                     |                                                                                   |               |                |        |      |      |      |                                                                                                |    |               |           |                                                                                                           |
|                     |                                                                                   |               |                |        |      |      |      |                                                                                                |    |               |           |                                                                                                           |
|                     |                                                                                   |               |                |        |      |      |      |                                                                                                |    |               |           |                                                                                                           |

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

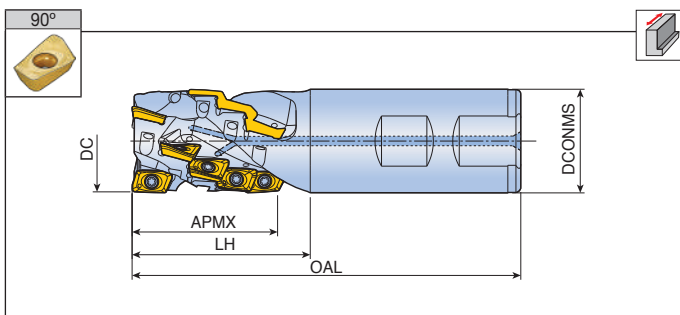
| Designation     | Screw         | Wrench |       |  |  |
|-----------------|---------------|--------|-------|--|--|
|                 |               |        |       |  |  |
| <b>TES-AN11</b> | TS 35A088I/HG | TD 10P | -     |  |  |
| <b>TES-AN16</b> | TS 40120I/HG  | -      | T-T15 |  |  |
|                 |               |        |       |  |  |
|                 |               |        |       |  |  |
|                 |               |        |       |  |  |



# TEF-AV10



### Extended flute cutters

[illegible]

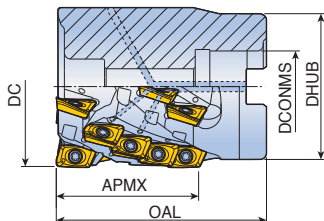
## Spare parts

| Designation     | Screw                                                                               | Wrench                                                                              |  |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                 |  |  |  |  |  |
| <b>TEF-AV10</b> | TS 30B062/HG-P                                                                      | TD 8P                                                                               |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |





WINMILL  
ADVANCED GAMING

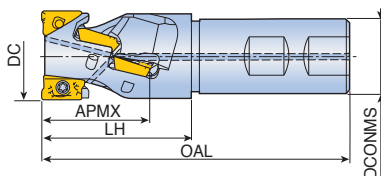
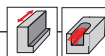
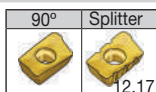


► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation     | Screw                                                                               | Wrench                                                                              |  |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                 |  |  |  |  |  |
| <b>TES-AV10</b> | TS 30B062/HG-P                                                                      | TD 8P                                                                               |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |
|                 |                                                                                     |                                                                                     |  |  |  |



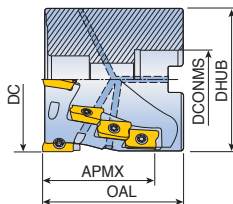
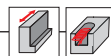
### Extended flute cutters



## Spare parts

|                                                                                                                             |                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <p>Cutting Condition</p>  <p>E322-E325</p> | <p>Torque</p>  <p>E328</p> |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|

### Extended flute cutters

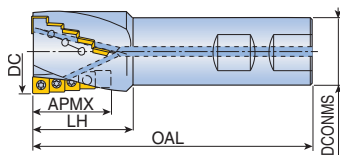


► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

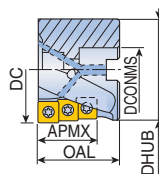
## Spare parts

| Designation     | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                 |  |  |  |  |  |
| <b>TES-AP12</b> | TS 35A088I/HG                                                                       | TD 10P                                                                              | -                                                                                   |  |  |
| <b>TES-AP17</b> | TS 40093I/HG                                                                        | -                                                                                   | T-T15                                                                               |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |
|                 |                                                                                     |                                                                                     |                                                                                     |  |  |





**Fig.1**



**Fig.2**

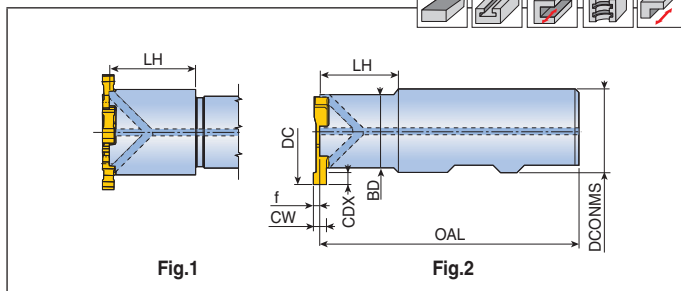
[illegible]

► Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

| Designation               | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|---------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                           |  |  |  |  |  |
| <b>TEF-SP09</b> (Ø32)     | TS 35088I                                                                           | TD 10                                                                               | -                                                                                   |  |  |
| <b>TEF-SP11</b> (Ø40-Ø50) | TS 40093I                                                                           | TD 15                                                                               | -                                                                                   |  |  |
| <b>TES-SP11</b> (Ø50-Ø63) | TS 40093I                                                                           | TD 15                                                                               | -                                                                                   |  |  |
| <b>TES-SP14</b> (Ø80)     | TS 50A121I/HG                                                                       | -                                                                                   | T-T20                                                                               |  |  |



**TOP SLOT**

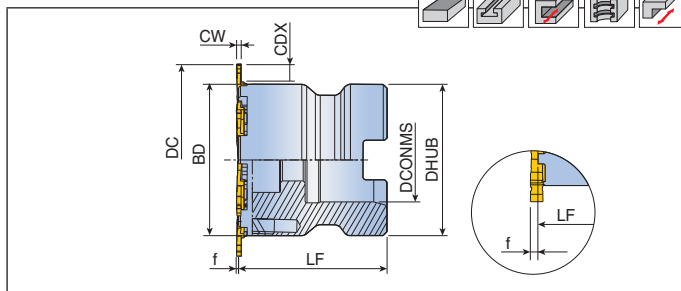
[illegible]

## Spare parts

| Designation                  | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                              |  |  |  |  |  |
| <b>TSM D32-W25-3Z-TS16</b>   | TS 40097I-N3.5                                                                      | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D32-W25-3Z-B-TS16</b> | TS 40097I                                                                           | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D40-W25-4Z-TS16</b>   | TS 40097I-N3.5                                                                      | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D40-W25-4Z-B-TS16</b> | TS 40097I                                                                           | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D50-W32-6Z-TS16</b>   | TS 40097I-N3.5                                                                      | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |





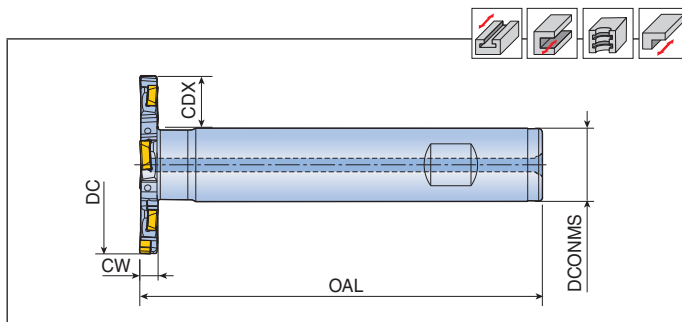
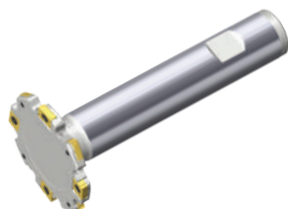
[illegible]

## Spare parts

| Designation                   | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                               |  |  |  |  |  |
| <b>TSM D50-22R-6Z-TS16</b>    | TS 40097I-N3.5                                                                      | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D50-22R-6Z-B-TS16</b>  | TS 40097I                                                                           | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D63-22R-8Z-TS16</b>    | TS 40097I-N3.5                                                                      | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D63-22R-8Z-B-TS16</b>  | TS 40097I                                                                           | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D80-27R-11Z-TS16</b>   | TS 40097I-N3.5                                                                      | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |
| <b>TSM D80-27R-11Z-B-TS16</b> | TS 40097I                                                                           | BLD T15/S7                                                                          | SW6-T                                                                               |  |  |



## Slotting cutters: End mills



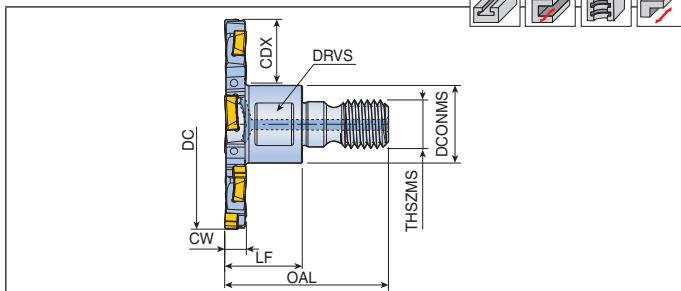
| Designation                | CW<br>(mm) |     | Dimension (mm) |        |     |      | Coolant<br>hole | Insert              |
|----------------------------|------------|-----|----------------|--------|-----|------|-----------------|---------------------|
|                            |            |     | DC             | DCONMS | OAL | CDX  |                 |                     |
| <b>TSM D25-03-W12-SL18</b> | 3          | 1+1 | 25             | 12     | 90  | 6.5  | ●               | SLOT 018...<br>E298 |
| <b>D32-03-W16-SL18</b>     | 3          | 2+2 | 32             | 16     | 90  | 8.0  | ●               |                     |
| <b>D40-03-W16-SL18</b>     | 3          | 3+3 | 40             | 16     | 105 | 12.0 | ●               |                     |
| <b>D50-03-W20-SL18</b>     | 3          | 4+4 | 50             | 20     | 110 | 15.0 | ●               |                     |
| <b>D63-03-W20-SL18</b>     | 3          | 5+5 | 63             | 20     | 110 | 21.5 | ●               |                     |
| <b>TSM D25-04-W12-SL23</b> | 4          | 1+1 | 25             | 12     | 90  | 6.5  | ●               | SLOT 023...<br>E298 |
| <b>D32-04-W16-SL23</b>     | 4          | 2+2 | 32             | 16     | 90  | 8.0  | ●               |                     |
| <b>D40-04-W16-SL23</b>     | 4          | 3+3 | 40             | 16     | 105 | 12.0 | ●               |                     |
| <b>D50-04-W20-SL23</b>     | 4          | 4+4 | 50             | 20     | 110 | 15.0 | ●               |                     |
| <b>D63-04-W20-SL23</b>     | 4          | 5+5 | 63             | 20     | 110 | 21.5 | ●               |                     |
| <b>TSM D25-05-W12-SL28</b> | 5          | 1+1 | 25             | 12     | 90  | 6.5  | ●               | SLOT 028...<br>E298 |
| <b>D32-05-W16-SL28</b>     | 5          | 2+2 | 32             | 16     | 90  | 8.0  | ●               |                     |
| <b>D40-05-W16-SL28</b>     | 5          | 3+3 | 40             | 16     | 105 | 12.0 | ●               |                     |
| <b>D50-05-W20-SL28</b>     | 5          | 4+4 | 50             | 20     | 110 | 15.0 | ●               |                     |
| <b>D63-05-W20-SL28</b>     | 5          | 5+5 | 63             | 20     | 110 | 21.5 | ●               |                     |
| <b>TSM D25-06-W12-SL33</b> | 6          | 1+1 | 25             | 12     | 90  | 6.5  | ●               | SLOT 033...<br>E298 |
| <b>D32-06-W16-SL33</b>     | 6          | 2+2 | 32             | 16     | 90  | 8.0  | ●               |                     |
| <b>D40-06-W16-SL33</b>     | 6          | 3+3 | 40             | 16     | 105 | 12.0 | ●               |                     |
| <b>D50-06-W20-SL33</b>     | 6          | 4+4 | 50             | 20     | 110 | 15.0 | ●               |                     |
| <b>D63-06-W20-SL33</b>     | 6          | 5+5 | 63             | 20     | 110 | 21.5 | ●               |                     |

## Spare parts

| Designation        | Screw         | Wrench |       |  |  |
|--------------------|---------------|--------|-------|--|--|
|                    |               |        |       |  |  |
| <b>TSM-03-SL18</b> | TS 25B024I/HG | TD 7P  | L-T7P |  |  |
| <b>TSM-04-SL23</b> | TS 25B031I/HG | TD 7P  | L-T7P |  |  |
| <b>TSM-05-SL28</b> | TS 25B042I/HG | TD 7P  | L-T7P |  |  |
| <b>TSM-06-SL33</b> | TS 25B053I/HG | TD 7P  | L-T7P |  |  |



## Slotting cutters: modular heads



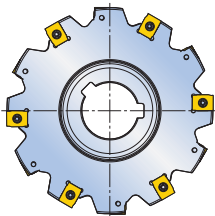
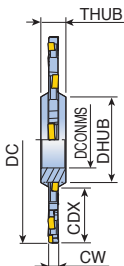
| Designation                | CW<br>(mm) |  | Dimension (mm) |        |    |      |        |     |      |   | Coolant<br>hole                                                                                        | Insert |
|----------------------------|------------|-----------------------------------------------------------------------------------|----------------|--------|----|------|--------|-----|------|---|--------------------------------------------------------------------------------------------------------|--------|
|                            |            |                                                                                   | DC             | DCONMS | LF | OAL  | THSZMS | CDX | DRVS |   |                                                                                                        |        |
| <b>TSM D25-03-M08-SL18</b> | 3          | 1+1                                                                               | 25             | 13     | 18 | 35.5 | M08    | 6   | 10   | ● | SLOT 018...<br> E298 |        |
| <b>D32-03-M08-SL18</b>     | 3          | 2+2                                                                               | 32             | 13     | 18 | 35.5 | M08    | 9   | 10   | ● |                                                                                                        |        |
| <b>D40-03-M08-SL18</b>     | 3          | 3+3                                                                               | 40             | 13     | 18 | 35.5 | M08    | 13  | 10   | ● |                                                                                                        |        |
| <b>D50-03-M10-SL18</b>     | 3          | 4+4                                                                               | 50             | 18     | 18 | 38   | M10    | 15  | 15   | ● |                                                                                                        |        |
| <b>D63-03-M10-SL18</b>     | 3          | 5+5                                                                               | 63             | 18     | 18 | 38   | M10    | 22  | 15   | ● |                                                                                                        |        |
| <b>TSM D25-04-M08-SL23</b> | 4          | 1+1                                                                               | 25             | 13     | 18 | 35.5 | M08    | 6   | 10   | ● | SLOT 023...<br> E298 |        |
| <b>D32-04-M08-SL23</b>     | 4          | 2+2                                                                               | 32             | 13     | 18 | 35.5 | M08    | 9   | 10   | ● |                                                                                                        |        |
| <b>D40-04-M08-SL23</b>     | 4          | 3+3                                                                               | 40             | 13     | 18 | 35.5 | M08    | 13  | 10   | ● |                                                                                                        |        |
| <b>D50-04-M10-SL23</b>     | 4          | 4+4                                                                               | 50             | 18     | 18 | 38   | M10    | 15  | 15   | ● |                                                                                                        |        |
| <b>D63-04-M10-SL23</b>     | 4          | 5+5                                                                               | 63             | 18     | 18 | 38   | M10    | 22  | 15   | ● |                                                                                                        |        |
| <b>TSM D25-05-M08-SL28</b> | 5          | 1+1                                                                               | 25             | 13     | 18 | 35.5 | M08    | 6   | 10   | ● | SLOT 028...<br> E298 |        |
| <b>D32-05-M08-SL28</b>     | 5          | 2+2                                                                               | 32             | 13     | 18 | 35.5 | M08    | 9   | 10   | ● |                                                                                                        |        |
| <b>D40-05-M08-SL28</b>     | 5          | 3+3                                                                               | 40             | 13     | 18 | 35.5 | M08    | 13  | 10   | ● |                                                                                                        |        |
| <b>D50-05-M10-SL28</b>     | 5          | 4+4                                                                               | 50             | 18     | 18 | 38   | M10    | 15  | 15   | ● |                                                                                                        |        |
| <b>D63-05-M10-SL28</b>     | 5          | 5+5                                                                               | 63             | 18     | 18 | 38   | M10    | 22  | 15   | ● |                                                                                                        |        |
| <b>TSM D25-06-M08-SL33</b> | 6          | 1+1                                                                               | 25             | 13     | 18 | 35.5 | M08    | 6   | 10   | ● | SLOT 033...<br> E298 |        |
| <b>D32-06-M08-SL33</b>     | 6          | 2+2                                                                               | 32             | 13     | 18 | 35.5 | M08    | 9   | 10   | ● |                                                                                                        |        |
| <b>D40-06-M08-SL33</b>     | 6          | 3+3                                                                               | 40             | 13     | 18 | 35.5 | M08    | 13  | 10   | ● |                                                                                                        |        |
| <b>D50-06-M10-SL33</b>     | 6          | 4+4                                                                               | 50             | 18     | 18 | 38   | M10    | 15  | 15   | ● |                                                                                                        |        |
| <b>D63-06-M10-SL33</b>     | 6          | 5+5                                                                               | 63             | 18     | 18 | 38   | M10    | 22  | 15   | ● |                                                                                                        |        |
|                            |            |                                                                                   |                |        |    |      |        |     |      |   |                                                                                                        |        |

► Matched with T-FLEXTEC holder

## Spare parts

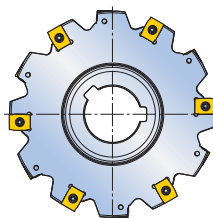
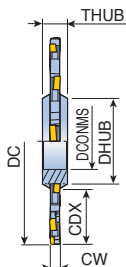
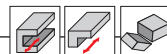
| Designation        | Screw         | Wrench |       |  |  |
|--------------------|---------------|--------|-------|--|--|
|                    |               |        |       |  |  |
| <b>TSM-03-SL18</b> | TS 25B024I/HG | TD 7P  | L-T7P |  |  |
| <b>TSM-04-SL23</b> | TS 25B031I/HG | TD 7P  | L-T7P |  |  |
| <b>TSM-05-SL28</b> | TS 25B042I/HG | TD 7P  | L-T7P |  |  |
| <b>TSM-06-SL33</b> | TS 25B053I/HG | TD 7P  | L-T7P |  |  |





|                                                                                                                             |                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <p>Cutting Condition</p>  <p>E322-E325</p> | <p>Torque</p>  <p>E328</p> |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|

## Slotting cutters: Fixed pocket disk type



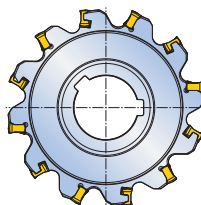
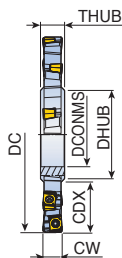
| Designation                  | CW<br>(mm) |       | Dimension (mm) |        |      |     |      | Kg  | Insert              |
|------------------------------|------------|-------|----------------|--------|------|-----|------|-----|---------------------|
|                              |            |       | DC             | DCONMS | DHUB | OAL | CDX  |     |                     |
| <b>TSM 080FD-08-22N-Z043</b> | 8          | 4+4   | 80             | 22     | 34   | 12  | 20.5 | 0.2 | ZNHT 043...<br>E318 |
| <b>100FD-08-27N-Z043</b>     | 8          | 5+5   | 100            | 27     | 41   | 12  | 27.0 | 0.3 |                     |
| <b>125FD-08-40N-Z043</b>     | 8          | 6+6   | 125            | 40     | 55   | 12  | 32.5 | 0.5 |                     |
| <b>160FD-08-40N-Z043</b>     | 8          | 8+8   | 160            | 40     | 55   | 12  | 50.0 | 0.9 |                     |
| <b>200FD-08-50N-Z043</b>     | 8          | 9+9   | 200            | 50     | 69   | 12  | 63.0 | 1.4 |                     |
| <b>250FD-08-50N-Z043</b>     | 8          | 12+12 | 250            | 50     | 69   | 12  | 88.0 | 2.3 | ZNHT 048...<br>E318 |
| <b>TSM 100FD-09-27N-Z048</b> | 9          | 5+5   | 100            | 27     | 41   | 12  | 27.5 | 0.4 |                     |
| <b>125FD-09-40N-Z048</b>     | 9          | 6+6   | 125            | 40     | 55   | 12  | 33.0 | 0.6 |                     |
| <b>160FD-09-40N-Z048</b>     | 9          | 8+8   | 160            | 40     | 55   | 12  | 50.5 | 1.0 |                     |
| <b>200FD-09-50N-Z048</b>     | 9          | 9+9   | 200            | 50     | 69   | 12  | 63.5 | 1.6 |                     |
| <b>250FD-09-50N-Z048</b>     | 9          | 12+12 | 250            | 50     | 69   | 12  | 88.5 | 2.6 | ZNHT 053...<br>E318 |
| <b>TSM 100FD-10-27N-Z053</b> | 10         | 5+5   | 100            | 27     | 41   | 12  | 28.0 | 0.4 |                     |
| <b>125FD-10-40N-Z053</b>     | 10         | 6+6   | 125            | 40     | 55   | 12  | 33.5 | 0.6 |                     |
| <b>160FD-10-40N-Z053</b>     | 10         | 8+8   | 160            | 40     | 55   | 12  | 51.0 | 1.3 |                     |
| <b>200FD-10-50N-Z053</b>     | 10         | 9+9   | 200            | 50     | 69   | 12  | 64.0 | 2.0 |                     |
| <b>250FD-10-50N-Z053</b>     | 10         | 12+12 | 250            | 50     | 69   | 12  | 89.0 | 3.2 |                     |
|                              |            |       |                |        |      |     |      |     |                     |
|                              |            |       |                |        |      |     |      |     |                     |
|                              |            |       |                |        |      |     |      |     |                     |
|                              |            |       |                |        |      |     |      |     |                     |
|                              |            |       |                |        |      |     |      |     |                     |

► Arbor: SCA, SEMC

## Spare parts

| Designation     | Screw         |       |       | Designation     | Screw       |       |       |
|-----------------|---------------|-------|-------|-----------------|-------------|-------|-------|
|                 |               |       |       |                 |             |       |       |
| <b>TSM-Z018</b> | TS 25B024I/HG | TD 7P | L-T7P | <b>TSM-Z038</b> | TS 40K0535I | T-T15 | L-T15 |
| <b>TSM-Z023</b> | TS 25B031I/HG | TD 7P | L-T7P | <b>TSM-Z043</b> | TS 40K065I  | T-T15 | L-T15 |
| <b>TSM-Z028</b> | TS 25B042I/HG | TD 7P | L-T7P | <b>TSM-Z048</b> | TS 40K075I  | T-T15 | L-T15 |
| <b>TSM-Z033</b> | TS 25B053I/HG | TD 7P | L-T7P | <b>TSM-Z053</b> | TS 40K085I  | T-T15 | L-T15 |
|                 |               |       |       |                 |             |       |       |



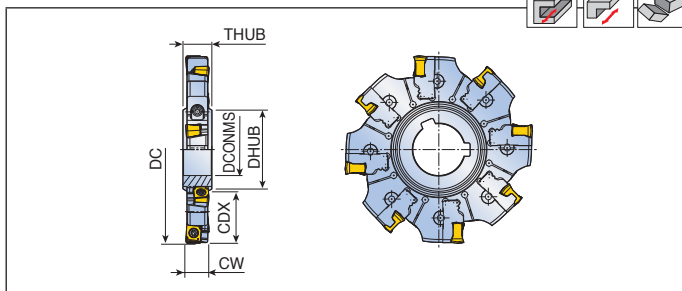


► Arbor: SCA, SEMC

| Designation        | Screw                                                                               | Wrench                                                                              |                                                                                     |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|                    |  |  |  |  |  |
| <b>TSM FD-ZN08</b> | TS 30085I/HG                                                                        | TD 9                                                                                | -                                                                                   |  |  |
| <b>TSM FD-ZN11</b> | TS 40120I/HG                                                                        | -                                                                                   | T-T15                                                                               |  |  |
|                    |                                                                                     |                                                                                     |                                                                                     |  |  |
|                    |                                                                                     |                                                                                     |                                                                                     |  |  |



## Slotting cutters: Adjustable disk type

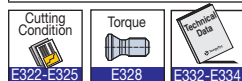


| Designation                 | CW<br>(mm) |     | Dimension (mm) |        |      |     |      | Kg  | Insert              |
|-----------------------------|------------|-----|----------------|--------|------|-----|------|-----|---------------------|
|                             |            |     | DC             | DCONMS | DHUB | OAL | CDX  |     |                     |
| <b>TSM 100FD-S-27N-ZN08</b> | 10-12      | 4+4 | 100            | 27     | 41   | 15  | 26.5 | 0.4 | ZNHU 080...<br>E319 |
| <b>125FD-S-40N-ZN08</b>     | 10-12      | 5+5 | 125            | 40     | 55   | 15  | 31.5 | 0.7 |                     |
| <b>160FD-S-40N-ZN08</b>     | 10-12      | 6+6 | 160            | 40     | 55   | 15  | 48.5 | 1.1 |                     |
| <b>200FD-S-50N-ZN08</b>     | 10-12      | 8+8 | 200            | 50     | 69   | 15  | 61.5 | 1.8 |                     |
| <b>250FD-S-50N-ZN08</b>     | 10-12      | 9+9 | 250            | 50     | 69   | 15  | 87.5 | 2.8 |                     |
| <b>100FD-W-27N-ZN08</b>     | 12-14      | 4+4 | 100            | 27     | 41   | 15  | 27.0 | 0.5 |                     |
| <b>125FD-W-40N-ZN08</b>     | 12-14      | 5+5 | 125            | 40     | 55   | 15  | 31.5 | 0.8 |                     |
| <b>160FD-W-40N-ZN08</b>     | 12-14      | 6+6 | 160            | 40     | 55   | 15  | 49.5 | 1.3 |                     |
| <b>200FD-W-50N-ZN08</b>     | 12-14      | 8+8 | 200            | 50     | 69   | 15  | 62.5 | 2.1 |                     |
| <b>250FD-W-50N-ZN08</b>     | 12-14      | 9+9 | 250            | 50     | 69   | 15  | 87.5 | 3.4 |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |
|                             |            |     |                |        |      |     |      |     |                     |

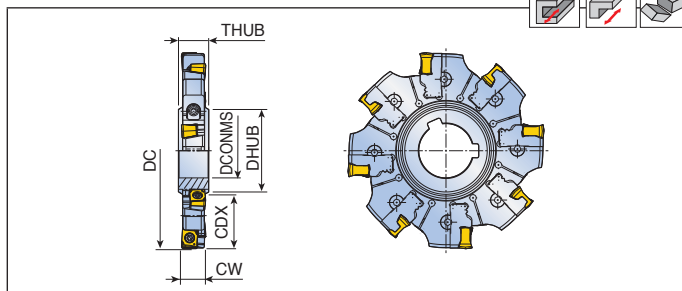
- ▶ Width of cut is set at the smallest unless a specific width is requested
- ▶ Arbor: SCA, SEMC

## Spare parts

| Designation            | Right cartridge            | Left cartridge             | Wedge     | Adjust screw | Insert screw |
|------------------------|----------------------------|----------------------------|-----------|--------------|--------------|
| <b>TSM FD-S/W-ZN08</b> |                            |                            |           |              |              |
|                        | TCT-SR-ZN08<br>TCT-WR-ZN08 | TCT-SL-ZN08<br>TCT-WL-ZN08 | WFZ 5     | SA M8-6.0    | TS 30085I/HG |
|                        | Wedge screw                | Wrench                     | L-Wrench  | Wedge Wrench |              |
|                        | <br>WS 5                   | <br>TD 9                   | <br>L-W 3 | <br>F-W 2.5  |              |



**TOP SLOT**

[illegible]

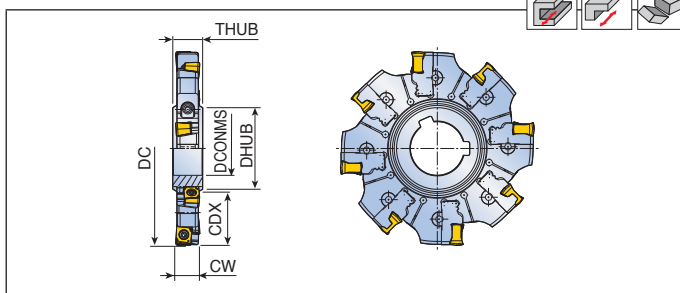
- ▶ Width of cut is set at the smallest unless a specific width is requested
- ▶ Arbor: SCA, SEMC

| Designation            | Right cartridge                                                                     | Left cartridge                                                                      | Wedge                                                                               | Adjust screw                                                                        | Insert screw                                                                        |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                        |  |  |  |  |  |
| <b>TSM FD-S/W-ZN11</b> | TCT-SR-ZN11<br>TCT-WR-ZN11                                                          | TCT-SL-ZN11<br>TCT-WL-ZN11                                                          | WFZ 6                                                                               | SA M8-9.0                                                                           | TS 40120I/HG                                                                        |
|                        | Wedge screw                                                                         | Wrench                                                                              | L-Wrench                                                                            | Wedge Wrench                                                                        |                                                                                     |
|                        |  |  |  |  |                                                                                     |
|                        | WS 6                                                                                | T-T15                                                                               | L-W 4                                                                               | T-W 3                                                                               |                                                                                     |



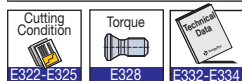


**TOP SLOT**

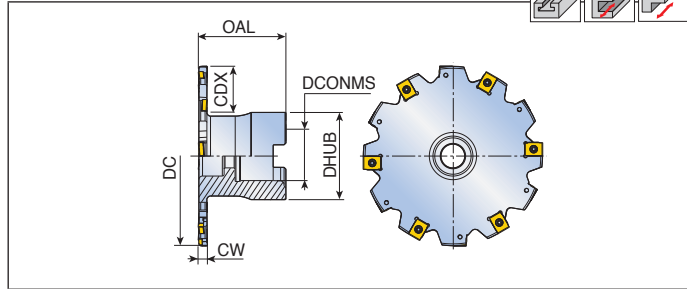
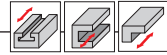


- ▶ Width of cut is set at the smallest unless a specific width is requested
- ▶ Arbor: SCA, SEMC

| Designation            | Right cartridge                                                                     | Left cartridge                                                                      | Wedge                                                                               | Adjust screw                                                                        | Insert screw                                                                        |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                        |  |  |  |  |  |
| <b>TSM FD-S/W-ZN14</b> | TCT-SR-ZN14                                                                         | TCT-SL-ZN14                                                                         | WFZ 6                                                                               | SA M8-9.0                                                                           | TS 40120/HG                                                                         |
|                        | Wedge screw                                                                         | Wrench                                                                              | L-Wrench                                                                            | Wedge Wrench                                                                        |                                                                                     |
|                        |  |  |  |  |                                                                                     |
|                        | WS 6                                                                                | T-T15                                                                               | L-W 4                                                                               | T-W 3                                                                               |                                                                                     |



## Slotting cutters: Fixed pocket flange type



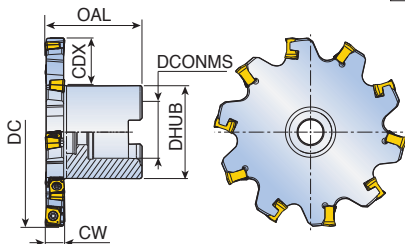
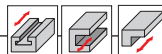
| Designation                  | CW<br>(mm) |  | Dimension (mm) |        |      |     |      | Arbor<br>style |  Kg | Mounting<br>bolt | Insert                                                                                             |
|------------------------------|------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|------|----------------|--------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------|
|                              |            |                                                                                   | DC             | DCONMS | DHUB | OAL | CDX  |                |                                                                                      |                  |                                                                                                    |
| <b>TSM 080FF-03-22R-Z018</b> | 3          | 5+5                                                                               | 80             | 22     | 40   | 50  | 20.0 | A              | 0.4                                                                                  | SH M10x35        | ZNHT 018...                                                                                        |
| <b>100FF-03-27R-Z018</b>     | 3          | 6+6                                                                               | 100            | 27     | 48   | 50  | 26.0 | A              | 0.6                                                                                  | SH M12x35        |                                                                                                    |
| <b>080FF-04-22R-Z023</b>     | 4          | 5+5                                                                               | 80             | 22     | 40   | 50  | 20.0 | A              | 0.4                                                                                  | SH M10x35        |                                                                                                    |
| <b>100FF-04-27R-Z023</b>     | 4          | 6+6                                                                               | 100            | 27     | 48   | 50  | 26.0 | A              | 0.6                                                                                  | SH M12x35        | ZNHT 023...                                                                                        |
| <b>080FF-05-22R-Z028</b>     | 5          | 5+5                                                                               | 80             | 22     | 40   | 50  | 20.0 | A              | 0.5                                                                                  | SH M10x35        |                                                                                                    |
| <b>100FF-05-27R-Z028</b>     | 5          | 6+6                                                                               | 100            | 27     | 48   | 50  | 26.0 | A              | 0.7                                                                                  | SH M12x35        |                                                                                                    |
| <b>080FF-06-22R-Z033</b>     | 6          | 5+5                                                                               | 80             | 22     | 40   | 50  | 20.0 | A              | 0.5                                                                                  | SH M10x35        | ZNHT 033...<br>   |
| <b>100FF-06-27R-Z033</b>     | 6          | 6+6                                                                               | 100            | 27     | 48   | 50  | 26.0 | A              | 0.7                                                                                  | SH M12x35        |                                                                                                    |
| <b>125FF-06-40R-Z033</b>     | 6          | 7+7                                                                               | 125            | 40     | 70   | 50  | 25.0 | B              | 1.1                                                                                  | -                |                                                                                                    |
| <b>160FF-06-40R-Z033</b>     | 6          | 9+9                                                                               | 160            | 40     | 70   | 50  | 43.0 | B              | 1.4                                                                                  | -                | ZNHT 038...<br>   |
| <b>080FF-07-22R-Z038</b>     | 7          | 4+4                                                                               | 80             | 22     | 40   | 50  | 20.0 | A              | 0.5                                                                                  | SH M10x40        |                                                                                                    |
| <b>100FF-07-27R-Z038</b>     | 7          | 5+5                                                                               | 100            | 27     | 48   | 50  | 25.5 | A              | 0.7                                                                                  | SH M12x35        |                                                                                                    |
| <b>125FF-07-40R-Z038</b>     | 7          | 6+6                                                                               | 125            | 40     | 70   | 50  | 24.5 | B              | 1.1                                                                                  | -                | ZNHT 043...<br>   |
| <b>160FF-07-40R-Z038</b>     | 7          | 8+8                                                                               | 160            | 40     | 70   | 50  | 42.0 | B              | 1.4                                                                                  | -                |                                                                                                    |
| <b>080FF-08-22R-Z043</b>     | 8          | 4+4                                                                               | 80             | 22     | 40   | 50  | 20.0 | A              | 0.5                                                                                  | SH M10x35        |                                                                                                    |
| <b>100FF-08-27R-Z043</b>     | 8          | 5+5                                                                               | 100            | 27     | 48   | 50  | 25.5 | A              | 0.8                                                                                  | SH M12x35        | ZNHT 048...<br>  |
| <b>125FF-08-40R-Z043</b>     | 8          | 6+6                                                                               | 125            | 40     | 70   | 50  | 24.5 | B              | 1.2                                                                                  | -                |                                                                                                    |
| <b>160FF-08-40R-Z043</b>     | 8          | 8+8                                                                               | 160            | 40     | 70   | 50  | 42.0 | B              | 1.5                                                                                  | -                |                                                                                                    |
| <b>100FF-09-27R-Z048</b>     | 9          | 5+5                                                                               | 100            | 27     | 48   | 50  | 26.0 | A              | 0.7                                                                                  | SH M12x35        | ZNHT 053...<br> |
| <b>125FF-09-40R-Z048</b>     | 9          | 6+6                                                                               | 125            | 40     | 70   | 50  | 24.5 | B              | 1.2                                                                                  | -                |                                                                                                    |
| <b>160FF-09-40R-Z048</b>     | 9          | 8+8                                                                               | 160            | 40     | 70   | 50  | 42.0 | B              | 1.6                                                                                  | -                |                                                                                                    |
| <b>100FF-10-27R-Z053</b>     | 10         | 5+5                                                                               | 100            | 27     | 48   | 50  | 26.0 | A              | 0.8                                                                                  | SH M12x35        | ZNHT 053...<br> |
| <b>125FF-10-40R-Z053</b>     | 10         | 6+6                                                                               | 125            | 40     | 70   | 50  | 24.5 | B              | 1.4                                                                                  | -                |                                                                                                    |
| <b>160FF-10-40R-Z053</b>     | 10         | 8+8                                                                               | 160            | 40     | 70   | 50  | 42.0 | B              | 1.7                                                                                  | -                |                                                                                                    |

## Spare parts

| Designation     | Screw         |       |       | Designation     | Wrench      |       |       |
|-----------------|---------------|-------|-------|-----------------|-------------|-------|-------|
|                 |               |       |       |                 |             |       |       |
| <b>TSM-Z018</b> | TS 25B024I/HG | TD 7P | L-T7P | <b>TSM-Z038</b> | TS 40K0535I | T-T15 | L-T15 |
| <b>TSM-Z023</b> | TS 25B031I/HG | TD 7P | L-T7P | <b>TSM-Z043</b> | TS 40K065I  | T-T15 | L-T15 |
| <b>TSM-Z028</b> | TS 25B042I/HG | TD 7P | L-T7P | <b>TSM-Z048</b> | TS 40K075I  | T-T15 | L-T15 |
| <b>TSM-Z033</b> | TS 25B053I/HG | TD 7P | L-T7P | <b>TSM-Z053</b> | TS 40K085I  | T-T15 | L-T15 |



## Slotting cutters: Fixed pocket flange type

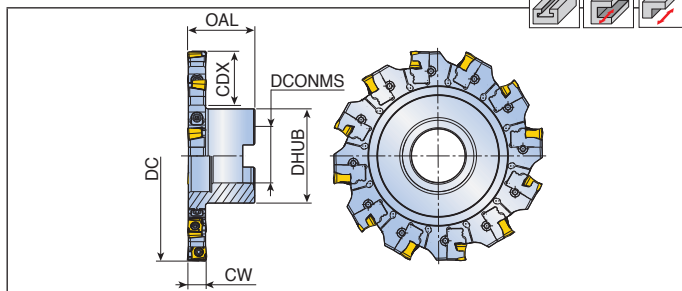


| Designation                  | CW<br>(mm) |  | Dimension (mm) |        |      |     |     | Arbor<br>style |  Kg | Mounting<br>bolt | Insert                                                                                                |
|------------------------------|------------|-----------------------------------------------------------------------------------|----------------|--------|------|-----|-----|----------------|--------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------------------------|
|                              |            |                                                                                   | DC             | DCONMS | DHUB | OAL | CDX |                |                                                                                      |                  |                                                                                                       |
| <b>TSM 063FF-10-22R-ZN08</b> | 10.0       | 3+3                                                                               | 63             | 22     | 40   | 50  | 15  | A              | 0.4                                                                                  | SH M10x35        |  ZNHU 080...<br>E319 |
| <b>080FF-10-22R-ZN08</b>     | 10.0       | 4+4                                                                               | 80             | 22     | 40   | 50  | 24  | A              | 0.5                                                                                  | SH M10x35        |                                                                                                       |
| <b>100FF-10-27R-ZN08</b>     | 10.0       | 5+5                                                                               | 100            | 27     | 48   | 50  | 26  | A              | 0.8                                                                                  | SH M12x35        |                                                                                                       |
| <b>125FF-10-32R-ZN08</b>     | 10.0       | 6+6                                                                               | 125            | 32     | 58   | 50  | 34  | B              | 1.1                                                                                  | -                |                                                                                                       |
| <b>063FF-12-22R-ZN08</b>     | 12.0       | 3+3                                                                               | 63             | 22     | 40   | 50  | 15  | A              | 0.4                                                                                  | SH M10x35        |                                                                                                       |
| <b>080FF-12-22R-ZN08</b>     | 12.0       | 4+4                                                                               | 80             | 22     | 40   | 50  | 24  | A              | 0.5                                                                                  | SH M10x35        |                                                                                                       |
| <b>100FF-12-27R-ZN08</b>     | 12.0       | 5+5                                                                               | 100            | 27     | 48   | 50  | 26  | A              | 0.9                                                                                  | SH M12x35        |                                                                                                       |
| <b>125FF-12-32R-ZN08</b>     | 12.0       | 6+6                                                                               | 125            | 32     | 58   | 50  | 34  | B              | 1.2                                                                                  | -                |                                                                                                       |
| <b>TSM 063FF-14-22R-ZN11</b> | 14.0       | 3+3                                                                               | 63             | 22     | 40   | 50  | 15  | A              | 0.4                                                                                  | SH M10x35        |  ZNHU 110...<br>E319 |
| <b>080FF-14-22R-ZN11</b>     | 14.0       | 4+4                                                                               | 80             | 22     | 40   | 50  | 24  | A              | 0.5                                                                                  | SH M10x35        |                                                                                                       |
| <b>100FF-14-27R-ZN11</b>     | 14.0       | 5+5                                                                               | 100            | 27     | 48   | 50  | 26  | A              | 1.0                                                                                  | SH M12x35        |                                                                                                       |
| <b>125FF-14-32R-ZN11</b>     | 14.0       | 6+6                                                                               | 125            | 32     | 58   | 50  | 34  | B              | 1.3                                                                                  | -                |                                                                                                       |
| <b>160FF-14-40R-ZN11</b>     | 14.0       | 6+6                                                                               | 160            | 40     | 70   | 50  | 43  | B              | 2.5                                                                                  | -                |                                                                                                       |
| <b>080FF-17-22R-ZN11</b>     | 17.0       | 4+4                                                                               | 80             | 22     | 40   | 50  | 24  | A              | 0.6                                                                                  | SH M10x35        |                                                                                                       |
| <b>100FF-17-27R-ZN11</b>     | 17.0       | 5+5                                                                               | 100            | 27     | 48   | 50  | 26  | A              | 1.0                                                                                  | SH M12x35        |                                                                                                       |
| <b>125FF-17-32R-ZN11</b>     | 17.0       | 6+6                                                                               | 125            | 32     | 58   | 50  | 34  | B              | 1.5                                                                                  | -                |                                                                                                       |
| <b>080FF-20-22R-ZN11</b>     | 20.0       | 4+4                                                                               | 80             | 22     | 40   | 50  | 24  | A              | 0.7                                                                                  | SH M10x35        |                                                                                                       |
| <b>100FF-20-27R-ZN11</b>     | 20.0       | 5+5                                                                               | 100            | 27     | 48   | 50  | 26  | A              | 1.1                                                                                  | SH M12x35        |                                                                                                       |
| <b>125FF-20-32R-ZN11</b>     | 20.0       | 6+6                                                                               | 125            | 32     | 58   | 50  | 34  | B              | 1.6                                                                                  | -                |                                                                                                       |
|                              |            |                                                                                   |                |        |      |     |     |                |                                                                                      |                  |                                                                                                       |

## Spare parts

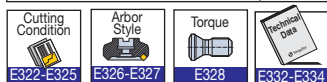
| Designation        | Screw        | Wrench |       |  |  |
|--------------------|--------------|--------|-------|--|--|
|                    |              |        |       |  |  |
| <b>TSM FF-ZN08</b> | TS 30085I/HG | TD 9   | -     |  |  |
| <b>TSM FF-ZN11</b> | TS 40120I/HG | -      | T-T15 |  |  |
|                    |              |        |       |  |  |
|                    |              |        |       |  |  |

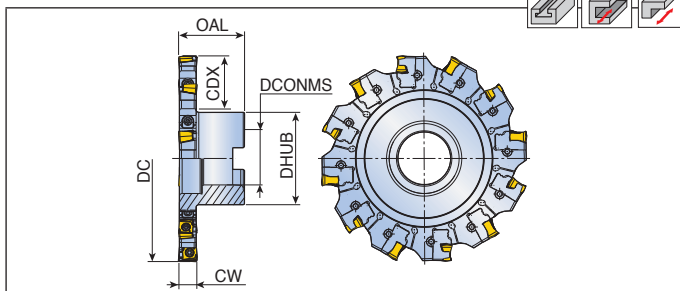


[illegible]

## Spare parts

|                        |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Designation            | Right cartridge                                                                     | Left cartridge                                                                      | Wedge                                                                               | Adjust screw                                                                        | Insert screw                                                                        |
|                        |  |  |  |  |  |
| <b>TSM FF-S/W-ZN08</b> | TCT-SR-ZN08<br>TCT-WR-ZN08                                                          | TCT-SL-ZN08<br>TCT-WL-ZN08                                                          | WFZ 5                                                                               | SA M8-6.0                                                                           | TS 30085I/HG                                                                        |
|                        | Wedge screw                                                                         | Wrench                                                                              | L-Wrench                                                                            | Wedge Wrench                                                                        |                                                                                     |
|                        |  |  |  |  |                                                                                     |
|                        | WS 5                                                                                | TD 9                                                                                | L-W 3                                                                               | F-W 2.5                                                                             |                                                                                     |



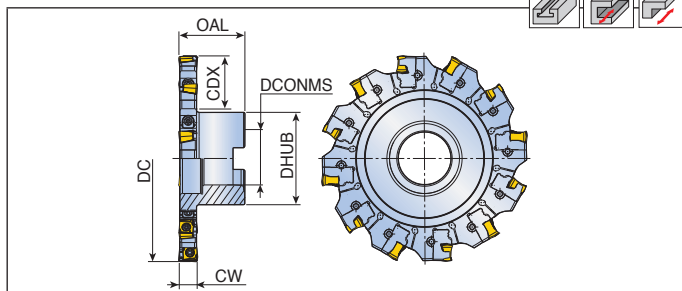
[illegible]

## Spare parts

| Designation            | Right cartridge                                                                     | Left cartridge                                                                      | Wedge                                                                               | Adjust screw                                                                        | Insert screw                                                                        |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                        |  |  |  |  |  |
| <b>TSM FD-S/W-ZN11</b> | TCT-SR-ZN11<br>TCT-WR-ZN11                                                          | TCT-SL-ZN11<br>TCT-WL-ZN11                                                          | WFZ 6                                                                               | SA M8-9.0                                                                           | TS 40120I/HG                                                                        |
|                        | Wedge screw                                                                         | Wrench                                                                              | L-Wrench                                                                            | Wedge Wrench                                                                        |                                                                                     |
|                        |  |  |  |  |                                                                                     |
|                        | WS 6                                                                                | T-T15                                                                               | L-W 4                                                                               | T-W 3                                                                               |                                                                                     |



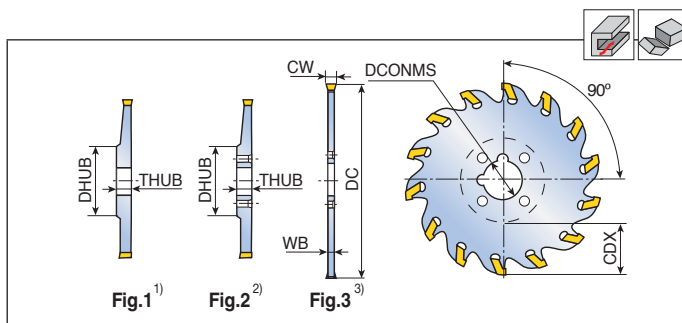
**TOP SLOT**

[illegible]

## Spare parts

| Designation            | Right cartridge                                                                     | Left cartridge                                                                      | Wedge                                                                               | Adjust screw                                                                        | Insert screw                                                                        |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                        |  |  |  |  |  |
| <b>TSM FD-S/W-ZN14</b> | TCT-SR-ZN14                                                                         | TCT-SL-ZN14                                                                         | WFZ 6                                                                               | SA M8-9.0                                                                           | TS 40120I/HG                                                                        |
|                        | Wedge screw                                                                         | Wrench                                                                              | L-Wrench                                                                            | Wedge Wrench                                                                        |                                                                                     |
|                        |  |  |  |  |                                                                                     |
|                        | WS 6                                                                                | T-T15                                                                               | L-W 4                                                                               | T-W 3                                                                               |                                                                                     |





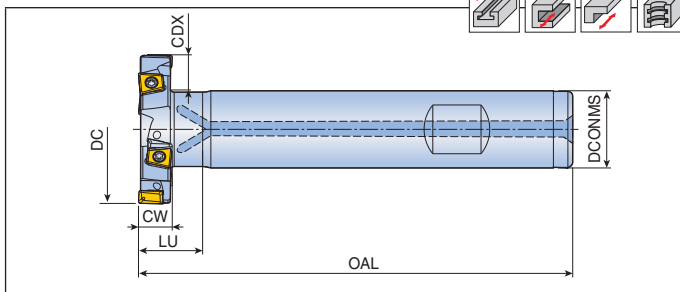
| Designation           | CW<br>(mm) |  | Dimension (mm) |        |      |      |      |     | Fig. | Insert seat<br>size | Insert                                                                                                              |
|-----------------------|------------|-----------------------------------------------------------------------------------|----------------|--------|------|------|------|-----|------|---------------------|---------------------------------------------------------------------------------------------------------------------|
|                       |            |                                                                                   | DC             | DCONMS | DHUB | WB   | THUB | CDX |      |                     |                                                                                                                     |
| <b>TSC 75 1.6 22A</b> | 1.6        | 8                                                                                 | 75             | 22.0   | 39   | 1.24 | 2.4  | 17  | 1    | 1                   | TIMC<br>TIMJ<br>TIPV<br> E310-E311 |
| <b>100 1.6 22A</b>    | 1.6        | 10                                                                                | 100            | 22.0   | 39   | 1.24 | 2.4  | 30  | 1    | 1                   |                                                                                                                     |
| <b>125 1.6 27A</b>    | 1.6        | 12                                                                                | 125            | 27.0   | 64   | 1.24 | 2.4  | 30  | 1    | 1                   |                                                                                                                     |
| <b>75 2 22A</b>       | 2.0-2.3    | 8                                                                                 | 75             | 22.0   | 39   | 1.6  | 2.4  | 17  | 1    | 2                   |                                                                                                                     |
| <b>100 2 22A</b>      | 2.0-2.3    | 10                                                                                | 100            | 22.0   | 39   | 1.6  | 2.4  | 30  | 1    | 2                   |                                                                                                                     |
| <b>125 2 27A</b>      | 2.0-2.3    | 12                                                                                | 125            | 27.0   | 64   | 1.6  | 2.4  | 30  | 1    | 2                   |                                                                                                                     |
| <b>100 2.4 22K</b>    | 2.3-2.5    | 10                                                                                | 100            | 22.0   | 46   | 1.9  | 2.4  | 26  | 2    | 2                   |                                                                                                                     |
| <b>125 2.4 32K</b>    | 2.3-2.5    | 12                                                                                | 125            | 32.0   | 55   | 1.9  | 2.4  | 34  | 2    | 2                   |                                                                                                                     |
| <b>160 2.4 32K</b>    | 2.3-2.5    | 16                                                                                | 160            | 32.0   | 55   | 1.9  | 2.4  | 52  | 2    | 2                   |                                                                                                                     |
| <b>100 3 22K</b>      | 2.8-3.58   | 6                                                                                 | 100            | 22.0   | -    | 2.4  | -    | 26  | 3    | 4                   |                                                                                                                     |
| <b>125 3 32K</b>      | 2.8-3.53   | 8                                                                                 | 125            | 32.0   | -    | 2.4  | -    | 34  | 3    | 4                   |                                                                                                                     |
| <b>160 3 40K</b>      | 2.8-3.53   | 10                                                                                | 160            | 40.0   | -    | 2.4  | -    | 39  | 3    | 4                   |                                                                                                                     |
| <b>100 4 22K</b>      | 3.54-4.52  | 6                                                                                 | 100            | 22.0   | -    | 3.2  | -    | 27  | 3    | 4                   |                                                                                                                     |
| <b>125 4 32K</b>      | 3.54-4.52  | 8                                                                                 | 125            | 32.0   | -    | 3.2  | -    | 34  | 3    | 4                   |                                                                                                                     |
| <b>160 4 40K</b>      | 3.54-4.52  | 10                                                                                | 160            | 40.0   | -    | 3.2  | -    | 39  | 3    | 4                   |                                                                                                                     |
|                       |            |                                                                                   |                |        |      |      |      |     |      |                     |                                                                                                                     |
|                       |            |                                                                                   |                |        |      |      |      |     |      |                     |                                                                                                                     |
|                       |            |                                                                                   |                |        |      |      |      |     |      |                     |                                                                                                                     |
|                       |            |                                                                                   |                |        |      |      |      |     |      |                     |                                                                                                                     |
|                       |            |                                                                                   |                |        |      |      |      |     |      |                     |                                                                                                                     |
|                       |            |                                                                                   |                |        |      |      |      |     |      |                     |                                                                                                                     |

- <sup>1)</sup> Arbor type, <sup>2)</sup> Drive shank, <sup>3)</sup> Drive flange+Drive shank
- Extractor(ESG 0.5 or ESG 1) supplied with each cutter
- Flange set and shank should be ordered separately

## Spare parts

| Designation        | Drive flange set                                                                    | Drive shank                                                                         |  |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                    |  |  |  |  |  |
| <b>TSC-2.4-22K</b> | -                                                                                   | TW32-40                                                                             |  |  |  |
| <b>TSC-2.4-32K</b> | -                                                                                   | T32-55                                                                              |  |  |  |
| <b>TSC-22K</b>     | TR22-46                                                                             | TW32-40                                                                             |  |  |  |
| <b>TSC-32K</b>     | TR32-55                                                                             | T32-55                                                                              |  |  |  |
| <b>TSC-40K</b>     | TR40-80                                                                             | T40-80                                                                              |  |  |  |



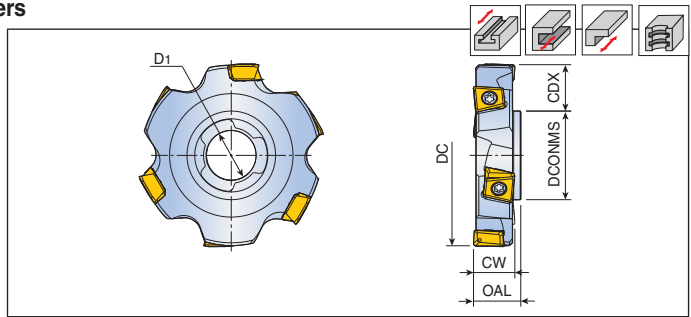
[illegible]

| Designation        | Screw                                                                               | Wrench                                                                              |  |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                    |  |  |  |  |  |
| <b>4T-TSM-W-05</b> | TS 18049/HG-P                                                                       | T 6P                                                                                |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |
|                    |                                                                                     |                                                                                     |  |  |  |





# MAXITANG

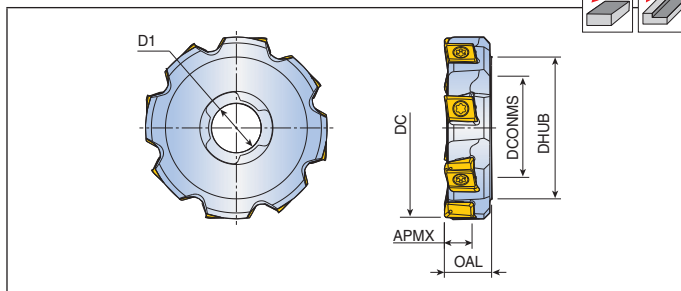


## Spare parts

| Designation   | Screw                                                                               | Wrench                                                                              |  |  |  |
|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|               |  |  |  |  |  |
| <b>4T-TSM</b> | TS 18049/HG-P                                                                       | T 6P                                                                                |  |  |  |
|               |                                                                                     |                                                                                     |  |  |  |
|               |                                                                                     |                                                                                     |  |  |  |
|               |                                                                                     |                                                                                     |  |  |  |
|               |                                                                                     |                                                                                     |  |  |  |

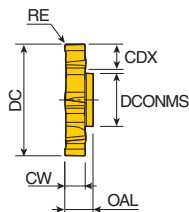
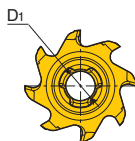


# MaxiTANG

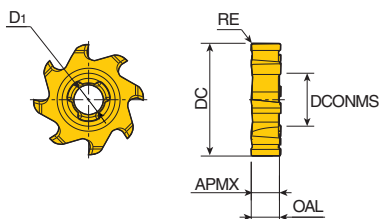
[illegible]

| Designation          | Screw                                                                               | Wrench                                                                              |  |  |  |
|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|
|                      |  |  |  |  |  |
| <b>4T-TE90-TR-05</b> | TS 18049/HG-P                                                                       | T 6P                                                                                |  |  |  |
|                      |                                                                                     |                                                                                     |  |  |  |
|                      |                                                                                     |                                                                                     |  |  |  |
|                      |                                                                                     |                                                                                     |  |  |  |

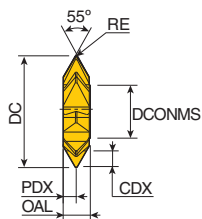
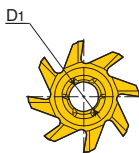


[illegible]

●: Standard items

[illegible]

●: Standard items

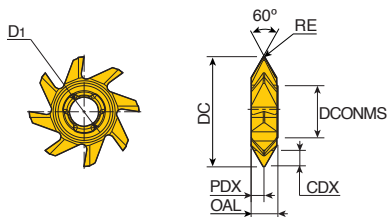


●: Standard items



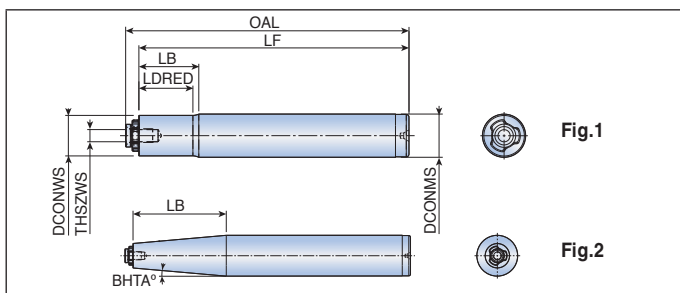
- ▶ TPI: Threads per inch
- ▶ ZEFP: Peripheral effective cutting edge count

**MAXISPEED**



|                                                                                                                 |                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <p>Arbor</p>  <p>E248-E250</p> | <p>Cutting Condition</p>  <p>E322-E325</p> |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|

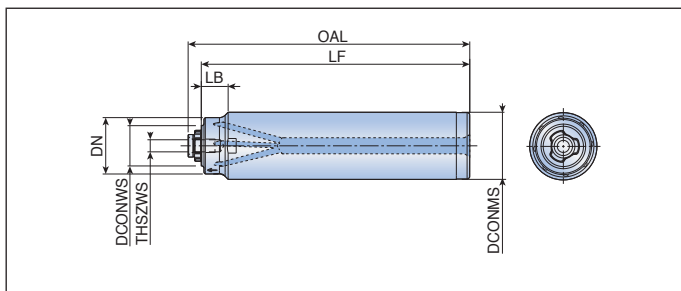
- : Standard items

[illegible]

## Spare parts

| Designation | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|-------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|             |  |  |  |  |  |
| <b>TR13</b> | TS 40T098/HG-P                                                                      | BLD IP15/S7                                                                         | SW6-T                                                                               |  |  |
| <b>TR15</b> | TS 50T110/HG-P                                                                      | BLD IP20/S7                                                                         | SW6-T                                                                               |  |  |
| <b>TR17</b> | SR M6x0.5-<br>SP1719-IP25-H                                                         | BLD IP25/S7                                                                         | SW6-T                                                                               |  |  |
|             |                                                                                     |                                                                                     |                                                                                     |  |  |

## Facing holders

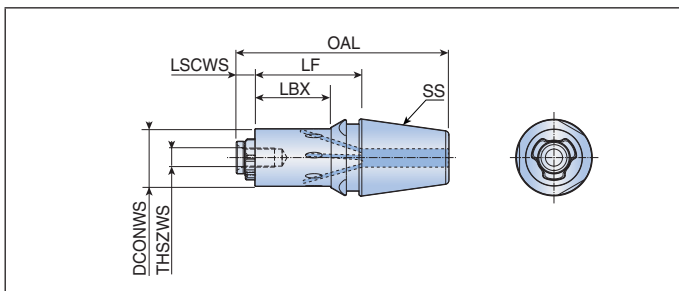
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## Spare parts

| Designation | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|-------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|             |  |  |  |  |  |
| <b>TR13</b> | TS 40T098/HG-P                                                                      | BLD IP15/S7                                                                         | SW6-T                                                                               |  |  |
| <b>TR15</b> | TS 50T110/HG-P                                                                      | BLD IP20/S7                                                                         | SW6-T                                                                               |  |  |
| <b>TR17</b> | SR M6x0.5-<br>SP1719-IP25-H                                                         | BLD IP20/S7                                                                         | SW6-T                                                                               |  |  |
|             |                                                                                     |                                                                                     |                                                                                     |  |  |



### ER Collet adapter



## Spare parts

| Designation | Screw                                                                               | Wrench                                                                              | Wrench handle                                                                       |  |  |
|-------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|
|             |  |  |  |  |  |
| <b>TR13</b> | TS 40T098/HG-P                                                                      | BLD IP15/S7                                                                         | SW6-T                                                                               |  |  |
| <b>TR15</b> | TS 50T110/HG-P                                                                      | BLD IP20/S7                                                                         | SW6-T                                                                               |  |  |
| <b>TR17</b> | SR M6x0.5-<br>SP1719-IP25-H                                                         | BLD IP25/S7                                                                         | SW6-T                                                                               |  |  |
|             |                                                                                     |                                                                                     |                                                                                     |  |  |

# Milling Inserts



# Insert Designation System



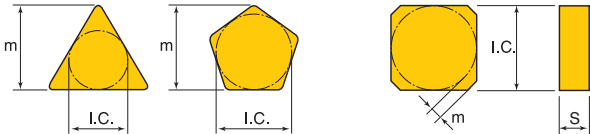
## 1 Shape

|   |   |   |   |   |   |   |   |   |   |   |         |
|---|---|---|---|---|---|---|---|---|---|---|---------|
|   |   |   |   |   |   |   |   |   |   |   | Special |
| A | B | C | H | L | O | P | R | S | T | W | X       |

## 2 Clearance angle

|    |    |     |     |     |     |    |     |
|----|----|-----|-----|-----|-----|----|-----|
|    |    |     |     |     |     |    |     |
| B  | C  | D   | E   | F   | G   | N  | P   |
| 5° | 7° | 15° | 20° | 25° | 30° | 0° | 11° |

## 3 Tolerance



| Class | Tolerance (mm) |        |        | I.C. Dimension (mm) |      |       |       |       |       |
|-------|----------------|--------|--------|---------------------|------|-------|-------|-------|-------|
|       | m              | S      | I.C.   | 6.35                | 9.52 | 12.70 | 15.87 | 19.05 | 25.40 |
| A     | ±0.005         | ±0.025 | ±0.025 | •                   | •    | •     | •     | •     | •     |
| E     | ±0.025         | ±0.025 | ±0.025 | •                   | •    | •     | •     | •     | •     |
| F     | ±0.005         | ±0.025 | ±0.013 | •                   | •    | •     | •     | •     | •     |
| G     | ±0.025         | ±0.130 | ±0.025 | •                   | •    | •     | •     | •     | •     |
| H     | ±0.013         | ±0.025 | ±0.013 | •                   | •    | •     | •     | •     | •     |
| K     | ±0.013         | ±0.025 | ±0.05  | •                   | •    |       |       |       |       |
|       |                |        | ±0.08  |                     |      | •     |       |       |       |
|       |                |        | ±0.10  |                     |      |       | •     | •     |       |
|       |                |        | ±0.13  |                     |      |       |       |       | •     |
| M     | ±0.08          | ±0.130 | ±0.05  | •                   | •    |       |       |       |       |
|       | ±0.13          |        | ±0.08  |                     |      | •     |       |       |       |
|       | ±0.15          |        | ±0.10  |                     |      |       | •     | •     |       |
|       | ±0.18          |        | ±0.13  |                     |      |       |       |       | •     |

## 4 Chipformer and clamp type

|   |   |   |   |   |   |   |   |         |
|---|---|---|---|---|---|---|---|---------|
|   |   |   |   |   |   |   |   | Special |
| A | F | G | M | N | R | T | W | X       |

# Insert Designation System



5 Cutting edge length(mm)

6 Thickness(mm)

7 Corner radius(mm)

| I.C(mm) | C  | R,S | T  | H  | O  |
|---------|----|-----|----|----|----|
| 5.56    |    |     |    |    |    |
| 6.35    | 06 | 06  | 11 |    |    |
| 7.94    | 08 |     | 13 |    |    |
| 9.52    | 09 | 09  | 16 |    |    |
| 12.70   | 12 | 12  | 22 | 05 | 05 |
| 15.87   | 16 | 15  | 27 | 09 |    |
| 25.40   | 25 | 25  |    |    |    |

|    |      |
|----|------|
|    | S    |
|    | S    |
| 01 | 1.59 |
| 02 | 2.38 |
| 03 | 3.18 |
| T3 | 3.97 |
| 04 | 4.76 |
| 05 | 5.56 |
| 06 | 6.35 |
| 07 | 7.94 |
| 09 | 9.52 |

|     |     |
|-----|-----|
|     | RE  |
| 02R | 0.2 |
| 04R | 0.4 |
| 05R | 0.5 |
| 08R | 0.8 |
| 10R | 1.0 |
| 12R | 1.2 |
| 15R | 1.5 |
| 16R | 1.6 |
| 24R | 2.4 |
| 32R | 3.2 |
| 40R | 4.0 |

7 Parallel land

8 Edge condition

9 Hand of tool

10 Manufacturer's option

A=45° D=60°

E=75° F=85°

P=90° Z=Special

Entering angle

B= 5° F=25°

C= 7° G=30°

D=15° N= 0°

E=20° P=11°

Z=Special

Clearance angle of wiper

|   |  |
|---|--|
| F |  |
| E |  |
| T |  |
| S |  |

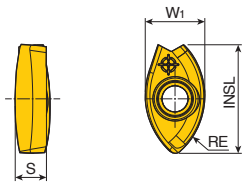
R

L

N

|     |              |
|-----|--------------|
| AL  | Aluminum     |
| WC  | Wiper crown  |
| MR  | Medium rough |
| M   | Medium       |
| L   | Light        |
| ML  | Medium light |
| E□□ | Economical   |

Inserts



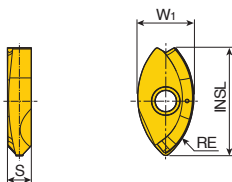
| Size | Dimension (mm) |      |     |      |      |  |
|------|----------------|------|-----|------|------|--|
|      | INSL           | W1   | S   | APMX | RE   |  |
| 160  | 12.4           | 6.8  | 3.7 | 8.0  | 8.0  |  |
| 200  | 14.9           | 8.2  | 4.8 | 10.0 | 10.0 |  |
| 250  | 18.9           | 10.2 | 5.9 | 12.5 | 12.5 |  |
| 300  | 22.1           | 11.8 | 6.8 | 15.0 | 15.0 |  |
| 320  | 23.9           | 12.8 | 7.5 | 16.0 | 16.0 |  |
|      |                |      |     |      |      |  |
|      |                |      |     |      |      |  |



| Insert                                                                           | Designation | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|----------------------------------------------------------------------------------|-------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                  |             | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510   | K10 |  |
|  | 2FB 160-M   | 2.0-6.5                          | 0.30-0.07       | ●      |        | ●      | ●      | ●      |        |        |        | ●        |     |  |
|                                                                                  | 200-M       | 3.0-8.0                          | 0.35-0.08       | ●      |        | ●      | ●      | ●      |        |        |        | ●        |     |  |
|                                                                                  | 250-M       | 3.5-10.0                         | 0.35-0.08       | ●      |        | ●      | ●      |        |        |        |        | ●        |     |  |
|                                                                                  | 300-M       | 4.0-12.5                         | 0.40-0.08       | ●      |        | ●      | ●      |        |        |        |        | ●        |     |  |
|                                                                                  | 320-M       | 4.5-13.0                         | 0.40-0.08       | ●      |        | ●      | ●      |        |        |        |        | ●        |     |  |
|  | 2FB 160-ML  | 2.0-6.5                          | 0.28-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                  | 200-ML      | 3.0-8.0                          | 0.32-0.07       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                  | 250-ML      | 3.5-10.0                         | 0.32-0.07       | ●      |        | ●      |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

●: Standard items





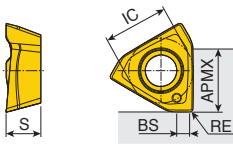
| Size          | Dimension (mm) |      |     |      |    |  |
|---------------|----------------|------|-----|------|----|--|
|               | INSL           | W1   | S   | APMX | RE |  |
| <b>320C-M</b> | 23             | 12.0 | 5.2 | 16   | 16 |  |
| <b>500C-M</b> | 36             | 18.6 | 7.0 | 25   | 25 |  |
| <b>320P-M</b> | 21             | 9.9  | 5.2 | 16   | 16 |  |
| <b>500P-M</b> | 32.9           | 15.3 | 7.0 | 25   | 25 |  |
|               |                |      |     |      |    |  |
|               |                |      |     |      |    |  |

[illegible]

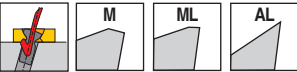
- : Standard items



Inserts



| Size | Dimension (mm) |     |      |         |         |  |
|------|----------------|-----|------|---------|---------|--|
|      | IC             | S   | APMX | BS      | RE      |  |
| 04   | 3.9            | 2.1 | 3.5  | 0.5-0.7 | 0.2-0.4 |  |
| 06   | 5.3            | 2.8 | 4.7  | 0.6-1.2 | 0.2-0.8 |  |
| 10   | 6.9            | 4.0 | 7.0  | 0.5-1.3 | 0.4-1.6 |  |
| 15   | 10.7           | 5.0 | 11.0 | 0.5-2.0 | 0.4-2.4 |  |
| 19   | 13.5           | 6.0 | 15.0 | 0.5-2.4 | 0.4-3.2 |  |
|      |                |     |      |         |         |  |
|      |                |     |      |         |         |  |

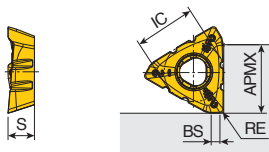


| Insert                                                                             | Designation | Recommended machining conditions |                 | Cermet    |   | Coated |        |        |        |        |        |        |        |        |        | Uncoated |     |   |   |
|------------------------------------------------------------------------------------|-------------|----------------------------------|-----------------|-----------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|---|---|
|                                                                                    |             | ap (mm)                          | Feed (mm/tooth) | CT7000    |   | TT9080 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT3535 | TT3520 | TT2510 | TTA101   | K10 |   |   |
|    | 3PKT        | 040202R-M                        | 0.5-3.0         | 0.08-0.04 |   |        | •      | •      |        |        |        |        |        |        |        |          |     |   |   |
|                                                                                    |             | 040204R-M                        | 0.5-3.0         | 0.08-0.04 |   |        | •      | •      |        |        |        |        |        |        |        |          |     |   |   |
|                                                                                    |             | 060302R-M                        | 1.0-4.0         | 0.10-0.04 |   |        | •      | •      | •      |        |        |        |        |        |        | •        |     |   |   |
|                                                                                    |             | 060304R-M                        | 1.0-4.0         | 0.10-0.04 |   |        | •      | •      | •      |        |        |        | •      |        |        | •        |     |   |   |
|                                                                                    |             | 060308R-M                        | 1.0-4.0         | 0.10-0.04 |   |        | •      | •      | •      |        |        |        | •      |        |        | •        |     |   |   |
|                                                                                    |             | 100404R-M                        | 2.0-6.0         | 0.12-0.05 |   |        | •      | •      | •      | •      | •      | •      |        |        |        | •        |     |   |   |
|                                                                                    |             | 100408R-M                        | 2.0-6.0         | 0.12-0.05 |   |        | •      | •      | •      | •      | •      | •      |        |        |        | •        |     |   |   |
|                                                                                    |             | 100416R-M                        | 2.0-6.0         | 0.12-0.05 |   |        | •      |        |        | •      |        |        |        |        |        | •        |     |   |   |
|                                                                                    |             | 150508R-M                        | 3.0-9.0         | 0.17-0.07 |   |        | •      | •      | •      | •      | •      | •      |        |        |        | •        |     |   |   |
|                                                                                    |             | 150516R-M                        | 3.0-9.0         | 0.17-0.07 |   |        | •      | •      |        |        | •      |        |        |        |        | •        |     |   |   |
|                                                                                    |             | 150524R-M                        | 3.0-9.0         | 0.17-0.07 |   |        | •      |        |        |        |        |        |        |        |        | •        |     |   |   |
|                                                                                    |             | 190608R-M                        | 4.5-12.0        | 0.22-0.09 |   |        | •      | •      | •      | •      | •      | •      | •      |        |        | •        |     |   |   |
|                                                                                    |             | 190616R-M                        | 4.5-12.0        | 0.22-0.09 |   |        | •      | •      | •      |        | •      |        |        |        |        | •        |     |   |   |
|                                                                                    |             | 190624R-M                        | 4.5-12.0        | 0.22-0.09 |   |        | •      |        |        |        |        |        |        |        |        | •        |     |   |   |
|                                                                                    | 190632R-M   | 4.5-12.0                         | 0.22-0.09       |           |   | •      |        |        |        |        |        |        |        |        | •      |          |     |   |   |
| 3PHT                                                                               | 100404R-M   | 2.0-6.0                          | 0.12-0.05       | •         |   | •      |        |        |        |        |        |        |        |        |        |          |     |   |   |
|                                                                                    | 100408R-M   | 2.0-6.0                          | 0.12-0.05       | •         |   | •      |        |        |        |        |        |        |        |        |        |          |     |   |   |
|                                                                                    | 150504R-M   | 3.0-9.0                          | 0.17-0.07       |           |   | •      |        |        |        |        |        |        |        |        |        |          |     |   |   |
|                                                                                    | 150508R-M   | 3.0-9.0                          | 0.17-0.07       | •         |   | •      |        |        |        |        |        | •      |        |        |        |          |     |   |   |
|                                                                                    | 150516R-M   | 3.0-9.0                          | 0.17-0.07       | •         |   | •      |        |        |        |        |        |        |        |        |        |          |     |   |   |
|                                                                                    | 190608R-M   | 4.5-12.0                         | 0.22-0.09       | •         |   | •      |        |        |        |        |        |        |        |        |        |          |     |   |   |
|  | 3PKT        | 100404R-ML                       | 2.0-6.0         | 0.10-0.04 |   |        | •      | •      | •      |        |        | •      | •      |        |        |          |     |   |   |
|                                                                                    |             | 100408R-ML                       | 2.0-6.0         | 0.10-0.04 |   |        | •      | •      | •      |        |        |        | •      |        |        |          |     |   |   |
|                                                                                    |             | 150508R-ML                       | 3.0-9.0         | 0.12-0.05 |   |        | •      | •      | •      |        |        | •      | •      | •      |        |          |     |   |   |
|                                                                                    |             | 150524R-ML                       | 3.0-9.0         | 0.12-0.05 |   |        |        | •      |        |        |        |        |        |        |        |          |     |   |   |
|                                                                                    |             | 190608R-ML                       | 4.5-12.0        | 0.14-0.06 |   |        | •      | •      | •      |        |        | •      |        |        |        |          |     |   |   |
|                                                                                    | 3PHT        | 100408R-ML                       | 2.0-6.0         | 0.10-0.04 |   |        | •      | •      |        |        |        |        |        |        |        |          |     |   |   |
| 150508R-ML                                                                         | 3.0-9.0     | 0.12-0.05                        |                 |           | • | •      |        |        |        |        |        |        |        |        |        |          |     |   |   |
|  | 3PHT        | 060304R-AL                       | 1.0-4.0         | 0.22-0.07 |   |        |        |        |        |        |        |        |        |        |        | •        | •   |   |   |
|                                                                                    |             | 100404R-AL                       | 2.0-6.0         | 0.40-0.10 |   |        |        |        |        |        |        |        |        |        |        |          | •   | • |   |
|                                                                                    |             | 100408R-AL                       | 2.0-6.0         | 0.40-0.10 |   |        |        |        |        |        |        |        |        |        |        |          |     | • | • |
|                                                                                    |             | 150504R-AL                       | 3.0-9.0         | 0.50-0.10 |   |        |        |        |        |        |        |        |        |        |        |          |     | • | • |
|                                                                                    |             | 150508R-AL                       | 3.0-9.0         | 0.50-0.10 |   |        |        |        |        |        |        |        |        |        |        |          |     | • | • |
|                                                                                    |             | 190604R-AL                       | 4.5-12.0        | 0.50-0.15 |   |        |        |        |        |        |        |        |        |        |        |          |     | • | • |
|                                                                                    |             | 190608R-AL                       | 4.5-12.0        | 0.50-0.15 |   |        |        |        |        |        |        |        |        |        |        |          |     | • | • |

•: Standard items



## Splitter Inserts



| Size      | Dimension (mm) |     |      |     |     |  |
|-----------|----------------|-----|------|-----|-----|--|
|           | IC             | S   | APMX | BS  | RE  |  |
| <b>15</b> | 10.7           | 5.0 | 11.0 | 1.6 | 0.8 |  |
| <b>19</b> | 13.5           | 6.0 | 15.0 | 2.0 | 0.8 |  |
|           |                |     |      |     |     |  |
|           |                |     |      |     |     |  |
|           |                |     |      |     |     |  |
|           |                |     |      |     |     |  |

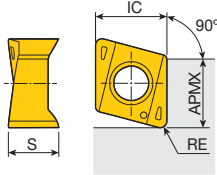
[illegible]

●: Standard items

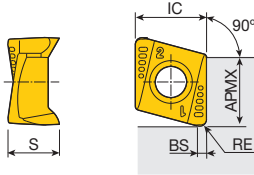




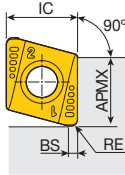
## Inserts



4NKT M/ML

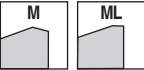


PNR-M



4NHT ML

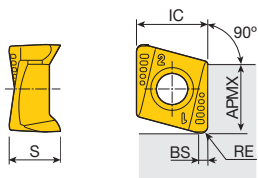
| Size | Dimension (mm) |         |           |         |         |  |
|------|----------------|---------|-----------|---------|---------|--|
|      | IC             | S       | APMX      | BS      | RE      |  |
| 04   | 4.0            | 3.1     | 3.5       | -       | 0.2-0.8 |  |
| 06   | 6.6            | 4.2-5.0 | 5.6-6.2   | 0.6-1.0 | 0.4-2.0 |  |
| 09   | 8.6            | 5.7-6.3 | 8.0       | 0.8-1.2 | 0.4-2.0 |  |
| 11   | 10.7           | 8.1     | 9.9-10.5  | 1.0     | 0.8-2.4 |  |
| 14   | 14.0           | 9.2-9.4 | 13.5-13.8 | 1.25    | 0.8     |  |



| Insert                                                                              | Designation       | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|-------------------------------------------------------------------------------------|-------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                     |                   | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT3535 | TT2510   | K10 |  |
|    | 4NKT 040202R-M    | 0.5-3.0                          | 0.08-0.04       | ●      | ●      |        |        |        |        |        |        |          |     |  |
|                                                                                     | 040204R-M         | 1.0-3.0                          | 0.12-0.06       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 040208R-M         | 1.0-3.0                          | 0.12-0.06       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 060304R-M         | 0.5-5.0                          | 0.15-0.07       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 060308R-M         | 1.0-5.0                          | 0.15-0.07       | ●      | ●      |        | ●      |        |        | ●      |        | ●        |     |  |
|                                                                                     | 060312R-M         | 1.0-5.0                          | 0.15-0.07       | ●      | ●      |        |        |        |        | ●      |        | ●        |     |  |
|                                                                                     | 060316R-M         | 2.0-4.5                          | 0.15-0.07       | ●      | ●      |        |        |        |        | ●      |        | ●        |     |  |
|                                                                                     | 060320R-M         | 2.0-4.5                          | 0.15-0.07       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 090404R-M         | 2.5-7.0                          | 0.15-0.07       | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                     | 090408R-M         | 2.5-7.0                          | 0.15-0.07       | ●      | ●      |        | ●      |        | ●      | ●      |        | ●        |     |  |
|                                                                                     | 090416R-M         | 2.5-7.0                          | 0.15-0.07       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 090420R-M         | 2.5-7.0                          | 0.15-0.07       | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                     | 110608R-M         | 3.5-10.0                         | 0.18-0.09       | ●      | ●      |        | ●      |        |        | ●      |        |          |     |  |
|                                                                                     | 110616R-M         | 2.5-9.5                          | 0.18-0.09       | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                     | 110624R-M         | 2.5-9.5                          | 0.18-0.09       | ●      |        |        |        |        |        |        |        |          |     |  |
| 140708R-M                                                                           | 4.0-12.0          | 0.18-0.09                        | ●               | ●      |        | ●      | ●      |        | ●      |        |        |          |     |  |
|   | 4NKT 110608 PNR-M | 3.5-10.0                         | 0.18-0.09       | ●      | ●      |        | ●      |        |        |        |        |          |     |  |
|                                                                                     | 140708 PNR-M      | 4.0-12.0                         | 0.18-0.09       | ●      | ●      |        | ●      |        |        |        |        |          |     |  |
|                                                                                     |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|  | 4NKT 060304R-ML   | 0.5-5.0                          | 0.12-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 060308R-ML        | 1.0-5.0                          | 0.12-0.05       | ●      | ●      |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                     | 060312R-ML        | 1.0-5.0                          | 0.12-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 060316R-ML        | 2.0-4.5                          | 0.12-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 060320R-ML        | 2.0-4.5                          | 0.12-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 090408R-ML        | 2.5-7.0                          | 0.10-0.05       | ●      | ●      |        |        |        |        |        |        |          |     |  |
|                                                                                     |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|  | 4NHT 060304R-ML   | 0.5-5.0                          | 0.13-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                     | 060308R-ML        | 1.0-5.0                          | 0.13-0.05       | ●      | ●      |        |        |        |        | ●      |        | ●        |     |  |
|                                                                                     | 090404R-ML        | 2.5-7.0                          | 0.12-0.05       | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                     | 090408R-ML        | 2.5-7.0                          | 0.12-0.05       | ●      | ●      |        |        |        |        |        |        |          |     |  |
|                                                                                     |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                     |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                     |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

●: Standard items





| Size      | Dimension (mm) |         |      |         |         |  |
|-----------|----------------|---------|------|---------|---------|--|
|           | IC             | S       | APMX | BS      | RE      |  |
| <b>06</b> | 6.6            | 4.9     | 6.0  | 0.6-1.0 | 0.4-0.8 |  |
| <b>09</b> | 8.6            | 6.2-6.3 | 8.0  | 0.8-1.2 | 0.4-0.8 |  |
| <b>11</b> | 10.7           | 8.1     | 10.5 | 1.0     | 0.8     |  |
| <b>14</b> | 11.0           | 8.7-9.3 | 13.5 | 0-1.19  | 0.8-3.0 |  |
|           |                |         |      |         |         |  |

[illegible]

E58-E59



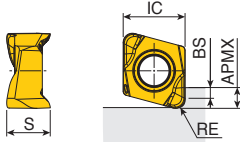
E144-E147

- : Standard items

# 4NHT-F



Inserts (Side wiper for side finishing)



| Size   | Dimension (mm) |     |      |     |     |  |
|--------|----------------|-----|------|-----|-----|--|
|        | IC             | S   | APMX | BS  | RE  |  |
| 04-05R | 4.0            | 3.1 | 2.2  | 1.7 | 0.5 |  |
| 04-10R | 4.0            | 3.0 | 2.0  | 1.0 | 1.0 |  |
| 06-05R | 6.6            | 4.9 | 2.3  | 1.8 | 0.5 |  |
| 06-10R | 6.6            | 4.7 | 2.1  | 1.1 | 1.0 |  |
| 06-15R | 6.6            | 4.5 | 3.3  | 1.8 | 1.5 |  |
| 06-20R | 6.6            | 4.3 | 3.0  | 1.1 | 2.0 |  |



| Insert                                                                           | Designation           | Recommended machining conditions |                    | Coated |        |        |        |        |        |        |        | Uncoated |  |     |  |
|----------------------------------------------------------------------------------|-----------------------|----------------------------------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|-----|--|
|                                                                                  |                       | ap<br>(mm)                       | Feed<br>(mm/tooth) | TT9080 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 |          |  | K10 |  |
|  | <b>4NHT 040205R-F</b> | 0.2-2.0                          | 0.30-0.07          |        |        |        |        |        |        |        | ●      |          |  |     |  |
|                                                                                  | <b>040210R-F</b>      | 0.2-1.8                          | 0.30-0.07          |        |        |        |        |        |        |        | ●      |          |  |     |  |
|                                                                                  | <b>060305R-F</b>      | 0.2-2.0                          | 0.30-0.07          | ●      |        |        |        |        |        |        | ●      |          |  |     |  |
|                                                                                  | <b>060310R-F</b>      | 0.2-1.8                          | 0.30-0.07          | ●      |        |        |        |        |        |        | ●      |          |  |     |  |
|                                                                                  | <b>060315R-F</b>      | 0.2-3.0                          | 0.30-0.07          | ●      |        |        |        |        |        |        | ●      |          |  |     |  |
|                                                                                  | <b>060320R-F</b>      | 0.2-2.7                          | 0.30-0.07          | ●      |        |        |        |        |        |        | ●      |          |  |     |  |

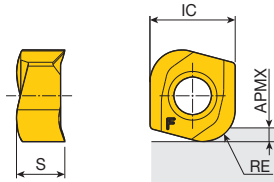
●: Standard items



# 4NKT-HF



High feed inserts



| Size  | Dimension (mm) |      |      |     |  |  |  |
|-------|----------------|------|------|-----|--|--|--|
|       | IC             | S    | APMX | RE  |  |  |  |
| 04-HF | 4.0            | 2.65 | 0.5  | 1.2 |  |  |  |
| 06-HF | 6.6            | 3.85 | 1.0  | 2.0 |  |  |  |
| 09-HF | 8.6            | 4.76 | 1.5  | 3.2 |  |  |  |
| 11-HF | 10.7           | 6.56 | 2.0  | 4.0 |  |  |  |
| 14-HF | 14.0           | 7.34 | 3.0  | 5.0 |  |  |  |

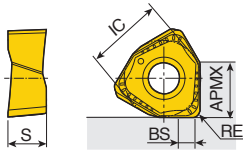
| Insert | Designation     | Recommended machining conditions |                 | Coated |        |        |        |        |        |        | Uncoated |  |
|--------|-----------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                 | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT8080 | TT8625 | TT7515 | TT7080 | TT6080 | TT2510 | K10      |  |
|        | 4NKT 040212R-HF | 0.2-0.4                          | 0.60-0.10       | ●      |        |        |        |        | ●      |        |          |  |
|        | 060320R-HF      | 0.2-0.6                          | 0.80-0.20       | ●      | ●      | ●      |        |        | ●      |        |          |  |
|        | 090432R-HF      | 0.3-0.8                          | 1.00-0.20       | ●      |        | ●      |        |        | ●      |        |          |  |
|        | 110640R-HF      | 0.3-1.2                          | 1.20-0.30       | ●      |        | ●      |        |        |        |        |          |  |
|        | 140750R-HF      | 0.3-1.5                          | 1.50-0.30       | ●      |        | ●      |        |        |        |        |          |  |

●: Standard items





Inserts



| Size | Dimension (mm) |      |      |        |         |  |
|------|----------------|------|------|--------|---------|--|
|      | IC             | S    | APMX | BS     | RE      |  |
| 06   | 9.26           | 4.76 | 6.2  | 12-2.4 | 0.4-1.6 |  |
| 09   | 13.05          | 6.70 | 9.2  | 12-2.2 | 0.4-1.6 |  |
|      |                |      |      |        |         |  |
|      |                |      |      |        |         |  |
|      |                |      |      |        |         |  |
|      |                |      |      |        |         |  |



| Insert                                                                            | Designation |            | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|-----------------------------------------------------------------------------------|-------------|------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                   |             |            | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT3535 | TT2510   | K10 |  |
|   | 6NGU        | 060404R-M  | 1.5-5.0                          | 0.15-0.08       | ●      | ●      |        |        | ●      |        | ●      |        | ●        |     |  |
|                                                                                   |             | 060405R-M  | 1.5-5.0                          | 0.15-0.08       | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             | 060408R-M  | 1.5-5.0                          | 0.15-0.08       | ●      | ●      | ●      | ●      | ●      |        | ●      |        | ●        |     |  |
|                                                                                   |             | 060410R-M  | 1.5-5.0                          | 0.15-0.08       | ●      |        |        |        |        |        | ●      |        |          |     |  |
|                                                                                   |             | 060416R-M  | 1.5-5.0                          | 0.15-0.08       | ●      | ●      |        |        | ●      |        | ●      |        |          |     |  |
|                                                                                   |             | 090504R-M  | 2.5-7.5                          | 0.20-0.10       | ●      | ●      |        |        | ●      |        | ●      |        | ●        |     |  |
|                                                                                   |             | 090508R-M  | 2.5-7.5                          | 0.20-0.10       | ●      | ●      | ●      | ●      | ●      | ●      | ●      |        | ●        |     |  |
|                                                                                   |             | 090516R-M  | 2.5-7.5                          | 0.20-0.10       | ●      | ●      |        | ●      | ●      | ●      | ●      |        |          |     |  |
|   | 6NGU        | 060404R-ML | 1.5-5.0                          | 0.10-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                   |             | 060405R-ML | 1.5-5.0                          | 0.10-0.05       | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             | 060408R-ML | 1.5-5.0                          | 0.10-0.05       | ●      | ●      | ●      |        | ●      |        | ●      | ●      |          |     |  |
|                                                                                   |             | 060416R-ML | 1.5-5.0                          | 0.10-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                   |             | 090504R-ML | 2.5-7.5                          | 0.10-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                   |             | 090508R-ML | 2.5-7.5                          | 0.10-0.05       | ●      | ●      | ●      |        | ●      |        | ●      |        |          |     |  |
|                                                                                   |             | 090516R-ML | 2.5-7.5                          | 0.10-0.05       | ●      | ●      |        |        |        |        | ●      |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|  | 6NGU        | 060404R-AL | 1.5-5.0                          | 0.40-0.10       |        |        |        |        |        |        |        |        |          | ●   |  |
|                                                                                   |             | 060408R-AL | 1.5-5.0                          | 0.40-0.10       |        |        |        |        |        |        |        |        |          | ●   |  |
|                                                                                   |             | 090504R-AL | 2.5-7.5                          | 0.40-0.10       |        |        |        |        |        |        |        |        |          | ●   |  |
|                                                                                   |             | 090508R-AL | 2.5-7.5                          | 0.40-0.10       |        |        |        |        |        |        |        |        |          | ●   |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                   |             |            |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

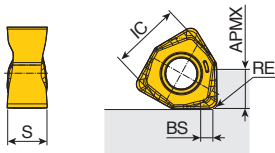
●: Standard items



6NKG 04



Inserts



| Size | Dimension (mm) |     |      |          |         |  |
|------|----------------|-----|------|----------|---------|--|
|      | IC             | S   | APMX | BS       | RE      |  |
| 04   | 7              | 3.9 | 4.1  | 0.85-125 | 0.4-0.8 |  |
|      |                |     |      |          |         |  |
|      |                |     |      |          |         |  |
|      |                |     |      |          |         |  |
|      |                |     |      |          |         |  |
|      |                |     |      |          |         |  |



| Insert                                                                           | Designation           | Recommended machining conditions |                    | Coated |        |        |        |        |        |        |        | Uncoated |  |     |
|----------------------------------------------------------------------------------|-----------------------|----------------------------------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|-----|
|                                                                                  |                       | ap<br>(mm)                       | Feed<br>(mm/tooth) | TT9080 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 |          |  | K10 |
|  | <b>6NKG 040304R-M</b> | 1.0-3.0                          | 0.10-0.05          | ●      | ●      |        |        |        |        | ●      | ●      |          |  |     |
|                                                                                  | <b>040308R-M</b>      | 1.0-3.0                          | 0.10-0.05          | ●      | ●      |        |        |        |        | ●      | ●      |          |  |     |
|                                                                                  |                       |                                  |                    |        |        |        |        |        |        |        |        |          |  |     |
|                                                                                  |                       |                                  |                    |        |        |        |        |        |        |        |        |          |  |     |

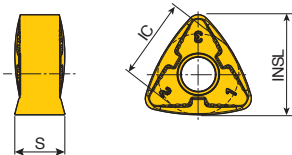


●: Standard items

6RBE



Inserts



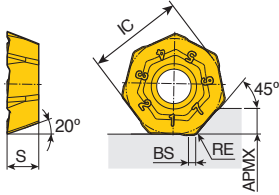
| Size    | Dimension (mm) |   |      |  |  |  |
|---------|----------------|---|------|--|--|--|
|         | IC             | S | INSL |  |  |  |
| 6RBE 50 | 13             | 8 | 16   |  |  |  |
|         |                |   |      |  |  |  |
|         |                |   |      |  |  |  |
|         |                |   |      |  |  |  |
|         |                |   |      |  |  |  |
|         |                |   |      |  |  |  |



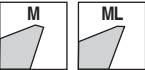
| Insert                                                                             | Designation      | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|------------------------------------------------------------------------------------|------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                    |                  |                                  |                 | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510   | K10 |
|                                                                                    |                  | ap (mm)                          | Feed (mm/tooth) |        |        |        |        |        |        |        |        |          |     |
|  | <b>6RBE 50-M</b> | 1.0-5.0                          | 0.80-0.10       | ●      |        | ●      | ●      | ●      |        |        | ●      | ●        |     |
|                                                                                    |                  |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                    |                  |                                  |                 |        |        |        |        |        |        |        |        |          |     |



●: Standard items



| Size | Dimension (mm) |     |      |     |     |  |
|------|----------------|-----|------|-----|-----|--|
|      | IC             | S   | APMX | BS  | RE  |  |
| 06   | 12.8           | 4.2 | 3.2  | 1.0 | 0.8 |  |
|      |                |     |      |     |     |  |
|      |                |     |      |     |     |  |
|      |                |     |      |     |     |  |
|      |                |     |      |     |     |  |
|      |                |     |      |     |     |  |



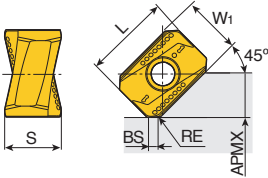
| Insert                                                                           | Designation              | Recommended machining conditions |           | Coated |        |        |        |        |        |        |        | Uncoated |  |     |
|----------------------------------------------------------------------------------|--------------------------|----------------------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|-----|
|                                                                                  |                          |                                  |           | TT9080 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 |          |  | K10 |
|  | <b>7EMT 0604 AETR-M</b>  | 1.0-2.5                          | 0.15-0.06 | ●      | ●      |        |        | ●      |        | ●      |        |          |  |     |
|                                                                                  |                          |                                  |           |        |        |        |        |        |        |        |        |          |  |     |
|  | <b>7EMT 0604 AETR-ML</b> | 1.0-2.5                          | 0.15-0.06 | ●      | ●      |        |        |        |        | ●      |        |          |  |     |
|                                                                                  |                          |                                  |           |        |        |        |        |        |        |        |        |          |  |     |
|                                                                                  |                          |                                  |           |        |        |        |        |        |        |        |        |          |  |     |



●: Standard items

ANHX 1607 ANR-M

Inserts



| Size | Dimension (mm) |    |      |      |     |     |
|------|----------------|----|------|------|-----|-----|
|      | L              | W1 | S    | APMX | BS  | RE  |
| 16   | 16             | 11 | 10.4 | 8.4  | 1.6 | 1.0 |
|      |                |    |      |      |     |     |
|      |                |    |      |      |     |     |
|      |                |    |      |      |     |     |
|      |                |    |      |      |     |     |
|      |                |    |      |      |     |     |



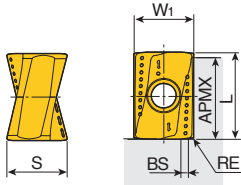
| Insert                                                                             | Designation     | Recommended machining conditions |                    | Coated |        |        |        |        |        |        |  | Uncoated |     |
|------------------------------------------------------------------------------------|-----------------|----------------------------------|--------------------|--------|--------|--------|--------|--------|--------|--------|--|----------|-----|
|                                                                                    |                 | ap<br>(mm)                       | Feed<br>(mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 |  |          |     |
|                                                                                    |                 |                                  |                    |        |        |        |        |        |        |        |  |          |     |
|  | ANHX 1607 ANR-M | 2.5-7.0                          | 0.30-0.15          | ●      |        | ●      |        | ●      | ●      | ●      |  |          | K10 |
|                                                                                    |                 |                                  |                    |        |        |        |        |        |        |        |  |          |     |
|                                                                                    |                 |                                  |                    |        |        |        |        |        |        |        |  |          |     |



► Use only for 45° cutter

●: Standard items

Inserts



| Size | Dimension (mm) |      |           |      |         |         |
|------|----------------|------|-----------|------|---------|---------|
|      | L              | W1   | S         | APMX | BS      | RE      |
| 11   | 12             | 9.2  | 8.5       | 11   | 0.7-1.5 | 0.4-1.6 |
| 16   | 16             | 11.0 | 10.4-10.9 | 15   | 0.6-1.7 | 0.4-2.4 |
|      |                |      |           |      |         |         |
|      |                |      |           |      |         |         |
|      |                |      |           |      |         |         |
|      |                |      |           |      |         |         |
|      |                |      |           |      |         |         |



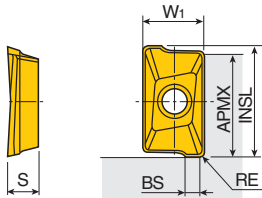
| Insert                                                                             | Designation     | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        |        |  | Uncoated |     |  |
|------------------------------------------------------------------------------------|-----------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|----------|-----|--|
|                                                                                    |                 | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 |  |          | K10 |  |
|    | ANMX 110608R-M  | 3.0-9.0                          | 0.20-0.10       | ●      |        | ●      |        |        |        |        |        |        |  |          |     |  |
|                                                                                    | 160708R-M       | 4.5-12.0                         | 0.20-0.10       | ●      |        | ●      |        |        |        |        |        |        |  |          |     |  |
|                                                                                    | ANHX 110604R-M  | 3.0-9.0                          | 0.15-0.08       | ●      |        | ●      |        |        |        |        | ●      | ●      |  |          |     |  |
|                                                                                    | 110608R-M       | 3.0-9.0                          | 0.15-0.08       | ●      |        | ●      | ●      |        | ●      | ●      | ●      | ●      |  |          |     |  |
|                                                                                    | 110616R-M       | 3.0-9.0                          | 0.15-0.08       | ●      |        | ●      |        |        |        |        |        | ●      |  |          |     |  |
|                                                                                    | 160704R-M       | 4.5-12.0                         | 0.20-0.10       | ●      | ●      | ●      |        |        | ●      |        | ●      | ●      |  |          |     |  |
|                                                                                    | 160708R-M       | 4.5-12.0                         | 0.20-0.10       | ●      | ●      | ●      | ●      |        | ●      | ●      | ●      | ●      |  |          |     |  |
|                                                                                    | 160716R-M       | 4.5-12.0                         | 0.20-0.10       | ●      |        | ●      |        |        | ●      |        | ●      | ●      |  |          |     |  |
|                                                                                    | 160720R-M       | 4.5-12.0                         | 0.20-0.10       |        |        |        |        |        | ●      |        |        |        |  |          |     |  |
|                                                                                    | 160724R-M       | 4.5-12.0                         | 0.20-0.10       | ●      |        | ●      |        |        | ●      |        | ●      | ●      |  |          |     |  |
|    | ANHX 110608R-ML | 3.0-9.0                          | 0.15-0.08       | ●      |        | ●      |        |        |        |        |        |        |  |          |     |  |
|                                                                                    | 160708R-ML      | 4.5-12.0                         | 0.12-0.06       |        |        | ●      | ●      |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|    | ANHX 160708R-MR | 4.5-12.0                         | 0.25-0.13       |        |        | ●      |        |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|  | ANHX 110604R-AL | 3.0-9.0                          | 0.40-0.10       |        |        |        |        |        |        |        |        |        |  | ●        |     |  |
|                                                                                    | 110608R-AL      | 3.0-9.0                          | 0.40-0.10       |        |        |        |        |        |        |        |        |        |  | ●        |     |  |
|                                                                                    | 160704R-AL      | 4.5-12.0                         | 0.40-0.10       |        |        |        |        |        |        |        |        |        |  | ●        |     |  |
|                                                                                    | 160708R-AL      | 4.5-12.0                         | 0.40-0.10       |        |        |        |        |        |        |        |        |        |  | ●        |     |  |
|  | ANHX 110608R-SM | 3.0-9.0                          | 0.15-0.08       | ●      |        | ●      |        | ●      |        |        | ●      |        |  |          |     |  |
|                                                                                    | 160708R-SM      | 4.5-12.0                         | 0.20-0.10       | ●      |        | ●      |        |        |        |        | ●      |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |
|                                                                                    |                 |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |     |  |

• Standard items





Inserts



| Size     | Dimension (mm) |      |     |      |          |         |
|----------|----------------|------|-----|------|----------|---------|
|          | INSL           | W1   | S   | APMX | BS       | RE      |
| 09       | 9.7-10.6       | 6.20 | 3.8 | 8.8  | 0.5-1.79 | 0.4-3.2 |
| 09T3 PER | 9.8-9.9        | 6.20 | 3.8 | 8.8  | 0-1.14   | 0.4     |
|          |                |      |     |      |          |         |
|          |                |      |     |      |          |         |
|          |                |      |     |      |          |         |
|          |                |      |     |      |          |         |



| Insert | Designation      | Recommended machining conditions |                 | Cermet |  | Coated |        |        |        |        |        |        |        |        |        | Uncoated |  |
|--------|------------------|----------------------------------|-----------------|--------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                  | ap (mm)                          | Feed (mm/tooth) | CT7000 |  | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 | TTA101 | K10      |  |
|        | APKT 09T3 PER-EM | 2.5-7.5                          | 0.10-0.05       | ●      |  | ●      | ●      | ●      | ●      | ●      | ●      |        | ●      | ●      |        | ●        |  |
|        | 09T305R-EM       | 2.5-7.5                          | 0.10-0.05       |        |  |        |        |        | ●      |        |        |        |        |        |        |          |  |
|        | 09T308R-EM       | 2.5-7.5                          | 0.10-0.05       |        |  | ●      | ●      | ●      | ●      |        | ●      |        | ●      | ●      |        |          |  |
|        | 09T316R-EM       | 2.5-7.5                          | 0.10-0.05       |        |  |        | ●      | ●      | ●      |        | ●      |        | ●      | ●      |        |          |  |
|        | 09T320R-EM       | 2.5-7.5                          | 0.10-0.05       |        |  | ●      |        | ●      |        |        |        |        |        | ●      |        |          |  |
|        | 09T332R-EM       | 2.5-7.5                          | 0.10-0.05       |        |  | ●      | ●      |        |        |        |        |        |        | ●      |        |          |  |
|        | 09T3 PER-M       | 2.5-7.5                          | 0.10-0.05       |        |  |        |        |        | ●      |        | ●      |        | ●      | ●      |        |          |  |
|        | APCT 09T3 PER-ML | 3.0-7.5                          | 0.10-0.05       |        |  | ●      |        | ●      | ●      |        | ●      |        | ●      |        |        |          |  |
|        | APCT 09T3 PER-AL | 2.5-7.5                          | 0.35-0.05       |        |  |        |        |        |        |        |        |        |        |        | ●      | ●        |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |  |

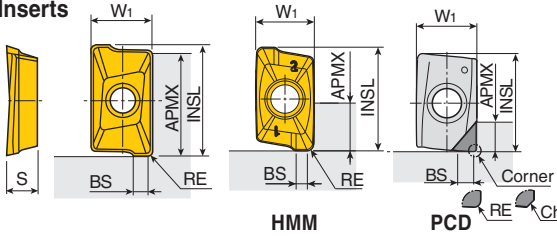
●: Standard items



# APK(C)T 12



## Inserts



| Size              | Dimension (mm) |     |         |           |         |         |
|-------------------|----------------|-----|---------|-----------|---------|---------|
|                   | INSL           | W1  | S       | APMX      | BS      | RE(ch)  |
| <b>12</b>         | 13.0-14.6      | 8.3 | 4.5-4.9 | 11.8-12.5 | 0.9-2.1 | 0.4-0.0 |
| <b>1204 PER</b>   | 13.4-14.6      | 8.3 | 4.5-4.9 | 11.8-12.5 | 0.9-2.1 | 0.8     |
| <b>1204-HMM</b>   | 14.6           | 8.3 | 4.7     | 6.5       | 1.6     | 0.8     |
| <b>12...R-PCD</b> | 13.3           | 8.2 | 4.5     | 3.5       | 2       | 0.4     |
| <b>12...C-PCD</b> | 13.3           | 8.2 | 4.5     | 3.5       | 2.1     | (0.25)  |
| <b>12...-L</b>    | 13.0           | 8.3 | 4.75    | 11.8      |         | 0.4     |

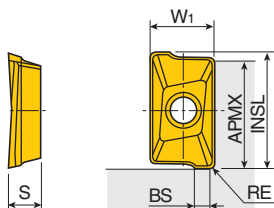


| Insert                                                                             | Designation        | Recommended machining conditions |                 | PCD    |  | Coated |        |        |        |        |        |        |        |        |        | Uncoated |     |  |
|------------------------------------------------------------------------------------|--------------------|----------------------------------|-----------------|--------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                    |                    | ap (mm)                          | Feed (mm/tooth) | TD1030 |  | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 | TTD620 | TTA101   | K10 |  |
|    | APKT 1204 PER-EM   | 3.5-10.0                         | 0.14-0.07       |        |  | ●      | ●      | ●      | ●      | ●      | ●      | ●      | ●      |        |        |          |     |  |
|                                                                                    | 120404R-EM         | 3.5-10.0                         | 0.14-0.07       |        |  | ●      |        |        | ●      |        | ●      |        | ●      | ●      |        |          |     |  |
|                                                                                    | 120416R-EM         | 3.5-10.0                         | 0.14-0.07       |        |  | ●      | ●      | ●      | ●      | ●      |        |        | ●      | ●      |        |          |     |  |
|                                                                                    | 120420R-EM         | 3.5-10.0                         | 0.14-0.07       |        |  | ●      |        |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                    | 120424R-EM         | 3.5-10.0                         | 0.14-0.07       |        |  |        | ●      | ●      |        |        |        |        |        | ●      |        |          |     |  |
|                                                                                    | 120430R-EM         | 3.5-10.0                         | 0.14-0.07       |        |  | ●      | ●      | ●      | ●      | ●      |        |        | ●      | ●      |        |          |     |  |
|                                                                                    | 120432R-EM         | 3.5-10.0                         | 0.14-0.07       |        |  |        | ●      |        | ●      |        |        |        | ●      | ●      |        |          |     |  |
|                                                                                    | 120440R-EM         | 3.5-10.0                         | 0.14-0.07       |        |  | ●      |        | ●      |        |        |        |        |        | ●      |        |          |     |  |
|    | APKT 1204 PER-SM   | 3.5-10.0                         | 0.14-0.07       |        |  | ●      | ●      |        | ●      |        |        | ●      |        |        |        |          |     |  |
|                                                                                    |                    |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |     |  |
|    | APKT 1204 PER-SML  | 3.5-10.5                         | 0.14-0.06       |        |  | ●      |        | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                    |                    |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |     |  |
|    | APKT 1204 PER-EML  | 3.5-10.0                         | 0.08-0.04       |        |  | ●      |        | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                    | 120412R-EML        | 3.5-10.0                         | 0.08-0.04       |        |  | ●      |        | ●      |        |        |        |        |        |        |        |          |     |  |
|   | APKT 1204 PER-EL   | 3.5-10.0                         | 0.05-0.03       |        |  | ●      | ●      | ●      | ●      |        |        |        |        |        |        |          |     |  |
|                                                                                    |                    |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |     |  |
|  | APKT 1204 PER-HMM  | 3.5-6.5                          | 0.12-0.05       |        |  | ●      |        |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                    |                    |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |     |  |
|  | APCT 120430R-ML    | 3.5-10.0                         | 0.08-0.04       |        |  | ●      |        | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                    | 120432R-ML         | 3.5-10.0                         | 0.08-0.04       |        |  | ●      |        | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                    | 120440R-ML         | 3.5-9.5                          | 0.08-0.04       |        |  | ●      |        | ●      |        |        |        |        |        |        |        |          |     |  |
|  | APCT 120404R-L     | 3.5-9.5                          | 0.08-0.04       |        |  |        |        |        |        |        |        |        |        |        | ●      |          |     |  |
|                                                                                    |                    |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |     |  |
|  | APCT 1204 PER-AL   | 3.5-10.0                         | 0.50-0.10       |        |  |        |        |        |        |        |        |        |        |        |        | ●        | ●   |  |
|                                                                                    | 120404R-AL         | 3.5-10.0                         | 0.50-0.10       |        |  |        |        |        |        |        |        |        |        |        |        | ●        | ●   |  |
|                                                                                    | 120416R-AL         | 3.5-10.0                         | 0.50-0.10       |        |  |        |        |        |        |        |        |        |        |        |        | ●        | ●   |  |
|  | APCT 120404R-PCD35 | 0.2-3.0                          | 0.30-0.05       | ●      |  |        |        |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                    | 1204C025-PCD35     | 0.2-3.0                          | 0.30-0.05       | ●      |  |        |        |        |        |        |        |        |        |        |        |          |     |  |
| PCD                                                                                |                    |                                  |                 |        |  |        |        |        |        |        |        |        |        |        |        |          |     |  |

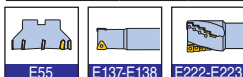
• Standard items



## Inserts

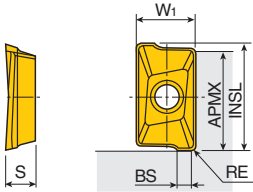


| Size          | Dimension (mm) |                |      |      |           |         |
|---------------|----------------|----------------|------|------|-----------|---------|
|               | INSL           | W <sub>1</sub> | S    | APMX | BS        | RE      |
| <b>17-ML</b>  | 18.5           | 10.8           | 5.55 | 16.1 | 2.07      | 0.8     |
| <b>17-AL</b>  | 18.3-18.5      | 10.8           | 5.62 | 16.1 | 1.55-2.56 | 0.8-3.0 |
| <b>17-SAL</b> | 18.5           | 10.8           | 5.62 | 16.1 | 2.56      | 0.8     |
|               |                |                |      |      |           |         |
|               |                |                |      |      |           |         |
|               |                |                |      |      |           |         |

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●: Standard items

Inserts



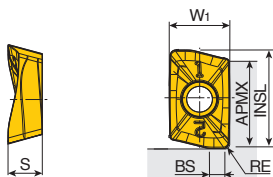
| Size   | Dimension (mm) |      |          |       |          |         |
|--------|----------------|------|----------|-------|----------|---------|
|        | INSL           | W1   | S        | APMX  | BS       | RE      |
| 17     | 16.8-18.5      | 10.7 | 5.56     | 15-16 | 0.9-3.17 | 0.4-6.4 |
| 17 PER | 18.5-18.9      | 10.7 | 5.56-6.5 | 16    | 0.9-3.17 | 0.8     |
|        |                |      |          |       |          |         |
|        |                |      |          |       |          |         |
|        |                |      |          |       |          |         |
|        |                |      |          |       |          |         |



| Insert | Designation       | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        |        |  | Uncoated |  |
|--------|-------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|----------|--|
|        |                   | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 |  | K10      |  |
|        | APKT 1705 PER-EM  | 4.5-13.0                         | 0.18-0.09       | •      | •      | •      | •      | •      | •      | •      | •      | •      |  | •        |  |
|        | 170504R-EM        | 4.5-13.0                         | 0.18-0.09       | •      |        | •      | •      |        | •      |        | •      | •      |  |          |  |
|        | 170510R-EM        | 4.5-13.0                         | 0.17-0.09       | •      | •      | •      |        | •      | •      |        | •      | •      |  |          |  |
|        | 170516R-EM        | 4.5-13.0                         | 0.17-0.09       | •      | •      | •      | •      |        | •      |        | •      | •      |  |          |  |
|        | 170524R-EM        | 4.5-13.0                         | 0.17-0.09       | •      | •      | •      | •      | •      |        |        | •      | •      |  |          |  |
|        | 170530R-EM        | 4.5-13.0                         | 0.17-0.09       | •      | •      | •      | •      |        | •      |        |        | •      |  |          |  |
|        | 170532R-EM        | 4.5-13.0                         | 0.17-0.09       | •      | •      | •      | •      | •      |        |        | •      | •      |  |          |  |
|        | 170535R-EM        | 4.5-13.0                         | 0.17-0.09       | •      | •      |        |        |        |        |        | •      | •      |  |          |  |
|        | 170540R-EM        | 4.5-13.0                         | 0.20-0.10       | •      | •      |        | •      |        |        |        |        | •      |  |          |  |
|        | 170548R-EM        | 4.5-13.0                         | 0.17-0.09       | •      | •      | •      | •      | •      | •      | •      | •      | •      |  |          |  |
|        | 170550R-EM        | 4.5-13.0                         | 0.20-0.10       |        | •      |        | •      |        |        |        |        | •      |  |          |  |
|        | APKT 1705 PER-M   | 4.5-13.0                         | 0.18-0.09       |        |        |        | •      |        | •      |        | •      | •      |  | •        |  |
|        | 170516R-M         | 4.5-13.0                         | 0.20-0.10       |        |        |        | •      |        |        |        |        |        |  |          |  |
|        | 170532R-M         | 4.5-13.0                         | 0.20-0.10       |        |        |        | •      |        | •      |        | •      | •      |  |          |  |
|        | 170548R-M         | 4.5-13.0                         | 0.20-0.10       |        |        |        | •      |        |        |        |        |        |  |          |  |
|        | APKT 1705 PER-SM  | 4.5-13.0                         | 0.17-0.09       | •      |        | •      |        | •      |        |        | •      |        |  |          |  |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |  |
|        | APKT 1705 PER-SML | 4.5-14.5                         | 0.17-0.06       | •      |        | •      |        |        |        |        |        |        |  |          |  |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |  |
|        | APKT 1705 PER-EML | 4.5-13.0                         | 0.14-0.07       | •      |        | •      |        |        | •      |        |        |        |  |          |  |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |  |
|        | APKT 1705 PER-EL  | 4.5-13.0                         | 0.10-0.05       | •      | •      | •      | •      | •      |        |        |        |        |  |          |  |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |  |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |  |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |  |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |  |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |        |  |          |  |



• Standard items



| Size      | Dimension (mm) |                |     |      |     |    |
|-----------|----------------|----------------|-----|------|-----|----|
|           | INSL           | W <sub>1</sub> | S   | APMX | BS  | RE |
| <b>19</b> | 21             | 13             | 735 | 179  | 2.0 | 12 |
|           |                |                |     |      |     |    |
|           |                |                |     |      |     |    |
|           |                |                |     |      |     |    |
|           |                |                |     |      |     |    |

[illegible]

●: Standard items

Technical drawing of a yellow cylindrical component. The drawing includes a side view on the left showing a width dimension  $S$ . The main view on the right is a front view showing a diameter dimension  $W_1$  and two height dimensions:  $APMX$  (from the base to the top of the inner cylinder) and  $NSL$  (total height from the base to the top of the outer cylinder).

| Size      | Dimension (mm) |                |     |      |  |
|-----------|----------------|----------------|-----|------|--|
|           | INSL           | W <sub>1</sub> | S   | APMX |  |
| <b>06</b> | 6.7            | 4.04           | 2.6 | 0.5  |  |
| <b>09</b> | 10.7           | 5.94           | 3.9 | 1.0  |  |
| <b>12</b> | 14.2           | 8.0            | 5.0 | 1.2  |  |
|           |                |                |     |      |  |
|           |                |                |     |      |  |
|           |                |                |     |      |  |
|           |                |                |     |      |  |

[illegible]

Two cross-sectional diagrams of electrodes. The left diagram shows a blue electrode with a wide base and a narrower top section, labeled 'E53'. The right diagram shows a blue electrode with a narrow base and a wider top section, labeled 'E131-E132'.

| Size      | Dimension (mm) |                |     |      |         |       |
|-----------|----------------|----------------|-----|------|---------|-------|
|           | INSL           | W <sub>1</sub> | S   | APMX | BS      | RE    |
| <b>06</b> | 6.5            | 4.2            | 2.6 | 5.5  | 0.6-1.0 | 0-0.4 |
|           |                |                |     |      |         |       |
|           |                |                |     |      |         |       |
|           |                |                |     |      |         |       |
|           |                |                |     |      |         |       |

[illegible]

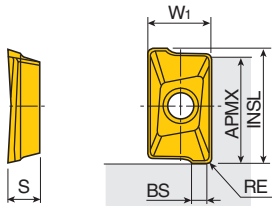
●: Standard items



AXM(C)T 06



Inserts



| Size  | Dimension (mm) |      |     |      |           |         |
|-------|----------------|------|-----|------|-----------|---------|
|       | INSL           | W1   | S   | APMX | BS        | RE      |
| 06-EM | 6.7            | 4.15 | 2.6 | 5.5  | 0-0.76    | 0.2-2.0 |
| 06-AL | 6.7            | 4.20 | 2.6 | 5.5  | 0.23-0.83 | 0.2-0.8 |
|       |                |      |     |      |           |         |
|       |                |      |     |      |           |         |
|       |                |      |     |      |           |         |
|       |                |      |     |      |           |         |



| Insert | Designation      | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        |        |        | Uncoated |  |
|--------|------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                  | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT5525 | TT2510 | K10      |  |
|        | AXMT 0602 PER-EM | 1.5-5.0                          | 0.08-0.04       | ●      | ●      | ●      | ●      |        |        |        |        |        | ●      |          |  |
|        | 060204R-EM       | 1.5-5.0                          | 0.13-0.07       | ●      | ●      | ●      | ●      |        |        |        | ●      |        | ●      |          |  |
|        | 060208R-EM       | 1.5-5.0                          | 0.13-0.07       | ●      | ●      | ●      | ●      |        |        |        | ●      |        | ●      |          |  |
|        | 060216R-EM       | 1.5-5.0                          | 0.13-0.07       | ●      | ●      | ●      | ●      |        |        |        |        |        | ●      |          |  |
|        | 060220R-EM       | 1.5-5.0                          | 0.13-0.07       | ●      |        | ●      |        |        |        |        |        |        |        |          |  |
|        | AXCT 060202R-AL  | 1.5-5.0                          | 0.20-0.10       |        |        |        |        |        |        |        |        |        |        | ●        |  |
|        | 060204R-AL       | 1.5-5.0                          | 0.20-0.10       |        |        |        |        |        |        |        |        |        |        | ●        |  |
|        | 060208R-AL       | 1.5-5.0                          | 0.20-0.10       |        |        |        |        |        |        |        |        |        |        | ●        |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|        |                  |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |

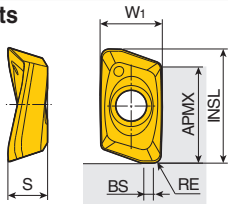


●: Standard items

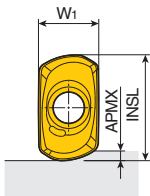


# AVK(C)T 10

## Inserts



**M / EL / AL**



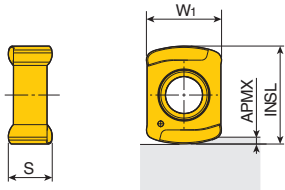
### HF (High Feed)

| Size           | Dimension (mm) |         |         |          |       |         |
|----------------|----------------|---------|---------|----------|-------|---------|
|                | INSL           | W1      | S       | APMX     | BS    | RE      |
| <b>10-M/EL</b> | 10.8-12.5      | 6.8     | 3.8-4.3 | 9.3-10   | 0-1.4 | 0.4-4.0 |
| <b>10-HF</b>   | 11.6           | 6.6     | 4.4     | 1.0      | -     | -       |
| <b>10-AL</b>   | 11.3-12.5      | 6.7-6.8 | 4.0-4.5 | 9.5-10.1 | 0-1.2 | 0.4-3.2 |
|                |                |         |         |          |       |         |
|                |                |         |         |          |       |         |
|                |                |         |         |          |       |         |

[illegible]

●: Standard items

High feed inserts



| Size | Dimension (mm) |      |      |      |  |  |  |
|------|----------------|------|------|------|--|--|--|
|      | INSL           | W1   | S    | APMX |  |  |  |
| 04   | 6.0            | 4.2  | 2.5  | 0.5  |  |  |  |
| 06   | 9.0            | 6.39 | 3.73 | 1.0  |  |  |  |
| 09   | 11.9           | 9.20 | 4.79 | 1.5  |  |  |  |
| 11   | 14.6           | 11.2 | 6.54 | 2.0  |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |

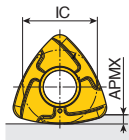


| Insert                                                                           | Designation          | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|----------------------------------------------------------------------------------|----------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                  |                      | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 |          | K10 |
|  | <b>BLMP 0402R-M</b>  | 0.1-0.5                          | 1.00-0.20       | ●      | ●      |        |        |        |        |        | ●      |          |     |
|                                                                                  | <b>0603R-M</b>       | 0.1-1.0                          | 1.20-0.30       | ●      | ●      | ●      | ●      |        |        | ●      | ●      |          |     |
|                                                                                  | <b>0904R-M</b>       | 0.1-1.5                          | 1.30-0.30       | ●      | ●      | ●      | ●      |        | ●      | ●      | ●      |          |     |
|                                                                                  | <b>1105R-M</b>       | 0.3-2.0                          | 1.50-0.30       | ●      | ●      | ●      | ●      |        |        |        | ●      |          |     |
|  | <b>BLMP 0603R-MM</b> | 0.1-1.0                          | 1.20-0.30       | ●      | ●      | ●      |        |        |        |        | ●      |          |     |
|                                                                                  | <b>0904R-MM</b>      | 0.1-1.5                          | 1.30-0.30       | ●      | ●      | ●      |        |        |        |        | ●      |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|  | <b>BLMP 0402R-ML</b> | 0.1-0.5                          | 0.80-0.20       | ●      | ●      |        |        |        |        |        |        |          |     |
|                                                                                  | <b>0603R-ML</b>      | 0.1-1.0                          | 1.00-0.20       | ●      | ●      | ●      |        |        |        |        |        |          |     |
|                                                                                  | <b>0904R-ML</b>      | 0.1-1.5                          | 1.00-0.30       | ●      | ●      | ●      |        |        |        |        |        |          |     |
|                                                                                  | <b>1105R-ML</b>      | 0.3-2.0                          | 1.20-0.30       | ●      | ●      |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |

●: Standard items



**CHASE2FEED**



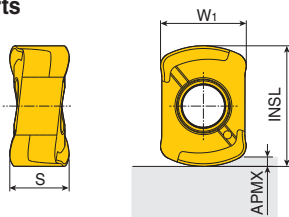
| Size      | Dimension (mm) |   |      |  |  |
|-----------|----------------|---|------|--|--|
|           | IC             | S | APMX |  |  |
| <b>13</b> | 12.3           | 7 | 2.0  |  |  |
|           |                |   |      |  |  |
|           |                |   |      |  |  |
|           |                |   |      |  |  |
|           |                |   |      |  |  |

[illegible]

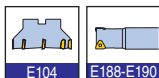
- : Standard items



## High feed inserts



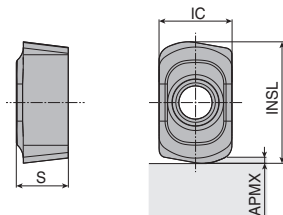
| Size      | Dimension (mm) |                |      |      |  |
|-----------|----------------|----------------|------|------|--|
|           | INSL           | W <sub>1</sub> | S    | APMX |  |
| <b>06</b> | 9              | 6.4            | 4.43 | 1.0  |  |
|           |                |                |      |      |  |
|           |                |                |      |      |  |
|           |                |                |      |      |  |
|           |                |                |      |      |  |

[illegible]

●: Standard items

# BCGT 04

## High feed inserts



| Size      | Dimension (mm) |     |   |      |  |
|-----------|----------------|-----|---|------|--|
|           | INSL           | IC  | S | APMX |  |
| <b>04</b> | 7              | 4.2 | 3 | 0.35 |  |
|           |                |     |   |      |  |
|           |                |     |   |      |  |
|           |                |     |   |      |  |
|           |                |     |   |      |  |
|           |                |     |   |      |  |
|           |                |     |   |      |  |

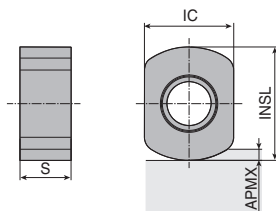
| Insert                                                                           | Designation       | Recommended machining conditions |                 | Ceramic |        | Coated |        |        |        |        |        |        |        | Uncoated |  |
|----------------------------------------------------------------------------------|-------------------|----------------------------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                  |                   | ap (mm)                          | Feed (mm/tooth) | TC3030  | TC3020 | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | K10      |  |
|  | <b>BCGT 0403G</b> | 0.1-0.3                          | 0.20-0.08       | ●       |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                   |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                   |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                   |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |



● Standard items

# BNGT 06

## High feed inserts



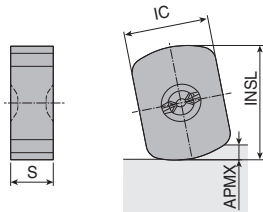
| Size      | Dimension (mm) |     |     |      |  |
|-----------|----------------|-----|-----|------|--|
|           | INSL           | IC  | S   | APMX |  |
| <b>06</b> | 8              | 6.3 | 3.6 | 1.0  |  |
|           |                |     |     |      |  |
|           |                |     |     |      |  |
|           |                |     |     |      |  |
|           |                |     |     |      |  |
|           |                |     |     |      |  |
|           |                |     |     |      |  |

| Insert                                                                             | Designation         | Recommended machining conditions |                 | Ceramic |        | Coated |        |        |        |        |        |        |        | Uncoated |  |
|------------------------------------------------------------------------------------|---------------------|----------------------------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                    |                     | ap (mm)                          | Feed (mm/tooth) | TC3030  | TC3020 | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | K10      |  |
|  | <b>BNGT 0603K-E</b> | 0.4-0.8                          | 0.30-0.10       | ●       |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                    |                     |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                    |                     |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                    |                     |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |



● Standard items

High feed inserts



| Size | Dimension (mm) |    |   |      |  |
|------|----------------|----|---|------|--|
|      | INSL           | IC | S | APMX |  |
| 06   | 8              | 6  | 3 | 1.0  |  |
| 09   | 12             | 9  | 5 | 1.5  |  |
|      |                |    |   |      |  |
|      |                |    |   |      |  |
|      |                |    |   |      |  |
|      |                |    |   |      |  |
|      |                |    |   |      |  |

| Insert                                                                           | Designation      | Recommended machining conditions |                 | Ceramic |        | Coated |        |        |        |        |        |        |        | Uncoated |  |
|----------------------------------------------------------------------------------|------------------|----------------------------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                  |                  | ap (mm)                          | Feed (mm/tooth) | TC3030  | TC3020 | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | K10      |  |
|  | BNGX 0603 CH-E04 | 0.4-0.8                          | 0.30-0.10       | ●       |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                  | 0904 CH-E04      | 0.5-1.0                          | 0.35-0.15       | ●       |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                  |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |

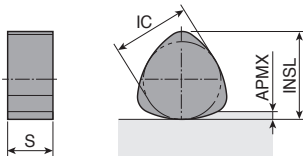


► E04: Honing 0.04-0.05 mm

●: Standard items

BNGX 12

High feed inserts



| Size | Dimension (mm) |    |   |      |  |  |
|------|----------------|----|---|------|--|--|
|      | INSL           | IC | S | APMX |  |  |
| 12   | 13.6           | 12 | 7 | 2.5  |  |  |
|      |                |    |   |      |  |  |
|      |                |    |   |      |  |  |
|      |                |    |   |      |  |  |
|      |                |    |   |      |  |  |
|      |                |    |   |      |  |  |

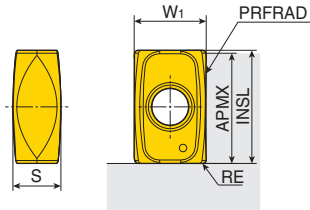
| Insert                                                                             | Designation   | Recommended machining conditions |                 | Ceramic |        | Coated |        |        |        |        |        |        |        | Uncoated |  |
|------------------------------------------------------------------------------------|---------------|----------------------------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                    |               | ap (mm)                          | Feed (mm/tooth) | TC3030  | TC3020 | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | K10      |  |
|  | BNGX 1207-E04 | 1.0-2.0                          | 0.35-0.15       | ●       |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                    |               |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                    |               |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                    |               |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                    |               |                                  |                 |         |        |        |        |        |        |        |        |        |        |          |  |



► E04: Honing 0.04-0.05 mm

●: Standard items

Inserts



| Size | Dimension (mm) |      |      |      |     |        |
|------|----------------|------|------|------|-----|--------|
|      | W1             | S    | APMX | INSL | RE  | PRFRAD |
| 06   | 4.2            | 2.8  | 6.4  | 6.6  | 0.2 | 20     |
| 12   | 7              | 4.56 | 12.2 | 12.4 | 0.2 | 30     |
|      |                |      |      |      |     |        |
|      |                |      |      |      |     |        |
|      |                |      |      |      |     |        |
|      |                |      |      |      |     |        |

| Insert                                                                           | Designation           | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |  |
|----------------------------------------------------------------------------------|-----------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                  |                       | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT5515 | TT2510   |  |
|  | <b>BRHU 06R2002-L</b> | -                                | 0.15-0.08       |        |        |        |        |        |        |        | ●      |          |  |
|                                                                                  | <b>12R3002-L</b>      | -                                | 0.20-0.08       |        |        |        |        |        |        |        | ●      |          |  |
|                                                                                  |                       |                                  |                 |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                       |                                  |                 |        |        |        |        |        |        |        |        |          |  |

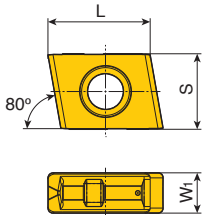


●: Standard items

CNHX



Inserts



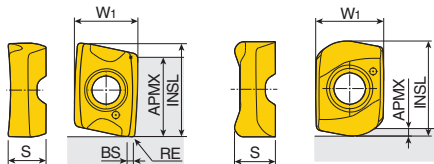
| Size | Dimension (mm) |    |     |  |  |
|------|----------------|----|-----|--|--|
|      | L              | S  | W1  |  |  |
| 13   | 12.7           | 11 | 5.4 |  |  |
| 16   | 16.0           | 12 | 6.4 |  |  |
|      |                |    |     |  |  |
|      |                |    |     |  |  |
|      |                |    |     |  |  |
|      |                |    |     |  |  |

| Insert | Designation  | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |  |
|--------|--------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|        |              | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | K10      |  |
|        | CNHX 131108T | 1.2-5.5                          | 0.55-0.17       |        |        |        |        | ●      |        |        |        |          |  |
|        | 160608T      | 1.2-5.5                          | 0.60-0.20       |        |        |        |        | ●      |        |        |        |          |  |
|        |              |                                  |                 |        |        |        |        |        |        |        |        |          |  |
|        |              |                                  |                 |        |        |        |        |        |        |        |        |          |  |



●: Standard items

Inserts



M / L / AL

HF (High Feed)

| Size    | Dimension (mm) |     |     |      |     |         |
|---------|----------------|-----|-----|------|-----|---------|
|         | INSL           | W1  | S   | APMX | BS  | RE      |
| 05-M    | 6.2-6.3        | 4.2 | 2.6 | 5.0  | 0.3 | 0.2-0.4 |
| 05-L/AL | 6.3            | 4.1 | 2.6 | 5.0  | 0.3 | 0.2     |
| 05-HF   | 5.6            | 4.1 | 2.5 | 0.5  | -   | -       |
|         |                |     |     |      |     |         |
|         |                |     |     |      |     |         |
|         |                |     |     |      |     |         |

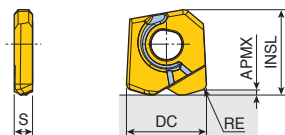


| Insert                                                                           | Designation     | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        |        |        | Uncoated |       |   |
|----------------------------------------------------------------------------------|-----------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-------|---|
|                                                                                  |                 |                                  |                 | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT5525 | TT3535 | TT2510   | UF-10 |   |
|                                                                                  |                 | ap (mm)                          | Feed (mm/tooth) |        |        |        |        |        |        |        |        |        |        |          |       |   |
|  | CVKT 0502PNR-M  | 0.5-4.0                          | 0.08-0.04       | ●      |        | ●      |        |        |        |        |        |        |        |          |       |   |
|                                                                                  | 050204R-M       | 0.5-4.0                          | 0.08-0.04       | ●      |        | ●      |        |        |        |        |        |        |        |          | ●     |   |
|  | CVHT 0502PNR-L  | 0.5-4.0                          | 0.07-0.03       | ●      |        | ●      |        |        |        |        |        | ●      |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|  | CVHT 0502PNR-AL | 0.5-4.0                          | 0.20-0.07       |        |        |        |        |        |        |        |        |        |        |          |       | ● |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|  | CVKT 0502R-HF   | 0.2-0.4                          | 0.70-0.30       | ●      |        | ●      |        |        |        |        |        |        |        | ●        | ●     |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |
|                                                                                  |                 |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |       |   |

●: Standard items







| Size      | Dimension (mm) |    |     |      |     |  |
|-----------|----------------|----|-----|------|-----|--|
|           | INSL           | DC | S   | APMX | RE  |  |
| <b>06</b> | 5.9            | 6  | 1.6 | 0.3  | 0.5 |  |
| <b>08</b> | 8.4            | 8  | 1.8 | 0.5  | 0.6 |  |
|           |                |    |     |      |     |  |
|           |                |    |     |      |     |  |
|           |                |    |     |      |     |  |
|           |                |    |     |      |     |  |

[illegible]

●: Standard items



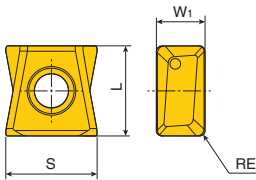


| Size      | Dimension (mm) |     |           |      |       |         |
|-----------|----------------|-----|-----------|------|-------|---------|
|           | L              | W1  | S         | APMX | BS    | RE      |
| <b>05</b> | 5              | 2.7 | 4.9-5.03  | 4.6  | -     | 0-0.8   |
| <b>09</b> | 9              | 4.5 | 8.3-8.6   | 8.3  | 0-0.6 | 0.4-1.6 |
| <b>14</b> | 13.5           | 6.7 | 13.1-13.5 | 12.5 | 0-0.9 | 0.8-2.4 |
|           |                |     |           |      |       |         |
|           |                |     |           |      |       |         |
|           |                |     |           |      |       |         |

[illegible]

●: Standard items

Inserts



| Size | Dimension (mm) |     |     |      |    |     |
|------|----------------|-----|-----|------|----|-----|
|      | L              | W1  | S   | APMX | BS | RE  |
| 05   | 5              | 2.7 | 5.0 | -    | -  | 0.4 |
|      |                |     |     |      |    |     |
|      |                |     |     |      |    |     |
|      |                |     |     |      |    |     |
|      |                |     |     |      |    |     |
|      |                |     |     |      |    |     |
|      |                |     |     |      |    |     |
|      |                |     |     |      |    |     |

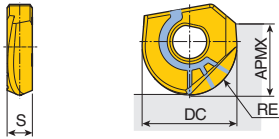


| Insert                                                                           | Designation   | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|----------------------------------------------------------------------------------|---------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                  |               | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT5525   | K10 |  |
|  | LXHU 05-04-ML | -                                | 0.08-0.04       | ●      |        | ●      |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |               |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |



●: Standard items

Inserts



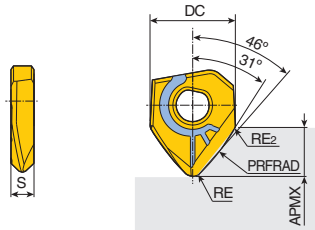
| Size | Dimension (mm) |     |           |      |  |  |  |
|------|----------------|-----|-----------|------|--|--|--|
|      | DC             | S   | APMX      | RE   |  |  |  |
| 060  | 6              | 2.0 | 4.5-4.8   | 3.0  |  |  |  |
| 080  | 8              | 2.2 | 6.6-6.9   | 4.0  |  |  |  |
| 100  | 10             | 2.7 | 8.0-8.2   | 5.0  |  |  |  |
| 120  | 12             | 3.2 | 9.6-9.7   | 6.0  |  |  |  |
| 160  | 16             | 4.2 | 12.3-12.7 | 8.0  |  |  |  |
| 200  | 20             | 5.2 | 14.4-14.7 | 10.0 |  |  |  |
| 250  | 25             | 6.2 | 16.8-17.4 | 12.5 |  |  |  |
| 300  | 30             | 7.2 | 18.6-19.2 | 15.0 |  |  |  |
| 320  | 32             | 7.2 | 18.4-19.2 | 16.0 |  |  |  |

| Insert                                                                                                    | Designation       | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|-----------------------------------------------------------------------------------------------------------|-------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                                           |                   | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT8080 | TT8625 | TT7080 | TT7515 | TT6080 | TT5525 | TT5515 | TT2510   | K10 |  |
| <br>Straight cutting edge | <b>NFB 060-FM</b> | 0.05-0.2                         | 0.15-0.05       |        |        |        |        |        |        |        | ●      |          |     |  |
|                                                                                                           | <b>080-FM</b>     | 0.05-0.3                         | 0.20-0.05       |        |        |        |        |        |        | ●      | ●      |          |     |  |
|                                                                                                           | <b>100-FM</b>     | 0.05-0.3                         | 0.20-0.05       |        |        |        |        |        |        | ●      | ●      |          |     |  |
|                                                                                                           | <b>120-FM</b>     | 0.05-0.5                         | 0.30-0.08       |        |        |        |        |        |        | ●      | ●      |          |     |  |
|                                                                                                           | <b>160-FM</b>     | 0.05-0.5                         | 0.30-0.08       |        |        |        |        |        |        | ●      | ●      |          |     |  |
|                                                                                                           | <b>200-FM</b>     | 0.10-1.0                         | 0.30-0.08       |        |        |        |        |        |        | ●      | ●      |          |     |  |
|                                                                                                           | <b>250-FM</b>     | 0.15-1.0                         | 0.40-0.08       |        |        |        |        |        |        | ●      | ●      |          |     |  |
|                                                                                                           | <b>300-FM</b>     | 0.15-1.0                         | 0.40-0.08       |        |        |        |        |        |        | ●      | ●      |          |     |  |
|                                                                                                           | <b>320-FM</b>     | 0.15-1.0                         | 0.40-0.08       |        |        |        |        |        |        | ●      | ●      |          |     |  |
| <br>Helical cutting edge  | <b>NFB 060-SM</b> | 0.80-2.5                         | 0.20-0.05       |        |        |        |        |        |        |        | ●      | ●        |     |  |
|                                                                                                           | <b>080-SM</b>     | 1.20-3.2                         | 0.25-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                                           | <b>100-SM</b>     | 1.50-4.0                         | 0.25-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                                           | <b>120-SM</b>     | 1.80-4.8                         | 0.35-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                                           | <b>160-SM</b>     | 2.40-6.4                         | 0.35-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                                           | <b>200-SM</b>     | 3.00-8.0                         | 0.35-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                                           | <b>250-SM</b>     | 3.75-10.0                        | 0.45-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                                           | <b>300-SM</b>     | 4.50-12.0                        | 0.45-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                                           | <b>320-SM</b>     | 4.80-12.8                        | 0.45-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                                           |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                                           |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                                           |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                                           |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                                           |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                                           |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                                           |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

●: Standard items



Inserts



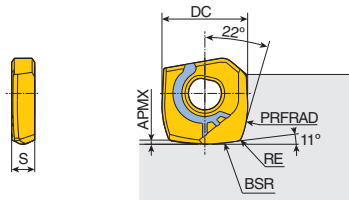
| Size | Dimension (mm) |     |      |     |        |                 |
|------|----------------|-----|------|-----|--------|-----------------|
|      | DC             | S   | APMX | RE  | PRFRAD | RE <sub>2</sub> |
| 080  | 8              | 2.2 | 4.3  | 1.0 | 20     | 0.6             |
| 100  | 10             | 2.7 | 5.4  | 1.2 | 25     | 0.8             |
| 120  | 12             | 3.2 | 6.4  | 1.5 | 30     | 1.0             |
| 160  | 16             | 4.2 | 8.5  | 2.0 | 40     | 1.3             |
| 200  | 20             | 5.2 | 10.7 | 2.5 | 50     | 1.6             |
| 250  | 25             | 6.2 | 13.5 | 3.0 | 62.5   | 2.0             |
| 300  | 30             | 7.2 | 16.3 | 3.5 | 75     | 2.4             |

| Insert                                                                           | Designation         | Recommended machining conditions |                    | Coated |        |        |        |        |        |        |        | Uncoated |  |     |  |
|----------------------------------------------------------------------------------|---------------------|----------------------------------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|-----|--|
|                                                                                  |                     | ap<br>(mm)                       | Feed<br>(mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT5515   |  | K10 |  |
|  | <b>NFCB 080-R20</b> | -                                | 0.12-0.05          |        |        |        |        |        |        |        |        | ●        |  |     |  |
|                                                                                  | <b>100-R25</b>      | -                                | 0.12-0.05          |        |        |        |        |        |        |        |        | ●        |  |     |  |
|                                                                                  | <b>120-R30</b>      | -                                | 0.15-0.08          |        |        |        |        |        |        |        |        | ●        |  |     |  |
|                                                                                  | <b>160-R40</b>      | -                                | 0.15-0.08          |        |        |        |        |        |        |        |        | ●        |  |     |  |
|                                                                                  | <b>200-R50</b>      | -                                | 0.15-0.08          |        |        |        |        |        |        |        |        | ●        |  |     |  |
|                                                                                  | <b>250-R62.5</b>    | -                                | 0.15-0.08          |        |        |        |        |        |        |        |        | ●        |  |     |  |
|                                                                                  | <b>300-R75</b>      | -                                | 0.20-0.08          |        |        |        |        |        |        |        |        | ●        |  |     |  |

●: Standard items

NFLB

Inserts



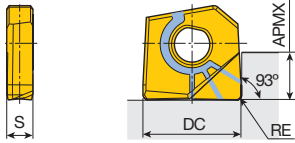
| Size | Dimension (mm) |     |      |     |     |        |
|------|----------------|-----|------|-----|-----|--------|
|      | DC             | S   | APMX | RE  | BSR | PRFRAD |
| 120  | 12             | 3.2 | 0.4  | 0.7 | 24  | 12     |
| 160  | 16             | 4.2 | 0.6  | 0.8 | 32  | 16     |
| 200  | 20             | 5.2 | 0.7  | 1   | 40  | 20     |
| 250  | 25             | 6.2 | 0.9  | 1.3 | 50  | 25     |
| 300  | 30             | 7.2 | 1.1  | 1.5 | 60  | 30     |
|      |                |     |      |     |     |        |
|      |                |     |      |     |     |        |

| Insert                                                                             | Designation             | Recommended machining conditions |                 | Coated |        |        |        |        |        |        | Uncoated |        |  |     |  |
|------------------------------------------------------------------------------------|-------------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|----------|--------|--|-----|--|
|                                                                                    |                         | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080   | TT5515 |  | K10 |  |
|  | <b>NFLB 120-L24-B12</b> | -                                | 0.15-0.08       |        |        |        |        |        |        |        |          | ●      |  |     |  |
|                                                                                    | <b>160-L32-B16</b>      | -                                | 0.15-0.08       |        |        |        |        |        |        |        |          | ●      |  |     |  |
|                                                                                    | <b>200-L40-B20</b>      | -                                | 0.15-0.08       |        |        |        |        |        |        |        |          | ●      |  |     |  |
|                                                                                    | <b>250-L50-B25</b>      | -                                | 0.15-0.08       |        |        |        |        |        |        |        |          | ●      |  |     |  |
|                                                                                    | <b>300-L60-B30</b>      | -                                | 0.20-0.08       |        |        |        |        |        |        |        |          | ●      |  |     |  |

●: Standard items



E168-E170

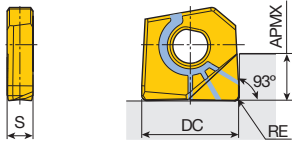


| Size       | Dimension (mm) |     |      |         |  |  |
|------------|----------------|-----|------|---------|--|--|
|            | DC             | S   | APMX | RE      |  |  |
| <b>060</b> | 6              | 2.0 | 2.5  | 0.3-1.0 |  |  |
| <b>080</b> | 8              | 2.2 | 3.4  | 0.3-1.0 |  |  |
| <b>100</b> | 10             | 2.7 | 4.0  | 0.3-2.0 |  |  |
| <b>110</b> | 11             | 2.7 | 4.4  | 0.3-2.0 |  |  |
| <b>120</b> | 12             | 3.2 | 5.0  | 0.3-2.0 |  |  |
| <b>130</b> | 13             | 3.2 | 5.4  | 0.3-2.0 |  |  |
| <b>160</b> | 16             | 4.2 | 6.9  | 0.3-3.0 |  |  |
| <b>170</b> | 17             | 4.2 | 7.4  | 1.0-2.0 |  |  |

| Insert                                                                           | Designation  | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|----------------------------------------------------------------------------------|--------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                  |              | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT8080 | TT8625 | TT7080 | TT7515 | TT6080 | TT5525 | TT5515 | TT2510   | K10 |  |
|  | NFR 060A-R03 | 0.05-0.15                        | 0.10-0.05       |        |        |        |        |        |        |        | ●      |          |     |  |
|                                                                                  | 060A-R05     | 0.10-0.15                        | 0.10-0.05       |        |        |        |        |        |        |        | ●      |          |     |  |
|                                                                                  | 060A-R10     | 0.10-0.15                        | 0.10-0.05       |        |        |        |        |        |        |        | ●      |          |     |  |
|                                                                                  | 080A-R03     | 0.05-0.2                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 080A-R05     | 0.05-0.2                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 080A-R06     | 0.05-0.2                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 080A-R10     | 0.05-0.2                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 100A-R03     | 0.05-0.3                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 100A-R05     | 0.05-0.3                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 100A-R08     | 0.05-0.3                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 100A-R10     | 0.05-0.3                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 100A-R15     | 0.05-0.3                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 100A-R20     | 0.05-0.3                         | 0.12-0.05       |        |        |        |        |        |        |        | ●      | ●        |     |  |
|                                                                                  | 110A-R10     | 0.05-0.3                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 110A-R20     | 0.05-0.3                         | 0.12-0.05       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 120A-R03     | 0.07-0.3                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 120A-R05     | 0.07-0.3                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 120A-R10     | 0.07-0.3                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 120A-R15     | 0.07-0.3                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 120A-R20     | 0.07-0.3                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 130A-R10     | 0.07-0.3                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 130A-R20     | 0.07-0.3                         | 0.15-0.08       |        |        |        |        |        |        | ●      |        | ●        |     |  |
|                                                                                  | 160A-R03     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 160A-R05     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 160A-R10     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 160A-R13     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        |        | ●      | ●        |     |  |
|                                                                                  | 160A-R15     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 160A-R20     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 160A-R30     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 170A-R10     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        |        | ●      | ●        |     |  |
|                                                                                  | 170A-R20     | 0.08-0.5                         | 0.15-0.08       |        |        |        |        |        |        |        | ●      |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

•: Standard items





| Size | Dimension (mm) |     |        |         |  |  |
|------|----------------|-----|--------|---------|--|--|
|      | DC             | S   | APMX   | RE      |  |  |
| 200  | 20             | 5.2 | 8.79.2 | 0.3-3.0 |  |  |
| 210  | 21             | 5.2 | 9.2    | 1.0-2.0 |  |  |
| 250  | 25             | 6.2 | 10.6   | 0.3-3.0 |  |  |
| 260  | 26             | 6.2 | 11     | 1.0-2.0 |  |  |
| 300  | 30             | 7.1 | 12.7   | 1.0-2.0 |  |  |
| 320  | 32             | 7.1 | 13.6   | 1.0-2.0 |  |  |
|      |                |     |        |         |  |  |

| Insert                                                                           | Designation  | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|----------------------------------------------------------------------------------|--------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                  |              | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT8080 | TT8625 | TT7080 | TT7515 | TT6080 | TT5525 | TT5515 | TT2510   | K10 |  |
|  | NFR 200A-R03 | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 200A-R05     | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 200A-R10     | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 200A-R15     | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 200A-R16     | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 200A-R20     | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 200A-R30     | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 210A-R10     | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 210A-R20     | 0.1-0.7                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 250A-R03     | 0.1-1.0                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 250A-R05     | 0.1-1.0                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 250A-R10     | 0.1-1.0                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 250A-R15     | 0.1-1.0                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 250A-R20     | 0.1-1.0                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 250A-R30     | 0.1-1.0                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 260A-R10     | 0.1-1.0                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 260A-R20     | 0.1-1.0                          | 0.15-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 300A-R05     | 0.1-1.0                          | 0.20-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 300A-R10     | 0.1-1.0                          | 0.20-0.08       |        |        |        |        |        |        |        | ●      | ●        |     |  |
|                                                                                  | 300A-R20     | 0.1-1.0                          | 0.20-0.08       |        |        |        |        |        |        |        | ●      | ●        |     |  |
|                                                                                  | 320A-R10     | 0.1-1.0                          | 0.20-0.08       |        |        |        |        |        |        | ●      | ●      | ●        |     |  |
|                                                                                  | 320A-R20     | 0.1-1.0                          | 0.20-0.08       |        |        |        |        |        |        |        | ●      | ●        |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |              |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

●: Standard items



E168-E173



| Size    | Dimension (mm) |     |      |     |  |  |  |
|---------|----------------|-----|------|-----|--|--|--|
|         | IC             | S   | APMX | RE  |  |  |  |
| 05(HF)  | 7.1            | 3.8 | 1.5  | 1.5 |  |  |  |
| 05(65°) | 7.1            | 3.8 | 3.3  | 1.5 |  |  |  |
| 10(HF)  | 14.2           | 7.7 | 3.0  | 3.0 |  |  |  |
| 10(65°) | 14.2           | 7.7 | 6.5  | 3.0 |  |  |  |
|         |                |     |      |     |  |  |  |
|         |                |     |      |     |  |  |  |

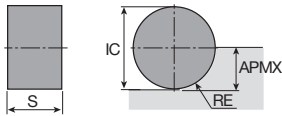
[illegible]

Two cross-sectional diagrams of pipe fittings. The left diagram shows a flange fitting with four yellow bolts, labeled F74 F102. The right diagram shows a butt-weld fitting with a yellow weld bead, labeled F187.

RNGN 12-FL



Inserts



| Size | Dimension (mm) |      |      |      |  |  |  |
|------|----------------|------|------|------|--|--|--|
|      | RE             | IC   | S    | APMX |  |  |  |
| 12   | 6.35           | 12.7 | 7.94 | 6.3  |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |

| Insert | Designation           | Recommended machining conditions |                 | Ceramic |        | Coated |        |        |        |        |        |        | Uncoated |  |
|--------|-----------------------|----------------------------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                       | ap (mm)                          | Feed (mm/tooth) | TC3020  | TC3030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 | K10      |  |
|        | <b>RNGN 1207 FL-E</b> | 0.5-3.0                          | 0.25-0.10       | ●       | ●      |        |        |        |        |        |        |        |          |  |
|        | <b>1207 FL-E04</b>    | 0.5-3.0                          | 0.25-0.10       | ●       | ●      |        |        |        |        |        |        |        |          |  |
|        | <b>1207 FL-T6</b>     | 0.5-3.0                          | 0.25-0.10       | ●       | ●      |        |        |        |        |        |        |        |          |  |

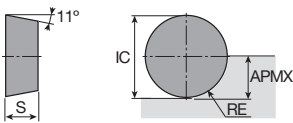


●: Standard items

RPGN 09/12-FL



Inserts



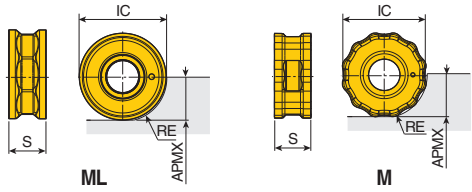
| Size | Dimension (mm) |      |      |      |  |  |  |
|------|----------------|------|------|------|--|--|--|
|      | RE             | IC   | S    | APMX |  |  |  |
| 09   | 4.76           | 9.52 | 3.18 | 4.7  |  |  |  |
| 12   | 6.35           | 12.7 | 4.76 | 6.3  |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |

| Insert | Designation             | Recommended machining conditions |                 | Ceramic |        | Coated |        |        |        |        |        |        | Uncoated |  |
|--------|-------------------------|----------------------------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                         | ap (mm)                          | Feed (mm/tooth) | TC3020  | TC3030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 | K10      |  |
|        | <b>RPGN 0903 FL-E04</b> | 0.5-1.5                          | 0.15-0.07       | ●       | ●      |        |        |        |        |        |        |        |          |  |
|        | <b>1204 FL-E</b>        | 0.5-2.0                          | 0.20-0.07       | ●       | ●      |        |        |        |        |        |        |        |          |  |
|        | <b>1204 FL-E04</b>      | 0.5-2.0                          | 0.20-0.07       | ●       | ●      |        |        |        |        |        |        |        |          |  |
|        | <b>1204 FL-T6</b>       | 0.5-2.0                          | 0.20-0.07       | ●       | ●      |        |        |        |        |        |        |        |          |  |

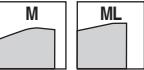


●: Standard items

Inserts



| Size | Dimension (mm) |    |     |      |  |  |  |
|------|----------------|----|-----|------|--|--|--|
|      | RE             | IC | S   | APMX |  |  |  |
| 10   | 5              | 10 | 4.5 | 5.0  |  |  |  |
| 12   | 6              | 12 | 5.0 | 6.0  |  |  |  |
| 16   | 8              | 16 | 6.3 | 8.0  |  |  |  |
|      |                |    |     |      |  |  |  |
|      |                |    |     |      |  |  |  |
|      |                |    |     |      |  |  |  |

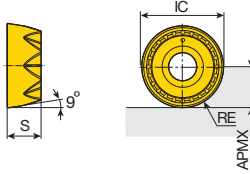


| Insert                                                                           | Designation        | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|----------------------------------------------------------------------------------|--------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                  |                    | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510   | K10 |  |
|  | <b>RNMU1004-ML</b> | 1.5-4.0                          | 0.30-0.05       | ●      |        | ●      | ●      | ●      |        |        |        | ●        |     |  |
|                                                                                  | <b>1205-ML</b>     | 1.5-5.0                          | 0.35-0.05       | ●      |        | ●      | ●      | ●      |        |        |        | ●        |     |  |
|                                                                                  | <b>1606-ML</b>     | 2.0-6.5                          | 0.40-0.05       | ●      |        | ●      | ●      | ●      |        |        |        | ●        |     |  |
|  | <b>RNMU1004S-M</b> | 1.5-4.0                          | 0.35-0.05       | ●      |        | ●      | ●      | ●      |        |        |        | ●        |     |  |
|                                                                                  | <b>1205S-M</b>     | 1.5-5.0                          | 0.40-0.05       | ●      |        | ●      | ●      | ●      |        |        |        | ●        |     |  |
|                                                                                  | <b>1606S-M</b>     | 2.0-6.5                          | 0.45-0.05       | ●      |        | ●      | ●      | ●      |        |        |        | ●        |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

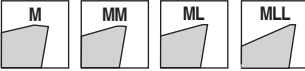
●: Standard items



## Inserts



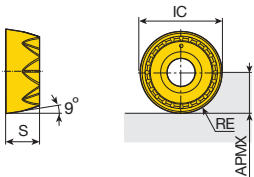
| Size      | Dimension (mm) |    |     |      |  |  |  |
|-----------|----------------|----|-----|------|--|--|--|
|           | RE             | IC | S   | APMX |  |  |  |
| <b>08</b> | 4              | 8  | 3.2 | 4.0  |  |  |  |
| <b>10</b> | 5              | 10 | 4.0 | 5.0  |  |  |  |
| <b>12</b> | 6              | 12 | 4.8 | 6.0  |  |  |  |
| <b>16</b> | 8              | 16 | 6.1 | 8.0  |  |  |  |
| <b>20</b> | 10             | 20 | 7.0 | 10.0 |  |  |  |
|           |                |    |     |      |  |  |  |
|           |                |    |     |      |  |  |  |



| Insert                                                                             | Designation          | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|------------------------------------------------------------------------------------|----------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|                                                                                    |                      | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510   | K10 |  |
|    | <b>RYMX 0803-M</b>   | 1.0-3.5                          | 0.25-0.05       | ●      |        | ●      |        | ●      | ●      |        | ●      | ●        |     |  |
|                                                                                    | <b>1004-M</b>        | 1.5-4.0                          | 0.30-0.10       | ●      |        | ●      | ●      | ●      | ●      |        | ●      | ●        |     |  |
|                                                                                    | <b>1205-M</b>        | 1.5-5.0                          | 0.50-0.10       | ●      |        | ●      | ●      | ●      | ●      |        | ●      | ●        |     |  |
|                                                                                    | <b>1205-6M</b>       | 1.5-5.0                          | 0.50-0.10       | ●      |        |        |        |        |        |        |        | ●        |     |  |
|                                                                                    | <b>1606-M</b>        | 2.0-6.5                          | 0.50-0.10       | ●      |        | ●      | ●      | ●      | ●      |        | ●      | ●        |     |  |
|                                                                                    | <b>1606-7M</b>       | 2.0-6.5                          | 0.50-0.10       | ●      |        |        |        | ●      |        |        |        | ●        |     |  |
|                                                                                    | <b>2007-M</b>        | 3.0-8.0                          | 0.50-0.10       | ●      |        | ●      | ●      | ●      | ●      |        | ●      | ●        |     |  |
|    | <b>RYMX 0803-MM</b>  | 1.0-3.5                          | 0.30-0.07       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>1004-MM</b>       | 1.5-4.0                          | 0.35-0.07       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>1205-MM</b>       | 1.5-5.0                          | 0.40-0.10       | ●      |        | ●      | ●      | ●      |        |        |        |          |     |  |
|                                                                                    | <b>1205-6MM</b>      | 1.5-5.0                          | 0.40-0.10       | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                    | <b>1606-MM</b>       | 2.0-6.5                          | 0.45-0.10       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>1606-7MM</b>      | 2.0-6.5                          | 0.45-0.10       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>RYHX 1205-MM</b>  | 3.0-8.0                          | 0.40-0.10       | ●      |        |        | ●      |        |        |        |        |          |     |  |
|    | <b>RYMX 0803-ML</b>  | 1.0-3.5                          | 0.25-0.05       | ●      |        | ●      | ●      | ●      |        |        |        |          |     |  |
|                                                                                    | <b>1004-ML</b>       | 1.5-4.0                          | 0.30-0.05       | ●      |        | ●      | ●      | ●      |        |        |        |          |     |  |
|                                                                                    | <b>1205-ML</b>       | 1.5-5.0                          | 0.35-0.05       | ●      |        | ●      | ●      | ●      |        |        |        |          |     |  |
|                                                                                    | <b>1205-6ML</b>      | 1.5-5.0                          | 0.35-0.05       | ●      |        | ●      |        |        |        |        |        |          |     |  |
|                                                                                    | <b>1606-ML</b>       | 2.0-6.5                          | 0.40-0.05       | ●      |        | ●      | ●      | ●      |        |        |        |          |     |  |
|                                                                                    | <b>1606-7ML</b>      | 2.0-6.5                          | 0.40-0.05       | ●      |        |        |        |        |        |        |        |          |     |  |
|                                                                                    | <b>2007-ML</b>       | 3.0-8.0                          | 0.50-0.10       | ●      |        | ●      | ●      | ●      | ●      |        |        |          |     |  |
|                                                                                    | <b>RYHX 0803-ML</b>  | 1.0-3.5                          | 0.25-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>1004-ML</b>       | 1.5-4.0                          | 0.30-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>1205-ML</b>       | 1.5-5.0                          | 0.35-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|  | <b>1606-ML</b>       | 2.0-6.5                          | 0.40-0.10       | ●      |        | ●      |        |        |        |        |        |          |     |  |
|                                                                                    | <b>RYMX 0803-MLL</b> | 1.0-3.5                          | 0.25-0.05       |        |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>1004-MLL</b>      | 1.5-4.0                          | 0.30-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>1205-MLL</b>      | 1.5-5.0                          | 0.35-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>RYHX 0803-MLL</b> | 1.0-3.5                          | 0.25-0.05       |        |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    | <b>1004-MLL</b>      | 1.5-4.0                          | 0.30-0.05       |        |        | ●      |        |        |        |        |        |          |     |  |
|                                                                                    | <b>1205-MLL</b>      | 1.5-5.0                          | 0.35-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |  |
|                                                                                    |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|                                                                                    |                      |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

●: Standard items





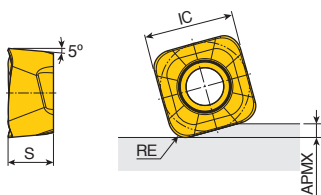
| Size | Dimension (mm) |    |     |      |  |  |
|------|----------------|----|-----|------|--|--|
|      | RE             | IC | S   | APMX |  |  |
| 08   | 4              | 8  | 3.2 | 4.0  |  |  |
| 10   | 5              | 10 | 4.0 | 5.0  |  |  |
| 12   | 6              | 12 | 4.8 | 6.0  |  |  |
| 16   | 8              | 16 | 6.1 | 8.0  |  |  |
| 20   | 10             | 20 | 7.0 | 10.0 |  |  |
|      |                |    |     |      |  |  |
|      |                |    |     |      |  |  |



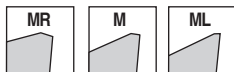
| Insert                                                                           | Designation         | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |   |
|----------------------------------------------------------------------------------|---------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|---|
|                                                                                  |                     | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510   | K10 |   |
|  | <b>RYMX 0803-MR</b> | 1.0-3.5                          | 0.30-0.05       | ●      |        |        |        | ●      | ●      |        | ●      | ●        |     |   |
|                                                                                  | <b>1004-MR</b>      | 1.5-4.0                          | 0.35-0.05       | ●      |        | ●      |        |        | ●      |        |        | ●        |     |   |
|                                                                                  | <b>1205-MR</b>      | 1.5-5.0                          | 0.35-0.05       | ●      |        | ●      |        |        | ●      |        | ●      | ●        |     |   |
|                                                                                  | <b>1606-MR</b>      | 2.0-6.5                          | 0.40-0.05       | ●      |        |        |        | ●      | ●      |        | ●      | ●        |     |   |
|                                                                                  | <b>2007-MR</b>      | 3.0-8.0                          | 0.45-0.10       | ●      |        |        |        | ●      |        |        | ●      | ●        |     |   |
|                                                                                  | <b>RYHX 0803-MR</b> | 1.5-4.0                          | 0.30-0.05       | ●      |        |        |        |        |        |        |        |          | ●   |   |
|                                                                                  | <b>1004-MR</b>      | 1.5-5.0                          | 0.35-0.05       | ●      |        |        |        |        |        |        | ●      | ●        |     |   |
|                                                                                  | <b>1205-MR</b>      | 2.0-6.5                          | 0.35-0.05       | ●      |        |        |        |        |        |        | ●      | ●        |     |   |
|  | <b>RYHX 0803-AL</b> | 1.0-3.5                          | 0.80-0.10       |        |        |        |        |        |        |        |        |          |     | ● |
|                                                                                  | <b>1004-AL</b>      | 1.5-4.0                          | 0.80-0.10       |        |        |        |        |        |        |        |        |          |     | ● |
|                                                                                  | <b>1205-AL</b>      | 1.5-5.0                          | 0.80-0.10       |        |        |        |        |        |        |        |        |          |     | ● |
|                                                                                  | <b>1606-AL</b>      | 2.0-6.5                          | 0.80-0.10       |        |        |        |        |        |        |        |        |          |     | ● |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|  | <b>RYHX 0803-L</b>  | 1.0-3.5                          | 0.25-0.05       |        |        | ●      |        |        |        |        |        |          |     |   |
|                                                                                  | <b>1004-L</b>       | 1.5-4.0                          | 0.30-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |   |
|                                                                                  | <b>1205-L</b>       | 1.5-5.0                          | 0.35-0.05       | ●      |        | ●      | ●      |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |
|                                                                                  |                     |                                  |                 |        |        |        |        |        |        |        |        |          |     |   |

●: Standard items



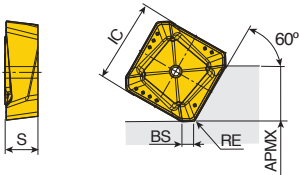


| Size      | Dimension (mm) |      |      |     |  |  |  |
|-----------|----------------|------|------|-----|--|--|--|
|           | IC             | S    | APMX | RE  |  |  |  |
| <b>06</b> | 6.3            | 3.16 | 1.0  | 1.0 |  |  |  |
| <b>09</b> | 9.0            | 4.0  | 1.2  | 1.5 |  |  |  |
| <b>13</b> | 13.1           | 6.7  | 2.0  | 2.5 |  |  |  |
|           |                |      |      |     |  |  |  |
|           |                |      |      |     |  |  |  |
|           |                |      |      |     |  |  |  |

[illegible]

●: Standard items

Inserts



| Size  | Dimension (mm) |      |      |    |     |  |
|-------|----------------|------|------|----|-----|--|
|       | IC             | S    | APMX | BS | RE  |  |
| 21-HE | 20.8           | 7    | 13   | 2  | 1.5 |  |
| 27-HE | 26.8           | 8.95 | 18   | 2  | 2   |  |
|       |                |      |      |    |     |  |
|       |                |      |      |    |     |  |
|       |                |      |      |    |     |  |
|       |                |      |      |    |     |  |



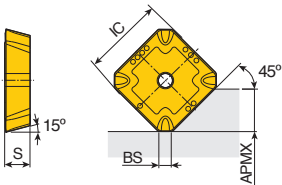
| Insert | Designation              | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|--------|--------------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|        |                          | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 |          | K10 |
|        | <b>SCKN 2107 DDTR-HE</b> | 3.5-10.5                         | 0.25-0.13       |        |        |        |        | ●      | ●      | ●      |        |          |     |
|        | <b>2708 DDTR-HE</b>      | 5.0-14.5                         | 0.30-0.15       |        |        |        |        | ●      |        |        |        |          |     |
|        |                          |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                          |                                  |                 |        |        |        |        |        |        |        |        |          |     |



●: Standard items

SDKN 12/15

Inserts



| Size | Dimension (mm) |      |      |      |  |  |
|------|----------------|------|------|------|--|--|
|      | IC             | S    | APMX | BS   |  |  |
| 12   | 12.7           | 3.18 | 6.5  | 2.00 |  |  |
| 15   | 15.875         | 4.76 | 8.7  | 1.89 |  |  |
|      |                |      |      |      |  |  |
|      |                |      |      |      |  |  |
|      |                |      |      |      |  |  |

| Insert | Designation             | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|--------|-------------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|        |                         | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 |          | K10 |
|        | <b>SDKN 1203 MT-HPN</b> | 1.5-6.0                          | 0.25-0.10       |        |        |        |        | ●      |        |        |        |          |     |
|        | <b>1504 MT-HPN</b>      | 1.5-8.0                          | 0.25-0.10       |        |        |        |        | ●      |        |        |        |          |     |
|        |                         |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                         |                                  |                 |        |        |        |        |        |        |        |        |          |     |

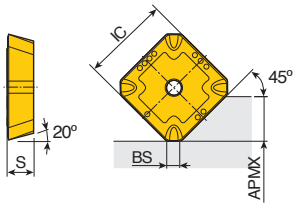


●: Standard items

SEKN 12/15



Inserts



| Size | Dimension (mm) |      |      |      |  |  |
|------|----------------|------|------|------|--|--|
|      | IC             | S    | APMX | BS   |  |  |
| 12   | 12.7           | 3.18 | 6.5  | 2.08 |  |  |
| 15   | 15.875         | 4.76 | 8.7  | 2.06 |  |  |
|      |                |      |      |      |  |  |
|      |                |      |      |      |  |  |
|      |                |      |      |      |  |  |
|      |                |      |      |      |  |  |
|      |                |      |      |      |  |  |

| Insert                                                                           | Designation        | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|----------------------------------------------------------------------------------|--------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                  |                    | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 |          | K10 |
|  | SEKN 1203 AFTN-HPN | 1.5-6.0                          | 0.25-0.10       |        |        |        |        |        | ●      |        |        |          |     |
|                                                                                  | 1504 AFTN-HPN      | 1.5-8.0                          | 0.25-0.10       |        |        |        |        |        | ●      |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |

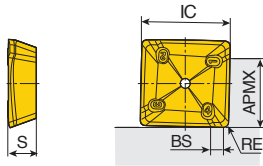


●: Standard items

SEKX 21



Inserts



| Size | Dimension (mm) |   |      |    |     |  |
|------|----------------|---|------|----|-----|--|
|      | IC             | S | APMX | BS | RE  |  |
| 21   | 21.85          | 7 | 17   | 2  | 1.2 |  |
|      |                |   |      |    |     |  |
|      |                |   |      |    |     |  |
|      |                |   |      |    |     |  |
|      |                |   |      |    |     |  |
|      |                |   |      |    |     |  |

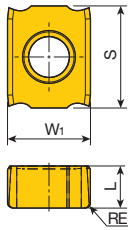
| Insert                                                                             | Designation      | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|------------------------------------------------------------------------------------|------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                    |                  | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 |          | K10 |
|  | SEKX 2107 PETR-M | 5.5-13.0                         | 0.22-0.10       |        |        |        |        | ●      |        | ●      |        |          |     |
|                                                                                    |                  |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                    |                  |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                    |                  |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                    |                  |                                  |                 |        |        |        |        |        |        |        |        |          |     |



●: Standard items



Inserts



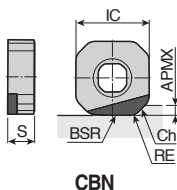
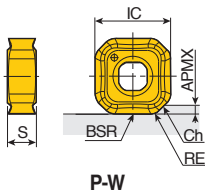
| Size | Dimension (mm) |     |     |     |  |  |
|------|----------------|-----|-----|-----|--|--|
|      | S              | W1  | L   | RE  |  |  |
| 018  | 8              | 6.5 | 1.8 | 0.4 |  |  |
| 023  | 8              | 6.5 | 2.3 | 0.4 |  |  |
| 028  | 8              | 6.5 | 2.8 | 0.4 |  |  |
| 033  | 8              | 6.5 | 3.3 | 0.4 |  |  |
|      |                |     |     |     |  |  |
|      |                |     |     |     |  |  |
|      |                |     |     |     |  |  |
|      |                |     |     |     |  |  |

| Insert                                                                           | Designation | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|----------------------------------------------------------------------------------|-------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                  |             | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 |          | K10 |
|  | SLOT 018-04 | -                                | 0.08-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|                                                                                  | 023-04      | -                                | 0.08-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|                                                                                  | 028-04      | -                                | 0.08-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|                                                                                  | 033-04      | -                                | 0.10-0.06       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |             |                                  |                 |        |        |        |        |        |        |        |        |          |     |

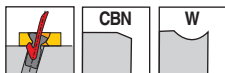
●: Standard items



## Inserts



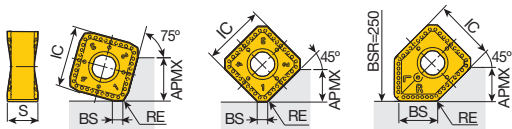
| Size             | Dimension (mm) |      |      |     |     |     |
|------------------|----------------|------|------|-----|-----|-----|
|                  | IC             | S    | APMX | RE  | BSR | C5  |
| <b>1204 P-W</b>  | 12.7           | 4.76 | 1.0  | 2.0 | 450 | 2.5 |
| <b>1204-W</b>    | 12.7           | 4.76 | 1.0  | 2.0 | 800 | -   |
| <b>1205-W</b>    | 12.7           | 5.56 | 1.0  | 2.0 | 450 | 2.5 |
| <b>1204R-CBN</b> | 12.7           | 4.76 | 1.0  | 0.8 | 250 | 1.5 |
|                  |                |      |      |     |     |     |
|                  |                |      |      |     |     |     |

[illegible]

- : Standard items



## Inserts



## ENTN / XTN

**AN(T)N / XTN**

W



| Size                | Dimension (mm) |     |      |     |     |
|---------------------|----------------|-----|------|-----|-----|
|                     | IC             | S   | APMX | BS  | RE  |
| <b>13 ENTN-M</b>    | 13.5           | 7.0 | 9.5  | 2.2 | 0.4 |
| <b>13 ANTN-M/ML</b> | 13.5           | 6.8 | 7.0  | 2.2 | 0.4 |
| <b>13 ANN-AL</b>    | 13.5           | 6.8 | 7.0  | 2.2 | 0.4 |
| <b>13 ANTN-MP</b>   | 13.5           | 6.8 | 6.0  | 2.2 | 0.4 |
| <b>13 ANTN-W</b>    | 13.5           | 6.8 | 7.0  | 7.5 | 12  |
| <b>13 XTN(75°)</b>  | 13.5           | 6.8 | 9.6  | 1.4 | 0.4 |
| <b>13 XTN(45°)</b>  | 13.5           | 6.8 | 6.35 | 1.4 | 0.4 |

[illegible]

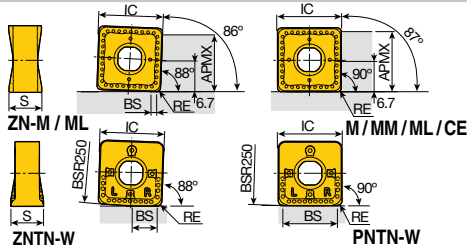
- : Standard items



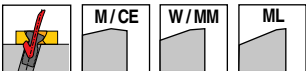
# SNG(M)X 13, SNKX 13



## Inserts



| Size | Dimension (mm) |         |       |         |         |  |
|------|----------------|---------|-------|---------|---------|--|
|      | IC             | S       | APMX  | BS      | RE      |  |
| 13   | 13.5           | 6.8-7.0 | 10-12 | 1.2-5.3 | 0.4-2.0 |  |
| 13-W | 13.5           | 6.8     | 10-12 | 11.5    | 1.0     |  |
|      |                |         |       |         |         |  |
|      |                |         |       |         |         |  |
|      |                |         |       |         |         |  |
|      |                |         |       |         |         |  |

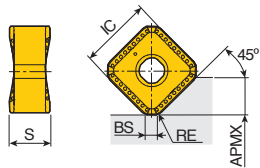


| Insert | Designation      | Recommended machining conditions |                 | Ceramic |        |        |        |        |        |        |        |        |     | Coated |  | Uncoated |  |
|--------|------------------|----------------------------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|--|----------|--|
|        |                  | ap (mm)                          | Feed (mm/tooth) | AS10    | TT9080 | TT9030 | TT8080 | TT8625 | TT7080 | TT7515 | TT6080 | TT2510 | K10 |        |  |          |  |
|        | SNGX 1306 ZN-M   | 3.5-10.0                         | 0.20-0.10       |         | ●      |        | ●      |        | ●      | ●      | ●      |        |     |        |  |          |  |
|        | 1306 ZN-ML       | 3.5-10.0                         | 0.25-0.13       |         |        |        | ●      |        |        |        | ●      |        |     |        |  |          |  |
|        | 1306C08 ZN-M     | 3.5-10.0                         | 0.20-0.10       |         | ●      |        |        |        | ●      | ●      | ●      |        |     |        |  |          |  |
|        | SNMX 1306 ZN-M   | 3.5-10.0                         | 0.20-0.10       |         | ●      |        |        |        |        | ●      | ●      |        |     |        |  |          |  |
|        | 1306C08 ZN-M     | 3.5-10.0                         | 0.20-0.10       |         |        |        |        |        |        | ●      |        |        |     |        |  |          |  |
|        | SNGX 130608-MM   | 3.5-10.0                         | 0.15-0.08       |         |        |        | ●      |        |        |        |        |        |     |        |  |          |  |
|        | 130612-MM        | 3.5-10.0                         | 0.15-0.08       |         |        |        |        |        |        |        | ●      |        |     |        |  |          |  |
|        | 130616-MM        | 3.5-10.0                         | 0.15-0.08       |         |        |        | ●      |        | ●      |        |        |        |     |        |  |          |  |
|        | 130608-ML        | 3.5-10.0                         | 0.25-0.13       |         |        |        |        |        |        | ●      | ●      |        |     |        |  |          |  |
|        | 130612-ML        | 3.5-10.0                         | 0.25-0.13       |         |        |        |        |        |        | ●      |        |        |     |        |  |          |  |
|        | SNMX 130608-ML   | 3.5-10.0                         | 0.25-0.13       |         |        |        |        |        |        |        | ●      |        |     |        |  |          |  |
|        | 130608-M         | 3.5-10.0                         | 0.20-0.10       |         | ●      |        |        |        | ●      | ●      | ●      |        |     |        |  |          |  |
|        | SNGX 130612-M    | 3.5-10.0                         | 0.20-0.10       |         | ●      |        |        |        |        | ●      | ●      |        |     |        |  |          |  |
|        | 130616-M         | 3.5-10.0                         | 0.20-0.10       |         | ●      |        | ●      | ●      | ●      | ●      | ●      |        |     |        |  |          |  |
|        | 130620-M         | 3.5-10.0                         | 0.20-0.10       |         | ●      |        |        |        | ●      | ●      | ●      |        |     |        |  |          |  |
|        | SNMX 130604-M    | 3.5-10.0                         | 0.20-0.10       |         |        |        |        |        |        |        | ●      |        |     |        |  |          |  |
|        | 130608-M         | 3.5-10.0                         | 0.20-0.10       |         | ●      |        |        |        |        |        | ●      |        |     |        |  |          |  |
|        | 130612-M         | 3.5-10.0                         | 0.20-0.10       |         |        |        |        |        |        |        | ●      |        |     |        |  |          |  |
|        | 130616-M         | 3.5-10.0                         | 0.20-0.10       |         | ●      | ●      |        |        |        |        | ●      |        |     |        |  |          |  |
|        | SNGX 130608-CE   | 3.5-10.0                         | 0.25-0.13       | ●       |        |        |        |        |        |        |        |        |     |        |  |          |  |
|        | SNKX 130608-CE   | 3.5-10.0                         | 0.25-0.13       | ●       |        |        |        |        |        |        |        |        |     |        |  |          |  |
|        | SNGX 1306 ZNTN-W | 0.2-1.0                          | 0.20-0.10       |         | ●      |        |        |        |        |        | ●      |        |     |        |  |          |  |
|        | 1306 PNTN-W      | 0.2-1.0                          | 0.20-0.10       |         | ●      |        |        |        |        |        |        | ●      |     |        |  |          |  |
|        |                  |                                  |                 |         |        |        |        |        |        |        |        |        |     |        |  |          |  |
|        |                  |                                  |                 |         |        |        |        |        |        |        |        |        |     |        |  |          |  |
|        |                  |                                  |                 |         |        |        |        |        |        |        |        |        |     |        |  |          |  |
|        |                  |                                  |                 |         |        |        |        |        |        |        |        |        |     |        |  |          |  |
|        |                  |                                  |                 |         |        |        |        |        |        |        |        |        |     |        |  |          |  |

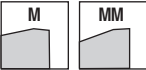


●: Standard items

Inserts



| Size    | Dimension (mm) |     |      |     |     |  |
|---------|----------------|-----|------|-----|-----|--|
|         | IC             | S   | APMX | BS  | RE  |  |
| SNMX 16 | 16.7           | 7.8 | 8.8  | 2.4 | 0.8 |  |
| SNHX 16 | 16.7           | 6.4 | 8.8  | 2.4 | 0.8 |  |
|         |                |     |      |     |     |  |
|         |                |     |      |     |     |  |
|         |                |     |      |     |     |  |
|         |                |     |      |     |     |  |

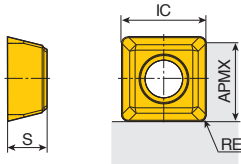


| Insert | Designation       | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|--------|-------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|        |                   | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 |          | K10 |
|        | SNMX 1607 ANT-N-M | 2.5-7.5                          | 0.25-0.13       | ●      |        | ●      |        | ●      | ●      |        | ●      |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        | SNHX 1606 ANN-MM  | 2.5-7.5                          | 0.20-0.10       |        |        |        |        |        | ●      |        | ●      |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|        |                   |                                  |                 |        |        |        |        |        |        |        |        |          |     |

●: Standard items



Inserts



| Size | Dimension (mm) |      |      |     |  |  |
|------|----------------|------|------|-----|--|--|
|      | IC             | S    | APMX | RE  |  |  |
| 06   | 6.16           | 2.56 | 5.6  | 0.4 |  |  |
| 09   | 9.8            | 4.3  | 9.0  | 0.8 |  |  |
| 11   | 11.5           | 4.8  | 10.7 | 0.8 |  |  |
| 14   | 14.2           | 5.2  | 13.4 | 0.8 |  |  |
|      |                |      |      |     |  |  |
|      |                |      |      |     |  |  |
|      |                |      |      |     |  |  |



| Insert | Designation    | Recommended machining conditions |                 | Cermet |  | Coated |        |        |        |        |        |        |        | Uncoated |  |
|--------|----------------|----------------------------------|-----------------|--------|--|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|        |                | ap (mm)                          | Feed (mm/tooth) | CT7000 |  | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | K10      |  |
|        | SPMG 090404-EM | 2.5-7.5                          | 0.15-0.08       |        |  |        |        |        | •      |        |        |        |        |          |  |
|        | 090408-EM      | 2.5-7.5                          | 0.15-0.08       |        |  | •      |        |        | •      |        | •      |        | •      |          |  |
|        | 110408-EM      | 3.0-8.5                          | 0.16-0.09       |        |  | •      | •      | •      | •      |        | •      |        | •      |          |  |
|        | 140508-EM      | 4.0-11.0                         | 0.18-0.10       |        |  | •      |        | •      |        | •      |        |        | •      |          |  |
|        | SPMT 090408-EM | 2.5-7.5                          | 0.15-0.08       |        |  | •      | •      |        | •      |        | •      |        | •      |          |  |
|        | 110408-EM      | 3.0-8.5                          | 0.16-0.09       |        |  | •      | •      | •      | •      |        | •      |        | •      |          |  |
|        | 140508-EM      | 4.0-11.0                         | 0.18-0.10       |        |  | •      |        | •      | •      | •      |        |        | •      |          |  |
|        | XOMT 060204    | 1.5-4.5                          | 0.06-0.03       |        |  |        | •      |        | •      |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |
|        |                |                                  |                 |        |  |        |        |        |        |        |        |        |        |          |  |



•: Standard items

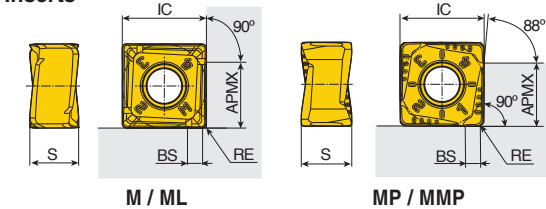
| Size      | Dimension (mm) |      |      |         |  |
|-----------|----------------|------|------|---------|--|
|           | IC             | S    | APMX | BS      |  |
| <b>12</b> | 12.7           | 3.18 | 9.5  | 1.2-1.6 |  |
| <b>15</b> | 15.875         | 4.76 | 12.5 | 1.4-1.6 |  |
|           |                |      |      |         |  |
|           |                |      |      |         |  |
|           |                |      |      |         |  |
|           |                |      |      |         |  |
|           |                |      |      |         |  |

[illegible]

●: Standard items



Inserts



| Size   | Dimension (mm) |         |      |         |         |  |
|--------|----------------|---------|------|---------|---------|--|
|        | IC             | S       | APMX | BS      | RE      |  |
| 07     | 7              | 3.9-4.1 | 5.0  | 0.2-0.9 | 0.8-1.6 |  |
| 10-M   | 10             | 5.6-5.8 | 7.0  | 0.4-1.1 | 0.8-1.6 |  |
| 10-MP  | 10             | 5.8-6.0 | 7.0  | 0.4-1.1 | 0.8-1.6 |  |
| 10-MMP | 10             | 6.0     | 6.5  | 1.1     | 0.8     |  |
| 12-MP  | 12.2           | 7.8-8.0 | 8.5  | 0.4-1.1 | 0.8-1.6 |  |
| 12-MMP | 12.2           | 8.0     | 8.0  | 1.1     | 0.8     |  |



| Insert                                                                            | Designation                | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        |        |        | Uncoated |  |
|-----------------------------------------------------------------------------------|----------------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                   |                            | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | TT3535 | TT2510 | K10      |  |
|   | <b>SQKU 070308 PNR-M</b>   | 1.0-4.0                          | 0.20-0.10       | ●      |        | ●      |        | ●      |        |        | ●      |        | ●      |          |  |
|                                                                                   | <b>070316 PNR-M</b>        | 1.0-4.0                          | 0.20-0.10       | ●      |        |        |        |        |        |        | ●      |        |        |          |  |
|                                                                                   | <b>100408 PNR-M</b>        | 1.5-5.5                          | 0.20-0.10       | ●      |        | ●      |        | ●      |        |        | ●      |        | ●      |          |  |
|                                                                                   | <b>100416 PNR-M</b>        | 1.5-5.5                          | 0.20-0.10       | ●      |        |        |        |        |        |        | ●      |        |        |          |  |
|   | <b>SQKU 070308 PNR-ML</b>  | 1.0-4.0                          | 0.20-0.10       | ●      |        | ●      |        |        |        |        | ●      | ●      |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|   | <b>SQKU 100408 PNR-MP</b>  | 1.5-5.5                          | 0.20-0.10       | ●      |        |        |        | ●      |        |        | ●      |        | ●      |          |  |
|                                                                                   | <b>100416 PNR-MP</b>       | 1.5-5.5                          | 0.20-0.10       | ●      |        |        |        | ●      |        |        | ●      |        |        |          |  |
|                                                                                   | <b>120608 PNR-MP</b>       | 2.0-6.5                          | 0.25-0.15       | ●      |        |        |        | ●      |        |        | ●      |        | ●      |          |  |
|                                                                                   | <b>120612 PNR-MP</b>       | 2.0-6.5                          | 0.25-0.15       | ●      |        |        |        | ●      |        |        | ●      |        |        |          |  |
|                                                                                   | <b>120616 PNR-MP</b>       | 2.0-6.5                          | 0.25-0.15       | ●      |        |        |        | ●      |        |        | ●      |        |        |          |  |
|  | <b>SQKH 100408 PNR-MMP</b> | 1.5-5.5                          | 0.25-0.10       | ●      |        |        |        |        |        |        | ●      |        |        |          |  |
|                                                                                   | <b>120608 PNR-MMP</b>      | 2.0-6.5                          | 0.25-0.15       | ●      |        |        |        |        |        |        | ●      |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |
|                                                                                   |                            |                                  |                 |        |        |        |        |        |        |        |        |        |        |          |  |



●: Standard items



| Size           | Dimension (mm) |     |      |     |  |  |  |
|----------------|----------------|-----|------|-----|--|--|--|
|                | IC             | S   | APMX | BS  |  |  |  |
| <b>11(45°)</b> | 11.2           | 6.3 | 4.2  | 1.9 |  |  |  |
| <b>11(20°)</b> | 11.2           | 6.3 | 1.8  | 1.0 |  |  |  |
| <b>14(45°)</b> | 14.5           | 7.8 | 6.0  | 2.0 |  |  |  |
| <b>14(20°)</b> | 14.5           | 7.8 | 2.5  | 1.6 |  |  |  |
|                |                |     |      |     |  |  |  |
|                |                |     |      |     |  |  |  |

[illegible]

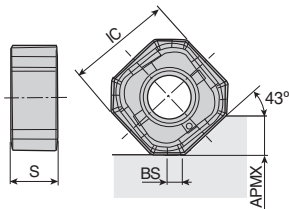
- : Standard items



SQKU 11/14(CE)



Inserts



| Size | Dimension (mm) |      |      |      |  |  |  |
|------|----------------|------|------|------|--|--|--|
|      | IC             | S    | APMX | BS   |  |  |  |
| 11   | 11.2           | 5.0  | 4.0  | 1.45 |  |  |  |
| 14   | 14.5           | 6.35 | 5.5  | 1.70 |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |
|      |                |      |      |      |  |  |  |

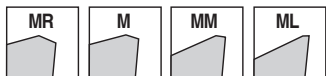
| Insert                                                                           | Designation         | Recommended machining conditions |                 | Ceramic | Coated |        |        |        |        |        |        |        | Uncoated |  |
|----------------------------------------------------------------------------------|---------------------|----------------------------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--|
|                                                                                  |                     | ap (mm)                          | Feed (mm/tooth) | AS10    | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 | K10      |  |
|  | <b>SQKU 1105-CE</b> | 1.0-3.0                          | 0.25-0.13       | ●       |        |        |        |        |        |        |        |        |          |  |
|                                                                                  | <b>1406-CE</b>      | 1.5-4.5                          | 0.25-0.15       | ●       |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |
|                                                                                  |                     |                                  |                 |         |        |        |        |        |        |        |        |        |          |  |



► 45° Cutter Only(20° Cutter 8D-TF20... Not Available)

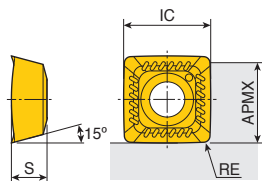
●: Standard items

| Size      | Dimension (mm) |     |      |     |  |  |
|-----------|----------------|-----|------|-----|--|--|
|           | IC             | S   | APMX | RE  |  |  |
| <b>07</b> | 6.5            | 3.0 | 0.7  | 1.0 |  |  |
| <b>10</b> | 9.5            | 4.7 | 1.0  | 1.5 |  |  |
| <b>14</b> | 14.0           | 6.5 | 2.0  | 2.0 |  |  |
|           |                |     |      |     |  |  |
|           |                |     |      |     |  |  |
|           |                |     |      |     |  |  |

[illegible]

●: Standard items



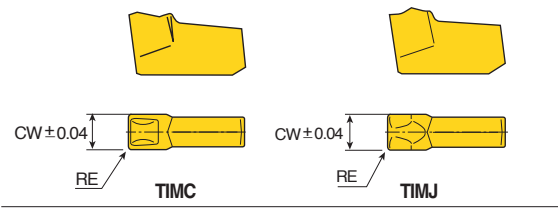


| Size          | Dimension (mm) |      |      |     |  |
|---------------|----------------|------|------|-----|--|
|               | IC             | S    | APMX | RE  |  |
| <b>093808</b> | 9              | 3.75 | 7.5  | 0.8 |  |
| <b>093816</b> | 9              | 3.75 | 7    | 1.6 |  |
| <b>114508</b> | 11             | 4.5  | 10   | 0.8 |  |
| <b>114516</b> | 11             | 4.5  | 9    | 1.6 |  |
|               |                |      |      |     |  |
|               |                |      |      |     |  |

[illegible]

# TIMC/J

## Slotting inserts



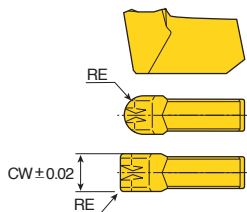
| Size | Dimension (mm) |     |      |  |  |  |
|------|----------------|-----|------|--|--|--|
|      | Seat size      | CW  | RE   |  |  |  |
| 1.6  | 1              | 1.6 | 0.16 |  |  |  |
| 2    | 2              | 2.2 | 0.20 |  |  |  |
| 2.4  | 2              | 2.4 | 0.20 |  |  |  |
| 3    | 4              | 3.1 | 0.20 |  |  |  |
| 4    | 4              | 4.1 | 0.25 |  |  |  |
| 4.8  | 4              | 4.8 | 0.28 |  |  |  |

| Insert | Designation     | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |  |
|--------|-----------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
|        |                 | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT7220 | TT7080 | TT6030 | TT5100 |          | K10 |  |
|        | <b>TIMC 1.6</b> | -                                | 0.12-0.04       |        | ●      |        | ●      | ●      |        | ●      |        |          | ●   |  |
|        | <b>2</b>        | -                                | 0.13-0.05       |        | ●      |        | ●      | ●      |        | ●      |        |          | ●   |  |
|        | <b>2.4</b>      | -                                | 0.15-0.06       |        | ●      |        |        |        |        |        |        |          |     |  |
|        | <b>3</b>        | -                                | 0.18-0.06       |        | ●      |        | ●      | ●      |        | ●      | ●      |          |     |  |
|        | <b>4</b>        | -                                | 0.20-0.08       |        | ●      |        | ●      | ●      |        |        |        |          |     |  |
|        | <b>4.8</b>      | -                                | 0.20-0.08       |        |        |        | ●      |        |        | ●      |        |          |     |  |
|        | <b>TIMJ 2</b>   | -                                | 0.12-0.04       |        |        |        | ●      |        |        | ●      |        |          |     |  |
|        | <b>2.4</b>      | -                                | 0.13-0.05       |        |        |        | ●      |        | ●      |        |        |          | ●   |  |
|        | <b>3</b>        | -                                | 0.15-0.05       |        |        |        | ●      |        |        | ●      |        |          | ●   |  |
|        | <b>4</b>        | -                                | 0.18-0.05       |        |        |        | ●      |        | ●      |        |        |          | ●   |  |
|        | <b>4.8</b>      | -                                | 0.18-0.05       |        |        |        | ●      |        | ●      |        |        |          | ●   |  |
|        |                 |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|        |                 |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|        |                 |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|        |                 |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|        |                 |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |
|        |                 |                                  |                 |        |        |        |        |        |        |        |        |          |     |  |

●: Standard items



## Slotting inserts

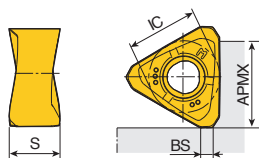


| Size                  | Dimension (mm) |           |           |  |
|-----------------------|----------------|-----------|-----------|--|
|                       | Seat size      | CW        | RE        |  |
| <b>TIPV...E ...</b>   | 3, 4           | 3.0-4.5   | 0.4-2.0   |  |
| <b>TIPV 1.85-2.15</b> | 2              | 1.85-2.15 | 0.1-0.2   |  |
| <b>TIPV 2.65-4.15</b> | 3, 4           | 2.65-4.15 | 0.15-0.20 |  |
|                       |                |           |           |  |
|                       |                |           |           |  |
|                       |                |           |           |  |

[illegible]

●: Standard items



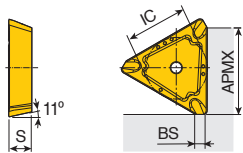


| Size      | Dimension (mm) |   |      |     |  |
|-----------|----------------|---|------|-----|--|
|           | IC             | S | APMX | BS  |  |
| <b>18</b> | 11.65          | 8 | 13   | 1.4 |  |
| <b>22</b> | 12.7           | 8 | 15   | 2.2 |  |
|           |                |   |      |     |  |
|           |                |   |      |     |  |
|           |                |   |      |     |  |
|           |                |   |      |     |  |

[illegible]

●: Standard items

Inserts



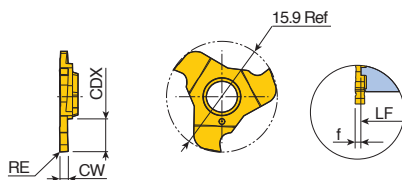
| Size | Dimension (mm) |      |      |         |  |
|------|----------------|------|------|---------|--|
|      | IC             | S    | APMX | BS      |  |
| 22   | 12.7           | 4.76 | 176  | 1.7-1.8 |  |
|      |                |      |      |         |  |
|      |                |      |      |         |  |
|      |                |      |      |         |  |
|      |                |      |      |         |  |
|      |                |      |      |         |  |

| Insert                                                                           | Designation        | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|----------------------------------------------------------------------------------|--------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|                                                                                  |                    | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 |          | K10 |
|  | TPKN 2204 PDTR-HPN | 1.5-13.0                         | 0.25-0.10       |        |        |        |        |        | ●      |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|  | TPKN 2204 PDR-HPN  | 1.5-13.0                         | 0.25-0.10       |        |        |        | ●      |        |        | ●      |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |
|                                                                                  |                    |                                  |                 |        |        |        |        |        |        |        |        |          |     |

●: Standard items





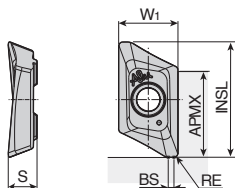


| Size        | Dimension (mm) |      |     | Size        | Dimension (mm) |      |     |
|-------------|----------------|------|-----|-------------|----------------|------|-----|
|             | CW             | RE   | CDX |             | CW             | RE   | CDX |
| <b>1.2</b>  | 1.2            | 0.05 | 4.6 | <b>3.0</b>  | 3.0            | 0.20 | 4.8 |
| <b>1.4</b>  | 1.4            | 0.10 | 4.8 | <b>3.25</b> | 3.25           | 0.15 | 4.8 |
| <b>1.5</b>  | 1.5            | 0.10 | 4.8 | <b>4.0</b>  | 4.0            | 0.20 | 4.8 |
| <b>1.7</b>  | 1.7            | 0.10 | 4.8 | <b>4.25</b> | 4.25           | 0.15 | 4.8 |
| <b>1.95</b> | 1.95           | 0.15 | 4.8 | <b>5.0</b>  | 5.0            | 0.20 | 4.8 |
| <b>2.0</b>  | 2.0            | 0.20 | 4.8 | <b>5.25</b> | 5.25           | 0.15 | 4.8 |
| <b>2.25</b> | 2.25           | 0.15 | 4.8 | <b>6.0</b>  | 6.0            | 0.20 | 4.8 |
| <b>2.75</b> | 2.75           | 0.15 | 4.8 |             |                |      |     |

[illegible]

●: Standard items

# CHASE ALU



| Size      | Dimension (mm) |                |         |         |         |         |
|-----------|----------------|----------------|---------|---------|---------|---------|
|           | INSL           | W <sub>1</sub> | S       | APMX    | BS      | RE      |
| <b>16</b> | 18.3-22.2      | 11.2           | 5.1-5.5 | 14-16   | 0.6-1.5 | 0.4-5.0 |
| <b>22</b> | 22.4-28        | 13.6           | 6.8-7.4 | 18.5-21 | 1.2-1.7 | 0.5-6.4 |
|           |                |                |         |         |         |         |
|           |                |                |         |         |         |         |
|           |                |                |         |         |         |         |
|           |                |                |         |         |         |         |

[illegible]

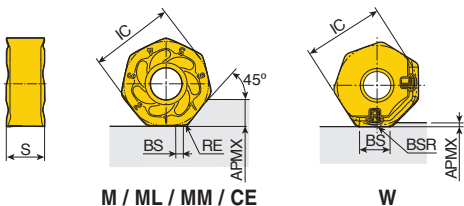
The technical drawing shows a hexagonal nut. The side view on the left indicates a thickness  $S$ . The top view on the right shows a hexagonal shape with an inscribed circle diameter  $IC$ . The base of the nut is labeled  $BS$  (base surface) and  $RE$  (recessed area). The height of the nut is labeled  $AF_{MX}$ . A  $45^\circ$  chamfer is shown on the top edge of the nut.

| Size                 | Dimension (mm) |     |      |     |     |
|----------------------|----------------|-----|------|-----|-----|
|                      | IC             | S   | APMX | BS  | RE  |
| <b>06(M, MM, ML)</b> | 13.7           | 6.2 | 3.5  | 1.0 | 1.0 |
| <b>06-MT</b>         | 13.7           | 6.0 | 4.2  | -   | 0.8 |
| <b>06-MLW</b>        | 13.7           | 6.2 | 3.5  | 1.5 | 0.2 |
|                      |                |     |      |     |     |
|                      |                |     |      |     |     |
|                      |                |     |      |     |     |

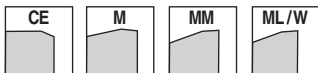
[illegible]

E81, E83

## Inserts



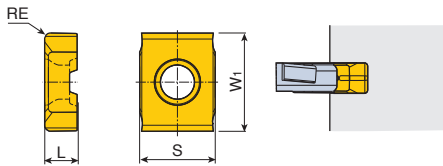
| Size        | Dimension (mm) |          |      |     |     |     |
|-------------|----------------|----------|------|-----|-----|-----|
|             | IC             | S        | APMX | BS  | RE  | BSR |
| <b>09</b>   | 18.5           | 6.35-7.4 | 5.0  | 1.0 | 1.0 | -   |
| <b>09-W</b> | 18.5           | 6.35     | 1.0  | 7.1 | -   | 250 |
|             |                |          |      |     |     |     |
|             |                |          |      |     |     |     |
|             |                |          |      |     |     |     |
|             |                |          |      |     |     |     |

[illegible]

- : Standard items



Inserts



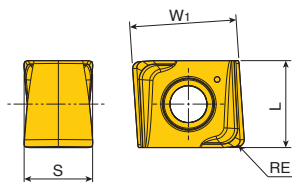
| Size | Dimension (mm) |     |     |         |  |  |
|------|----------------|-----|-----|---------|--|--|
|      | W1             | S   | L   | RE      |  |  |
| 018  | 10             | 7.5 | 1.8 | 0.2-0.8 |  |  |
| 023  | 10             | 7.5 | 2.3 | 0.2-0.8 |  |  |
| 028  | 10             | 7.5 | 2.8 | 0.2-0.8 |  |  |
| 033  | 10             | 7.5 | 3.3 | 0.2-0.8 |  |  |
| 038  | 13             | 10  | 3.8 | 0.4-0.8 |  |  |
| 043  | 13             | 10  | 4.3 | 0.4-0.8 |  |  |
| 048  | 13             | 10  | 4.8 | 0.4-0.8 |  |  |
| 053  | 13             | 10  | 5.3 | 0.4-0.8 |  |  |



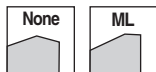
| Insert | Designation           | Recommended machining conditions |                 | Coated |        |        |        |        |        |        |        | Uncoated |     |
|--------|-----------------------|----------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|
|        |                       | ap (mm)                          | Feed (mm/tooth) | TT9080 | TT9030 | TT8080 | TT8020 | TT8625 | TT7080 | TT7515 | TT6080 |          | K10 |
|        | <b>ZNHT 018-04</b>    | -                                | 0.08-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>018-08</b>         | -                                | 0.08-0.05       | ●      |        | ●      |        |        |        |        |        |          |     |
|        | <b>023-04</b>         | -                                | 0.08-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>023-08</b>         | -                                | 0.08-0.05       | ●      |        | ●      |        |        |        |        |        |          |     |
|        | <b>028-04</b>         | -                                | 0.10-0.15       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>028-08</b>         | -                                | 0.10-0.15       | ●      |        | ●      |        |        |        |        |        |          |     |
|        | <b>033-04</b>         | -                                | 0.12-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>033-08</b>         | -                                | 0.12-0.05       | ●      |        | ●      |        |        |        |        |        |          |     |
|        | <b>038-04</b>         | -                                | 0.12-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>038-08</b>         | -                                | 0.12-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>043-04</b>         | -                                | 0.15-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>043-08</b>         | -                                | 0.15-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>048-04</b>         | -                                | 0.15-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>048-08</b>         | -                                | 0.15-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>053-04</b>         | -                                | 0.15-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>053-08</b>         | -                                | 0.15-0.05       | ●      |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>ZNHT 018-04-ML</b> | -                                | 0.08-0.05       |        | ●      |        |        |        |        |        | ●      |          |     |
|        | <b>023-04-ML</b>      | -                                | 0.08-0.05       |        |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>028-04-ML</b>      | -                                | 0.08-0.05       |        |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>033-04-ML</b>      | -                                | 0.12-0.05       |        |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>038-04-ML</b>      | -                                | 0.12-0.05       |        |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>043-04-ML</b>      | -                                | 0.12-0.05       |        |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>048-04-ML</b>      | -                                | 0.12-0.05       |        |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>053-04-ML</b>      | -                                | 0.12-0.05       |        |        | ●      |        |        |        |        | ●      |          |     |
|        | <b>ZNHT 018-02-AL</b> | -                                | 0.35-0.10       |        |        |        |        |        |        |        |        | ●        |     |
|        | <b>023-02-AL</b>      | -                                | 0.35-0.10       |        |        |        |        |        |        |        |        | ●        |     |
|        | <b>028-02-AL</b>      | -                                | 0.35-0.10       |        |        |        |        |        |        |        |        | ●        |     |
|        | <b>033-02-AL</b>      | -                                | 0.35-0.10       |        |        |        |        |        |        |        |        | ●        |     |
|        | <b>038-04-AL</b>      | -                                | 0.35-0.10       |        |        |        |        |        |        |        |        | ●        |     |
|        | <b>043-04-AL</b>      | -                                | 0.35-0.10       |        |        |        |        |        |        |        |        | ●        |     |
|        | <b>048-04-AL</b>      | -                                | 0.35-0.10       |        |        |        |        |        |        |        |        | ●        |     |
|        | <b>053-04-AL</b>      | -                                | 0.35-0.10       |        |        |        |        |        |        |        |        | ●        |     |

●: Standard items





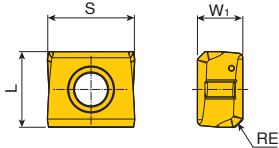
| Size       | Dimension (mm) |                |           |     |  |  |
|------------|----------------|----------------|-----------|-----|--|--|
|            | L              | W <sub>1</sub> | S         | RE  |  |  |
| <b>080</b> | 7.6            | 10.7           | 6.36-6.49 | 0.8 |  |  |
| <b>110</b> | 10.6           | 13.0           | 8.38-8.42 | 0.8 |  |  |
| <b>140</b> | 14             | 13.0           | 9.59-9.65 | 0.8 |  |  |
|            |                |                |           |     |  |  |
|            |                |                |           |     |  |  |
|            |                |                |           |     |  |  |

[illegible]

●: Standard items

# Tailor-made Insert

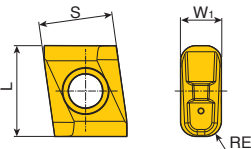
## Tangential inserts

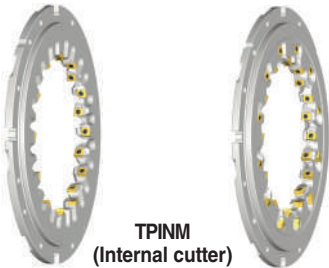




**TTRC**  
(Slotting cutter)

| Insert                                                                            | Designation               | Dimension (mm) |      |     |         |  |  |
|-----------------------------------------------------------------------------------|---------------------------|----------------|------|-----|---------|--|--|
|                                                                                   |                           | L              | S    | W1  | RE      |  |  |
|  | <b>LNC 1060-C</b>         | 10.0           | 11.5 | 6.0 | chamfer |  |  |
|                                                                                   |                           |                |      |     |         |  |  |
|  | <b>LNC 137020-L</b>       | 13.6           | 11.6 | 6.7 | 2.0     |  |  |
|                                                                                   |                           |                |      |     |         |  |  |
|  | <b>LNCX 136508 PNR-ML</b> | 13.0           | 10.6 | 6.5 | 0.8     |  |  |
|                                                                                   |                           |                |      |     |         |  |  |



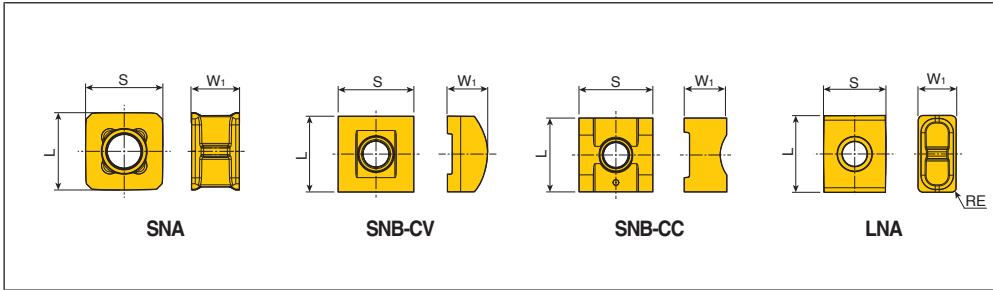


**TPINM**  
(Internal cutter)

| Insert                                                                              | Designation          | Dimension (mm) |     |     |     |  |  |
|-------------------------------------------------------------------------------------|----------------------|----------------|-----|-----|-----|--|--|
|                                                                                     |                      | L              | S   | W1  | RE  |  |  |
|  | <b>PMIN 120905-M</b> | 12.0           | 9.7 | 5.4 | 2.0 |  |  |
|                                                                                     | <b>PMIN 130907-M</b> | 13.5           | 9.7 | 7.0 | 2.0 |  |  |
|                                                                                     | <b>PMIN 150907-M</b> | 15.0           | 9.9 | 7.0 | 2.0 |  |  |
|                                                                                     | <b>PMIN 180907-M</b> | 18.0           | 9.7 | 7.0 | 2.0 |  |  |
|                                                                                     |                      |                |     |     |     |  |  |
|                                                                                     |                      |                |     |     |     |  |  |
|                                                                                     |                      |                |     |     |     |  |  |
|                                                                                     |                      |                |     |     |     |  |  |

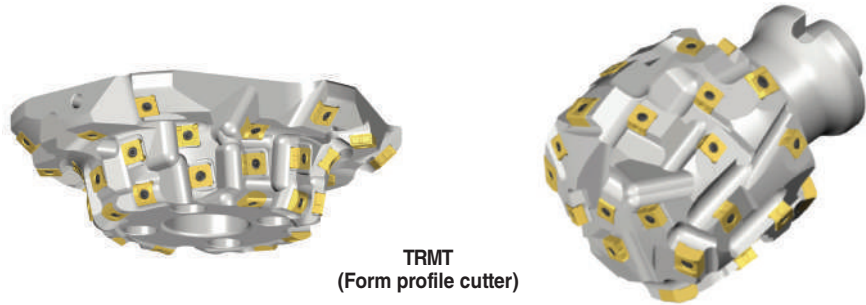
# Tailor-made Insert

## Tangential inserts



| Insert                                                                           | Designation         | Dimension (mm) |      |                |     |
|----------------------------------------------------------------------------------|---------------------|----------------|------|----------------|-----|
|                                                                                  |                     | L              | S    | W <sub>1</sub> | RE  |
|  | <b>SNA 1065-M</b>   | 10.5           | 10.5 | 6.5            | -   |
|                                                                                  | <b>SNA 1370-M</b>   | 13.0           | 13.0 | 7.0            | -   |
|                                                                                  | <b>SNA 1680-M</b>   | 16.0           | 16.0 | 8.0            | -   |
|  | <b>SNB 1375-CV</b>  | 13.0           | 13.0 | 7.5            | -   |
|                                                                                  | <b>SNB 1685-CV</b>  | 16.0           | 16.0 | 8.5            | -   |
|                                                                                  |                     |                |      |                |     |
|  | <b>SNB 1375-CC</b>  | 13.0           | 13.0 | 7.5            | -   |
|                                                                                  | <b>SNB 1685-CC</b>  | 16.0           | 16.0 | 8.5            | -   |
|                                                                                  |                     |                |      |                |     |
|  | <b>LNA 137008-M</b> | 13.5           | 10.0 | 6.7            | 0.8 |
|                                                                                  | <b>LNA 168008-M</b> | 16.5           | 14.0 | 8.0            | 0.8 |
|                                                                                  |                     |                |      |                |     |

- ▶ CV: Convex, CC: Concave
- ▶ Various corner radii are available for SNB insert



TRMT  
(Form profile cutter)



# Recommended Cutting Conditions

## Machining data for MAXI-SPEED

| ISO      | Material                    |                | Hardness<br>HB | Vc(m/min) | Feed (mm/tooth) |           |           |
|----------|-----------------------------|----------------|----------------|-----------|-----------------|-----------|-----------|
|          | Material                    | AISI/SAE/ASTM  |                |           | TR13            | TR15      | TR17      |
| <b>P</b> | Non-alloy steel             | 1020           | 130-180        | 120-200   | 0.04-0.12       | 0.05-0.15 | 0.06-0.15 |
|          | Low alloy steel             | 4030           | 260-300        | 200-300   | 0.04-0.12       | 0.05-0.15 | 0.06-0.15 |
|          | Low alloy steel             | 3135           | HRC 35-40      | 80-120    | 0.02-0.06       | 0.03-0.12 | 0.04-0.12 |
|          | High alloy steel            | H13            | 200-220        | 100-150   | 0.03-0.07       | 0.04-0.12 | 0.04-0.12 |
| <b>M</b> | Martensitic stainless steel | 420            | 200            | 100-150   | 0.02-0.06       | 0.04-0.12 | 0.04-0.12 |
|          | Austenitic stainless steel  | 304L           | 200            | 80-120    | 0.02-0.06       | 0.03-0.10 | 0.03-0.12 |
| <b>K</b> | Gray cast iron              | Class 40       | 250            | 150-200   | 0.04-0.12       | 0.05-0.20 | 0.05-0.20 |
|          | Malleable cast iron         | Class 65 45 12 | 200            | 130-180   | 0.04-0.10       | 0.05-0.18 | 0.05-0.18 |
| <b>S</b> | High temp.<br>alloys        | Inconel 718    | HRC 36-40      | 20-30     | 0.015-0.10      | 0.02-0.12 | 0.02-0.12 |
|          |                             | AMS R56400     | HRC40-45       | 30-40     | 0.015-0.06      | 0.02-0.12 | 0.02-0.12 |

► For more information of material groups, see the materials & grades "material conversion table".

 Steel    Stainless steel    Cast iron    Nonferrous    High temp. alloys    Hardened steel

# Recommended Cutting Conditions

## Machining data for CBN grade

| ISO | Material                     | D.O.C.<br>(mm) | Grade                      |                    |              |
|-----|------------------------------|----------------|----------------------------|--------------------|--------------|
|     |                              |                | TB7015                     |                    |              |
|     |                              |                | Cutting speed<br>Vc(m/min) | Feed<br>(mm/tooth) | Cutting edge |
| P   | Bearing steel                | < 2            | 180 - 220                  | 0.05 - 0.25        | Chamfer      |
|     | Ferrous powder metal         | < 2            | 150 - 300                  | 0.1 - 0.15         | Chamfer      |
| K   | Grey cast iron HB 200 - 280  | < 0.5          | 500 - 1500                 | 0.1 - 0.3          | Chamfer hone |
|     |                              | 0.5 - 2.0      | 500 - 1100                 | 0.1 - 0.25         | Chamfer      |
|     | Compated graphite iron (CGI) | < 0.5          | 400 - 600                  | 0.1 - 0.2          | Hone         |
| S   | Co based > 35 HRC            | 0.5 - 2.0      | 150 - 200                  | 0.05 - 0.15        | Chamfer      |
|     | Ni based > 35 HRC            |                | 120 - 150                  | 0.05 - 0.15        | Chamfer      |
|     | Fe based > 35 HRC            |                | 60 - 120                   | 0.05 - 0.15        | Chamfer      |
|     | Cr based > 35 HRC            |                | 50 - 75                    | 0.05 - 0.15        | Chamfer      |
| H   | Hardened steels > 45 HRC     | < 0.5          | 80 - 180                   | 0.1 - 0.25         | Chamfer      |
|     | Hardened cast iron           | < 2            | 80 - 200                   | 0.1 - 0.15         | Chamfer      |

► For more information of material groups, see the materials & grades "material conversion table".

Steel    Stainless steel    Cast iron    Nonferrous    High temp. alloys    Hardened steel

# Recommended Cutting Conditions

## Machining data

Cutting Speed: Vc(m/min)

| ISO | Material                                                           | Condition                      | Tensile strength<br>(N/mm <sup>2</sup> ) | Hardness<br>HB | Material<br>No. | Uncoated |         |         |         |         |
|-----|--------------------------------------------------------------------|--------------------------------|------------------------------------------|----------------|-----------------|----------|---------|---------|---------|---------|
|     |                                                                    |                                |                                          |                |                 | K10      | TT9080  | TT9030  | TT7080  | TT8625  |
| P   | Non-alloy steel, cast steel, free cutting steel                    | < 0.25%C Annealed              | 420                                      | 125            | 1               |          | 210-300 | 180-270 | 230-330 | 230-330 |
|     |                                                                    | >= 0.25%C Annealed             | 650                                      | 190            | 2               |          | 200-280 | 180-260 | 220-300 | 220-300 |
|     |                                                                    | < 0.55%C Quenched and tempered | 850                                      | 250            | 3               |          | 150-230 | 140-220 | 160-240 | 160-240 |
|     |                                                                    | >= 0.55%C Annealed             | 750                                      | 220            | 4               |          | 140-220 | 130-210 | 150-230 | 150-230 |
|     |                                                                    | Quenched and tempered          | 1000                                     | 300            | 5               |          | 130-200 | 120-190 | 140-210 | 140-210 |
|     | Low alloy steel and cast steel (less than 5% of alloying elements) | Annealed                       | 600                                      | 200            | 6               |          | 170-240 | 150-220 | 190-260 | 190-260 |
|     |                                                                    |                                | 930                                      | 275            | 7               |          | 160-230 | 140-210 | 180-250 | 180-250 |
|     |                                                                    | Quenched and tempered          | 1000                                     | 300            | 8               |          | 130-200 | 130-200 | 170-240 | 170-250 |
|     |                                                                    |                                | 1200                                     | 350            | 9               |          | 120-200 | 110-190 | 130-210 | 130-210 |
|     | High alloy steel, cast steel and tool steel                        | Annealed                       | 680                                      | 200            | 10              |          | 120-210 | 110-200 | 130-220 | 130-220 |
|     |                                                                    | Quenched and tempered          | 1100                                     | 325            | 11              |          | 110-170 | 100-150 | 120-180 | 120-180 |
| M   | Stainless steel and cast steel                                     | Ferritic / martensitic         | 680                                      | 200            | 12              |          | 150-230 | 140-210 |         |         |
|     |                                                                    | Martensitic                    | 820                                      | 240            | 13              |          | 140-220 | 130-200 |         |         |
|     |                                                                    | Austenitic                     | 600                                      | 180            | 14              |          | 120-180 | 110-160 |         |         |
| K   | Gray cast iron (GG)                                                | Ferritic                       |                                          | 160            | 15              |          | 130-300 |         |         |         |
|     |                                                                    | Pearlitic                      |                                          | 250            | 16              |          | 120-280 |         |         |         |
|     | Cast iron nodular (GGG)                                            | Ferritic                       |                                          | 180            | 17              |          | 110-220 |         |         |         |
|     |                                                                    | Pearlitic                      |                                          | 260            | 18              |          | 100-200 |         |         |         |
|     | Malleable cast iron                                                | Ferritic                       |                                          | 130            | 19              |          | 150-250 |         |         |         |
|     |                                                                    | Pearlitic                      |                                          | 230            | 20              |          | 100-250 |         |         |         |
| N   | Aluminum - wrought alloy                                           | Not cureable                   |                                          | 60             | 21              | 550-700  |         |         |         |         |
|     |                                                                    | Cured                          |                                          | 100            | 22              | 600-750  |         |         |         |         |
|     | Aluminum-cast, alloyed                                             | <=12% Si Not cureable          |                                          | 75             | 23              | 800-900  |         |         |         |         |
|     |                                                                    | Cured                          |                                          | 90             | 24              | 650-800  |         |         |         |         |
|     |                                                                    | >12% Si High temp.             |                                          | 130            | 25              | 250-320  |         |         |         |         |
|     | Copper alloys                                                      | >1% Pb Free cutting            |                                          | 110            | 26              | 300-400  |         |         |         |         |
|     |                                                                    | Brass                          |                                          | 90             | 27              | 300-400  |         |         |         |         |
|     |                                                                    | Electrolitic copper            |                                          | 100            | 28              | 210-280  |         |         |         |         |
|     | Non-metallic                                                       | Duroplastics, fiber plastics   |                                          | 70 Shore D     | 29              | 150-250  |         |         |         |         |
|     |                                                                    | Graphite                       |                                          |                |                 |          |         |         |         |         |
| S   | High temp. alloys                                                  | Hard rubber                    |                                          | 55Shore D      | 30              | 150-250  |         |         |         |         |
|     |                                                                    | Fe based Annealed              |                                          | 200            | 31              |          | 40-80   |         |         |         |
|     |                                                                    | Cured                          |                                          | 280            | 32              |          | 30-60   |         |         |         |
|     |                                                                    | Ni or Annealed                 |                                          | 250            | 33              |          | 35-70   |         |         |         |
|     |                                                                    | Cured                          |                                          | 350            | 34              |          | 30-60   |         |         |         |
|     |                                                                    | Co based Cast                  |                                          | 320            | 35              |          | 35-65   |         |         |         |
|     | Titanium, Ti alloys                                                | Pure                           | Rm 400                                   | 190            | 36              |          | 90-130  |         |         |         |
|     |                                                                    | Alpha-beta alloys, hardened    | Rm 1050                                  | 310            | 37              |          | 35-70   |         |         |         |
| H   | Hardened steel                                                     | Hardened                       |                                          | 55HRC          | 38              |          | 55-75   | 45-65   |         |         |
|     |                                                                    | Hardened                       |                                          | 60HRC          | 39              |          | 45-65   | 40-60   |         |         |
|     | Chilled cast iron                                                  | Cast                           |                                          | 400            | 40              |          | 90-105  | 70-90   |         |         |
|     | Cast iron nodular                                                  | Hardened                       |                                          | 55HRC          | 41              |          | 55-75   | 45-65   |         |         |

► For more information of material groups, see the materials & grades "material conversion table".

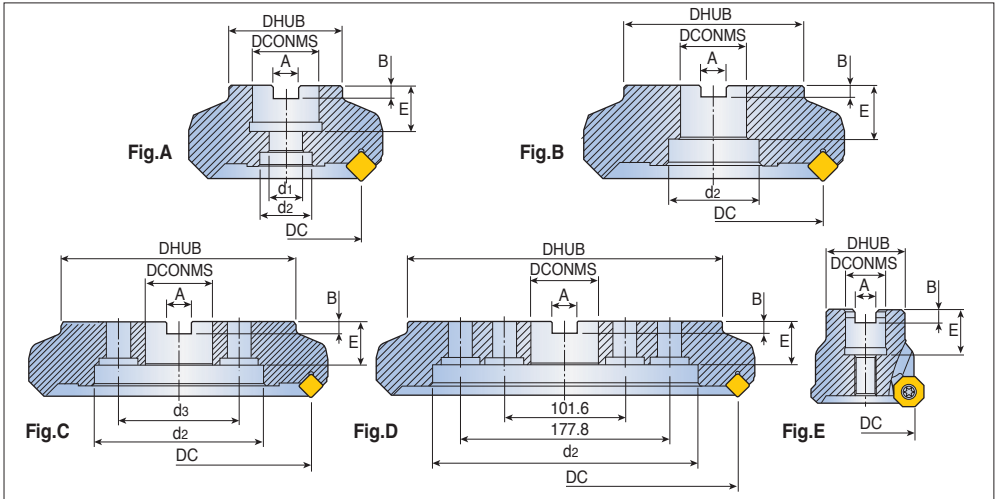
■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

## Machining data

| Coated  |         |         |         |         |         |         |         |         | Diamond Coated | Ceramic |         |          |          | Cermet  |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|---------|---------|----------|----------|---------|
| TT8080  | TT8020  | TT6080  | TT7515  | TT3535  | TT3520  | TT2510  | TT5515  | TT5525  | TTD620         | AS10    | AS20    | TC3020   | TC3030   | CT7000  |
| 150-240 | 140-200 |         |         |         |         |         | 260-280 | 150-210 |                |         |         |          |          | 250-350 |
| 140-230 | 130-190 |         |         |         |         |         | 200-230 | 120-200 |                |         |         |          |          | 200-300 |
| 140-220 | 130-200 |         |         |         |         |         | 160-220 | 70-140  |                |         |         |          |          | 150-250 |
| 130-200 | 120-190 |         |         |         |         |         | 160-220 | 90-150  |                |         |         |          |          | 135-200 |
| 120-190 | 120-170 |         |         |         |         |         | 140-180 | 60-130  |                |         |         |          |          | 120-180 |
| 120-190 | 120-160 |         |         |         |         |         | 160-220 | 130-170 |                |         |         |          |          | 180-240 |
| 120-170 | 110-150 |         |         |         |         |         | 120-180 | 70-150  |                |         |         |          |          | 135-210 |
| 110-170 | 100-140 |         |         |         |         |         | 130-180 | 60-110  |                |         |         |          |          | 120-200 |
| 100-160 | 90-150  |         |         |         |         |         | 140-180 | 50-100  |                |         |         |          |          | 110-220 |
| 100-170 | 90-160  |         |         |         |         |         | 130-180 | 60-100  |                |         |         |          |          | 110-160 |
| 90-140  | 80-120  |         |         |         |         |         | 70-120  | 60-120  |                |         |         |          |          | 80-100  |
| 110-200 | 100-180 |         |         | 130-240 | 130-240 |         | 80-150  | 75-170  |                |         |         |          |          | 120-200 |
| 100-180 | 90-160  |         |         | 120-240 | 120-240 |         | 60-140  | 60-130  |                |         |         |          |          | 100-160 |
| 100-150 | 80-120  |         |         | 100-200 | 100-200 |         | 60-120  | 80-180  |                |         |         |          |          |         |
|         |         | 180-350 | 200-390 |         |         | 250-430 | 80-260  |         |                | 400-900 |         |          |          |         |
|         |         | 160-300 | 180-330 |         |         | 190-320 | 130-240 |         |                | 250-600 |         |          |          |         |
|         |         | 180-250 | 200-270 |         |         |         | 150-270 |         |                | 350-800 |         |          |          |         |
|         |         | 160-220 | 180-240 |         |         |         | 90-270  |         |                | 250-600 |         |          |          |         |
|         |         | 200-300 | 220-330 |         |         |         | 150-270 |         |                | 360-540 |         |          |          |         |
|         |         | 170-280 | 180-300 |         |         |         | 140-240 |         |                | 300-440 |         |          |          |         |
|         |         |         |         |         |         |         |         |         |                |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         |                |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         |                |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         |                |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         | 250-350        |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         |                |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         |                |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         |                |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         | 500-900        |         |         |          |          |         |
|         |         |         |         |         |         |         |         |         |                |         |         |          |          |         |
| 35-55   |         |         |         | 40-70   | 40-70   |         | 20-40   | 30-55   |                |         | 500-900 |          |          |         |
| 30-45   |         |         |         | 40-65   | 40-70   |         | 20-30   | 20-45   |                |         | 500-900 |          |          |         |
| 30-45   |         |         |         | 30-70   | 30-70   |         | 20-30   | 25-50   |                |         | 500-900 | 600-1200 | 600-1200 |         |
| 25-35   |         |         |         | 30-55   | 30-55   |         | 20-30   | 20-40   |                |         | 500-900 | 600-1200 | 600-1200 |         |
| 30-35   |         |         |         | 35-70   | 35-70   |         | 30-70   | 20-45   |                |         | 500-900 | 600-1200 | 600-1200 |         |
| 50-90   |         |         |         | 70-120  | 70-120  |         | 30-70   | 50-90   |                |         | 500-900 |          |          |         |
| 40-80   |         |         |         | 40-75   | 40-75   |         | 30-70   | 25-55   |                |         | 500-900 |          |          |         |
|         |         | 60-90   |         |         |         | 70-130  |         |         |                |         |         |          |          | 50-75   |
|         |         | 50-90   |         |         |         | 50-100  |         |         |                |         |         |          |          | 40-65   |
|         |         | 60-100  |         |         |         |         | 60-80   |         |                |         |         |          |          | 80-105  |
|         |         | 60-80   |         |         |         | 70-130  | 30-50   |         |                |         |         |          |          | 50-75   |

# Mounting Reference

## Arbor style



| Dimension (mm) |        |        |     |    |                |             |                |                |                | Fig. | Arbor     |
|----------------|--------|--------|-----|----|----------------|-------------|----------------|----------------|----------------|------|-----------|
| DC             | DCONMS | A      | B   | E  | DHUB           |             | d <sub>1</sub> | d <sub>2</sub> | d <sub>3</sub> |      |           |
|                |        |        |     |    | For mold & die | For general |                |                |                |      |           |
| 32             | 16     | 8.4    | 5.6 | 20 | 30             | -           | -              | -              | -              | E    | SEM16     |
| 32             | 16     | 8.4    | 5.6 | 20 | 30             | -           | 9              | 13.5           | -              | A    | SEM16     |
| 40             | 16     | 8.4    | 5.6 | 20 | 38             | -           | 9              | 13.5           | -              | A    | SEM16     |
| 40             | 22     | 10.4   | 6.3 | 22 | 38             | -           | 11             | 17             | -              | A    | SEM22     |
| 50             | 22     | 10.4   | 6.3 | 22 | 40             | 45          | 11             | 17             | -              | A    | SEM22     |
| 63             | 22     | 10.4   | 6.3 | 22 | 47             | -           | 11             | 17             | -              | A    | SEM22     |
| 80             | 25.4   | 9.526  | 6   | 26 | -              | 70          | 13             | 20             | -              | A    | FMA25.4   |
| 80             | 27     | 12.4   | 7   | 28 | 58             | 70          | 13             | 22             | -              | A    | SEM27     |
| 100            | 31.75  | 12.7   | 8   | 32 | -              | 80          | 18             | 26             | -              | A    | FMA31.75  |
| 100            | 31.75  | 12.7   | 8   | 32 | -              | 80          | -              | 46             | -              | B    | FMA31.75  |
| 100            | 32     | 14.4   | 8   | 26 | 66             | 85          | 18             | 26             | -              | A    | SEM32     |
| 100            | 32     | 14.4   | 8   | 26 | 66             | 85          | -              | 46             | -              | B    | SEM32     |
| 125            | 38.1   | 15.875 | 10  | 38 | 80             | -           | -              | 56             | -              | B    | FMA38.1   |
| 125            | 40     | 16.4   | 9   | 32 | 85             | -           | 22             | 32             | -              | A    | SEM40     |
| 125            | 40     | 16.4   | 9   | 32 | 85             | -           | -              | 56             | -              | B    | SEM40     |
| 160            | 40     | 16.4   | 9   | 32 | 110            | -           | -              | 90             | 66.7           | C    | FM40      |
| 160            | 50.8   | 19.05  | 11  | 38 | 100            | -           | -              | 72             | -              | B    | FMA50.8   |
| 200            | 47.625 | 25.4   | 14  | 38 | 130            | -           | -              | 132            | 101.6          | C    | FMA47.625 |
| 200            | 60     | 25.7   | 14  | 40 | 130            | -           | -              | 132            | 101.6          | C    | FM60      |
| 250            | 47.625 | 25.4   | 14  | 38 | 160            | -           | -              | 150            | 101.6          | C    | FMA47.625 |
| 250            | 60     | 25.7   | 14  | 40 | 160            | -           | -              | 150            | 101.6          | C    | FM60      |
| 315            | 47.625 | 25.4   | 14  | 38 | 220            | -           | -              | 224            | -              | D    | -         |
| 315            | 60     | 25.7   | 14  | 40 | 220            | -           | -              | 220            | -              | D    | -         |

► For Face Mill arbors, please refer to TaeguTec tooling system(part G)

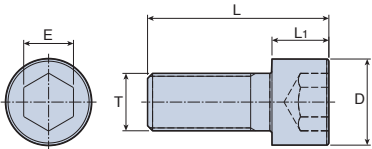
# Mounting Reference

## Mounting bolt

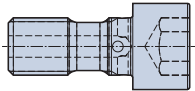
### SH type

| Designation        | Dimension (mm) |    |                |    |    | Cutter size |
|--------------------|----------------|----|----------------|----|----|-------------|
|                    | D              | L  | L <sub>1</sub> | T  | E  |             |
| SH M8x1.25x25(-C)  | 13             | 33 | 8              | 8  | 6  | 32,40       |
| SH M8x1.25x30(-C)  | 13             | 38 | 8              | 8  | 6  | 32,40       |
| SH M8x1.25x35(-C)  | 13             | 43 | 8              | 8  | 6  | 32,40       |
| SH M10x1.5x30(-C)  | 16             | 40 | 10             | 10 | 8  | 50, 63      |
| SH M12x1.75x35(-C) | 18             | 47 | 12             | 12 | 10 | 80          |
| SH M16x2x35(-C)    | 24             | 51 | 16             | 16 | 14 | 100         |
| SH M20x2.5x40(-C)  | 30             | 60 | 20             | 20 | 17 | 125         |

► "-C": Bolt with hole for internal coolant



SH

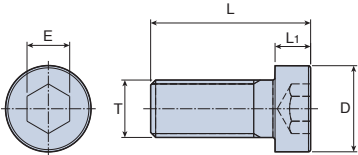


SH-C

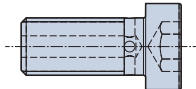
### LH type

| Description        | Dimension (mm) |      |                |    |    | Cutter size |
|--------------------|----------------|------|----------------|----|----|-------------|
|                    | D              | L    | L <sub>1</sub> | T  | E  |             |
| LH M10x1.5x25(-C)  | 16             | 31.5 | 6.5            | 10 | 8  | 50, 63      |
| LH M12x1.75x30(-C) | 18             | 36.9 | 6.9            | 12 | 8  | 80          |
| LH M16x2x35(-C)    | 24             | 45   | 10             | 16 | 12 | 100         |

► "-C": Bolt with hole for internal coolant



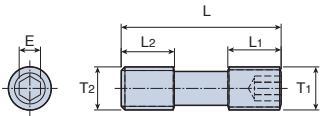
LH



LH-C

### KTB, TCS type

| Description | Dimension (mm) |                |                |                |                |   |
|-------------|----------------|----------------|----------------|----------------|----------------|---|
|             | L              | L <sub>1</sub> | L <sub>2</sub> | T <sub>1</sub> | T <sub>2</sub> | E |
| KTB 32B     | 30             | 10             | 10             | M8X1.0         | M8X1.25        | 4 |
| TCS10-40    | 40             | 10             | 15             | M10X1.25       | M10X1.5        | 5 |



KTB, TSC

## ► Recommended clamping torque for each screw

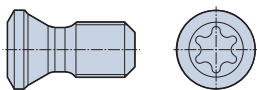


Fig.1

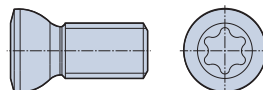
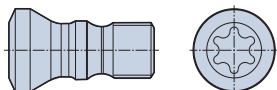


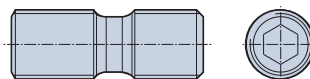
Fig.2

| Designation    | Thread | Length | Torx         | Tightening Torque | Fig. |
|----------------|--------|--------|--------------|-------------------|------|
| TS 18033/HG-P  | M1.8   | 3.3    | Torx Plus 6  | 0.5 Nm            | 1    |
| TS 18041/HG    | M1.8   | 4.09   | Torx Plus 6  | 0.5 Nm            | 1    |
| TS 18041/SG-P  | M1.8   | 4.09   | Torx Plus 6  | 0.5 Nm            | 1    |
| TS 200431/HG-P | M2     | 4.3    | Torx Plus 6  | 0.6 Nm            | 1    |
| TS 22046I      | M2.2   | 4.6    | Torx 7       | 0.9 Nm            | 1    |
| TS 22052I/HG   | M2.2   | 5.2    | Torx 7       | 0.9 Nm            | 1    |
| TS 25055I/HG   | M2.5   | 5.5    | Torx 8       | 1.2 Nm            | 1    |
| TS 25075I/HG   | M2.5   | 7.5    | Torx 8       | 1.2 Nm            | 1    |
| TS 25064I      | M2.5   | 6.4    | Torx 8       | 1.2 Nm            | 1    |
| TS 25064I/HG-P | M2.5   | 6.4    | Torx Plus 8  | 1.2 Nm            | 1    |
| TS 25B024I/HG  | M2.5   | 2.6    | Torx Plus 7  | 0.9 Nm            | 1    |
| TS 25B031I/HG  | M2.5   | 3.3    | Torx Plus 7  | 0.9 Nm            | 1    |
| TS 25B042I/HG  | M2.5   | 4.35   | Torx Plus 7  | 0.9 Nm            | 1    |
| TS 25B053I/HG  | M2.5   | 5.45   | Torx Plus 7  | 0.9 Nm            | 1    |
| TS 25C065I/HG  | M2.5   | 6.5    | Torx 8       | 1.2 Nm            | 2    |
| TS 30085I/HG   | M3     | 8.5    | Torx 9       | 2.0 Nm            | 1    |
| TS 30A060I/HG  | M3     | 6      | Torx 9       | 2.0 Nm            | 1    |
| TS 30B068I/HG  | M3     | 6.8    | Torx 8       | 1.2 Nm            | 1    |
| TS 30D082-P    | M3     | 8.2    | Torx Plus 8  | 1.2 Nm            | 1    |
| TS 35070I/HG   | M3.5   | 7      | Torx 15      | 3.0 Nm            | 1    |
| TS 35085I/HG   | M3.5   | 8.75   | Torx 15      | 3.0 Nm            | 1    |
| TS 35088I      | M3.5   | 8.75   | Torx 10      | 2.0 Nm            | 1    |
| TS 35A070I/HG  | M3.5   | 7      | Torx Plus 10 | 2.0 Nm            | 1    |
| TS 35A088I/HG  | M3.5   | 8.75   | Torx Plus 10 | 2.0 Nm            | 1    |
| TS 35C110I     | M3.5   | 11     | Torx 15      | 3.0 Nm            | 2    |
| TS 40085I/HG   | M4     | 8.5    | Torx 15      | 3.5 Nm            | 1    |

| Designation    | Thread | Length | Torx         | Tightening Torque | Fig. |
|----------------|--------|--------|--------------|-------------------|------|
| TS 40093I      | M4     | 9.3    | Torx 15      | 3.5 Nm            | 1    |
| TS 40093I/HG   | M4     | 9.3    | Torx 15      | 3.5 Nm            | 1    |
| TS 40097I      | M4     | 9.7    | Torx 15      | 3.5 Nm            | 1    |
| TS 40120I      | M4     | 12     | Torx 15      | 3.5 Nm            | 1    |
| TS 40120I/HG   | M4     | 12     | Torx 15      | 3.5 Nm            | 1    |
| TS 40A100I     | M4     | 10     | Torx 15      | 3.5 Nm            | 1    |
| TS 40A115I     | M4     | 11.5   | Torx 15      | 3.5 Nm            | 1    |
| TS 40B100I     | M4     | 10     | Torx 15      | 3.5 Nm            | 2    |
| TS 40G110I     | M4     | 11     | Torx 15      | 3.5 Nm            | 1    |
| TS 40M100/HG   | M4     | 10     | Torx 15      | 3.5 Nm            | 2    |
| TS 40K535I     | M4     | 5.35   | Torx 15      | 3.5 Nm            | 1    |
| TS 40K065I     | M4     | 6.5    | Torx 15      | 3.5 Nm            | 1    |
| TS 40K075I     | M4     | 7.5    | Torx 15      | 3.5 Nm            | 1    |
| TS 40K085I     | M4     | 8.5    | Torx 15      | 3.5 Nm            | 1    |
| TS 45120I      | M4.5   | 12     | Torx 20      | 5.0 Nm            | 2    |
| TS 50105I      | M5     | 10.5   | Torx 20      | 5.0 Nm            | 1    |
| TS 50115I      | M5     | 11.5   | Torx 20      | 5.0 Nm            | 1    |
| TS 50A140I     | M5     | 14     | Torx 20      | 5.0 Nm            | 1    |
| TS 50A121I/HG  | M5     | 12.1   | Torx 20      | 5.0 Nm            | 1    |
| TS 50B106I/HG  | M5     | 10.6   | Torx 20      | 5.0 Nm            | 1    |
| TS 50C130I/HG  | M5     | 13     | Torx 20      | 5.0 Nm            | 2    |
| TS 50D130/HG-P | M5     | 13     | Torx Plus 20 | 5.0 Nm            | 1    |
| TS 60A130I     | M6     | 13.5   | Torx 25      | 6.0 Nm            | 2    |
| TS 60A165I     | M6     | 16.5   | Torx 25      | 6.0 Nm            | 2    |
| TS 60170I      | M6     | 17     | Torx 25      | 6.0 Nm            | 1    |



| Designation | Thread | Length | Torx    | Tightening Torque |
|-------------|--------|--------|---------|-------------------|
| TS 20F060A  | M2     | 5      | Torx 6  | 0.7 Nm            |
| TS 25F080A  | M2.5   | 6.9    | Torx 8  | 1.1 Nm            |
| TS 30F100A  | M3     | 8.3    | Torx 10 | 2.0 Nm            |
| TS 40F120A  | M4     | 10.6   | Torx 15 | 4.0 Nm            |
| TS 50F160A  | M5     | 13.9   | Torx 20 | 5.0 Nm            |
| TS 60F200A  | M6     | 16.7   | Torx 25 | 6.0 Nm            |
| TS 70F250A  | M7     | 21     | Torx 25 | 7.0 Nm            |
| TS 80F300A  | M8     | 25     | Torx 30 | 8.0 Nm            |



| Designation | Thread | Length | Torx       | Tightening Torque |
|-------------|--------|--------|------------|-------------------|
| WS 4        | M4     | 12.5   | Hexa 2.0mm | 1.5 Nm            |
| WS 5        | M5     | 14     | Hexa 2.5mm | 3.3 Nm            |
| WS 6        | M6     | 15     | Hexa 3mm   | 5 Nm              |
| WS 8        | M8     | 21     | Hexa 4mm   | 7 Nm              |

► Quick change cutter adapter

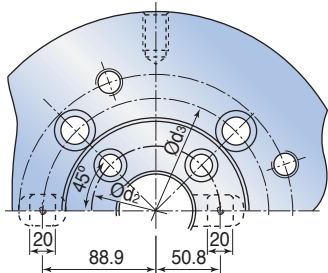


Fig.1

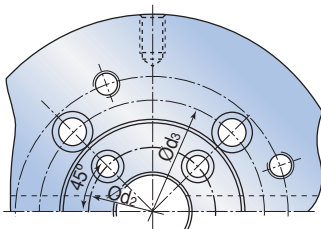
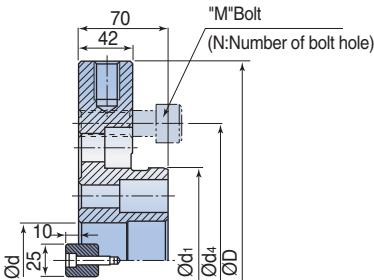
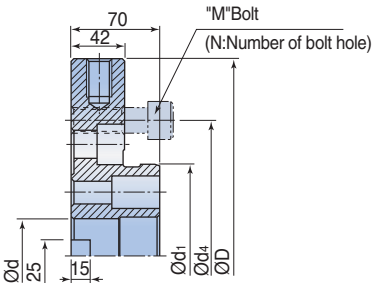


Fig.2



| Designation | Dimension (mm) |        |                |                |                |                |        |   | Weight (Kg) |
|-------------|----------------|--------|----------------|----------------|----------------|----------------|--------|---|-------------|
|             | D              | d      | d <sub>1</sub> | d <sub>2</sub> | d <sub>3</sub> | d <sub>4</sub> | M      | N |             |
| QA 08 K/M   | 198            | 47.625 | 63.5           | 101.6          | -              | 114.3          | M16x40 | 4 | 10          |
| QA 10 K/M   | 248            | 60     | 133.35         | 101.6          | -              | 177.8          | M16x50 | 4 | 15          |
| QA 12 K/M   | 313            | 60     | 146.05         | 101.6          | 177.8          | 215.9          | M20x50 | 4 | 19.7        |
| QA 14 K/M   | 353            | 60     | 215.9          | 101.6          | 177.8          | 260.4          | M20x50 | 6 | 24          |
| QA 16 K/M   | 398            | 60     | 254.0          | 101.6          | 177.8          | 304.8          | M20x50 | 6 | 29          |

- K: Adapter with setting key (Fig.1)  
M: Adapter without setting key (Fig.2)



## ► How to use splitter

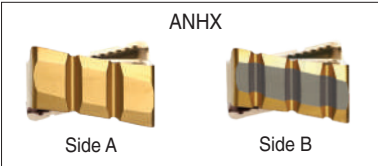
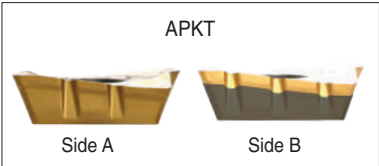
- 3 splitting grooves on one cutting edge and 2 splitting grooves on the opposite side



APKT

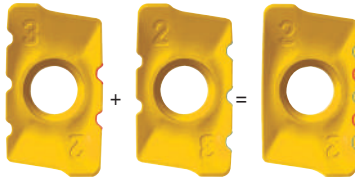
ANHX

- Full proof configuration-inserts have metal color appearance only on the 3 groove side for simplified mounting

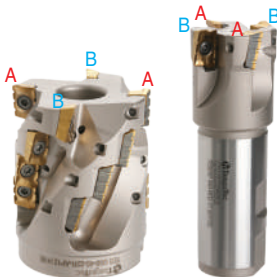
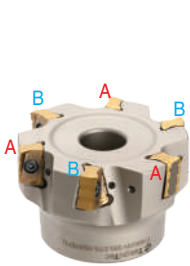
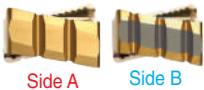


**Notice:** When insert mounting, ensure they are mounted in a staggered formation i.e. 1st tooth-2 groove side; 2nd tooth-3 groove side and repeat action for the remaining teeth

- Both cutting edges split chip to small pieces for cutting load reduction and create complete cutting edge when combined.

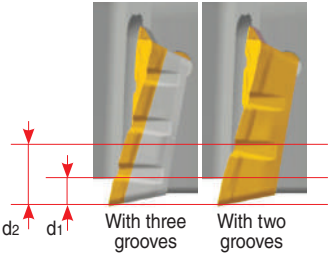


- For optimum machining efficiency, use even numbered flute type cutters

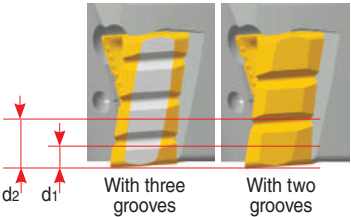


Also applicable to odd numbered flute type cutters

- The splitter inserts effective in axial depth of cuts  $\geq d_1$



| Depth of cut | APKT 17 | APKT 12 |
|--------------|---------|---------|
| d1           | 3mm     | 2.4mm   |
| d2           | 6.5mm   | 5.2mm   |



| Depth of cut | ANHX 16 |
|--------------|---------|
| d1           | 2.5mm   |
| d2           | 6mm     |

## ▶ Setting instructions

Height gauge

Insert

Insert screw

Adjust wedge

Wedge screw

T-Wrench



- 1 Move the adjust wedge to its bottom-most position by rotating the wedge screw clockwise.



\*Please avoid using too much force.

- 2 Mount new cutting edge of insert. Make sure that the insert pocket is thoroughly cleaned before mounting insert.



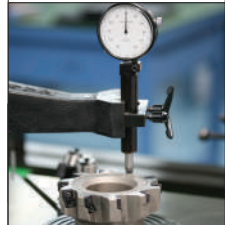
\*Please fix the insert screw completely as readjustment is not expected once it is done.

- 3 Measure the Runout of the cutter when all inserts are mounted and select the highest insert as a reference.



\*Please ensure that insert edge does not get damaged during setting. Use optimum dial pressure only.

- 4 Set the height of cutter, raising the reference insert by turning the wedge screw counter clockwise.



\*Increase height by 0.01mm at least from the highest insert.

- 5 Adjust axial Runout of the remaining inserts with the same process as used with the reference insert.



\*Please note that max adjustment height should not exceed 0.1mm(.004")

- 6 Adjust Runout in the range of 0.005mm rotating the wrench gradually.



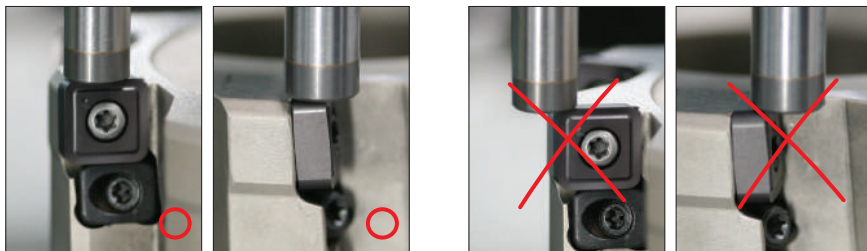
- 5 If it is beyond the acceptable range, please reset it with the order of 1 - 2 - 5



- 6 Runout adjustment is completed.(you don't have to clamp the insert screw anymore once it is fixed.)

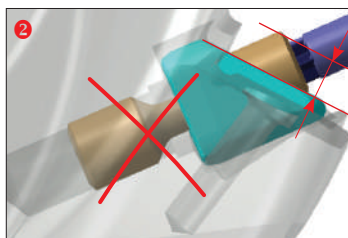
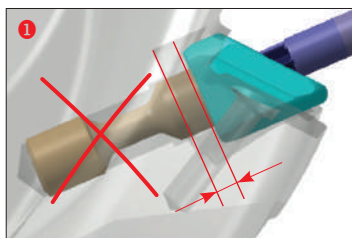


## ► Gauge user guide

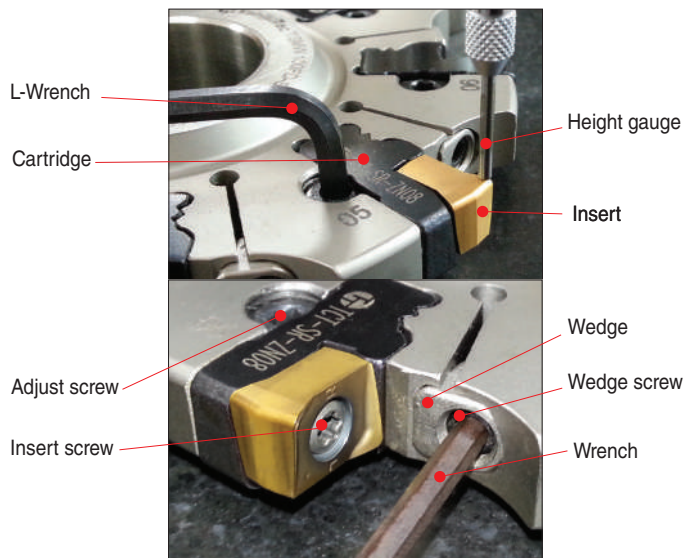


## ► Special precautions

- While loading a new insert corner, ensure that the adjust wedge is in the bottom-most position  
Bottom out the adjust wedge completely before unclamping the insert from cutter
- Clean the insert and pocket thoroughly before mounting fresh insert /corner
- While assembling adjust wedge onto cutter body, please ensure that the adjust wedge is tightened until it reaches the bottom



## ► TOPSLOT component names



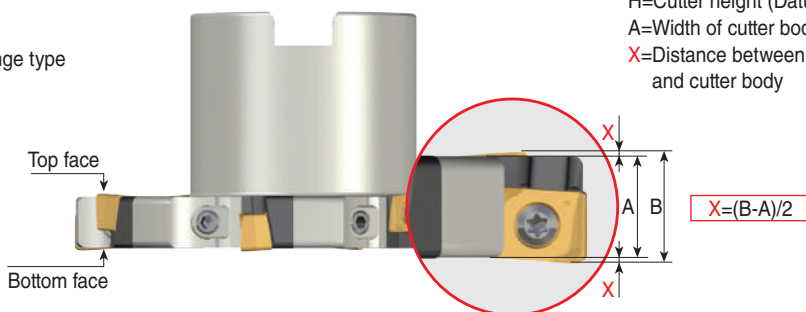
## ► TOPSLOT setup instructions

### ■ Disk type



B=Cutting width (Target width)  
H=Cutter height (Datum)  
A=Width of cutter body  
X=Distance between insert and cutter body

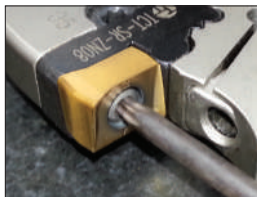
### ■ Flange type



## ► Setting procedure

### ■ Disk type

- 1 Index unused inserts firmly onto the cartridge.



- 2 Unfasten the wedge screw 1 turn counter-clockwise.



- 3 After fastening the wedge around 80%, adjust the cartridge to the desired "X" value after setting the datum zero point.



- 4 Follow the same method about other cartridges. (the same as opposite side)

- 5 After setting all cartridges, sequentially fasten the wedge 100% over two or three times.

- When adjusting cartridge to the "X" value, set the location of cartridge higher than "X" value and then adjust the cartridge to the "X" value.
- Clockwise rotation : cartridge descends.
- Counter-clockwise rotation : cartridge ascends.

### ■ Flange type

- 1 For setting of bottom face, repeat disk type steps 1-4. (The datum is bottom plane of flange type cutter.)



- 2 For top face set-up, the use of setting plate is mandatory and the height gauge must be reset to '0' for each insert.



- 3 Put the cutter bottom face on the setting plate and unfasten wedge screw 1 turn counter-clockwise



- 4 After fastening the wedge around 80%, adjust the cartridge to the desired (A+X) value.



- 5 Follow the same method about other cartridges.

- 6 After setting all cartridges, sequentially fasten the wedge 100% over two or three times.

- When adjusting cartridge to the "X" value, set the location of cartridge higher than "X" value and then adjust the cartridge to the "X" value.
- Clockwise rotation: cartridge descends.
- Counter-clockwise rotation: cartridge ascends.

## ► Setting notice

### ■ Important set-up points

- All adjustments must be done on a plane, flat surface.
  - For improved accuracy, remove any foreign substances from the insert and insert pocket surfaces before clamping.
  - During reassembly wedges and wedge screws, you must apply lubricant of the friction surface. (Fig.1)
  - "X" value must be equal for both top and bottom faces when adjusting the width of slot. (Fig.2)
  - Width of cut must be adjusted within the range of the laser marked on the cutter. (Fig.3)
- Ex) WIDTH 12-13 / WIDTH 20-23
- When adjusting cartridge to the "X" value, set the location of cartridge higher than "X" value and then adjust the cartridge to the "X" value.

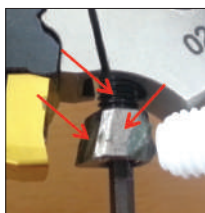


Fig.1 Lubricant

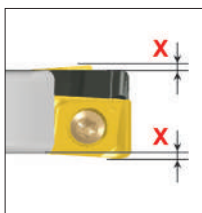
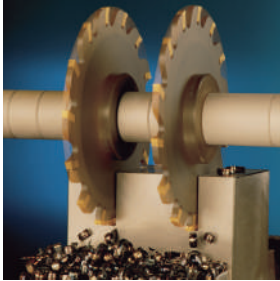


Fig.2 "X" setting



Fig.3 WIDTH

## ► Narrow width slotting cutters

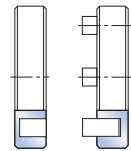
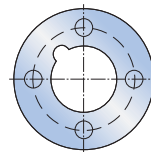
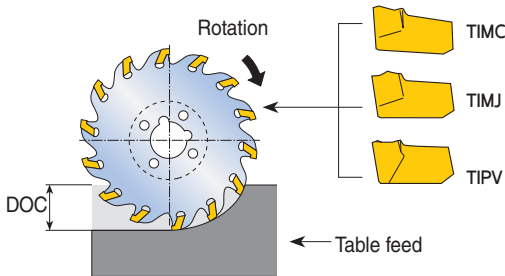


- Metric cutting diameters:  
75mm, 100mm, 125mm, 160mm, 250mm
- Cutting width ranges: 1.6mm - 6.35mm
- Geometry: Positive Rake
- Applications: Slotting and sawing
- Materials: Carbon steels, alloy steels, stainless steels, cast iron, aluminum and exotics

### ■ Features / Benefits of slotting cutters

- Narrow width applications to 1.6mm
- Simple easy-to-mount inserts
- Secure insert retention self-positioning insert stopper for repeatability
- Drive flange mounting for extra stability
- Minimal radial runout
- Efficient chip evacuation
- Reduced cutting forces
- Improved tool life
- Economical

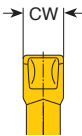
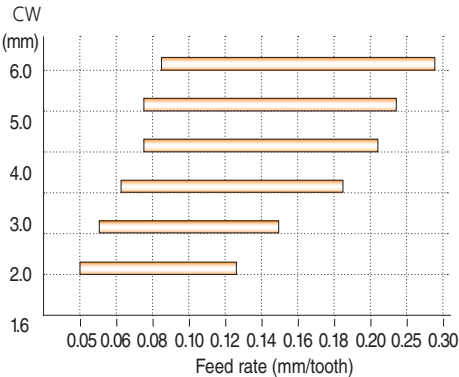
## ► Recommended feed rates for - TSC slotting cutters



Drive flange set  
recommended for  
style 2 cutters



► Recommended feed rates (Based on insert width)

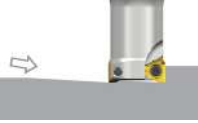


Feed rates are for radial  
D.O.C. => 1/4 the cutter diameter  
For radial DOC < 1/4 the cutter diameter  
increase feed rates by the following %

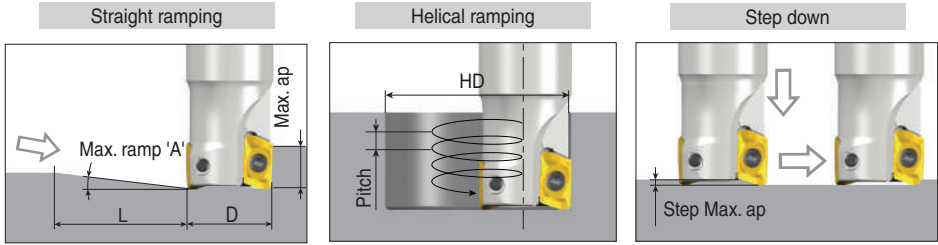
|                          |     |     |     |      |      |
|--------------------------|-----|-----|-----|------|------|
| DOC/Cutter diameter      | 1/4 | 1/6 | 1/8 | 1/10 | 1/20 |
| Increase feed rate by -> | 0%  | 15% | 30% | 45%  | 45%  |

- Cutter entry  
Climb milling enters the workpiece with a thick chip and exits with a thin chip. Honed inserts are recommended.  
Conventional milling enters the workpiece with a thin chip and exits with a thick chip. Sharp inserts are recommended. Climb milling should be used whenever possible, especially when replacing high speed steel slotting cutters. On machines with backlash eliminators, climb milling is preferred.
- Cutter mounting  
The use of drive flange sets are recommended to prevent denting of arbor drive keys and to provide added stability during increased metal removal rates.
- Insert mounting  
Manually place insert in pocket and seat in place by using a wooden or plastic hammer. This will ensure self positioning for insert repeatability and minimal radial runout. Pockets must be clean and free of debris prior to installation.

# Index for Ramping Data

| Series                                                                                                   | Insert          | Pages                                                                                       |
|----------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------|
| <b>WINMILL</b><br>      | AVKT<br>CVK(H)T | <br>E340   |
| <b>TANGSPEED</b><br>    | LPK(H)U         | <br>E345   |
| <b>MILLRUSH</b><br>     | 3PKT<br>3PHT    | <br>E347   |
| <b>CHASE4MILL</b><br>   | 4NKT<br>4NHT    | <br>E350   |
| <b>CHASEMILL</b><br>    | AXMT<br>APKT    | <br>E372   |
| <b>CHASE2MILL</b><br> | ANH(M)X         | <br>E379  |
| <b>CHASEALU</b><br>   | XEVT            | <br>E380 |
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| Series                                                                                                     | Insert               | Pages                                                                                         |
|------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------|
| <b>CHASE10MILL</b><br>    | PTKU                 | <br>E386   |
| <b>NANRUSH</b><br>        | HFN                  | <br>E388   |
| <b>WIN4FEED</b><br>       | BLMV                 | <br>E389   |
| <b>CHASE4FEED</b><br>     | BLMP                 | <br>E390   |
| <b>CHASEFEED</b><br>      | SBMT<br>SRMT         | <br>E395   |
| <b>CHASE2MOLD</b><br>   | RNMU                 | <br>E401  |
| <b>CHASEMOLD</b><br>    | RYHX<br>RYMX         | <br>E403 |
| <b>CERAMICSPEED</b><br> | BNGX<br>BNGT<br>BCGT | <br>E406 |



## AVKT 10: R0.8

(unit: mm)

| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 | Step down |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|-----------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. | Max. ap   |
| Ø16             | 10.9               | 10      | 52              | 20                |                | 2.4             | 1.7       |
|                 |                    |         |                 |                   | 32             | 9.7             |           |
| Ø18             | 8.3                | 10      | 69              | 24                |                | 2.7             | 2.0       |
|                 |                    |         |                 |                   | 36             | 8.2             |           |
| Ø20             | 6.5                | 10      | 88              | 28                |                | 2.9             | 2.0       |
|                 |                    |         |                 |                   | 40             | 7.2             |           |
| Ø25             | 4.3                | 10      | 133             | 38                |                | 3.1             | 2.0       |
|                 |                    |         |                 |                   | 50             | 5.9             |           |
| Ø32             | 2.9                | 10      | 198             | 52                |                | 3.2             | 2.0       |
|                 |                    |         |                 |                   | 64             | 5.1             |           |
| Ø40             | 2.1                | 10      | 267             | 68                |                | 3.3             | 2.0       |
|                 |                    |         |                 |                   | 80             | 4.7             |           |
| Ø50             | 1.6                | 10      | 347             | 88                |                | 3.4             | 2.0       |
|                 |                    |         |                 |                   | 100            | 4.5             |           |
| Ø63             | 1.2                | 10      | 459             | 114               |                | 3.5             | 2.0       |
|                 |                    |         |                 |                   | 126            | 4.3             |           |

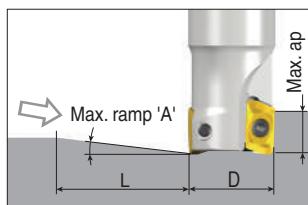
## AVKT 10: R1.6

(unit: mm)

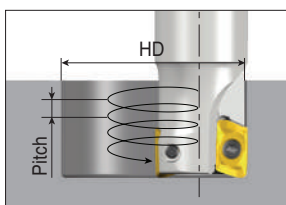
| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 | Step down |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|-----------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. | Max. ap   |
| Ø16             | 10.4               | 9.8     | 53              | 20                |                | 2.3             | 1.5       |
|                 |                    |         |                 |                   | 32             | 9.2             |           |
| Ø18             | 7.8                | 9.8     | 72              | 24                |                | 2.6             | 1.7       |
|                 |                    |         |                 |                   | 36             | 7.7             |           |
| Ø20             | 6.1                | 9.8     | 92              | 28                |                | 2.7             | 1.7       |
|                 |                    |         |                 |                   | 40             | 6.7             |           |
| Ø25             | 3.9                | 9.8     | 144             | 38                |                | 2.8             | 1.7       |
|                 |                    |         |                 |                   | 50             | 5.3             |           |
| Ø32             | 2.6                | 9.8     | 212             | 52                |                | 2.9             | 1.7       |
|                 |                    |         |                 |                   | 64             | 4.6             |           |
| Ø40             | 2                  | 9.8     | 281             | 68                |                | 3.1             | 1.7       |
|                 |                    |         |                 |                   | 80             | 4.4             |           |
| Ø50             | 1.5                | 9.8     | 374             | 88                |                | 3.1             | 1.7       |
|                 |                    |         |                 |                   | 100            | 4.1             |           |
| Ø63             | 1.1                | 9.8     | 488             | 114               |                | 3.2             | 1.7       |
|                 |                    |         |                 |                   | 126            | 4.0             |           |

# Ramping Data

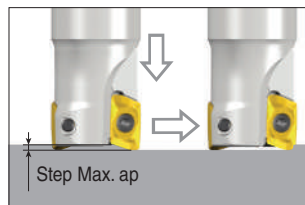
Straight ramping



Helical ramping



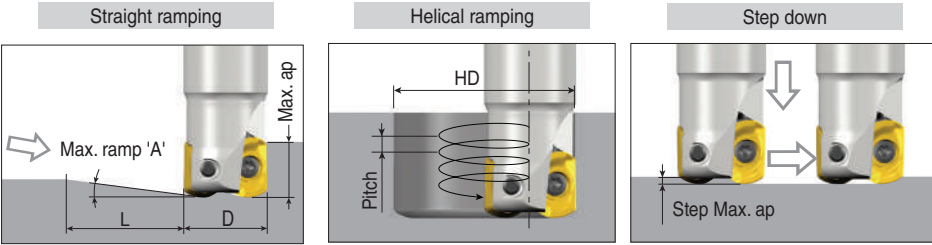
Step down



## AVKT 10: R3.2

(unit: mm)

| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 | Step down |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|-----------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. | Max. ap   |
| Ø16             | 8.6                | 9.5     | 63              | 20                |                | 1.9             | 1.1       |
|                 |                    |         |                 |                   | 32             | 7.6             |           |
| Ø18             | 6.2                | 9.5     | 87              | 24                |                | 2.0             | 1.4       |
|                 |                    |         |                 |                   | 36             | 6.1             |           |
| Ø20             | 4.6                | 9.5     | 118             | 28                |                | 2.0             | 1.4       |
|                 |                    |         |                 |                   | 40             | 5.1             |           |
| Ø25             | 2.9                | 9.5     | 188             | 38                |                | 2.1             | 1.4       |
|                 |                    |         |                 |                   | 50             | 4.0             |           |
| Ø32             | 1.9                | 9.5     | 287             | 52                |                | 2.1             | 1.4       |
|                 |                    |         |                 |                   | 64             | 3.3             |           |
| Ø40             | 1.45               | 9.5     | 375             | 68                |                | 2.2             | 1.4       |
|                 |                    |         |                 |                   | 80             | 3.2             |           |
| Ø50             | 1.05               | 9.5     | 519             | 88                |                | 2.2             | 1.4       |
|                 |                    |         |                 |                   | 100            | 2.9             |           |
| Ø63             | 0.8                | 9.5     | 681             | 114               |                | 2.2             | 1.4       |
|                 |                    |         |                 |                   | 126            | 2.8             |           |

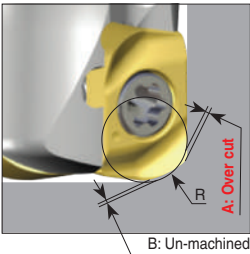


AVKT 1004R-HF

(unit: mm)

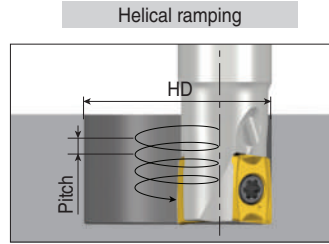
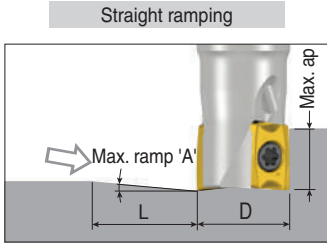
| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 | Step down |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|-----------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. | Max. ap   |
| Ø16             | 7.6                | 1.0     | 7               | 20.5              | 32             | 1.0             | 0.8       |
|                 |                    |         |                 |                   |                | 1.0             |           |
| Ø18             | 5.5                | 1.0     | 10              | 24.5              | 36             | 1.0             | 1.0       |
|                 |                    |         |                 |                   |                | 1.0             |           |
| Ø20             | 4.2                | 1.0     | 14              | 28.5              | 40             | 1.0             | 1.0       |
|                 |                    |         |                 |                   |                | 1.0             |           |
| Ø25             | 2.6                | 1.0     | 22              | 38.5              | 50             | 1.0             | 1.0       |
|                 |                    |         |                 |                   |                | 1.0             |           |
| Ø32             | 1.7                | 1.0     | 34              | 52.5              | 64             | 1.0             | 1.0       |
|                 |                    |         |                 |                   |                | 1.0             |           |
| Ø40             | 1.2                | 1.0     | 48              | 68.5              | 80             | 1.0             | 1.0       |
|                 |                    |         |                 |                   |                | 1.0             |           |
| Ø50             | 0.9                | 1.0     | 64              | 88.5              | 100            | 1.0             | 1.0       |
|                 |                    |         |                 |                   |                | 1.0             |           |
| Ø63             | 0.7                | 1.0     | 82              | 114.5             | 126            | 1.0             | 1.0       |
|                 |                    |         |                 |                   |                | 1.0             |           |

Programming technical data



|               | R<br>Program | A<br>Over cut | B<br>Un machined |
|---------------|--------------|---------------|------------------|
| AVKT 1004R-HF | 1.7          | 0             | 0.49             |
|               | 1.9          | 0             | 0.43             |
|               | 2.0          | 0.01          | 0.40             |
|               | 2.5          | 0.13          | 0.24             |
|               | 3.0          | 0.30          | 0.11             |

**1.9** : Recommended program 'R'

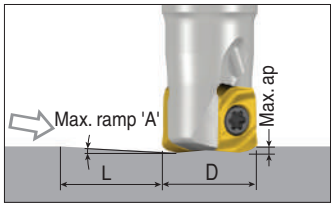


## CVK(H)T 05: R0.2

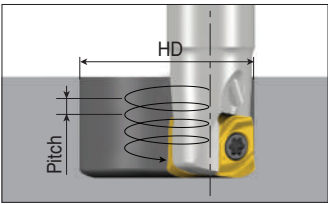
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø6             | 2.5                | 5.0     | 112             | 8                 |               | 0.2             |
|                |                    |         |                 |                   | 12            | 0.7             |
| Ø8             | 2.1                | 5.0     | 136             | 12                |               | 0.4             |
|                |                    |         |                 |                   | 16            | 0.8             |
| Ø9             | 1.7                | 5.0     | 164             | 14                |               | 0.4             |
|                |                    |         |                 |                   | 18            | 0.7             |
| Ø10            | 1.7                | 5.0     | 169             | 16                |               | 0.5             |
|                |                    |         |                 |                   | 20            | 0.8             |
| Ø11            | 1.3                | 5.0     | 212             | 18                |               | 0.4             |
|                |                    |         |                 |                   | 22            | 0.7             |
| Ø12            | 1.3                | 5.0     | 220             | 20                |               | 0.5             |
|                |                    |         |                 |                   | 24            | 0.7             |
| Ø13            | 1.1                | 5.0     | 249             | 22                |               | 0.5             |
|                |                    |         |                 |                   | 26            | 0.7             |
| Ø14            | 1.0                | 5.0     | 273             | 24                |               | 0.5             |
|                |                    |         |                 |                   | 28            | 0.7             |
| Ø16            | 0.9                | 5       | 302             | 28                |               | 0.5             |
|                |                    |         |                 |                   | 32            | 0.7             |
| Ø20            | 0.7                | 5       | 382             | 36                |               | 0.6             |
|                |                    |         |                 |                   | 40            | 0.7             |

Straight ramping



Helical ramping

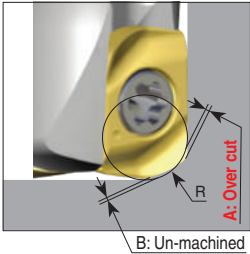


## CVKT 05-HF

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø6             | 0.20               | 0.5     | 143             | 8                 |               | 0.0             |
|                |                    |         |                 |                   | 12            | 0.1             |
| Ø8             | 0.45               | 0.5     | 64              | 12                |               | 0.1             |
|                |                    |         |                 |                   | 16            | 0.2             |
| Ø9             | 0.55               | 0.5     | 52              | 14                |               | 0.1             |
|                |                    |         |                 |                   | 18            | 0.2             |
| Ø10            | 0.30               | 0.5     | 96              | 16                |               | 0.1             |
|                |                    |         |                 |                   | 20            | 0.1             |
| Ø11            | 0.35               | 0.5     | 82              | 18                |               | 0.1             |
|                |                    |         |                 |                   | 22            | 0.2             |
| Ø12            | 0.70               | 0.5     | 41              | 20                |               | 0.3             |
|                |                    |         |                 |                   | 24            | 0.4             |
| Ø13            | 0.75               | 0.5     | 38              | 22                |               | 0.3             |
|                |                    |         |                 |                   | 26            | 0.5             |
| Ø14            | 0.85               | 0.5     | 34              | 24                |               | 0.4             |
|                |                    |         |                 |                   | 28            | 0.5             |
| Ø16            | 0.65               | 0.5     | 44              | 28                |               | 0.4             |
|                |                    |         |                 |                   | 32            | 0.5             |
| Ø20            | 0.50               | 0.5     | 57              | 36                |               | 0.4             |
|                |                    |         |                 |                   | 40            | 0.5             |

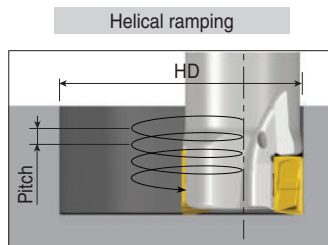
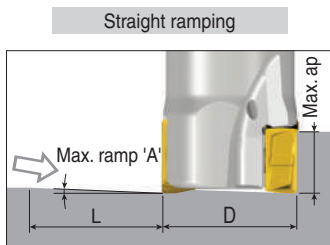
## Programming technical data



|            | R<br>Program | A<br>Over cut | B<br>Un-machined |
|------------|--------------|---------------|------------------|
| CVKT 05-HF | 0.8          | 0             | 0.21             |
|            | 0.9          | 0             | 0.18             |
|            | 1.0          | 0.02          | 0.14             |

Yellow: Recommended program 'R'

# Ramping Data



## LPK(H)U 05

(unit: mm)

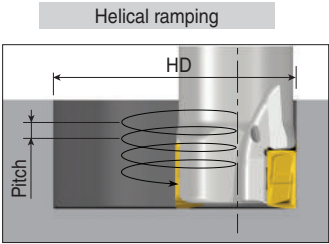
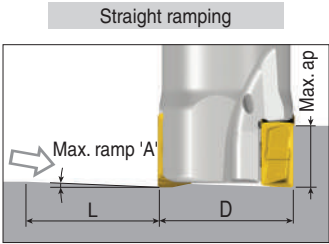
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø10            | 1.8                | 4.6     | 142             | 16.8              |               | 0.6             |
|                |                    |         |                 |                   | 20            | 0.9             |
| Ø11            | 1.6                | 4.6     | 160             | 18.8              |               | 0.6             |
|                |                    |         |                 |                   | 22            | 0.8             |
| Ø12            | 1.5                | 4.6     | 176             | 20.8              |               | 0.6             |
|                |                    |         |                 |                   | 24            | 0.8             |
| Ø13            | 1.3                | 4.6     | 195             | 22.8              |               | 0.6             |
|                |                    |         |                 |                   | 26            | 0.8             |
| Ø16            | 1.0                | 4.6     | 251             | 28.8              |               | 0.6             |
|                |                    |         |                 |                   | 32            | 0.8             |
| Ø20            | 0.8                | 4.6     | 330             | 36.8              |               | 0.6             |
|                |                    |         |                 |                   | 40            | 0.7             |
| Ø25            | 0.6                | 4.6     | 439             | 46.8              |               | 0.6             |
|                |                    |         |                 |                   | 50            | 0.7             |
| Ø32            | 0.4                | 4.6     | 586             | 60.8              |               | 0.6             |
|                |                    |         |                 |                   | 64            | 0.7             |

## LPK(H)U 09

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø20            | 1.4                | 8.3     | 328             | 33                |               | 1.0             |
|                |                    |         |                 |                   | 40            | 1.5             |
| Ø25            | 1.1                | 8.3     | 432             | 43                |               | 1.0             |
|                |                    |         |                 |                   | 50            | 1.5             |
| Ø32            | 0.8                | 8.3     | 594             | 57                |               | 1.1             |
|                |                    |         |                 |                   | 64            | 1.4             |
| Ø40            | 0.6                | 8.3     | 793             | 73                |               | 1.0             |
|                |                    |         |                 |                   | 80            | 1.3             |
| Ø50            | 0.4                | 8.3     | 1057            | 93                |               | 1.0             |
|                |                    |         |                 |                   | 100           | 1.2             |
| Ø63            | 0.3                | 8.3     | 1359            | 119               |               | 1.0             |
|                |                    |         |                 |                   | 126           | 1.2             |



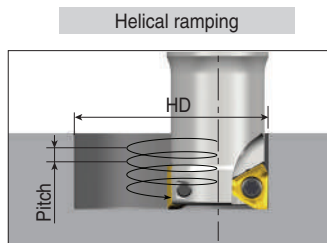
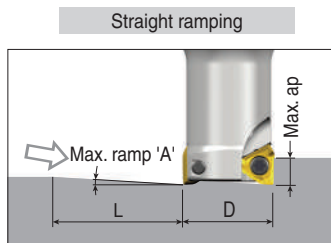


## LPKU 14

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø40            | 0.9                | 12.5    | 754             | 69                |               | 1.5             |
|                |                    |         |                 |                   | 80            | 2.0             |
| Ø50            | 0.7                | 12.5    | 1023            | 89                |               | 1.5             |
|                |                    |         |                 |                   | 100           | 1.9             |
| Ø63            | 0.5                | 12.5    | 1302            | 115               |               | 1.5             |
|                |                    |         |                 |                   | 126           | 1.9             |
| Ø80            | 0.4                | 12.5    | 1790            | 149               |               | 1.5             |
|                |                    |         |                 |                   | 160           | 1.7             |
| Ø100           | 0.3                | 12.5    | 2387            | 189               |               | 1.4             |
|                |                    |         |                 |                   | 200           | 1.6             |
| Ø125           | 0.2                | 12.5    | 2865            | 239               |               | 1.5             |
|                |                    |         |                 |                   | 250           | 1.7             |
| Ø160           | 0.2                | 12.5    | 3581            | 309               |               | 1.6             |
|                |                    |         |                 |                   | 320           | 1.7             |
| Ø200           | 0.1                | 12.5    | 4775            | 389               |               | 1.5             |
|                |                    |         |                 |                   | 400           | 1.6             |

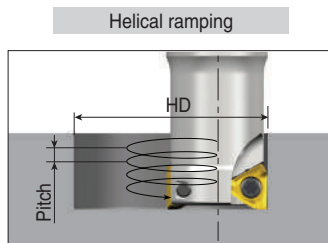
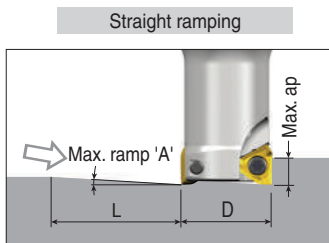
# Ramping Data



## 3PKT 04

(unit: mm)

| Cutter dia.(D) | Straight ramp down      |         |                 | Helical ramp down |               |                 |
|----------------|-------------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp ( $A^\circ$ ) | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| <b>Ø8</b>      | 2.1                     | 3.5     | 95              | 13.2              |               | 0.6             |
|                |                         |         |                 |                   | 16            | 0.9             |
| <b>Ø10</b>     | 2.2                     | 3.5     | 91              | 17.2              |               | 0.8             |
|                |                         |         |                 |                   | 20            | 1.2             |
| <b>Ø11</b>     | 3.6                     | 3.5     | 56              | 19.2              |               | 1.6             |
|                |                         |         |                 |                   | 22            | 2.1             |
| <b>Ø12</b>     | 3.3                     | 3.5     | 61              | 21.2              |               | 1.6             |
|                |                         |         |                 |                   | 24            | 2.1             |
| <b>Ø13</b>     | 2.5                     | 3.5     | 80              | 23.2              |               | 1.4             |
|                |                         |         |                 |                   | 26            | 1.7             |
| <b>Ø14</b>     | 2.2                     | 3.5     | 91              | 25.2              |               | 1.3             |
|                |                         |         |                 |                   | 28            | 1.6             |
| <b>Ø16</b>     | 1.6                     | 3.5     | 125             | 29.2              |               | 1.1             |
|                |                         |         |                 |                   | 32            | 1.4             |



## 3PK(H)T 06

(unit: mm)

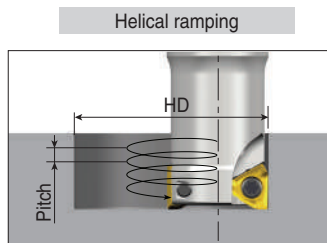
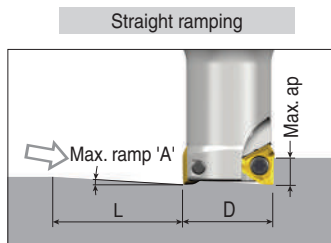
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø12            | 3.7                | 4.7     | 73              | 19.5              | 24            | 1.3             |
|                |                    |         |                 | 23.5              | 28            | 2.1             |
| Ø14            | 2.8                | 4.7     | 96              | 27.5              | 32            | 1.2             |
|                |                    |         |                 | 29.5              | 34            | 1.8             |
| Ø16            | 2.3                | 4.7     | 117             | 31.5              | 36            | 1.2             |
|                |                    |         |                 | 35.5              | 40            | 1.7             |
| Ø17            | 2.0                | 4.7     | 135             | 37.5              | 42            | 1.2             |
|                |                    |         |                 | 39.5              | 44            | 1.6             |
| Ø18            | 2.0                | 4.7     | 135             | 45.5              | 50            | 1.3             |
|                |                    |         |                 | 55.5              | 60            | 1.7             |
| Ø20            | 1.6                | 4.7     | 168             | 59.5              | 64            | 1.5             |
|                |                    |         |                 | 65.5              | 70            | 1.8             |
| Ø21            | 1.5                | 4.7     | 180             | 75.5              | 80            | 1.4             |
|                |                    |         |                 |                   |               | 1.6             |
| Ø22            | 1.5                | 4.7     | 180             |                   |               | 1.2             |
|                |                    |         |                 |                   |               | 1.5             |
| Ø25            | 1.5                | 4.7     | 180             |                   |               | 1.4             |
|                |                    |         |                 |                   |               | 1.7             |
| Ø30            | 1.2                | 4.7     | 224             |                   |               | 1.4             |
|                |                    |         |                 |                   |               | 1.7             |
| Ø32            | 1.2                | 4.7     | 224             |                   |               | 1.5             |
|                |                    |         |                 |                   |               | 1.8             |
| Ø35            | 1.0                | 4.7     | 269             |                   |               | 1.4             |
|                |                    |         |                 |                   |               | 1.6             |
| Ø40            | 0.7                | 4.7     | 385             |                   |               | 1.2             |
|                |                    |         |                 |                   |               | 1.3             |

## 3PK(H)T 10

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø16            | 7.0                | 7.0     | 57              | 24.7              | 32            | 2.8             |
|                |                    |         |                 | 33.9              | 40            | 5.2             |
| Ø20            | 3.3                | 7.0     | 121             | 35.9              | 42            | 2.1             |
|                |                    |         |                 | 37.9              | 44            | 3.1             |
| Ø21            | 3.2                | 7.0     | 125             | 43.5              | 50            | 2.2             |
|                |                    |         |                 | 45.9              | 52            | 3.1             |
| Ø22            | 3.2                | 7.0     | 125             | 53.9              | 60            | 2.4             |
|                |                    |         |                 | 57.5              | 64            | 3.3             |
| Ø25            | 2.8                | 7.0     | 143             | 59.9              | 66            | 2.4             |
|                |                    |         |                 | 73.7              | 80            | 3.3             |
| Ø26            | 2.6                | 7.0     | 154             | 93.7              | 100           | 2.4             |
|                |                    |         |                 | 119.7             | 126           | 3.1             |
| Ø30            | 2.0                | 7.0     | 201             |                   |               | 2.0             |
|                |                    |         |                 |                   |               | 2.3             |
| Ø32            | 1.8                | 7.0     | 223             |                   |               | 2.1             |
|                |                    |         |                 |                   |               | 2.7             |
| Ø33            | 1.7                | 7.0     | 236             |                   |               | 2.1             |
|                |                    |         |                 |                   |               | 2.6             |
| Ø40            | 1.3                | 7.0     | 309             |                   |               | 2.0             |
|                |                    |         |                 |                   |               | 2.4             |
| Ø50            | 1.0                | 7.0     | 401             |                   |               | 2.0             |
|                |                    |         |                 |                   |               | 2.3             |
| Ø63            | 0.8                | 7.0     | 502             |                   |               | 2.1             |
|                |                    |         |                 |                   |               | 2.3             |

# Ramping Data



## 3PK(H)T 15

(unit: mm)

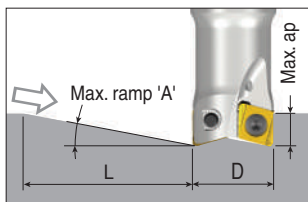
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø32            | 3.2                | 11.0    | 197             | 53.5              | 64            | 3.2             |
| Ø33            | 3.1                | 11.0    | 203             | 55.5              | 66            | 4.8             |
| Ø35            | 3.1                | 11.0    | 203             | 59.5              | 70            | 3.3             |
| Ø40            | 2.0                | 11.0    | 315             | 70.1              | 80            | 4.8             |
| Ø50            | 1.5                | 11.0    | 420             | 90.1              | 100           | 3.5             |
| Ø63            | 1.1                | 11.0    | 573             | 116.1             | 126           | 2.8             |
| Ø80            | 0.8                | 11.0    | 788             | 150.3             | 160           | 2.7             |
| Ø100           | 0.6                | 11.0    | 1051            | 190.5             | 200           | 2.6             |
| Ø125           | 0.5                | 11.0    | 1261            | 240.3             | 250           | 3.0             |
| Ø160           | 0.3                | 11.0    | 2102            | 310.3             | 320           | 2.5             |
| Ø200           | 0.2                | 11.0    | 3153            | 390.3             | 400           | 2.8             |
|                |                    |         |                 |                   |               | 2.9             |
|                |                    |         |                 |                   |               | 2.1             |
|                |                    |         |                 |                   |               | 2.2             |
|                |                    |         |                 |                   |               | 1.8             |
|                |                    |         |                 |                   |               | 1.9             |

## 3PK(H)T 19

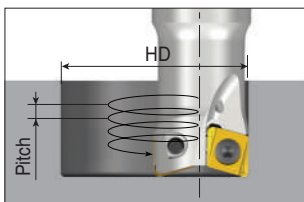
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø40            | 3.6                | 15.0    | 239             | 66.7              | 80            | 4.5             |
| Ø50            | 2.2                | 15.0    | 391             | 87.9              | 100           | 6.7             |
| Ø63            | 1.7                | 15.0    | 506             | 113.9             | 126           | 3.9             |
| Ø80            | 1.3                | 15.0    | 661             | 147.9             | 160           | 5.1             |
| Ø100           | 1.0                | 15.0    | 860             | 187.9             | 200           | 4               |
| Ø125           | 0.8                | 15.0    | 1075            | 237.9             | 250           | 5               |
| Ø160           | 0.6                | 15.0    | 1433            | 307.9             | 320           | 4.1             |
| Ø200           | 0.4                | 15.0    | 2150            | 387.9             | 400           | 4.8             |
| Ø250           | 0.3                | 15.0    | 2866            | 487.9             | 500           | 4.1             |
|                |                    |         |                 |                   |               | 4.7             |
|                |                    |         |                 |                   |               | 4.2             |
|                |                    |         |                 |                   |               | 4.7             |
|                |                    |         |                 |                   |               | 4.1             |
|                |                    |         |                 |                   |               | 4.5             |
|                |                    |         |                 |                   |               | 3.5             |
|                |                    |         |                 |                   |               | 3.7             |
|                |                    |         |                 |                   |               | 3.3             |
|                |                    |         |                 |                   |               | 3.5             |

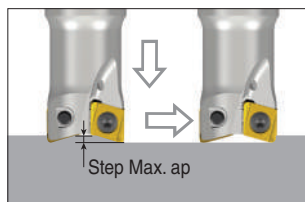
Straight ramping



Helical ramping



Step down



## 4NKT 04: R0.2

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø8             | 4.2                | 3.5     | 48              | 9.9               |               | 0.4             | 0.4       |
|                |                    |         |                 |                   | 16            | 3.1             |           |
| Ø10            | 4.6                | 3.5     | 44              | 13.9              |               | 0.8             | 0.6       |
|                |                    |         |                 |                   | 20            | 2.1             |           |
| Ø11            | 5.2                | 3.5     | 38              | 15.9              |               | 1.2             | 0.7       |
|                |                    |         |                 |                   | 22            | 2.7             |           |
| Ø12            | 4.8                | 3.5     | 42              | 17.9              |               | 1.3             | 0.8       |
|                |                    |         |                 |                   | 24            | 2.7             |           |
| Ø13            | 5.1                | 3.5     | 39              | 19.9              |               | 1.6             | 0.8       |
|                |                    |         |                 |                   | 26            | 3.1             |           |
| Ø16            | 4.4                | 3.5     | 46              | 25.9              |               | 2.0             | 1.0       |
|                |                    |         |                 |                   | 32            | 3.3             |           |
| Ø20            | 3.3                | 3.5     | 61              | 33.9              |               | 2.1             | 1.0       |
|                |                    |         |                 |                   | 40            | 3.1             |           |
| Ø25            | 2.5                | 3.5     | 80              | 43.9              |               | 2.2             | 1.0       |
|                |                    |         |                 |                   | 50            | 2.9             |           |
| Ø32            | 1.9                | 3.5     | 106             | 57.9              |               | 2.3             | 1.0       |
|                |                    |         |                 |                   | 64            | 2.8             |           |
| Ø40            | 1.4                | 3.5     | 138             | 73.9              |               | 2.3             | 1.0       |
|                |                    |         |                 |                   | 80            | 2.7             |           |

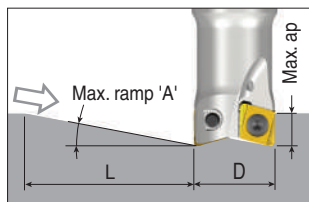
## 4NKT 04: R0.4

(unit: mm)

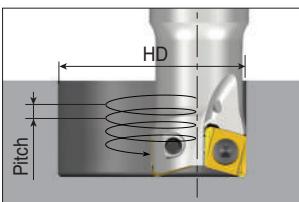
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø8             | 3.7                | 3.5     | 54              | 9.9               |               | 0.3             | 0.4       |
|                |                    |         |                 |                   | 16            | 2.8             |           |
| Ø10            | 4.2                | 3.5     | 48              | 13.9              |               | 0.8             | 0.5       |
|                |                    |         |                 |                   | 20            | 2.0             |           |
| Ø11            | 4.8                | 3.5     | 42              | 15.9              |               | 1.1             | 0.6       |
|                |                    |         |                 |                   | 22            | 2.5             |           |
| Ø12            | 4.5                | 3.5     | 44              | 17.9              |               | 1.2             | 0.7       |
|                |                    |         |                 |                   | 24            | 2.5             |           |
| Ø13            | 4.7                | 3.5     | 43              | 19.9              |               | 1.5             | 0.8       |
|                |                    |         |                 |                   | 26            | 2.9             |           |
| Ø16            | 4.1                | 3.5     | 49              | 25.9              |               | 1.9             | 0.9       |
|                |                    |         |                 |                   | 32            | 3.1             |           |
| Ø20            | 3.1                | 3.5     | 65              | 33.9              |               | 2.0             | 0.9       |
|                |                    |         |                 |                   | 40            | 2.9             |           |
| Ø25            | 2.3                | 3.5     | 85              | 43.9              |               | 2.1             | 0.9       |
|                |                    |         |                 |                   | 50            | 2.7             |           |
| Ø32            | 1.7                | 3.5     | 115             | 57.9              |               | 2.1             | 0.9       |
|                |                    |         |                 |                   | 64            | 2.6             |           |
| Ø40            | 1.3                | 3.5     | 149             | 73.9              |               | 2.1             | 0.9       |
|                |                    |         |                 |                   | 80            | 2.5             |           |

# Ramping Data

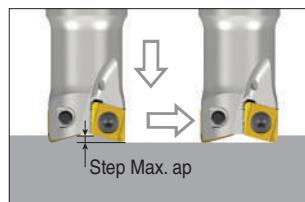
Straight ramping



Helical ramping



Step down

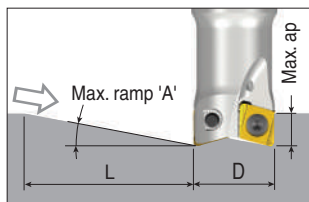


## 4NKT 04: R0.8

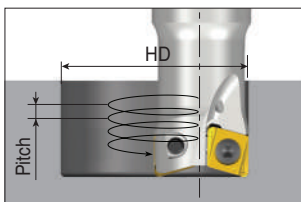
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø8             | 2.2                | 3.5     | 91              | 9.9               |               | 0.2             | 0.2       |
|                |                    |         |                 |                   | 16            | 1.6             |           |
| Ø10            | 3.0                | 3.5     | 67              | 13.9              |               | 0.5             | 0.4       |
|                |                    |         |                 |                   | 20            | 1.4             |           |
| Ø11            | 3.7                | 3.5     | 54              | 15.9              |               | 0.8             | 0.5       |
|                |                    |         |                 |                   | 22            | 1.9             |           |
| Ø12            | 3.5                | 3.5     | 57              | 17.9              |               | 1.0             | 0.5       |
|                |                    |         |                 |                   | 24            | 2.0             |           |
| Ø13            | 3.9                | 3.5     | 51              | 19.9              |               | 1.3             | 0.6       |
|                |                    |         |                 |                   | 26            | 2.4             |           |
| Ø16            | 3.5                | 3.5     | 57              | 25.9              |               | 1.6             | 0.7       |
|                |                    |         |                 |                   | 32            | 2.6             |           |
| Ø20            | 2.6                | 3.5     | 77              | 33.9              |               | 1.7             | 0.7       |
|                |                    |         |                 |                   | 40            | 2.4             |           |
| Ø25            | 1.9                | 3.5     | 103             | 43.9              |               | 1.7             | 0.7       |
|                |                    |         |                 |                   | 50            | 2.3             |           |
| Ø32            | 1.5                | 3.5     | 134             | 57.9              |               | 1.8             | 0.7       |
|                |                    |         |                 |                   | 64            | 2.2             |           |
| Ø40            | 1.1                | 3.5     | 174             | 73.9              |               | 1.8             | 0.7       |
|                |                    |         |                 |                   | 80            | 2.1             |           |

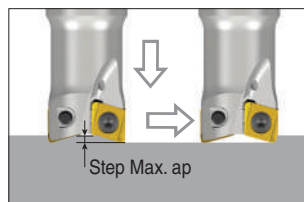
Straight ramping



Helical ramping



Step down



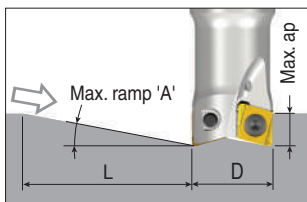
## 4NKT 06: R0.4

(unit: mm)

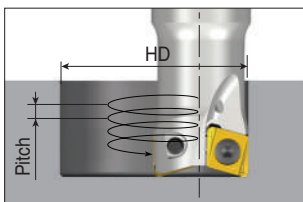
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 4.3                | 6.2     | 82              | 21.5              |               | 1.1             | 0.9       |
|                |                    |         |                 |                   | 32            | 3.2             |           |
| Ø17            | 4.3                | 6.2     | 82              | 23.5              |               | 1.3             | 1.0       |
|                |                    |         |                 |                   | 34            | 3.4             |           |
| Ø18            | 4.7                | 6.2     | 75              | 25.5              |               | 1.6             | 1.1       |
|                |                    |         |                 |                   | 36            | 3.9             |           |
| Ø20            | 4.9                | 6.2     | 72              | 29.5              |               | 2.2             | 1.3       |
|                |                    |         |                 |                   | 40            | 4.6             |           |
| Ø21            | 5.0                | 6.2     | 71              | 31.5              |               | 2.5             | 1.4       |
|                |                    |         |                 |                   | 42            | 4.9             |           |
| Ø25            | 4.9                | 6.2     | 72              | 39.5              |               | 3.3             | 1.6       |
|                |                    |         |                 |                   | 50            | 5.7             |           |
| Ø26            | 4.6                | 6.2     | 77              | 41.5              |               | 3.3             | 1.6       |
|                |                    |         |                 |                   | 52            | 5.6             |           |
| Ø32            | 3.5                | 6.2     | 101             | 53.5              |               | 3.5             | 1.7       |
|                |                    |         |                 |                   | 64            | 5.2             |           |
| Ø33            | 3.4                | 6.2     | 104             | 55.5              |               | 3.6             | 1.7       |
|                |                    |         |                 |                   | 66            | 5.2             |           |
| Ø35            | 3.1                | 6.2     | 115             | 59.5              |               | 3.5             | 1.7       |
|                |                    |         |                 |                   | 70            | 5.1             |           |
| Ø36            | 3.0                | 6.2     | 118             | 61.5              |               | 3.6             | 1.7       |
|                |                    |         |                 |                   | 72            | 5.0             |           |
| Ø38            | 2.8                | 6.2     | 127             | 65.5              |               | 3.6             | 1.7       |
|                |                    |         |                 |                   | 76            | 5.0             |           |
| Ø40            | 2.6                | 6.2     | 134             | 69.5              |               | 3.6             | 1.7       |
|                |                    |         |                 |                   | 80            | 4.9             |           |
| Ø43            | 2.4                | 6.2     | 148             | 75.5              |               | 3.6             | 1.7       |
|                |                    |         |                 |                   | 86            | 4.8             |           |
| Ø50            | 2.0                | 6.2     | 173             | 89.5              |               | 3.8             | 1.7       |
|                |                    |         |                 |                   | 100           | 4.8             |           |
| Ø63            | 1.6                | 6.2     | 222             | 115.5             |               | 3.9             | 1.7       |
|                |                    |         |                 |                   | 126           | 4.7             |           |

# Ramping Data

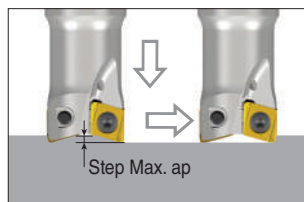
Straight ramping



Helical ramping



Step down



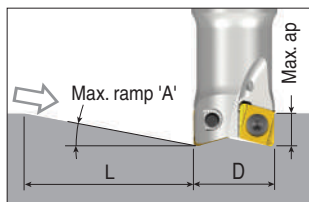
## 4NKT 06: R0.8

(unit: mm)

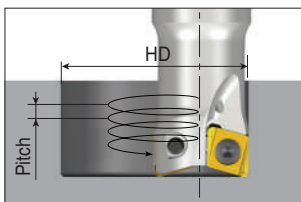
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 3.7                | 6.0     | 93              | 21.5              |               | 0.9             | 0.8       |
|                |                    |         |                 |                   | 32            | 2.8             |           |
| Ø17            | 3.8                | 6.0     | 90              | 23.5              |               | 1.2             | 0.8       |
|                |                    |         |                 |                   | 34            | 3.0             |           |
| Ø18            | 4.2                | 6.0     | 82              | 25.5              |               | 1.5             | 1.0       |
|                |                    |         |                 |                   | 36            | 3.5             |           |
| Ø20            | 4.4                | 6.0     | 78              | 29.5              |               | 2.0             | 1.1       |
|                |                    |         |                 |                   | 40            | 4.1             |           |
| Ø21            | 4.6                | 6.0     | 75              | 31.5              |               | 2.3             | 1.2       |
|                |                    |         |                 |                   | 42            | 4.5             |           |
| Ø25            | 4.6                | 6.0     | 75              | 39.5              |               | 3.1             | 1.5       |
|                |                    |         |                 |                   | 50            | 5.4             |           |
| Ø26            | 4.3                | 6.0     | 80              | 41.5              |               | 3.1             | 1.5       |
|                |                    |         |                 |                   | 52            | 5.2             |           |
| Ø32            | 3.2                | 6.0     | 107             | 53.5              |               | 3.2             | 1.5       |
|                |                    |         |                 |                   | 64            | 4.8             |           |
| Ø33            | 3.1                | 6.0     | 111             | 55.5              |               | 3.3             | 1.5       |
|                |                    |         |                 |                   | 66            | 4.8             |           |
| Ø35            | 2.8                | 6.0     | 121             | 59.5              |               | 3.3             | 1.5       |
|                |                    |         |                 |                   | 70            | 4.6             |           |
| Ø36            | 2.7                | 6.0     | 125             | 61.5              |               | 3.3             | 1.5       |
|                |                    |         |                 |                   | 72            | 4.6             |           |
| Ø38            | 2.5                | 6.0     | 135             | 65.5              |               | 3.3             | 1.5       |
|                |                    |         |                 |                   | 76            | 4.5             |           |
| Ø40            | 2.4                | 6.0     | 140             | 69.5              |               | 3.4             | 1.5       |
|                |                    |         |                 |                   | 80            | 4.6             |           |
| Ø43            | 2.2                | 6.0     | 153             | 75.5              |               | 3.4             | 1.5       |
|                |                    |         |                 |                   | 86            | 4.5             |           |
| Ø50            | 1.9                | 6.0     | 181             | 89.5              |               | 3.5             | 1.5       |
|                |                    |         |                 |                   | 100           | 4.4             |           |
| Ø63            | 1.4                | 6.0     | 237             | 115.5             |               | 3.5             | 1.6       |
|                |                    |         |                 |                   | 126           | 4.3             |           |



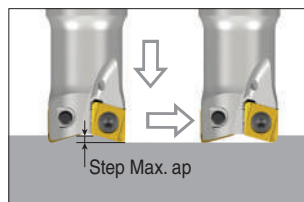
Straight ramping



Helical ramping



Step down



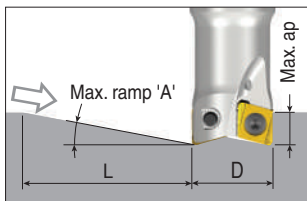
## 4NKT 06: R1.2

(unit: mm)

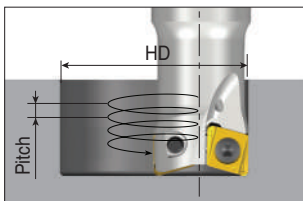
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 3.0                | 6.0     | 115             | 21.5              | 32            | 0.8             | 0.6       |
|                |                    |         |                 |                   |               | 2.2             |           |
| Ø17            | 3.2                | 6.0     | 107             | 23.5              | 34            | 1.0             | 0.7       |
|                |                    |         |                 |                   |               | 2.5             |           |
| Ø18            | 3.6                | 6.0     | 95              | 25.5              | 36            | 1.3             | 0.8       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø20            | 3.9                | 6.0     | 88              | 29.5              | 40            | 1.7             | 1.0       |
|                |                    |         |                 |                   |               | 3.6             |           |
| Ø21            | 4.1                | 6.0     | 84              | 31.5              | 42            | 2.0             | 1.1       |
|                |                    |         |                 |                   |               | 4.0             |           |
| Ø25            | 4.2                | 6.0     | 82              | 39.5              | 50            | 2.8             | 1.3       |
|                |                    |         |                 |                   |               | 4.9             |           |
| Ø26            | 3.9                | 6.0     | 88              | 41.5              | 52            | 2.8             | 1.3       |
|                |                    |         |                 |                   |               | 4.7             |           |
| Ø32            | 2.9                | 6.0     | 119             | 53.5              | 64            | 2.9             | 1.4       |
|                |                    |         |                 |                   |               | 4.3             |           |
| Ø33            | 2.8                | 6.0     | 123             | 55.5              | 66            | 2.9             | 1.4       |
|                |                    |         |                 |                   |               | 4.3             |           |
| Ø35            | 2.6                | 6.0     | 132             | 59.5              | 70            | 3.0             | 1.4       |
|                |                    |         |                 |                   |               | 4.2             |           |
| Ø36            | 2.5                | 6.0     | 137             | 61.5              | 72            | 3.0             | 1.4       |
|                |                    |         |                 |                   |               | 4.2             |           |
| Ø38            | 2.3                | 6.0     | 146             | 65.5              | 76            | 3.0             | 1.4       |
|                |                    |         |                 |                   |               | 4.2             |           |
| Ø40            | 2.2                | 6.0     | 156             | 69.5              | 80            | 3.0             | 1.4       |
|                |                    |         |                 |                   |               | 4.1             |           |
| Ø43            | 2.0                | 6.0     | 168             | 75.5              | 86            | 3.1             | 1.4       |
|                |                    |         |                 |                   |               | 4.1             |           |
| Ø50            | 1.7                | 6.0     | 202             | 89.5              | 100           | 3.1             | 1.4       |
|                |                    |         |                 |                   |               | 4.0             |           |
| Ø63            | 1.3                | 6.0     | 265             | 115.5             | 126           | 3.2             | 1.4       |
|                |                    |         |                 |                   |               | 3.8             |           |

# Ramping Data

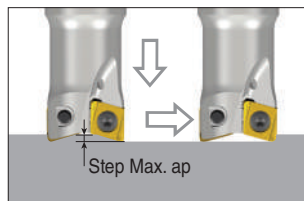
Straight ramping



Helical ramping



Step down

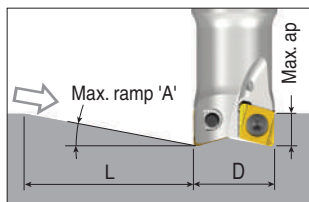


## 4NKT 06: R1.6

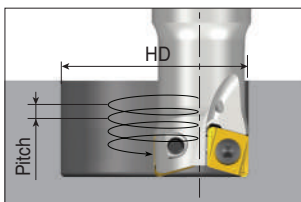
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 2.2                | 5.8     | 151             | 21.5              |               | 0.6             | 0.4       |
|                |                    |         |                 |                   | 32            | 1.6             |           |
| Ø17            | 2.4                | 5.8     | 138             | 23.5              |               | 0.7             | 0.5       |
|                |                    |         |                 |                   | 34            | 1.9             |           |
| Ø18            | 2.8                | 5.8     | 119             | 25.5              |               | 1.0             | 0.6       |
|                |                    |         |                 |                   | 36            | 2.3             |           |
| Ø20            | 3.2                | 5.8     | 104             | 29.5              |               | 1.4             | 0.8       |
|                |                    |         |                 |                   | 40            | 3.0             |           |
| Ø21            | 3.4                | 5.8     | 98              | 31.5              |               | 1.7             | 0.9       |
|                |                    |         |                 |                   | 42            | 3.3             |           |
| Ø25            | 3.7                | 5.8     | 90              | 39.5              |               | 2.5             | 1.1       |
|                |                    |         |                 |                   | 50            | 4.3             |           |
| Ø26            | 3.4                | 5.8     | 98              | 41.5              |               | 2.5             | 1.1       |
|                |                    |         |                 |                   | 52            | 4.1             |           |
| Ø32            | 2.5                | 5.8     | 130             | 53.5              |               | 2.6             | 1.2       |
|                |                    |         |                 |                   | 64            | 3.8             |           |
| Ø33            | 2.4                | 5.8     | 136             | 55.5              |               | 2.6             | 1.2       |
|                |                    |         |                 |                   | 66            | 3.8             |           |
| Ø35            | 2.3                | 5.8     | 144             | 59.5              |               | 2.6             | 1.2       |
|                |                    |         |                 |                   | 70            | 3.8             |           |
| Ø36            | 2.2                | 5.8     | 151             | 61.5              |               | 2.6             | 1.2       |
|                |                    |         |                 |                   | 72            | 3.7             |           |
| Ø38            | 2.0                | 5.8     | 162             | 65.5              |               | 2.6             | 1.2       |
|                |                    |         |                 |                   | 76            | 3.6             |           |
| Ø40            | 1.9                | 5.8     | 170             | 69.5              |               | 2.7             | 1.2       |
|                |                    |         |                 |                   | 80            | 3.6             |           |
| Ø43            | 1.8                | 5.8     | 185             | 75.5              |               | 2.7             | 1.2       |
|                |                    |         |                 |                   | 86            | 3.6             |           |
| Ø50            | 1.5                | 5.8     | 222             | 89.5              |               | 2.8             | 1.2       |
|                |                    |         |                 |                   | 100           | 3.5             |           |
| Ø63            | 1.1                | 5.8     | 289             | 115.5             |               | 2.8             | 1.2       |
|                |                    |         |                 |                   | 126           | 3.4             |           |

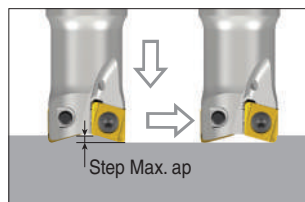
Straight ramping



Helical ramping



Step down



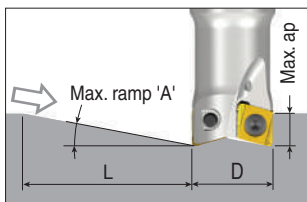
## 4NKT 06: R2.0

(unit: mm)

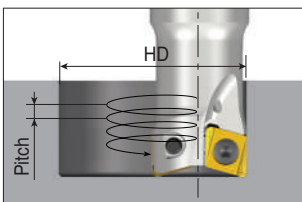
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 1.6                | 5.6     | 201             | 21.5              | 32            | 0.4             | 0.3       |
|                |                    |         |                 |                   |               | 1.2             |           |
| Ø17            | 1.8                | 5.6     | 178             | 23.5              | 34            | 0.5             | 0.3       |
|                |                    |         |                 |                   |               | 1.4             |           |
| Ø18            | 2.3                | 5.6     | 139             | 25.5              | 36            | 0.8             | 0.5       |
|                |                    |         |                 |                   |               | 1.9             |           |
| Ø20            | 2.7                | 5.6     | 117             | 29.5              | 40            | 1.2             | 0.6       |
|                |                    |         |                 |                   |               | 2.6             |           |
| Ø21            | 3.0                | 5.6     | 107             | 31.5              | 42            | 1.5             | 0.7       |
|                |                    |         |                 |                   |               | 2.9             |           |
| Ø25            | 3.3                | 5.6     | 97              | 39.5              | 50            | 2.2             | 1.0       |
|                |                    |         |                 |                   |               | 3.8             |           |
| Ø26            | 3.1                | 5.6     | 103             | 41.5              | 52            | 2.2             | 1.0       |
|                |                    |         |                 |                   |               | 3.8             |           |
| Ø32            | 2.3                | 5.6     | 139             | 53.5              | 64            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.4             |           |
| Ø33            | 2.2                | 5.6     | 146             | 55.5              | 66            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.4             |           |
| Ø35            | 2.0                | 5.6     | 157             | 59.5              | 70            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.3             |           |
| Ø36            | 2.0                | 5.6     | 160             | 61.5              | 72            | 2.4             | 1.0       |
|                |                    |         |                 |                   |               | 3.4             |           |
| Ø38            | 1.8                | 5.6     | 173             | 65.5              | 76            | 2.4             | 1.0       |
|                |                    |         |                 |                   |               | 3.3             |           |
| Ø40            | 1.7                | 5.6     | 183             | 69.5              | 80            | 2.4             | 1.0       |
|                |                    |         |                 |                   |               | 3.3             |           |
| Ø43            | 1.3                | 5.6     | 247             | 75.5              | 86            | 2.0             | 1.0       |
|                |                    |         |                 |                   |               | 2.6             |           |
| Ø50            | 1.3                | 5.6     | 238             | 89.5              | 100           | 2.5             | 1.0       |
|                |                    |         |                 |                   |               | 3.1             |           |
| Ø63            | 1.0                | 5.6     | 306             | 115.5             | 126           | 2.6             | 1.0       |
|                |                    |         |                 |                   |               | 3.1             |           |

# Ramping Data

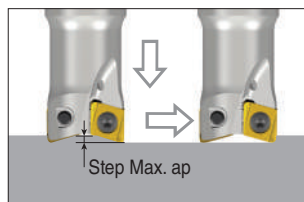
Straight ramping



Helical ramping



Step down



## 4NHT 04: R0.5-F

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø8             | 3.4                | 2.2     | 37              | 9.9               |               | 0.3             | 0.3       |
|                |                    |         |                 |                   | 16            | 1.3             |           |
| Ø10            | 4.0                | 2.2     | 31              | 13.9              |               | 0.7             | 0.5       |
|                |                    |         |                 |                   | 20            | 1.9             |           |
| Ø11            | 4.6                | 2.2     | 27              | 15.9              |               | 1.1             | 0.6       |
|                |                    |         |                 |                   | 22            | 2.2             |           |
| Ø12            | 4.3                | 2.2     | 29              | 17.9              |               | 1.2             | 0.7       |
|                |                    |         |                 |                   | 24            | 2.2             |           |
| Ø13            | 4.6                | 2.2     | 27              | 19.9              |               | 1.5             | 0.8       |
|                |                    |         |                 |                   | 26            | 2.2             |           |
| Ø16            | 3.9                | 2.2     | 32              | 25.9              |               | 1.8             | 0.9       |
|                |                    |         |                 |                   | 32            | 2.2             |           |
| Ø20            | 2.9                | 2.2     | 43              | 33.9              |               | 1.9             | 0.9       |
|                |                    |         |                 |                   | 40            | 2.2             |           |
| Ø25            | 2.2                | 2.2     | 57              | 43.9              |               | 1.9             | 0.9       |
|                |                    |         |                 |                   | 50            | 2.2             |           |
| Ø32            | 1.6                | 2.2     | 76              | 57.9              |               | 2.0             | 0.9       |
|                |                    |         |                 |                   | 64            | 2.2             |           |
| Ø40            | 1.3                | 2.2     | 97              | 73.9              |               | 2.1             | 0.9       |
|                |                    |         |                 |                   | 80            | 2.2             |           |

## 4NHT 04: R1.0-F

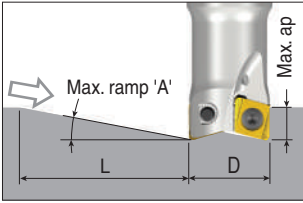
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø8             | 1.5                | 2.0     | 74              | 9.9               |               | 0.1             | 0.1       |
|                |                    |         |                 |                   | 16            | 0.6             |           |
| Ø10            | 2.5                | 2.0     | 45              | 13.9              |               | 0.5             | 0.3       |
|                |                    |         |                 |                   | 20            | 1.2             |           |
| Ø11            | 3.3                | 2.0     | 35              | 15.9              |               | 0.8             | 0.4       |
|                |                    |         |                 |                   | 22            | 1.7             |           |
| Ø12            | 3.1                | 2.0     | 37              | 17.9              |               | 0.9             | 0.5       |
|                |                    |         |                 |                   | 24            | 1.7             |           |
| Ø13            | 3.5                | 2.0     | 33              | 19.9              |               | 1.1             | 0.5       |
|                |                    |         |                 |                   | 26            | 2.0             |           |
| Ø16            | 3.0                | 2.0     | 38              | 25.9              |               | 1.4             | 0.6       |
|                |                    |         |                 |                   | 32            | 2.0             |           |
| Ø20            | 2.2                | 2.0     | 51              | 33.9              |               | 1.5             | 0.7       |
|                |                    |         |                 |                   | 40            | 2.0             |           |
| Ø25            | 1.7                | 2.0     | 65              | 43.9              |               | 1.5             | 0.7       |
|                |                    |         |                 |                   | 50            | 2.0             |           |
| Ø32            | 1.3                | 2.0     | 88              | 57.9              |               | 1.6             | 0.7       |
|                |                    |         |                 |                   | 64            | 1.9             |           |
| Ø40            | 1.0                | 2.0     | 115             | 73.9              |               | 1.6             | 0.7       |
|                |                    |         |                 |                   | 80            | 1.9             |           |

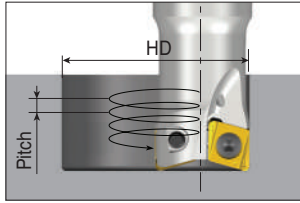
# Ramping Data



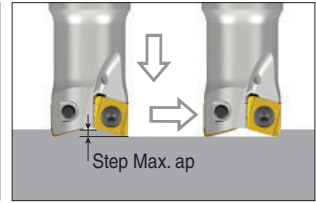
Straight ramping



Helical ramping



Step down



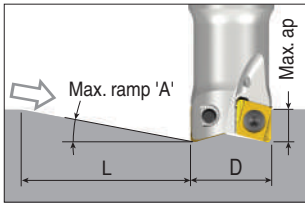
## 4NHT 06: R0.4

(unit: mm)

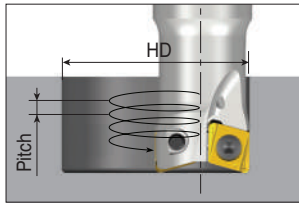
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 2.9                | 6.0     | 119             | 21.5              | 32            | 0.7             | 0.6       |
|                |                    |         |                 |                   |               | 2.2             |           |
| Ø17            | 3.0                | 6.0     | 115             | 23.5              | 34            | 0.9             | 0.6       |
|                |                    |         |                 |                   |               | 2.4             |           |
| Ø18            | 3.4                | 6.0     | 101             | 25.5              | 36            | 1.2             | 0.8       |
|                |                    |         |                 |                   |               | 2.9             |           |
| Ø20            | 3.8                | 6.0     | 90              | 29.5              | 40            | 1.7             | 0.9       |
|                |                    |         |                 |                   |               | 3.5             |           |
| Ø21            | 4.0                | 6.0     | 86              | 31.5              | 42            | 2.0             | 1.0       |
|                |                    |         |                 |                   |               | 3.9             |           |
| Ø25            | 4.1                | 6.0     | 84              | 39.5              | 50            | 2.8             | 1.3       |
|                |                    |         |                 |                   |               | 4.8             |           |
| Ø26            | 3.8                | 6.0     | 90              | 41.5              | 52            | 2.7             | 1.3       |
|                |                    |         |                 |                   |               | 4.6             |           |
| Ø32            | 2.8                | 6.0     | 123             | 53.5              | 64            | 2.8             | 1.3       |
|                |                    |         |                 |                   |               | 4.2             |           |
| Ø33            | 2.7                | 6.0     | 127             | 55.5              | 66            | 2.8             | 1.3       |
|                |                    |         |                 |                   |               | 4.2             |           |
| Ø35            | 2.5                | 6.0     | 135             | 59.5              | 70            | 2.9             | 1.3       |
|                |                    |         |                 |                   |               | 4.2             |           |
| Ø36            | 2.4                | 6.0     | 140             | 61.5              | 72            | 2.9             | 1.3       |
|                |                    |         |                 |                   |               | 4.1             |           |
| Ø38            | 2.3                | 6.0     | 149             | 65.5              | 76            | 2.9             | 1.3       |
|                |                    |         |                 |                   |               | 4.1             |           |
| Ø40            | 2.1                | 6.0     | 160             | 69.5              | 80            | 3.0             | 1.3       |
|                |                    |         |                 |                   |               | 4.0             |           |
| Ø43            | 1.9                | 6.0     | 176             | 75.5              | 86            | 3.0             | 1.3       |
|                |                    |         |                 |                   |               | 3.9             |           |
| Ø50            | 1.6                | 6.0     | 208             | 89.5              | 100           | 3.0             | 1.3       |
|                |                    |         |                 |                   |               | 3.8             |           |
| Ø63            | 1.2                | 6.0     | 275             | 115.5             | 126           | 3.1             | 1.3       |
|                |                    |         |                 |                   |               | 3.7             |           |

# Ramping Data

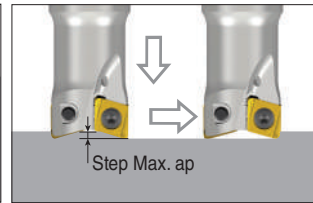
Straight ramping



Helical ramping



Step down

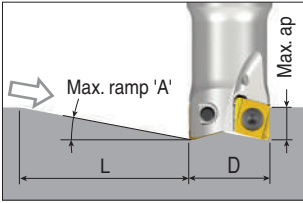


## 4NHT 06: R0.8

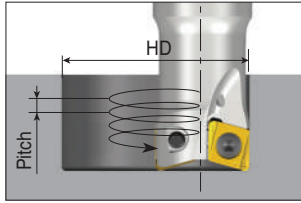
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 2.9                | 6.0     | 119             | 21.5              |               | 0.7             | 0.6       |
|                |                    |         |                 |                   | 32            | 2.2             |           |
| Ø17            | 3.0                | 6.0     | 115             | 23.5              |               | 0.9             | 0.6       |
|                |                    |         |                 |                   | 34            | 2.4             |           |
| Ø18            | 3.5                | 6.0     | 98              | 25.5              |               | 1.2             | 0.8       |
|                |                    |         |                 |                   | 36            | 2.9             |           |
| Ø20            | 3.8                | 6.0     | 90              | 29.5              |               | 1.7             | 0.9       |
|                |                    |         |                 |                   | 40            | 3.5             |           |
| Ø21            | 4.0                | 6.0     | 86              | 31.5              |               | 2.0             | 1.0       |
|                |                    |         |                 |                   | 42            | 3.9             |           |
| Ø25            | 4.1                | 6.0     | 84              | 39.5              |               | 2.8             | 1.3       |
|                |                    |         |                 |                   | 50            | 4.8             |           |
| Ø26            | 3.8                | 6.0     | 90              | 41.5              |               | 2.7             | 1.3       |
|                |                    |         |                 |                   | 52            | 4.6             |           |
| Ø32            | 2.8                | 6.0     | 123             | 53.5              |               | 2.8             | 1.3       |
|                |                    |         |                 |                   | 64            | 4.2             |           |
| Ø33            | 2.7                | 6.0     | 127             | 55.5              |               | 2.8             | 1.3       |
|                |                    |         |                 |                   | 66            | 4.2             |           |
| Ø35            | 2.5                | 6.0     | 135             | 59.5              |               | 2.9             | 1.3       |
|                |                    |         |                 |                   | 70            | 4.2             |           |
| Ø36            | 2.4                | 6.0     | 140             | 61.5              |               | 2.9             | 1.3       |
|                |                    |         |                 |                   | 72            | 4.1             |           |
| Ø38            | 2.3                | 6.0     | 149             | 65.5              |               | 2.9             | 1.3       |
|                |                    |         |                 |                   | 76            | 4.1             |           |
| Ø40            | 2.1                | 6.0     | 160             | 69.5              |               | 3.0             | 1.3       |
|                |                    |         |                 |                   | 80            | 4.0             |           |
| Ø43            | 1.9                | 6.0     | 176             | 75.5              |               | 3.0             | 1.3       |
|                |                    |         |                 |                   | 86            | 3.9             |           |
| Ø50            | 1.6                | 6.0     | 208             | 89.5              |               | 3.0             | 1.3       |
|                |                    |         |                 |                   | 100           | 3.8             |           |
| Ø63            | 1.25               | 6.0     | 275             | 115.5             |               | 3.1             | 1.3       |
|                |                    |         |                 |                   | 126           | 3.7             |           |

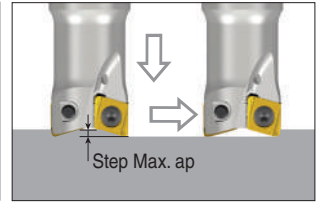
Straight ramping



Helical ramping



Step down



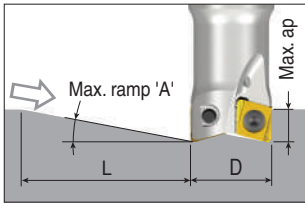
## 4NHT 06: R0.5-F

(unit: mm)

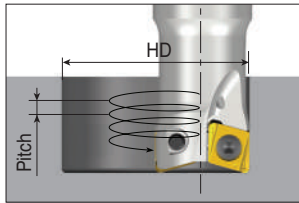
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 3.5                | 2.3     | 38              | 21.5              | 32            | 0.9             | 0.8       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø17            | 3.6                | 2.3     | 37              | 23.5              | 34            | 1.1             | 0.8       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø18            | 4.0                | 2.3     | 33              | 25.5              | 36            | 1.4             | 1.0       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø20            | 4.3                | 2.3     | 31              | 29.5              | 40            | 1.9             | 1.2       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø21            | 4.4                | 2.3     | 30              | 31.5              | 42            | 2.2             | 1.2       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø25            | 4.9                | 2.3     | 27              | 39.5              | 50            | 2.3             | 1.6       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø26            | 4.6                | 2.3     | 29              | 41.5              | 52            | 2.3             | 1.6       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø32            | 3.5                | 2.3     | 38              | 53.5              | 64            | 2.3             | 1.6       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø33            | 3.3                | 2.3     | 40              | 55.5              | 66            | 2.3             | 1.6       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø35            | 3.1                | 2.3     | 42              | 59.5              | 70            | 2.3             | 1.6       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø36            | 3.0                | 2.3     | 44              | 61.5              | 72            | 2.3             | 1.6       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø38            | 2.8                | 2.3     | 47              | 65.5              | 76            | 2.3             | 1.7       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø40            | 2.6                | 2.3     | 51              | 69.5              | 80            | 2.3             | 1.7       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø43            | 2.4                | 2.3     | 55              | 75.5              | 86            | 2.3             | 1.7       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø50            | 2.0                | 2.3     | 64              | 89.5              | 100           | 2.3             | 1.7       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø63            | 1.7                | 2.3     | 78              | 115.5             | 126           | 2.3             | 1.7       |
|                |                    |         |                 |                   |               | 2.3             |           |

# Ramping Data

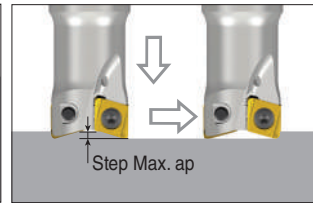
Straight ramping



Helical ramping



Step down



## 4NHT 06: R0.8-F

(unit: mm)

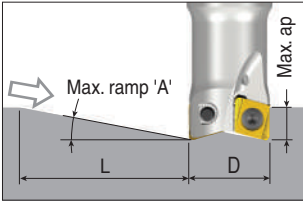
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 3.1                | 1.9     | 35              | 21.5              |               | 0.8             | 0.7       |
|                |                    |         |                 |                   | 32            | 1.9             |           |
| Ø17            | 3.2                | 1.9     | 34              | 23.5              |               | 1.0             | 0.7       |
|                |                    |         |                 |                   | 34            | 1.9             |           |
| Ø18            | 3.6                | 1.9     | 30              | 25.5              |               | 1.3             | 0.9       |
|                |                    |         |                 |                   | 36            | 1.9             |           |
| Ø20            | 3.9                | 1.9     | 28              | 29.5              |               | 1.7             | 1.0       |
|                |                    |         |                 |                   | 40            | 1.9             |           |
| Ø21            | 4.1                | 1.9     | 27              | 31.5              |               | 1.9             | 1.1       |
|                |                    |         |                 |                   | 42            | 1.9             |           |
| Ø25            | 4.6                | 1.9     | 24              | 39.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 50            | 1.9             |           |
| Ø26            | 4.4                | 1.9     | 25              | 41.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 52            | 1.9             |           |
| Ø32            | 3.3                | 1.9     | 33              | 53.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 64            | 1.9             |           |
| Ø33            | 3.1                | 1.9     | 35              | 55.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 66            | 1.9             |           |
| Ø35            | 2.9                | 1.9     | 38              | 59.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 70            | 1.9             |           |
| Ø36            | 2.8                | 1.9     | 39              | 61.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 72            | 1.9             |           |
| Ø38            | 2.6                | 1.9     | 41              | 65.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 76            | 1.9             |           |
| Ø40            | 2.4                | 1.9     | 44              | 69.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 80            | 1.9             |           |
| Ø43            | 2.2                | 1.9     | 48              | 75.5              |               | 1.9             | 1.5       |
|                |                    |         |                 |                   | 86            | 1.9             |           |
| Ø50            | 1.9                | 1.9     | 57              | 89.5              |               | 1.9             | 1.6       |
|                |                    |         |                 |                   | 100           | 1.9             |           |
| Ø63            | 1.4                | 1.9     | 75              | 115.5             |               | 1.9             | 1.6       |
|                |                    |         |                 |                   | 126           | 1.9             |           |



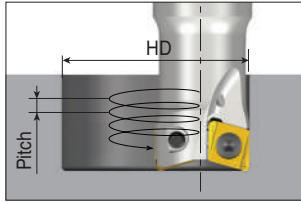
# Ramping Data



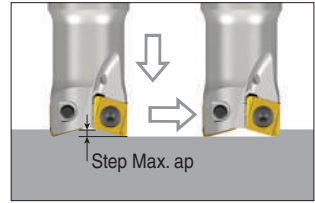
Straight ramping



Helical ramping



Step down



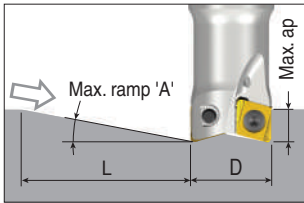
## 4NHT 06: R1.0-F

(unit: mm)

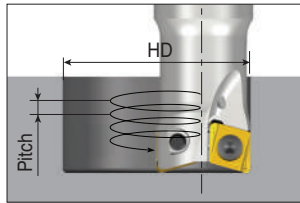
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 2.7                | 2.1     | 44              | 21.5              | 32            | 0.7             | 0.6       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø17            | 2.9                | 2.1     | 41              | 23.5              | 34            | 0.9             | 0.7       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø18            | 3.3                | 2.1     | 36              | 25.5              | 36            | 1.2             | 0.8       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø20            | 3.6                | 2.1     | 33              | 29.5              | 40            | 1.6             | 1.0       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø21            | 3.8                | 2.1     | 32              | 31.5              | 42            | 1.9             | 1.0       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø25            | 4.4                | 2.1     | 27              | 39.5              | 50            | 2.1             | 1.4       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø26            | 4.2                | 2.1     | 29              | 41.5              | 52            | 2.1             | 1.4       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø32            | 3.1                | 2.1     | 39              | 53.5              | 64            | 2.1             | 1.4       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø33            | 3.0                | 2.1     | 40              | 55.5              | 66            | 2.1             | 1.4       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø35            | 2.8                | 2.1     | 43              | 59.5              | 70            | 2.1             | 1.4       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø36            | 2.6                | 2.1     | 45              | 61.5              | 72            | 2.1             | 1.4       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø38            | 2.5                | 2.1     | 48              | 65.5              | 76            | 2.1             | 1.5       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø40            | 2.3                | 2.1     | 51              | 69.5              | 80            | 2.1             | 1.5       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø43            | 2.1                | 2.1     | 56              | 75.5              | 86            | 2.1             | 1.5       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø50            | 1.8                | 2.1     | 67              | 89.5              | 100           | 2.1             | 1.5       |
|                |                    |         |                 |                   |               | 2.1             |           |
| Ø63            | 1.4                | 2.1     | 86              | 115.5             | 126           | 2.1             | 1.5       |
|                |                    |         |                 |                   |               | 2.1             |           |

# Ramping Data

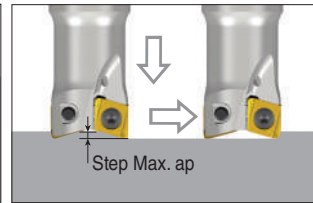
Straight ramping



Helical ramping



Step down



## 4NHT 06: R1.5-F

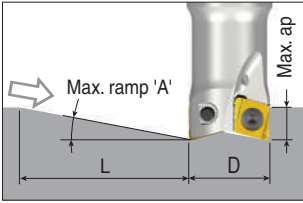
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 1.9                | 3.3     | 97              | 21.5              |               | 0.5             | 0.4       |
|                |                    |         |                 |                   | 32            | 1.5             |           |
| Ø17            | 2.1                | 3.3     | 88              | 23.5              |               | 0.7             | 0.5       |
|                |                    |         |                 |                   | 34            | 1.7             |           |
| Ø18            | 2.6                | 3.3     | 73              | 25.5              |               | 0.9             | 0.6       |
|                |                    |         |                 |                   | 36            | 2.2             |           |
| Ø20            | 3.0                | 3.3     | 63              | 29.5              |               | 1.3             | 0.8       |
|                |                    |         |                 |                   | 40            | 2.8             |           |
| Ø21            | 3.2                | 3.3     | 59              | 31.5              |               | 1.6             | 0.9       |
|                |                    |         |                 |                   | 42            | 3.1             |           |
| Ø25            | 3.9                | 3.3     | 48              | 39.5              |               | 2.6             | 1.2       |
|                |                    |         |                 |                   | 50            | 3.3             |           |
| Ø26            | 3.7                | 3.3     | 51              | 41.5              |               | 2.7             | 1.2       |
|                |                    |         |                 |                   | 52            | 3.3             |           |
| Ø32            | 2.7                | 3.3     | 70              | 53.5              |               | 2.7             | 1.2       |
|                |                    |         |                 |                   | 64            | 3.3             |           |
| Ø33            | 2.6                | 3.3     | 71              | 55.5              |               | 2.8             | 1.2       |
|                |                    |         |                 |                   | 66            | 3.3             |           |
| Ø35            | 2.4                | 3.3     | 77              | 59.5              |               | 2.8             | 1.3       |
|                |                    |         |                 |                   | 70            | 3.3             |           |
| Ø36            | 2.3                | 3.3     | 80              | 61.5              |               | 2.8             | 1.3       |
|                |                    |         |                 |                   | 72            | 3.3             |           |
| Ø38            | 2.2                | 3.3     | 86              | 65.5              |               | 2.8             | 1.3       |
|                |                    |         |                 |                   | 76            | 3.3             |           |
| Ø40            | 2.1                | 3.3     | 90              | 69.5              |               | 2.9             | 1.3       |
|                |                    |         |                 |                   | 80            | 3.3             |           |
| Ø43            | 1.9                | 3.3     | 100             | 75.5              |               | 2.9             | 1.3       |
|                |                    |         |                 |                   | 86            | 3.3             |           |
| Ø50            | 1.6                | 3.3     | 118             | 89.5              |               | 2.9             | 1.3       |
|                |                    |         |                 |                   | 100           | 3.3             |           |
| Ø63            | 1.2                | 3.3     | 151             | 115.5             |               | 3.1             | 1.3       |
|                |                    |         |                 |                   | 126           | 3.3             |           |

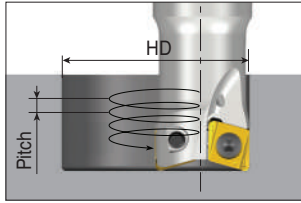
# Ramping Data



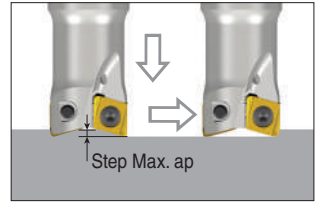
Straight ramping



Helical ramping



Step down



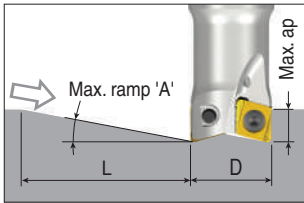
## 4NHT 06: R2.0-F

(unit: mm)

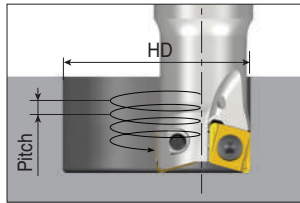
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø16            | 0.8                | 3.0     | 202             | 21.5              | 32            | 0.2             | 0.1       |
|                |                    |         |                 |                   |               | 0.6             |           |
| Ø17            | 1.1                | 3.0     | 156             | 23.5              | 34            | 0.3             | 0.2       |
|                |                    |         |                 |                   |               | 0.9             |           |
| Ø18            | 1.6                | 3.0     | 107             | 25.5              | 36            | 0.6             | 0.3       |
|                |                    |         |                 |                   |               | 1.3             |           |
| Ø20            | 2.1                | 3.0     | 82              | 29.5              | 40            | 0.9             | 0.5       |
|                |                    |         |                 |                   |               | 2.0             |           |
| Ø21            | 2.3                | 3.0     | 73              | 31.5              | 42            | 1.1             | 0.6       |
|                |                    |         |                 |                   |               | 2.3             |           |
| Ø25            | 3.2                | 3.0     | 54              | 39.5              | 50            | 2.2             | 0.9       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø26            | 3.0                | 3.0     | 57              | 41.5              | 52            | 2.2             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø32            | 2.2                | 3.0     | 76              | 53.5              | 64            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø33            | 2.1                | 3.0     | 80              | 55.5              | 66            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø35            | 2.0                | 3.0     | 86              | 59.5              | 70            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø36            | 1.9                | 3.0     | 88              | 61.5              | 72            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø38            | 1.8                | 3.0     | 96              | 65.5              | 76            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø40            | 1.7                | 3.0     | 101             | 69.5              | 80            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø43            | 1.5                | 3.0     | 111             | 75.5              | 86            | 2.3             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø50            | 1.3                | 3.0     | 132             | 89.5              | 100           | 2.4             | 1.0       |
|                |                    |         |                 |                   |               | 3.0             |           |
| Ø63            | 1.0                | 3.0     | 172             | 115.5             | 126           | 2.4             | 1.0       |
|                |                    |         |                 |                   |               | 2.9             |           |

# Ramping Data

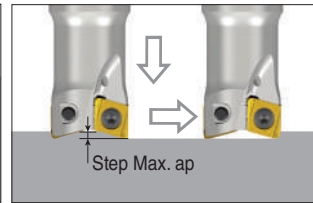
Straight ramping



Helical ramping



Step down



## 4NKT 09: R0.8

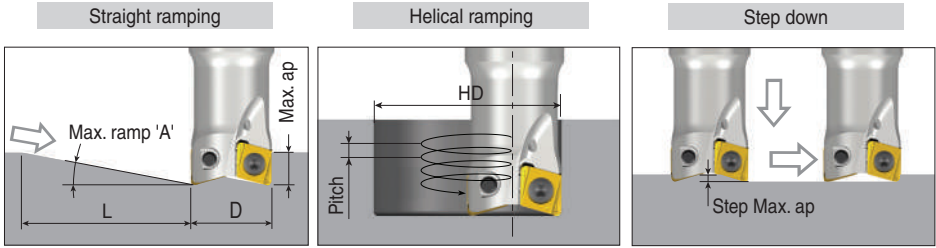
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø20            | 3.7                | 8.0     | 124             | 25.5              |               | 0.9             | 1.0       |
|                |                    |         |                 |                   | 40            | 3.5             |           |
| Ø25            | 4.9                | 8.0     | 93              | 35.5              |               | 2.4             | 1.6       |
|                |                    |         |                 |                   | 50            | 5.7             |           |
| Ø32            | 4.9                | 8.0     | 93              | 49.5              |               | 4.0             | 2.1       |
|                |                    |         |                 |                   | 64            | 7.3             |           |
| Ø40            | 3.6                | 8.0     | 127             | 65.5              |               | 4.3             | 2.1       |
|                |                    |         |                 |                   | 80            | 6.7             |           |
| Ø50            | 2.7                | 8.0     | 170             | 85.5              |               | 4.5             | 2.1       |
|                |                    |         |                 |                   | 100           | 6.3             |           |
| Ø63            | 2.0                | 8.0     | 224             | 111.5             |               | 4.6             | 2.1       |
|                |                    |         |                 |                   | 126           | 6.0             |           |
| Ø80            | 1.5                | 8.0     | 296             | 145.5             |               | 4.7             | 2.1       |
|                |                    |         |                 |                   | 160           | 5.8             |           |

## 4NKT 09: R1.6

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø20            | 2.7                | 8.0     | 167             | 25.5              |               | 0.7             | 0.7       |
|                |                    |         |                 |                   | 40            | 2.6             |           |
| Ø25            | 4.1                | 8.0     | 112             | 35.5              |               | 2.0             | 1.3       |
|                |                    |         |                 |                   | 50            | 4.8             |           |
| Ø32            | 4.4                | 8.0     | 104             | 49.5              |               | 3.6             | 1.8       |
|                |                    |         |                 |                   | 64            | 6.6             |           |
| Ø40            | 3.1                | 8.0     | 148             | 65.5              |               | 3.7             | 1.8       |
|                |                    |         |                 |                   | 80            | 5.8             |           |
| Ø50            | 2.3                | 8.0     | 195             | 85.5              |               | 3.9             | 1.8       |
|                |                    |         |                 |                   | 100           | 5.5             |           |
| Ø63            | 1.8                | 8.0     | 255             | 111.5             |               | 4.1             | 1.8       |
|                |                    |         |                 |                   | 126           | 5.3             |           |
| Ø80            | 1.3                | 8.0     | 340             | 145.5             |               | 4.1             | 1.8       |
|                |                    |         |                 |                   | 160           | 5.0             |           |



## 4NHT 09: R0.4

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø20            | 2.9                | 8.0     | 155             | 25.5              | 40            | 0.8             | 0.8       |
|                |                    |         |                 |                   |               | 2.7             |           |
| Ø25            | 4.3                | 8.0     | 106             | 35.5              | 50            | 2.1             | 1.3       |
|                |                    |         |                 |                   |               | 5.0             |           |
| Ø32            | 4.5                | 8.0     | 102             | 49.5              | 64            | 3.7             | 1.8       |
|                |                    |         |                 |                   |               | 6.7             |           |
| Ø40            | 3.2                | 8.0     | 143             | 65.5              | 80            | 3.8             | 1.8       |
|                |                    |         |                 |                   |               | 6.0             |           |
| Ø50            | 2.4                | 8.0     | 191             | 85.5              | 100           | 4.0             | 1.8       |
|                |                    |         |                 |                   |               | 5.6             |           |
| Ø63            | 1.8                | 8.0     | 255             | 111.5             | 126           | 4.1             | 1.8       |
|                |                    |         |                 |                   |               | 5.3             |           |
| Ø80            | 1.3                | 8.0     | 340             | 145.5             | 160           | 4.1             | 1.8       |
|                |                    |         |                 |                   |               | 5.0             |           |

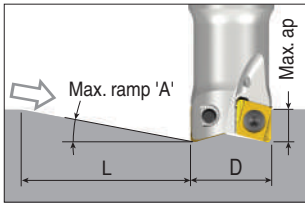
## 4NHT 09: R0.8

(unit: mm)

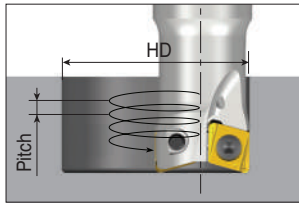
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø20            | 2.9                | 8.0     | 155             | 25.5              | 40            | 0.8             | 0.8       |
|                |                    |         |                 |                   |               | 2.7             |           |
| Ø25            | 4.3                | 8.0     | 106             | 35.5              | 50            | 2.1             | 1.3       |
|                |                    |         |                 |                   |               | 5.0             |           |
| Ø32            | 4.5                | 8.0     | 102             | 49.5              | 64            | 3.7             | 1.8       |
|                |                    |         |                 |                   |               | 6.7             |           |
| Ø40            | 3.2                | 8.0     | 143             | 65.5              | 80            | 3.8             | 1.8       |
|                |                    |         |                 |                   |               | 6.0             |           |
| Ø50            | 2.4                | 8.0     | 191             | 85.5              | 100           | 4.0             | 1.8       |
|                |                    |         |                 |                   |               | 5.6             |           |
| Ø63            | 1.8                | 8.0     | 255             | 111.5             | 126           | 4.1             | 1.8       |
|                |                    |         |                 |                   |               | 5.3             |           |
| Ø80            | 1.3                | 8.0     | 340             | 145.5             | 160           | 4.1             | 1.8       |
|                |                    |         |                 |                   |               | 5.0             |           |

# Ramping Data

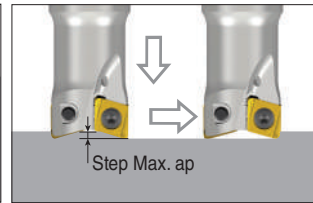
Straight ramping



Helical ramping



Step down



## 4NKT 11: R0.8

(unit: mm)

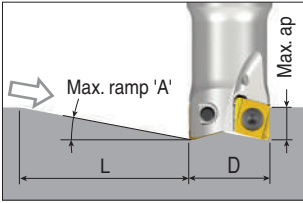
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø25            | 5.1                | 10.3    | 115             | 31.5              | 1.5           |                 | 1.7       |
|                |                    |         |                 |                   | 50            | 6.0             |           |
| Ø32            | 5.3                | 10.3    | 111             | 45.5              | 3.3           |                 | 2.4       |
|                |                    |         |                 |                   | 64            | 7.9             |           |
| Ø40            | 5.0                | 10.3    | 118             | 61.5              | 5.0           |                 | 2.7       |
|                |                    |         |                 |                   | 80            | 9.3             |           |
| Ø50            | 3.7                | 10.3    | 159             | 81.5              | 5.4           |                 | 2.7       |
|                |                    |         |                 |                   | 100           | 8.6             |           |
| Ø63            | 2.7                | 10.3    | 219             | 107.5             | 5.6           |                 | 2.7       |
|                |                    |         |                 |                   | 126           | 7.9             |           |
| Ø80            | 2.0                | 10.3    | 288             | 141.5             | 5.9           |                 | 2.7       |
|                |                    |         |                 |                   | 160           | 7.6             |           |

## 4NKT 14: R0.8

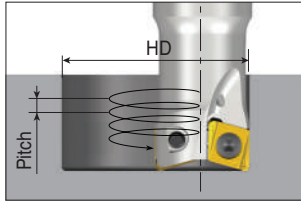
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø32            | 5.2                | 13.5    | 148             | 39.5              | 1.8           |                 | 2.3       |
|                |                    |         |                 |                   | 64            | 7.8             |           |
| Ø40            | 5.2                | 13.5    | 148             | 55.5              | 3.8           |                 | 3.0       |
|                |                    |         |                 |                   | 80            | 9.7             |           |
| Ø50            | 5.5                | 13.5    | 140             | 75.5              | 6.6           |                 | 3.3       |
|                |                    |         |                 |                   | 100           | 12.8            |           |
| Ø63            | 4.0                | 13.5    | 193             | 101.5             | 7.2           |                 | 3.3       |
|                |                    |         |                 |                   | 126           | 11.8            |           |
| Ø80            | 2.9                | 13.5    | 267             | 135.5             | 7.5           |                 | 3.3       |
|                |                    |         |                 |                   | 160           | 10.8            |           |
|                |                    |         |                 |                   |               |                 |           |
|                |                    |         |                 |                   |               |                 |           |
|                |                    |         |                 |                   |               |                 |           |

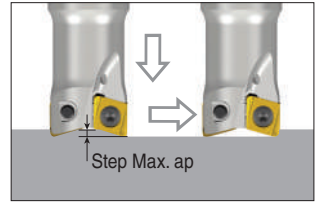
Straight ramping



Helical ramping



Step down



## 4NKT 11 PNR: R0.8

(unit: mm)

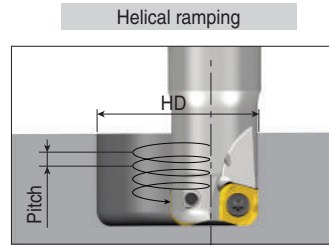
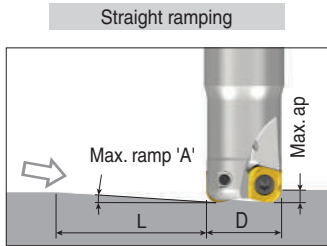
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø25            | 4.0                | 10.3    | 147             | 31.5              | 50            | 1.2             | 1.1       |
|                |                    |         |                 |                   |               | 4.7             |           |
| Ø32            | 4.3                | 10.3    | 135             | 45.5              | 64            | 2.7             | 1.0       |
|                |                    |         |                 |                   |               | 6.5             |           |
| Ø40            | 4.5                | 10.3    | 131             | 61.5              | 80            | 4.5             | 0.9       |
|                |                    |         |                 |                   |               | 8.4             |           |
| Ø50            | 3.2                | 10.3    | 184             | 81.5              | 100           | 4.7             | 0.9       |
|                |                    |         |                 |                   |               | 7.5             |           |
| Ø63            | 2.4                | 10.3    | 246             | 107.5             | 126           | 5.0             | 0.9       |
|                |                    |         |                 |                   |               | 7.0             |           |
| Ø80            | 1.8                | 10.3    | 328             | 141.5             | 160           | 5.2             | 0.9       |
|                |                    |         |                 |                   |               | 6.7             |           |

## 4NKT 14 PNR: R0.8

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø32            | 4.1                | 13.5    | 188             | 39.5              | 64            | 1.4             | 1.1       |
|                |                    |         |                 |                   |               | 6.1             |           |
| Ø40            | 4.3                | 13.5    | 180             | 55.5              | 80            | 3.1             | 0.9       |
|                |                    |         |                 |                   |               | 8.0             |           |
| Ø50            | 4.7                | 13.5    | 163             | 75.5              | 100           | 5.7             | 0.9       |
|                |                    |         |                 |                   |               | 11.1            |           |
| Ø63            | 3.5                | 13.5    | 221             | 101.5             | 126           | 6.3             | 0.9       |
|                |                    |         |                 |                   |               | 10.3            |           |
| Ø80            | 2.6                | 13.5    | 297             | 135.5             | 160           | 6.7             | 0.9       |
|                |                    |         |                 |                   |               | 9.7             |           |

# Ramping Data



## 4NKT 04-HF: R1.2

(unit: mm)

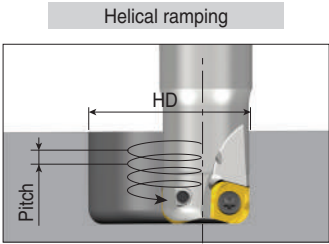
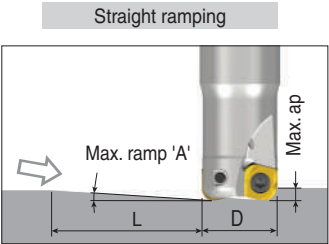
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø8             | 0.1                | 0.5     | 191             | 9.9               |               | 0.0             |
|                |                    |         |                 |                   | 16            | 0.1             |
| Ø10            | 0.8                | 0.5     | 34              | 13.9              |               | 0.2             |
|                |                    |         |                 |                   | 20            | 0.4             |
| Ø11            | 1.6                | 0.5     | 18              | 15.9              |               | 0.4             |
|                |                    |         |                 |                   | 22            | 0.5             |
| Ø12            | 1.6                | 0.5     | 18              | 17.9              |               | 0.4             |
|                |                    |         |                 |                   | 24            | 0.5             |
| Ø13            | 2.0                | 0.5     | 14              | 19.9              |               | 0.5             |
|                |                    |         |                 |                   | 26            | 0.5             |
| Ø16            | 1.9                | 0.5     | 15              | 25.9              |               | 0.5             |
|                |                    |         |                 |                   | 32            | 0.5             |
| Ø20            | 2.3                | 0.5     | 12              | 33.9              |               | 0.5             |
|                |                    |         |                 |                   | 40            | 0.5             |
| Ø25            | 1.7                | 0.5     | 16              | 43.9              |               | 0.5             |
|                |                    |         |                 |                   | 50            | 0.5             |
| Ø32            | 1.3                | 0.5     | 22              | 57.9              |               | 0.5             |
|                |                    |         |                 |                   | 64            | 0.5             |
| Ø40            | 1.0                | 0.5     | 29              | 73.9              |               | 0.5             |
|                |                    |         |                 |                   | 80            | 0.5             |

## 4NKT 06-HF: R2.0

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø16            | 0.6                | 1.0     | 88              | 21.4              |               | 0.2             |
|                |                    |         |                 |                   | 32            | 0.5             |
| Ø17            | 0.7                | 1.0     | 76              | 23.4              |               | 0.2             |
|                |                    |         |                 |                   | 34            | 0.6             |
| Ø18            | 1.1                | 1.0     | 50              | 25.4              |               | 0.4             |
|                |                    |         |                 |                   | 36            | 1.0             |
| Ø20            | 1.7                | 1.0     | 34              | 29.4              |               | 0.7             |
|                |                    |         |                 |                   | 40            | 1.0             |
| Ø21            | 1.9                | 1.0     | 29              | 31.4              |               | 0.9             |
|                |                    |         |                 |                   | 42            | 1.0             |
| Ø25            | 2.3                | 1.0     | 24              | 39.4              |               | 1.0             |
|                |                    |         |                 |                   | 50            | 1.0             |
| Ø26            | 3.2                | 1.0     | 18              | 41.4              |               | 1.0             |
|                |                    |         |                 |                   | 52            | 1.0             |
| Ø32            | 2.4                | 1.0     | 24              | 53.4              |               | 1.0             |
|                |                    |         |                 |                   | 64            | 1.0             |
| Ø40            | 1.8                | 1.0     | 32              | 69.4              |               | 1.0             |
|                |                    |         |                 |                   | 80            | 1.0             |
| Ø50            | 1.4                | 1.0     | 41              | 89.4              |               | 1.0             |
|                |                    |         |                 |                   | 100           | 1.0             |
| Ø63            | 1.1                | 1.0     | 52              | 115.4             |               | 1.0             |
|                |                    |         |                 |                   | 126           | 1.0             |





## 4NKT 09-HF: R3.2

(unit: mm)

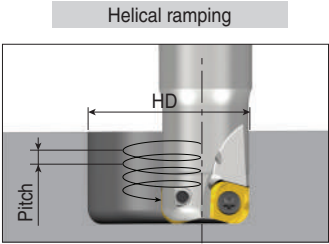
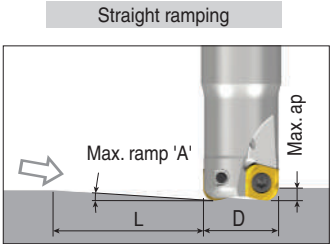
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø20            | 0.3                | 1.5     | 287             | 25                |               | 0.1             |
|                |                    |         |                 |                   | 40            | 0.3             |
| Ø25            | 1.2                | 1.5     | 69              | 35                |               | 0.6             |
|                |                    |         |                 |                   | 50            | 1.5             |
| Ø32            | 2.4                | 1.5     | 35              | 49                |               | 1.5             |
|                |                    |         |                 |                   | 64            | 1.5             |
| Ø40            | 2.3                | 1.5     | 37              | 65                |               | 1.5             |
|                |                    |         |                 |                   | 80            | 1.5             |
| Ø50            | 1.7                | 1.5     | 49              | 85                |               | 1.5             |
|                |                    |         |                 |                   | 100           | 1.5             |
| Ø63            | 1.3                | 1.5     | 66              | 111               |               | 1.5             |
|                |                    |         |                 |                   | 126           | 1.5             |
| Ø80            | 1.0                | 1.5     | 86              | 145               |               | 1.5             |
|                |                    |         |                 |                   | 160           | 1.5             |

## 4NKT 11-HF: R4.0

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø25            | 0.8                | 2.0     | 143             | 31                |               | 0.2             |
|                |                    |         |                 |                   | 50            | 0.9             |
| Ø32            | 2.0                | 2.0     | 57              | 45                |               | 1.2             |
|                |                    |         |                 |                   | 64            | 2.0             |
| Ø40            | 3.4                | 2.0     | 34              | 61                |               | 2.0             |
|                |                    |         |                 |                   | 80            | 2.0             |
| Ø50            | 2.4                | 2.0     | 48              | 81                |               | 2.0             |
|                |                    |         |                 |                   | 100           | 2.0             |
| Ø63            | 1.8                | 2.0     | 64              | 107               |               | 2.0             |
|                |                    |         |                 |                   | 126           | 2.0             |
| Ø80            | 1.3                | 2.0     | 85              | 141               |               | 2.0             |
|                |                    |         |                 |                   | 160           | 2.0             |

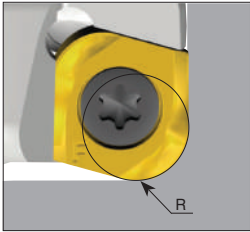
# Ramping Data



**4NKT 14-HF: R5.0** (unit: mm)

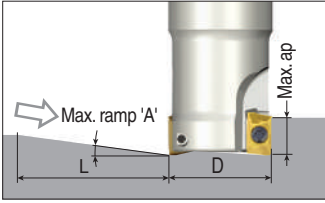
| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. |
| Ø32             | 1.0                | 3.0     | 172             | 39                | 64             | 0.3             |
| Ø40             | 1.8                | 3.0     | 96              | 55                | 80             | 1.5             |
|                 |                    |         |                 |                   |                | 1.3             |
| Ø50             | 3.9                | 3.0     | 44              | 75                | 100            | 3.0             |
|                 |                    |         |                 |                   |                | 3.0             |
| Ø63             | 2.7                | 3.0     | 64              | 101               | 126            | 3.0             |
|                 |                    |         |                 |                   |                | 3.0             |
| Ø80             | 1.9                | 3.0     | 88              | 135               | 160            | 3.0             |
|                 |                    |         |                 |                   |                | 3.0             |

## Programming technical data

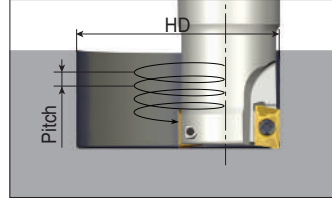


|                 | R<br>Program | A<br>Over cut | B<br>Un-machined |
|-----------------|--------------|---------------|------------------|
| 4NKT 040212R-HF | 1.2          | 0             | 0                |
| 4NKT 060320R-HF | 2.0          | 0             | 0                |
| 4NKT 090432R-HF | 3.2          | 0             | 0                |
| 4NKT 110640R-HF | 4.0          | 0             | 0                |
| 4NKT 140750R-HF | 5.0          | 0             | 0                |

Straight ramping



Helical ramping



## AXMT 06

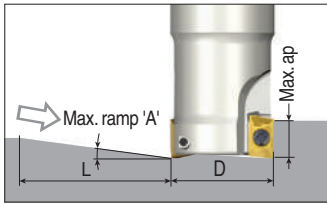
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø8             | 1.0                | 5.0     | 287             | 9                 |               | 0.0             |
|                |                    |         |                 |                   | 16            | 0.4             |
| Ø10            | 8.0                | 5.0     | 36              | 13                |               | 1.1             |
|                |                    |         |                 |                   | 20            | 3.7             |
| Ø11            | 6.0                | 5.0     | 48              | 15                |               | 1.1             |
|                |                    |         |                 |                   | 22            | 3.1             |
| Ø12            | 6.0                | 5.0     | 48              | 17                |               | 1.4             |
|                |                    |         |                 |                   | 24            | 3.4             |
| Ø13            | 5.5                | 5.0     | 52              | 19                |               | 1.5             |
|                |                    |         |                 |                   | 26            | 3.3             |
| Ø14            | 4.8                | 5.0     | 60              | 21                |               | 1.6             |
|                |                    |         |                 |                   | 28            | 3.1             |
| Ø15            | 4.3                | 5.0     | 67              | 23                |               | 1.6             |
|                |                    |         |                 |                   | 30            | 3.0             |
| Ø16            | 4.0                | 5.0     | 72              | 25                |               | 1.7             |
|                |                    |         |                 |                   | 32            | 3.0             |
| Ø17            | 3.5                | 5.0     | 82              | 27                |               | 1.6             |
|                |                    |         |                 |                   | 34            | 2.8             |
| Ø18            | 5.0                | 5.0     | 57              | 29                |               | 2.6             |
|                |                    |         |                 |                   | 36            | 4.2             |
| Ø19            | 4.8                | 5.0     | 60              | 31                |               | 2.7             |
|                |                    |         |                 |                   | 38            | 4.3             |
| Ø20            | 4.0                | 5.0     | 72              | 33                |               | 2.4             |
|                |                    |         |                 |                   | 40            | 3.7             |
| Ø21            | 3.5                | 5.0     | 82              | 35                |               | 2.3             |
|                |                    |         |                 |                   | 42            | 3.4             |
| Ø25            | 3.0                | 5.0     | 95              | 43                |               | 2.5             |
|                |                    |         |                 |                   | 50            | 3.5             |
| Ø32            | 2.0                | 5.0     | 143             | 57                |               | 2.3             |
|                |                    |         |                 |                   | 64            | 3.0             |
| Ø40            | 1.5                | 5.0     | 191             | 73                |               | 2.3             |
|                |                    |         |                 |                   | 80            | 2.8             |
|                |                    |         |                 |                   |               |                 |
|                |                    |         |                 |                   |               |                 |
|                |                    |         |                 |                   |               |                 |

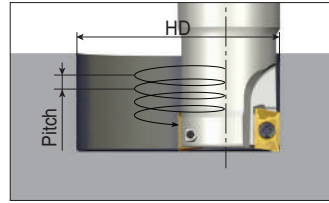
# Ramping Data



Straight ramping



Helical ramping

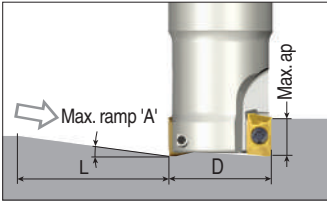


## APKT 09

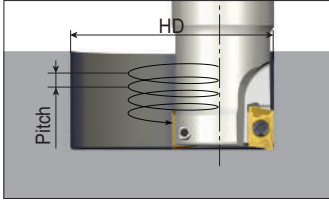
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø10            | 7.5                | 9.0     | 68              | 14                | 20            | 1.4             |
| Ø12            | 7.3                | 9.0     | 70              | 16                | 24            | 1.4             |
| Ø14            | 6.0                | 9.0     | 86              | 18                | 28            | 1.1             |
| Ø16            | 4.9                | 9.0     | 105             | 21.08             | 32            | 1.2             |
| Ø17            | 4.4                | 9.0     | 117             | 23.08             | 34            | 1.2             |
| Ø18            | 4.0                | 9.0     | 129             | 25.08             | 36            | 1.3             |
| Ø20            | 3.4                | 9.0     | 152             | 29.08             | 40            | 1.4             |
| Ø21            | 3.1                | 9.0     | 166             | 31.08             | 42            | 1.5             |
| Ø22            | 2.8                | 9.0     | 184             | 33.08             | 44            | 1.4             |
| Ø25            | 1.8                | 9.0     | 287             | 39.08             | 50            | 1.2             |
| Ø26            | 2.0                | 9.0     | 258             | 41.08             | 52            | 1.4             |
| Ø30            | 2.2                | 9.0     | 234             | 49.08             | 60            | 2.0             |
| Ø32            | 2.0                | 9.0     | 258             | 53.08             | 64            | 2.0             |
| Ø33            | 1.7                | 9.0     | 303             | 55.08             | 66            | 1.7             |
| Ø40            | 1.5                | 9.0     | 344             | 69.08             | 80            | 2.0             |
| Ø50            | 1.1                | 9.0     | 469             | 89.08             | 100           | 2.0             |
| Ø63            | 0.8                | 9.0     | 645             | 115.08            | 126           | 1.9             |
| Ø80            | 0.5                | 9.0     | 1032            | 149.08            | 160           | 1.6             |

Straight ramping



Helical ramping



## APKT 12

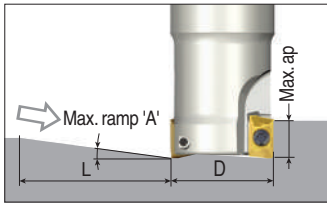
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø16            | 12.5               | 12.0    | 54              | 17.5              |               | 0.5             |
|                |                    |         |                 |                   | 32            | 9.5             |
| Ø18            | 9.7                | 12.0    | 70              | 20.9              |               | 1.3             |
|                |                    |         |                 |                   | 36            | 8.2             |
| Ø20            | 6.8                | 12.0    | 101             | 24.9              |               | 1.6             |
|                |                    |         |                 |                   | 40            | 6.4             |
| Ø21            | 6.2                | 12.0    | 111             | 26.9              |               | 1.7             |
|                |                    |         |                 |                   | 42            | 6.1             |
| Ø25            | 8.0                | 12.0    | 85              | 34.9              |               | 3.7             |
|                |                    |         |                 |                   | 50            | 9.4             |
| Ø26            | 7.5                | 12.0    | 91              | 36.9              |               | 3.8             |
|                |                    |         |                 |                   | 52            | 9.1             |
| Ø32            | 5.0                | 12.0    | 137             | 48.9              |               | 3.9             |
|                |                    |         |                 |                   | 64            | 7.5             |
| Ø33            | 4.6                | 12.0    | 149             | 50.9              |               | 3.8             |
|                |                    |         |                 |                   | 66            | 7.1             |
| Ø40            | 3.5                | 12.0    | 196             | 64.9              |               | 4.1             |
|                |                    |         |                 |                   | 80            | 6.5             |
| Ø50            | 2.5                | 12.0    | 275             | 84.9              |               | 4.8             |
|                |                    |         |                 |                   | 100           | 5.8             |
| Ø63            | 1.7                | 12.0    | 405             | 110.9             |               | 4.5             |
|                |                    |         |                 |                   | 126           | 5.0             |
| Ø80            | 1.3                | 12.0    | 529             | 144.9             |               | 4.6             |
|                |                    |         |                 |                   | 160           | 4.8             |

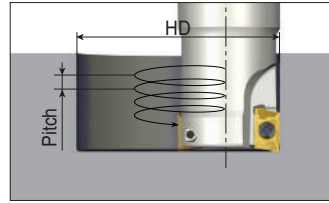
# Ramping Data



Straight ramping



Helical ramping



## APKT 17

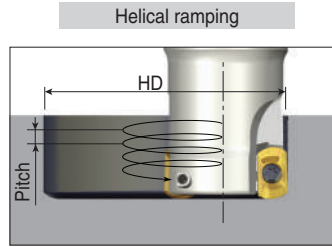
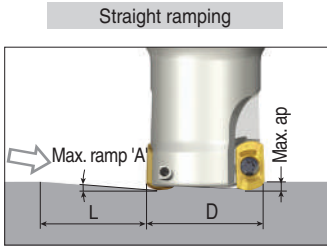
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø20            | 8.0                | 16.1    | 115             | 22                | 40            | 0.7             |
|                |                    |         |                 | 30.6              | 50            | 7.5             |
| Ø25            | 5.0                | 16.1    | 184             | 32.6              | 52            | 1.3             |
|                |                    |         |                 | 44.6              | 64            | 5.8             |
| Ø26            | 4.0                | 16.1    | 230             | 46.6              | 66            | 1.2             |
|                |                    |         |                 | 60.6              | 80            | 4.9             |
| Ø32            | 9.0                | 16.1    | 102             | 80.6              | 100           | 5.3             |
|                |                    |         |                 | 106.6             | 126           | 13.5            |
| Ø33            | 9.0                | 16.1    | 102             | 140.6             | 160           | 5.7             |
|                |                    |         |                 | 180.6             | 200           | 13.9            |
| Ø40            | 5.0                | 16.1    | 184             | 230.6             | 250           | 4.8             |
|                |                    |         |                 | 300.6             | 320           | 9.3             |
| Ø50            | 4.4                | 16.1    | 209             | 380.6             | 400           | 6.3             |
|                |                    |         |                 |                   |               | 10.3            |
| Ø63            | 3.2                | 16.1    | 288             |                   |               | 6.5             |
|                |                    |         |                 |                   |               | 9.4             |
| Ø80            | 2.3                | 16.1    | 401             |                   |               | 6.5             |
|                |                    |         |                 |                   |               | 8.6             |
| Ø100           | 1.8                | 16.1    | 513             |                   |               | 6.8             |
|                |                    |         |                 |                   |               | 8.4             |
| Ø125           | 1.4                | 16.1    | 659             |                   |               | 6.9             |
|                |                    |         |                 |                   |               | 8.1             |
| Ø160           | 1.0                | 16.1    | 923             |                   |               | 6.5             |
|                |                    |         |                 |                   |               | 7.5             |
| Ø200           | 0.7                | 16.1    | 1318            |                   |               | 5.9             |
|                |                    |         |                 |                   |               | 6.5             |

## APKT 19

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø40            | 6.0                | 17.5    | 167             | 56                | 80            | 4.5             |
|                |                    |         |                 | 76                | 100           | 11.2            |
| Ø50            | 4.0                | 17.5    | 250             | 102               | 126           | 4.9             |
|                |                    |         |                 | 136               | 160           | 9.3             |
| Ø63            | 2.9                | 17.5    | 346             | 176               | 200           | 5.3             |
|                |                    |         |                 | 226               | 250           | 8.5             |
| Ø80            | 2.1                | 17.5    | 477             | 296               | 320           | 5.5             |
|                |                    |         |                 | 376               | 400           | 7.8             |
| Ø100           | 1.6                | 17.5    | 627             |                   |               | 5.7             |
|                |                    |         |                 |                   |               | 7.5             |
| Ø125           | 1.2                | 17.5    | 736             |                   |               | 5.6             |
|                |                    |         |                 |                   |               | 7.0             |
| Ø160           | 0.9                | 17.5    | 1115            |                   |               | 5.7             |
|                |                    |         |                 |                   |               | 6.7             |
| Ø200           | 0.7                | 17.5    | 1433            |                   |               | 5.7             |
|                |                    |         |                 |                   |               | 6.5             |

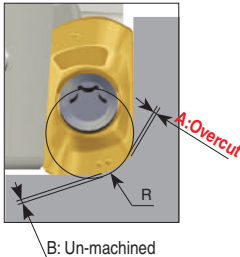


## AXMT 0602R-HF

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø8             | 0.3                | 0.5     | 96              | 14                | 16            | 0.1             |
|                |                    |         |                 | 14                | 20            | 0.1             |
| Ø10            | 0.5                | 0.5     | 57              | 18                | 22            | 0.2             |
|                |                    |         |                 | 18                | 24            | 0.3             |
| Ø11            | 1.0                | 0.5     | 29              | 18                | 26            | 0.5             |
|                |                    |         |                 | 18                | 28            | 0.5             |
| Ø12            | 2.3                | 0.5     | 12              | 18                | 30            | 0.5             |
|                |                    |         |                 | 18                | 32            | 0.5             |
| Ø13            | 4.5                | 0.5     | 6               | 26                | 34            | 0.5             |
|                |                    |         |                 | 26                | 36            | 0.5             |
| Ø14            | 3.5                | 0.5     | 8               | 26                | 38            | 0.5             |
|                |                    |         |                 | 26                | 40            | 0.5             |
| Ø15            | 3.0                | 0.5     | 10              | 34                | 42            | 0.5             |
|                |                    |         |                 | 34                | 44            | 0.5             |
| Ø16            | 2.8                | 0.5     | 10              | 44                | 50            | 0.5             |
|                |                    |         |                 | 44                | 58            | 0.5             |
| Ø17            | 2.5                | 0.5     | 11              | 58                | 64            | 0.5             |
|                |                    |         |                 | 58                | 74            | 0.5             |
| Ø18            | 2.3                | 0.5     | 12              | 74                | 80            | 0.5             |
|                |                    |         |                 | 74                |               | 0.5             |
| Ø19            | 2.2                | 0.5     | 13              |                   |               | 0.5             |
|                |                    |         |                 |                   |               | 0.5             |
| Ø20            | 1.9                | 0.5     | 15              |                   |               | 0.5             |
|                |                    |         |                 |                   |               | 0.5             |
| Ø21            | 1.7                | 0.5     | 17              |                   |               | 0.5             |
|                |                    |         |                 |                   |               | 0.5             |
| Ø25            | 1.4                | 0.5     | 20              |                   |               | 0.5             |
|                |                    |         |                 |                   |               | 0.5             |
| Ø32            | 1.0                | 0.5     | 29              |                   |               | 0.5             |
|                |                    |         |                 |                   |               | 0.5             |
| Ø40            | 0.7                | 0.5     | 41              |                   |               | 0.5             |
|                |                    |         |                 |                   |               | 0.5             |

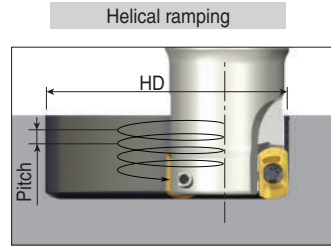
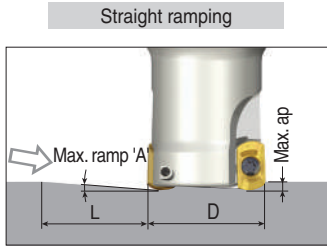
## Programming technical data



|               | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------------|--------------|---------------|------------------|
| AXMT 0602R-HF | 0.9          | 0             | 0.22             |
|               | 1.0          | 0.01          | 0.19             |
|               | 1.5          | 0.16          | 0.05             |
|               | 2.0          | 0.35          | 0                |
| APKT 09T3R-HF | 1.5          | 0             | 0.47             |
|               | 1.7          | 0             | 0.29             |
|               | 2.0          | 0.04          | 0.3              |
|               | 2.5          | 0.18          | 0.15             |
| APKT 1204R-HF | 3.0          | 0.36          | 0.04             |
|               | 2            | 0             | 0.57             |
|               | 2.5          | 0.07          | 0.42             |
|               | 3            | 0.21          | 0.28             |
|               | 3.5          | 0.39          | 0.15             |
|               | 4            | 0.58          | 0.06             |

Yellow background: Recommended program 'R'

# Ramping Data



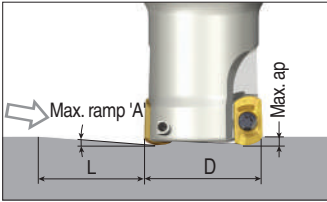
## APKT 09T3R-HF

(unit: mm)

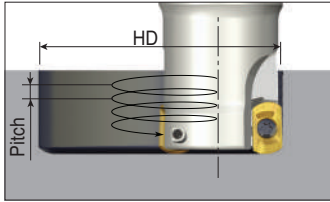
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø16            | 3.8                | 1.0     | 15              | 22                | 32            | 1.0             |
|                |                    |         |                 | 24                | 34            | 1.0             |
| Ø17            | 3.5                | 1.0     | 16              | 26                | 36            | 1.0             |
|                |                    |         |                 | 30                | 40            | 1.0             |
| Ø18            | 3.4                | 1.0     | 17              | 32                | 42            | 1.0             |
|                |                    |         |                 | 34                | 44            | 1.0             |
| Ø20            | 3.0                | 1.0     | 19              | 40                | 50            | 1.0             |
|                |                    |         |                 | 42                | 52            | 1.0             |
| Ø21            | 2.3                | 1.0     | 25              | 50                | 60            | 1.0             |
|                |                    |         |                 | 54                | 64            | 1.0             |
| Ø22            | 2.0                | 1.0     | 29              | 56                | 66            | 1.0             |
|                |                    |         |                 | 70                | 80            | 1.0             |
| Ø25            | 2.1                | 1.0     | 27              | 90                | 100           | 1.0             |
|                |                    |         |                 | 116               | 126           | 1.0             |
| Ø26            | 2.0                | 1.0     | 29              | 150               | 160           | 1.0             |
|                |                    |         |                 |                   |               |                 |
| Ø30            | 1.8                | 1.0     | 32              |                   |               |                 |
|                |                    |         |                 |                   |               |                 |
| Ø32            | 1.6                | 1.0     | 36              |                   |               |                 |
|                |                    |         |                 |                   |               |                 |
| Ø33            | 1.5                | 1.0     | 38              |                   |               |                 |
|                |                    |         |                 |                   |               |                 |
| Ø40            | 1.2                | 1.0     | 48              |                   |               |                 |
|                |                    |         |                 |                   |               |                 |
| Ø50            | 0.9                | 1.0     | 64              |                   |               |                 |
|                |                    |         |                 |                   |               |                 |
| Ø63            | 0.5                | 1.0     | 115             |                   |               |                 |
|                |                    |         |                 |                   |               |                 |
| Ø80            | 0.4                | 1.0     | 143             |                   |               |                 |
|                |                    |         |                 |                   |               |                 |



Straight ramping



Helical ramping

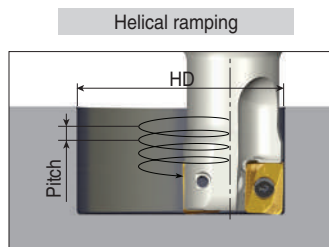
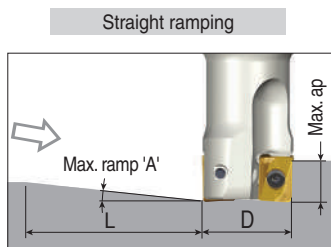


## APKT 1204R-HF

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø16            | 3.8                | 1.2     | 18              | 21                | 32            | 0.8             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø18            | 4.0                | 1.2     | 17              | 24                | 36            | 1.1             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø20            | 4.0                | 1.2     | 17              | 27                | 40            | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø21            | 3.5                | 1.2     | 20              | 29                | 42            | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø25            | 2.5                | 1.2     | 27              | 37                | 50            | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø26            | 2.3                | 1.2     | 30              | 39                | 52            | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø32            | 1.7                | 1.2     | 40              | 51                | 64            | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø33            | 1.7                | 1.2     | 40              | 53                | 66            | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø40            | 1.5                | 1.2     | 46              | 67                | 80            | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø50            | 1.1                | 1.2     | 63              | 86                | 100           | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø63            | 1.0                | 1.2     | 69              | 112               | 126           | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |
| Ø80            | 0.8                | 1.2     | 86              | 146               | 160           | 1.2             |
|                |                    |         |                 |                   |               | 1.2             |

# Ramping Data



## ANH(M)X 11

(unit: mm)

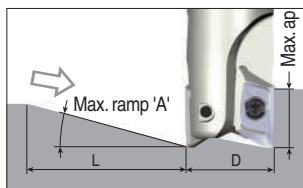
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø25            | 1.5                | 11.0    | 420             | 30                |               | 0.3             |
|                |                    |         |                 |                   | 50            | 1.7             |
| Ø26            | 1.4                | 11.0    | 450             | 32                |               | 0.4             |
|                |                    |         |                 |                   | 52            | 1.7             |
| Ø32            | 1.1                | 11.0    | 573             | 44                |               | 0.6             |
|                |                    |         |                 |                   | 64            | 1.6             |
| Ø33            | 1.0                | 11.0    | 631             | 46                |               | 0.6             |
|                |                    |         |                 |                   | 66            | 1.5             |
| Ø40            | 0.8                | 11.0    | 788             | 60                |               | 0.7             |
|                |                    |         |                 |                   | 80            | 1.5             |
| Ø50            | 0.6                | 11.0    | 1051            | 80                |               | 0.8             |
|                |                    |         |                 |                   | 100           | 1.4             |
| Ø63            | 0.4                | 11.0    | 1576            | 106               |               | 0.8             |
|                |                    |         |                 |                   | 126           | 1.2             |
| Ø80            | 0.3                | 11.0    | 2102            | 140               |               | 0.8             |
|                |                    |         |                 |                   | 160           | 1.1             |
| Ø100           | 0.2                | 11.0    | 3153            | 180               |               | 0.7             |
|                |                    |         |                 |                   | 200           | 0.9             |
| Ø125           | 0.2                | 11.0    | 3153            | 230               |               | 1.0             |
|                |                    |         |                 |                   | 250           | 1.2             |

## ANH(M)X 16

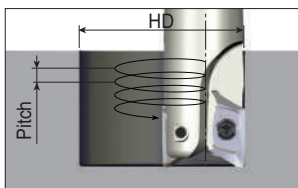
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø32            | 1.2                | 15.0    | 716             | 44                |               | 0.7             |
|                |                    |         |                 |                   | 64            | 1.8             |
| Ø33            | 1.0                | 15.0    | 560             | 46                |               | 0.6             |
|                |                    |         |                 |                   | 66            | 1.5             |
| Ø40            | 0.9                | 15.0    | 955             | 60                |               | 0.8             |
|                |                    |         |                 |                   | 80            | 1.7             |
| Ø50            | 0.8                | 15.0    | 1075            | 80                |               | 1.1             |
|                |                    |         |                 |                   | 100           | 1.9             |
| Ø63            | 0.6                | 15.0    | 1433            | 106               |               | 1.2             |
|                |                    |         |                 |                   | 126           | 1.8             |
| Ø80            | 0.45               | 15.0    | 1911            | 140               |               | 1.3             |
|                |                    |         |                 |                   | 160           | 1.7             |
| Ø100           | 0.35               | 15.0    | 2457            | 180               |               | 1.3             |
|                |                    |         |                 |                   | 200           | 1.6             |
| Ø125           | 0.25               | 15.0    | 3439            | 230               |               | 1.2             |
|                |                    |         |                 |                   | 250           | 1.5             |
| Ø160           | 0.15               | 15.0    | 5732            | 300               |               | 1.0             |
|                |                    |         |                 |                   | 320           | 1.1             |
| Ø200           | 0.1                | 15.0    | 8599            | 380               |               | 0.8             |
|                |                    |         |                 |                   | 400           | 0.9             |

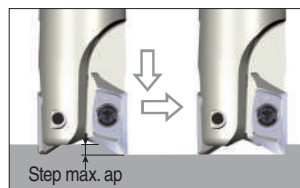
Straight ramping



Helical ramping



Step down



## XEVT 16: 0.4R-1.6R

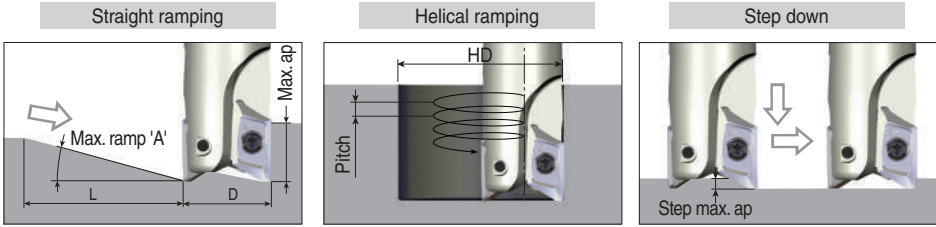
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø25            | 20.5               | 16      | 43              | 29.1              |               | 4.1             | 4         |
|                |                    |         |                 |                   | 50            | 13.6            | 4         |
| Ø32            | 17.5               | 16      | 51              | 43.1              |               | 9.3             | 4         |
|                |                    |         |                 |                   | 64            | 13.6            | 4         |
| Ø40            | 11.0               | 16      | 82              | 59.1              |               | 9.9             | 4         |
|                |                    |         |                 |                   | 80            | 13.6            | 4         |
| Ø50            | 8.5                | 16      | 107             | 79.1              |               | 11.6            | 4         |
|                |                    |         |                 |                   | 100           | 13.6            | 4         |
| Ø63            | 5.5                | 16      | 166             | 105.1             |               | 10.8            | 4         |
|                |                    |         |                 |                   | 126           | 13.6            | 4         |
| Ø80            | 4.3                | 16      | 213             | 139.1             |               | 11.9            | 4         |
|                |                    |         |                 |                   | 160           | 13.6            | 4         |
| Ø100           | 3.3                | 16      | 278             | 179.1             |               | 12.2            | 4         |
|                |                    |         |                 |                   | 200           | 13.6            | 4         |
| Ø125           | 2.5                | 16      | 367             | 229.1             |               | 12.1            | 4         |
|                |                    |         |                 |                   | 250           | 13.6            | 4         |
| Ø160           | 1.9                | 16      | 483             | 299.1             |               | 12.3            | 4         |
|                |                    |         |                 |                   | 320           | 13.6            | 4         |
| Ø200           | 1.5                | 16      | 611             | 379.1             |               | 12.5            | 4         |
|                |                    |         |                 |                   | 400           | 13.6            | 4         |

## XEVT 16: 2.0R-2.4R

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø25            | 19.5               | 15.5    | 44              | 29.1              |               | 3.9             | 3.5       |
|                |                    |         |                 |                   | 50            | 13.2            | 3.5       |
| Ø32            | 16.5               | 15.5    | 52              | 43.1              |               | 8.8             | 3.5       |
|                |                    |         |                 |                   | 64            | 13.2            | 3.5       |
| Ø40            | 10.5               | 15.5    | 84              | 59.1              |               | 9.4             | 3.5       |
|                |                    |         |                 |                   | 80            | 13.2            | 3.5       |
| Ø50            | 8.0                | 15.5    | 110             | 79.1              |               | 10.9            | 3.5       |
|                |                    |         |                 |                   | 100           | 13.2            | 3.5       |
| Ø63            | 5.0                | 15.5    | 177             | 105.1             |               | 9.8             | 3.5       |
|                |                    |         |                 |                   | 126           | 13.2            | 3.5       |
| Ø80            | 3.9                | 15.5    | 227             | 139.1             |               | 10.7            | 3.5       |
|                |                    |         |                 |                   | 160           | 13.2            | 3.5       |
| Ø100           | 3.0                | 15.5    | 296             | 179.1             |               | 11.1            | 3.5       |
|                |                    |         |                 |                   | 200           | 13.2            | 3.5       |
| Ø125           | 2.3                | 15.5    | 386             | 229.1             |               | 11.2            | 3.5       |
|                |                    |         |                 |                   | 250           | 13.2            | 3.5       |
| Ø160           | 1.7                | 15.5    | 523             | 299.1             |               | 11.0            | 3.5       |
|                |                    |         |                 |                   | 320           | 12.7            | 3.5       |
| Ø200           | 1.3                | 15.5    | 683             | 379.1             |               | 10.8            | 3.5       |
|                |                    |         |                 |                   | 400           | 12.1            | 3.5       |



## XEVT 16: 3.0R-3.2R

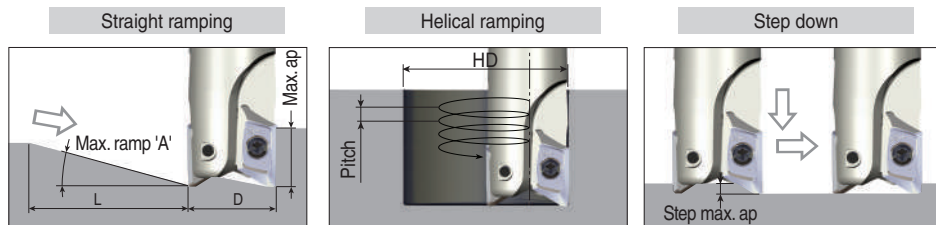
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø25            | 18.5               | 14.5    | 43              | 29.1              | 50            | 3.7             | 2.8       |
|                |                    |         |                 | 43.1              | 64            | 12.3            | 2.8       |
| Ø32            | 16.0               | 14.5    | 51              | 59.1              | 80            | 8.5             | 2.8       |
|                |                    |         |                 | 79.1              | 100           | 12.3            | 2.8       |
| Ø40            | 9.5                | 14.5    | 87              | 105.1             | 126           | 9.5             | 2.8       |
|                |                    |         |                 | 139.1             | 160           | 12.3            | 2.8       |
| Ø50            | 7.0                | 14.5    | 118             | 179.1             | 200           | 10.2            | 2.8       |
|                |                    |         |                 | 229.1             | 250           | 12.3            | 2.8       |
| Ø63            | 5.0                | 14.5    | 166             | 299.1             | 320           | 10.2            | 2.8       |
|                |                    |         |                 | 379.1             | 400           | 12.2            | 2.8       |
| Ø80            | 3.7                | 14.5    | 224             |                   |               | 9.7             | 2.8       |
|                |                    |         |                 |                   |               | 11.2            | 2.8       |
| Ø100           | 2.8                | 14.5    | 297             |                   |               | 10.0            | 2.8       |
|                |                    |         |                 |                   |               | 11.2            | 2.8       |
| Ø125           | 2.1                | 14.5    | 396             |                   |               |                 | 2.8       |
|                |                    |         |                 |                   |               |                 | 2.8       |
| Ø160           | 1.5                | 14.5    | 554             |                   |               |                 | 2.8       |
|                |                    |         |                 |                   |               |                 | 2.8       |
| Ø200           | 1.2                | 14.5    | 693             |                   |               |                 | 2.8       |
|                |                    |         |                 |                   |               |                 | 2.8       |

## XEVT 16: 4.0R-5.0R

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø25            | 17.5               | 14.5    | 46              | 29.1              | 50            | 3.4             | 2.5       |
|                |                    |         |                 | 43.1              | 64            | 12.3            | 2.5       |
| Ø32            | 15.0               | 14.5    | 54              | 59.1              | 80            | 7.9             | 2.5       |
|                |                    |         |                 | 79.1              | 100           | 12.3            | 2.5       |
| Ø40            | 8.5                | 14.5    | 97              | 105.1             | 126           | 7.6             | 2.5       |
|                |                    |         |                 | 139.1             | 160           | 12.3            | 2.5       |
| Ø50            | 6.5                | 14.5    | 127             | 179.1             | 200           | 8.8             | 2.5       |
|                |                    |         |                 | 229.1             | 250           | 12.3            | 2.5       |
| Ø63            | 4.5                | 14.5    | 184             | 299.1             | 320           | 8.8             | 2.5       |
|                |                    |         |                 | 379.1             | 400           | 10.2            | 2.5       |
| Ø80            | 3.3                | 14.5    | 252             |                   |               | 9.1             | 2.5       |
|                |                    |         |                 |                   |               | 12.3            | 2.5       |
| Ø100           | 2.4                | 14.5    | 346             |                   |               | 8.8             | 2.5       |
|                |                    |         |                 |                   |               | 11.2            | 2.5       |
| Ø125           | 1.8                | 14.5    | 462             |                   |               | 8.7             | 2.5       |
|                |                    |         |                 |                   |               | 10.5            | 2.5       |
| Ø160           | 1.4                | 14.5    | 594             |                   |               | 9.1             | 2.5       |
|                |                    |         |                 |                   |               | 10.4            | 2.5       |
| Ø200           | 1.1                | 14.5    | 756             |                   |               | 9.2             | 2.5       |
|                |                    |         |                 |                   |               | 10.2            | 2.5       |



## XEVT 22: 0.5R-0.8R

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø32            | 21.0               | 21.2    | 55              | 38.5              | 64            | 6.7             | 5.5       |
|                |                    |         |                 |                   |               | 18.0            | 5.5       |
| Ø40            | 14.0               | 21.0    | 84              | 54.5              | 80            | 9.6             | 5.5       |
|                |                    |         |                 |                   |               | 17.9            | 5.5       |
| Ø50            | 9.5                | 21.0    | 126             | 74.5              | 100           | 10.9            | 5.5       |
|                |                    |         |                 |                   |               | 17.9            | 5.5       |
| Ø63            | 7.0                | 21.0    | 171             | 100.5             | 126           | 12.3            | 5.5       |
|                |                    |         |                 |                   |               | 17.9            | 5.5       |
| Ø80            | 5.0                | 20.9    | 239             | 134.5             | 160           | 12.7            | 5.5       |
|                |                    |         |                 |                   |               | 17.8            | 5.5       |
| Ø100           | 3.7                | 20.9    | 323             | 174.5             | 200           | 12.9            | 5.5       |
|                |                    |         |                 |                   |               | 17.3            | 5.5       |
| Ø125           | 2.6                | 20.9    | 460             | 224.5             | 250           | 12.1            | 5.5       |
|                |                    |         |                 |                   |               | 15.1            | 5.5       |
| Ø200           | 1.6                | 20.9    | 749             | 374.5             |               | 13.0            | 5.5       |
|                |                    |         |                 |                   | 400           | 14.9            | 5.5       |

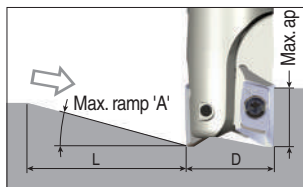
## XEVT 22: 1.6R-2.0R

(unit: mm)

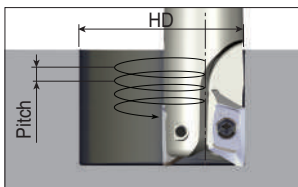
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø32            | 20.5               | 21.0    | 56              | 38.5              | 64            | 6.5             | 5.0       |
|                |                    |         |                 |                   |               | 17.9            | 5.0       |
| Ø40            | 13.5               | 20.9    | 87              | 54.5              | 80            | 9.3             | 5.0       |
|                |                    |         |                 |                   |               | 17.8            | 5.0       |
| Ø50            | 9.5                | 20.9    | 125             | 74.5              | 100           | 10.9            | 5.0       |
|                |                    |         |                 |                   |               | 17.8            | 5.0       |
| Ø63            | 6.7                | 20.9    | 178             | 100.5             | 126           | 11.8            | 5.0       |
|                |                    |         |                 |                   |               | 17.8            | 5.0       |
| Ø80            | 4.7                | 20.8    | 253             | 134.5             | 160           | 12.0            | 5.0       |
|                |                    |         |                 |                   |               | 17.5            | 5.0       |
| Ø100           | 3.5                | 20.8    | 340             | 174.5             | 200           | 12.2            | 5.0       |
|                |                    |         |                 |                   |               | 16.3            | 5.0       |
| Ø125           | 2.5                | 20.8    | 477             | 224.5             | 250           | 11.6            | 5.0       |
|                |                    |         |                 |                   |               | 14.6            | 5.0       |
| Ø200           | 1.5                | 20.8    | 795             | 374.5             |               | 12.2            | 5.0       |
|                |                    |         |                 |                   | 400           | 14.0            | 5.0       |

# Ramping Data

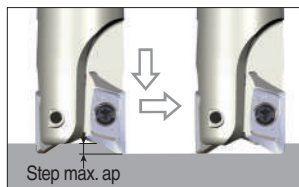
Straight ramping



Helical ramping



Step down



## XEVT 22: 3.0R-4.0R

(unit: mm)

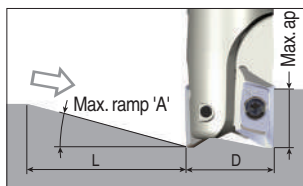
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø32            | 20.0               | 20.0    | 55              | 38.5              | 64            | 6.3             | 4.0       |
|                |                    |         |                 |                   |               | 17.0            | 4.0       |
| Ø40            | 12.3               | 19.9    | 91              | 54.5              | 80            | 8.4             | 4.0       |
|                |                    |         |                 |                   |               | 16.9            | 4.0       |
| Ø50            | 8.5                | 19.9    | 133             | 74.5              | 100           | 9.8             | 4.0       |
|                |                    |         |                 |                   |               | 16.9            | 4.0       |
| Ø63            | 5.5                | 19.9    | 207             | 100.5             | 126           | 9.6             | 4.0       |
|                |                    |         |                 |                   |               | 16.2            | 4.0       |
| Ø80            | 4.0                | 19.8    | 283             | 134.5             | 160           | 10.2            | 4.0       |
|                |                    |         |                 |                   |               | 14.9            | 4.0       |
| Ø100           | 3.0                | 19.8    | 378             | 174.5             | 200           | 10.4            | 4.0       |
|                |                    |         |                 |                   |               | 14.0            | 4.0       |
| Ø125           | 2.0                | 19.8    | 567             | 224.5             | 250           | 9.3             | 4.0       |
|                |                    |         |                 |                   |               | 11.6            | 4.0       |
| Ø200           | 1.0                | 19.8    | 1135            | 374.5             | 400           | 8.1             | 4.0       |
|                |                    |         |                 |                   |               | 9.3             | 4.0       |

## XEVT 22: 5.0R

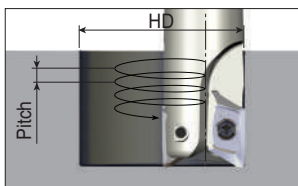
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø32            | 19.0               | 19.5    | 57              | 38.5              | 64            | 6.0             | 3.5       |
|                |                    |         |                 |                   |               | 16.6            | 3.5       |
| Ø40            | 11.4               | 19.4    | 96              | 54.5              | 80            | 7.8             | 3.5       |
|                |                    |         |                 |                   |               | 16.5            | 3.5       |
| Ø50            | 7.5                | 19.4    | 147             | 74.5              | 100           | 8.6             | 3.5       |
|                |                    |         |                 |                   |               | 16.5            | 3.5       |
| Ø63            | 5.0                | 19.4    | 222             | 100.5             | 126           | 8.8             | 3.5       |
|                |                    |         |                 |                   |               | 14.7            | 3.5       |
| Ø80            | 3.5                | 19.3    | 316             | 134.5             | 160           | 8.9             | 3.5       |
|                |                    |         |                 |                   |               | 13.1            | 3.5       |
| Ø100           | 2.5                | 19.3    | 442             | 174.5             | 200           | 8.7             | 3.5       |
|                |                    |         |                 |                   |               | 11.6            | 3.5       |
| Ø125           | 1.7                | 19.3    | 651             | 224.5             | 250           | 7.9             | 3.5       |
|                |                    |         |                 |                   |               | 9.9             | 3.5       |
| Ø200           | 0.8                | 19.3    | 1383            | 374.5             | 400           | 6.5             | 3.5       |
|                |                    |         |                 |                   |               | 7.4             | 3.5       |

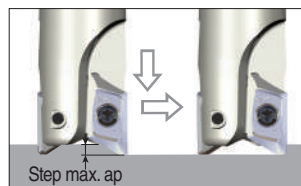
Straight ramping



Helical ramping



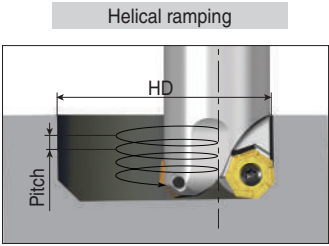
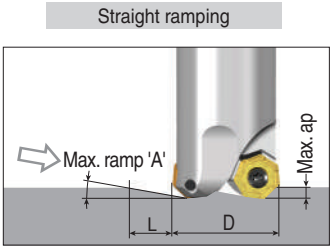
Step down



## XEVT 22: 6.4R

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 | Step down |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|-----------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. | Max. ap   |
| Ø32            | 18.0               | 18.8    | 58              | 38.5              |               | 5.6             | 3.0       |
|                |                    |         |                 |                   | 64            | 16.0            | 3.0       |
| Ø40            | 10.0               | 18.7    | 106             | 54.5              |               | 6.8             | 3.0       |
|                |                    |         |                 |                   | 80            | 15.9            | 3.0       |
| Ø50            | 6.5                | 18.7    | 164             | 74.5              |               | 7.4             | 3.0       |
|                |                    |         |                 |                   | 100           | 15.2            | 3.0       |
| Ø63            | 4.5                | 18.7    | 238             | 100.5             |               | 7.9             | 3.0       |
|                |                    |         |                 |                   | 126           | 13.2            | 3.0       |
| Ø80            | 3.0                | 18.6    | 355             | 134.5             |               | 7.6             | 3.0       |
|                |                    |         |                 |                   | 160           | 11.2            | 3.0       |
| Ø100           | 2.0                | 18.6    | 533             | 174.5             |               | 6.9             | 3.0       |
|                |                    |         |                 |                   | 200           | 9.3             | 3.0       |
| Ø125           | 1.5                | 18.6    | 711             | 224.5             |               | 7.0             | 3.0       |
|                |                    |         |                 |                   | 250           | 8.7             | 3.0       |
| Ø200           | 0.7                | 18.6    | 1523            | 374.5             |               | 5.7             | 3.0       |
|                |                    |         |                 |                   | 400           | 6.5             | 3.0       |

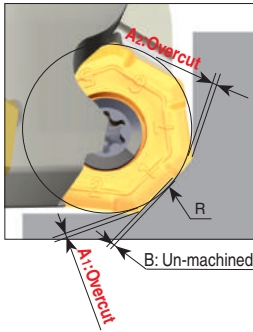


7EMT 06

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø32            | 29                 | 3.2     | 6               | 45.5              |               | 3.2             |
|                |                    |         |                 |                   | 64            | 3.2             |
| Ø40            | 15.5               | 3.2     | 12              | 61.5              |               | 3.2             |
|                |                    |         |                 |                   | 80            | 3.2             |
| Ø50            | 9.5                | 3.2     | 19              | 81.5              |               | 3.2             |
|                |                    |         |                 |                   | 100           | 3.2             |
| Ø63            | 5.5                | 3.2     | 33              | 107.5             |               | 3.2             |
|                |                    |         |                 |                   | 126           | 3.2             |
| Ø80            | 4.0                | 3.2     | 46              | 141.5             |               | 3.2             |
|                |                    |         |                 |                   | 160           | 3.2             |
| Ø100           | 3.0                | 3.2     | 61              | 181.5             |               | 3.2             |
|                |                    |         |                 |                   | 200           | 3.2             |
| Ø125           | 2.0                | 2.3     | 66              | 231.5             |               | 3.2             |
|                |                    |         |                 |                   | 250           | 3.2             |
|                |                    |         |                 |                   |               |                 |
|                |                    |         |                 |                   |               |                 |

Programming technical data

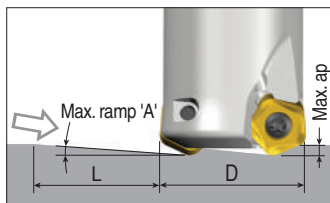


| R<br>Program | A<br>Over cut |      | B<br>Un-machined |
|--------------|---------------|------|------------------|
|              | A1            | A2   | B                |
| 7EMT 06      | 3             | 0    | 1.77             |
|              | 4.5           | 0    | 1.51             |
|              | 5             | 0.03 | 0.94             |
|              | 6             | 0.21 | 0.53             |

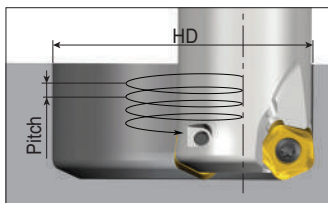
**4.5** :Recommended program 'R'



Straight ramping



Helical ramping

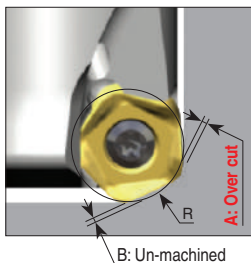


## PTKU 05

(unit: mm)

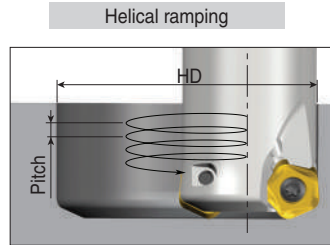
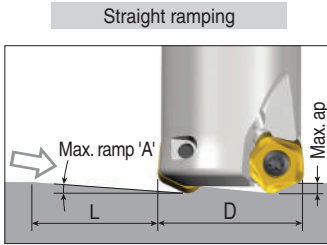
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø20            | 1.3                | 1.5     | 66              | 33                |               | 0.7             |
|                |                    |         |                 |                   | 40            | 0.9             |
| Ø25            | 1.1                | 1.5     | 78              | 43                |               | 0.8             |
|                |                    |         |                 |                   | 50            | 1.0             |
| Ø26            | 1.0                | 1.5     | 86              | 45                |               | 0.8             |
|                |                    |         |                 |                   | 52            | 0.9             |
| Ø32            | 1.0                | 1.5     | 86              | 57                |               | 1.0             |
|                |                    |         |                 |                   | 64            | 1.1             |
| Ø33            | 1.0                | 1.5     | 86              | 59                |               | 1.0             |
|                |                    |         |                 |                   | 66            | 1.2             |
| Ø40            | 0.8                | 1.5     | 101             | 73                |               | 1.1             |
|                |                    |         |                 |                   | 80            | 1.2             |
| Ø50            | 0.7                | 1.5     | 123             | 93                |               | 1.1             |
|                |                    |         |                 |                   | 100           | 1.2             |
| Ø52            | 0.7                | 1.5     | 123             | 97                |               | 1.2             |
|                |                    |         |                 |                   | 104           | 1.3             |
| Ø63            | 0.6                | 1.5     | 132             | 119               |               | 1.3             |
|                |                    |         |                 |                   | 126           | 1.4             |
| Ø66            | 0.6                | 1.5     | 143             | 125               |               | 1.3             |
|                |                    |         |                 |                   | 132           | 1.4             |

## Programming technical data



|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| PTKU 05 | 2.5          | 0.00          | 0.83             |
|         | 2.7          | 0.00          | 0.76             |
|         | 3.0          | 0.04          | 0.66             |

Yellow: Recommended program 'R'

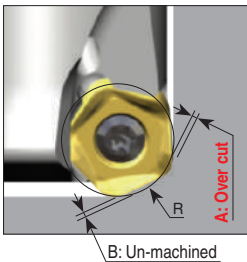


## PTKU 10

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø40            | 1.5                | 3.0     | 111             | 63                |               | 1.7             |
|                |                    |         |                 |                   | 80            | 2.2             |
| Ø50            | 1.9                | 3.0     | 88              | 83                |               | 2.8             |
|                |                    |         |                 |                   | 100           | 3.0             |
| Ø63            | 1.7                | 3.0     | 101             | 109               |               | 3.0             |
|                |                    |         |                 |                   | 126           | 3.0             |
| Ø66            | 2.2                | 3.0     | 78              | 115               |               | 3.0             |
|                |                    |         |                 |                   | 132           | 3.0             |
| Ø80            | 1.5                | 3.0     | 115             | 143               |               | 3.0             |
|                |                    |         |                 |                   | 160           | 3.0             |
| Ø100           | 1.1                | 3.0     | 150             | 183               |               | 3.0             |
|                |                    |         |                 |                   | 200           | 3.0             |
| Ø125           | 0.8                | 3.0     | 202             | 233               |               | 3.0             |
|                |                    |         |                 |                   | 250           | 3.0             |
| Ø160           | 0.6                | 3.0     | 265             | 303               |               | 3.0             |
|                |                    |         |                 |                   | 320           | 3.0             |
| Ø200           | 0.5                | 3.0     | 344             | 383               |               | 3.0             |
|                |                    |         |                 |                   | 400           | 3.0             |
|                |                    |         |                 |                   |               |                 |
|                |                    |         |                 |                   |               |                 |

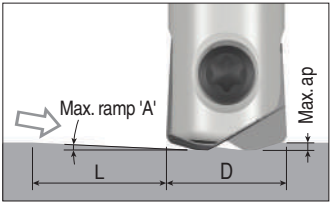
## Programming technical data



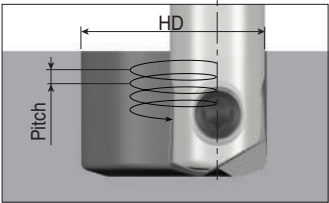
|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| PTKU 10 | 5.5          | 0.00          | 1.45             |
|         | 6.0          | 0.09          | 1.28             |
|         | 6.5          | 0.21          | 1.11             |

 : Recommended program 'R'

Straight ramping



Helical ramping

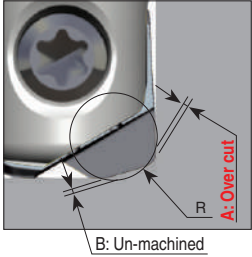


**HFN**

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø6             | 2.0                | 0.3     | 9               | 9.6               |               | 0.3             |
|                |                    |         |                 |                   | 11            | 0.3             |
| Ø8             | 2.5                | 0.5     | 11              | 12                |               | 0.5             |
|                |                    |         |                 |                   | 15            | 0.5             |

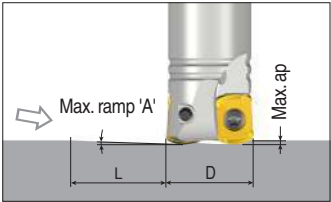
**Programming technical data**



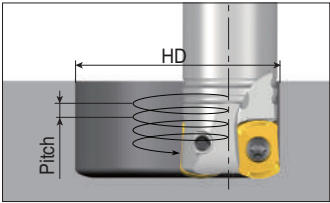
|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| HFN 060 | 0.8          | 0.00          | 0.21             |
|         | 1.0          | 0.03          | 0.16             |
| HFN 080 | 0.8          | 0.00          | 0.38             |
|         | 1.0          | 0.00          | 0.32             |
|         | 1.2          | 0.02          | 0.27             |

**Recommended program 'R'**

Straight ramping



Helical ramping

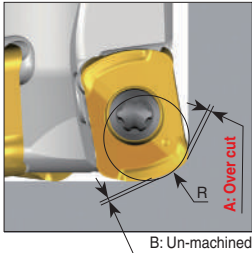


## BLMV 06

(unit: mm)

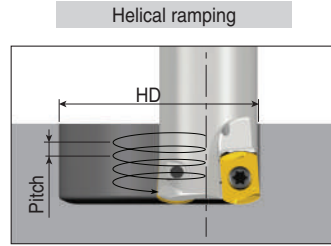
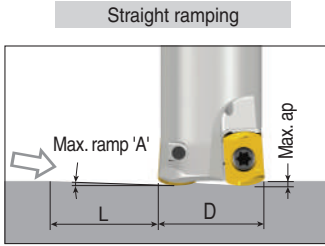
| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. |
| Ø16             | 5.1                | 0.7     | 8               | 27                | 32             | 0.7             |
| Ø17             | 4.5                | 0.7     | 9               | 29                | 34             | 0.7             |
| Ø18             | 4.4                | 0.7     | 10              | 31                | 36             | 0.7             |
| Ø20             | 2.5                | 1.0     | 23              | 34                | 40             | 1.0             |
| Ø21             | 2.3                | 1.0     | 25              | 35                | 42             | 1.0             |
| Ø22             | 2.7                | 1.0     | 22              | 39                | 44             | 1.0             |
| Ø25             | 2.5                | 1.0     | 23              | 43                | 50             | 1.0             |
| Ø26             | 2.2                | 1.0     | 26              | 45                | 52             | 1.0             |
| Ø30             | 1.6                | 1.0     | 35              | 55                | 60             | 1.0             |
| Ø32             | 1.4                | 1.0     | 40              | 57                | 64             | 1.0             |
| Ø33             | 1.3                | 1.0     | 43              | 59                | 66             | 1.0             |
| Ø35             | 1.2                | 1.0     | 46              | 63                | 70             | 1.0             |
| Ø40             | 1.0                | 1.0     | 55              | 73                | 80             | 1.0             |
| Ø42             | 1.0                | 1.0     | 58              | 79                | 84             | 1.0             |
| Ø50             | 0.8                | 1.0     | 72              | 93                | 100            | 1.0             |
| Ø52             | 0.8                | 1.0     | 77              | 97                | 104            | 1.0             |
| Ø63             | 0.6                | 1.0     | 96              | 119               | 126            | 1.0             |
| Ø66             | 0.6                | 1.0     | 96              | 127               | 132            | 1.0             |

## Programming technical data



|                       | R<br>Program | A<br>Over cut | B<br>Un-machined |
|-----------------------|--------------|---------------|------------------|
| BLMV 06<br>(Ø16, Ø17) | 1.5          | 0             | 0.36             |
|                       | 2.0          | 0.09          | 0.22             |
|                       | 2.5          | 0.27          | 0.10             |
| BLMV 06<br>(Ø20~)     | 1.5          | 0             | 0.58             |
|                       | 2.0          | 0             | 0.41             |
|                       | 2.5          | 0.12          | 0.26             |
|                       | 3.0          | 0.29          | 0.12             |

**Yellow background:** Recommended program 'R'

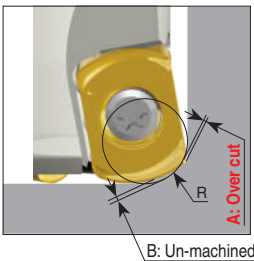


## BLMP 04

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø8             | 0.4                | 0.5     | 72              | 12.6              | 16            | 0.1             |
| Ø10            | 0.6                | 0.5     | 44              | 16.6              | 20            | 0.2             |
| Ø11            | 0.7                | 0.5     | 38              | 18.6              | 22            | 0.2             |
| Ø12            | 1.0                | 0.5     | 29              | 20.6              | 24            | 0.3             |
| Ø13            | 1.1                | 0.5     | 25              | 22.6              | 26            | 0.4             |
| Ø16            | 1.0                | 0.5     | 29              | 28.6              | 32            | 0.5             |
| Ø17            | 1.1                | 0.5     | 26              | 30.6              | 34            | 0.5             |
| Ø20            | 1.0                | 0.5     | 27              | 36.6              | 40            | 0.5             |
| Ø21            | 0.7                | 0.5     | 38              | 38.6              | 42            | 0.5             |
| Ø25            | 0.7                | 0.5     | 38              | 46.6              | 50            | 0.5             |
| Ø32            | 0.6                | 0.5     | 48              | 60.6              | 64            | 0.5             |

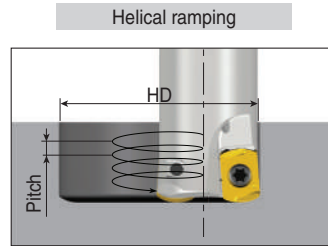
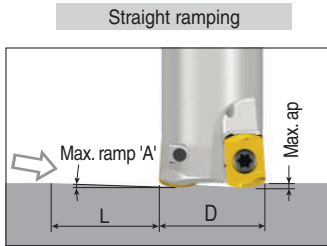
## Programming technical data



|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| BLMP 04 | 0.8          | 0.00          | 0.28             |
|         | 0.9          | 0.00          | 0.25             |
|         | 1.0          | 0.08          | 0.22             |

     : Recommended program 'R'

# Ramping Data

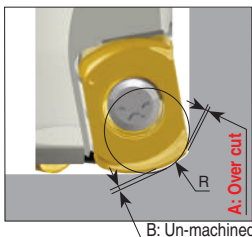


## BLMP 06

(unit: mm)

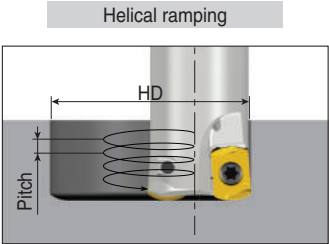
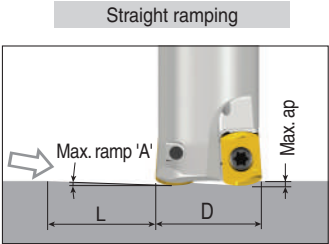
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø16            | 2.0                | 0.7     | 13              | 23                | 32            | 0.7             |
| Ø17            | 2.0                | 0.7     | 15              | 25                | 34            | 0.7             |
| Ø18            | 2.3                | 0.7     | 16              | 27                | 36            | 0.7             |
| Ø20            | 1.5                | 1.0     | 38              | 31                | 40            | 0.8             |
| Ø21            | 1.5                | 1.0     | 38              | 33                | 42            | 0.8             |
| Ø22            | 1.5                | 1.0     | 38              | 35                | 44            | 1.0             |
| Ø25            | 1.3                | 1.0     | 41              | 41                | 50            | 1.0             |
| Ø26            | 1.2                | 1.0     | 44              | 43                | 52            | 1.0             |
| Ø30            | 1.0                | 1.0     | 52              | 51                | 60            | 1.0             |
| Ø32            | 0.9                | 1.0     | 57              | 55                | 64            | 1.0             |
| Ø33            | 0.9                | 1.0     | 57              | 57                | 66            | 1.0             |
| Ø35            | 0.8                | 1.0     | 57              | 61                | 70            | 1.0             |
| Ø40            | 0.7                | 1.0     | 64              | 71                | 80            | 1.0             |
| Ø42            | 0.7                | 1.0     | 72              | 75                | 84            | 1.0             |
| Ø50            | 0.6                | 1.0     | 96              | 91                | 100           | 1.0             |
| Ø52            | 0.6                | 1.0     | 96              | 95                | 104           | 1.0             |
| Ø63            | 0.5                | 1.0     | 115             | 117               | 126           | 1.0             |
| Ø66            | 0.5                | 1.0     | 115             | 123               | 132           | 1.0             |

## Programming technical data



|                            | R<br>Program | A<br>Over cut | B<br>Un-machined |
|----------------------------|--------------|---------------|------------------|
| BLMP 06<br>(Ø16, Ø17, Ø18) | 1.5          | 0             | 0.35             |
|                            | 2.0          | 0.1           | 0.22             |
|                            | 2.5          | 0.27          | 0.1              |
| BLMP 06<br>(Ø20- )         | 2.0          | 0             | 0.42             |
|                            | 2.5          | 0.12          | 0.26             |
|                            | 3.0          | 0.29          | 0.17             |

    : Recommended program 'R'

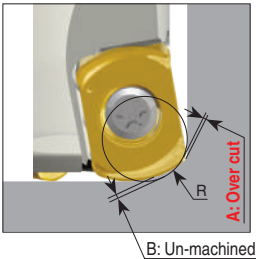


BLMP 09

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø25            | 2.2                | 1.5     | 39              | 42                | 50            | 1.5             |
| Ø26            | 2.2                | 1.5     | 39              | 44                | 52            | 1.5             |
| Ø30            | 2.0                | 1.5     | 43              | 52                | 60            | 1.5             |
| Ø32            | 2.0                | 1.5     | 43              | 56                | 64            | 1.5             |
| Ø33            | 2.0                | 1.5     | 43              | 58                | 66            | 1.5             |
| Ø35            | 2.0                | 1.5     | 43              | 60                | 70            | 1.5             |
| Ø40            | 1.5                | 1.5     | 57              | 72                | 80            | 1.5             |
| Ø42            | 1.5                | 1.5     | 57              | 76                | 84            | 1.5             |
| Ø50            | 1.0                | 1.5     | 86              | 92                | 100           | 1.5             |
| Ø52            | 1.0                | 1.5     | 86              | 96                | 104           | 1.5             |
| Ø63            | 0.9                | 1.5     | 96              | 118               | 126           | 1.5             |
| Ø66            | 0.9                | 1.5     | 96              | 124               | 132           | 1.5             |
| Ø80            | 0.8                | 1.5     | 107             | 152               | 160           | 1.5             |
| Ø100           | 0.7                | 1.5     | 123             | 192               | 200           | 1.5             |
| Ø125           | 0.4                | 1.5     | 215             | 240               | 250           | 1.5             |

Programming technical data



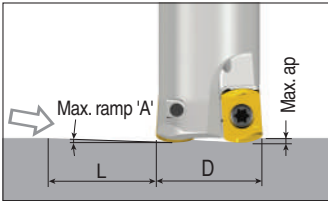
| BLMP 09 | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
|         | 2.5          | 0             | 0.61             |
|         | 3.0          | 0.09          | 0.45             |
|         | 3.5          | 0.24          | 0.30             |
|         | 4.0          | 0.41          | 0.17             |
|         | 3.0          | 0.36          | 0.04             |

Recommended program 'R'

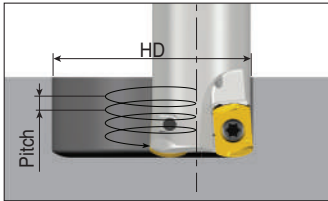
# Ramping Data



Straight ramping



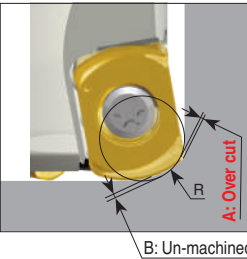
Helical ramping



BLMP 11 (unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø30            | 0.50               | 2.0     | 229             | 41                | 60            | 0.3             |
| Ø32            | 0.50               | 2.0     | 229             | 45                | 64            | 0.3             |
| Ø33            | 0.45               | 2.0     | 255             | 47                | 66            | 0.3             |
| Ø35            | 0.50               | 2.0     | 229             | 51                | 70            | 0.4             |
| Ø40            | 0.55               | 2.0     | 208             | 61                | 80            | 0.5             |
| Ø42            | 0.50               | 2.0     | 229             | 65                | 84            | 0.5             |
| Ø50            | 0.50               | 2.0     | 229             | 81                | 100           | 0.7             |
| Ø52            | 0.45               | 2.0     | 255             | 85                | 104           | 0.7             |
| Ø63            | 0.45               | 2.0     | 255             | 107               | 126           | 0.9             |
| Ø66            | 0.40               | 2.0     | 287             | 113               | 132           | 0.9             |
| Ø80            | 0.35               | 2.0     | 328             | 141               | 160           | 1.0             |
| Ø100           | 0.30               | 2.0     | 382             | 181               | 200           | 1.1             |
| Ø125           | 0.25               | 2.0     | 459             | 231               | 250           | 1.2             |
| Ø160           | 0.20               | 2.0     | 573             | 301               | 320           | 1.3             |
| Ø200           | 0.15               | 2.0     | 764             | 381               | 400           | 1.3             |

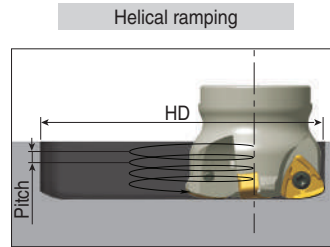
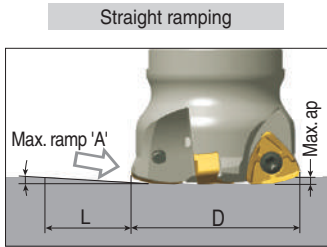
## Programming technical data



|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| BLMP 11 | 2.4          | 0.00          | 1.09             |
|         | 3.0          | 0.00          | 0.90             |
|         | 3.2          | 0.18          | 0.85             |

Recommended program 'R'



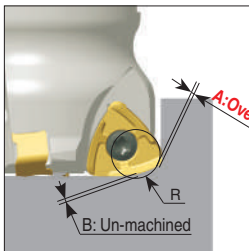


## BLMP 13

(unit: mm)

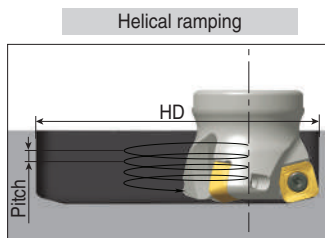
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø32            | 0.8                | 2.0     | 143             | 50                |               | 0.7             |
|                |                    |         |                 |                   | 64            | 0.9             |
| Ø33            | 1.1                | 2.0     | 104             | 52                |               | 1.0             |
|                |                    |         |                 |                   | 66            | 1.3             |
| Ø35            | 1.1                | 2.0     | 104             | 56                |               | 1.1             |
|                |                    |         |                 |                   | 70            | 1.3             |
| Ø40            | 1.2                | 2.0     | 96              | 66                |               | 1.4             |
|                |                    |         |                 |                   | 80            | 1.7             |
| Ø42            | 1.1                | 2.0     | 104             | 70                |               | 1.3             |
|                |                    |         |                 |                   | 84            | 1.6             |
| Ø50            | 0.8                | 2.0     | 143             | 86                |               | 1.2             |
|                |                    |         |                 |                   | 100           | 1.4             |
| Ø52            | 0.8                | 2.0     | 143             | 90                |               | 1.3             |
|                |                    |         |                 |                   | 104           | 1.5             |
| Ø63            | 0.6                | 2.0     | 191             | 112               |               | 1.2             |
|                |                    |         |                 |                   | 126           | 1.3             |
| Ø66            | 0.6                | 2.0     | 191             | 118               |               | 1.2             |
|                |                    |         |                 |                   | 132           | 1.4             |
| Ø80            | 0.5                | 2.0     | 229             | 146               |               | 1.3             |
|                |                    |         |                 |                   | 160           | 1.4             |
| Ø100           | 0.4                | 2.0     | 287             | 186               |               | 1.3             |
|                |                    |         |                 |                   | 200           | 1.4             |
| Ø125           | 0.3                | 2.0     | 382             | 236               |               | 1.2             |
|                |                    |         |                 |                   | 250           | 1.3             |
| Ø160           | 0.3                | 2.0     | 382             | 306               |               | 1.6             |
|                |                    |         |                 |                   | 320           | 1.7             |
| Ø200           | 0.2                | 2.0     | 573             | 386               |               | 1.3             |
|                |                    |         |                 |                   | 400           | 1.4             |
| Ø250           | 0.2                | 2.0     | 573             | 486               |               | 1.7             |
|                |                    |         |                 |                   | 500           | 1.7             |

## Programming technical data



|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| BLMP 13 | 3.0          | 0             | 1.31             |
|         | 3.5          | 0             | 1.17             |
|         | 4.0          | 0.04          | 1.03             |
|         | 4.5          | 0.15          | 0.89             |
|         | 5.0          | 0.3           | 0.76             |

  : Recommended program 'R'



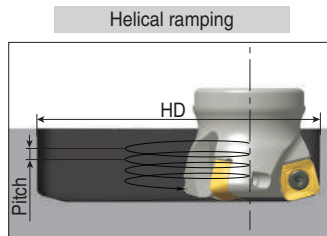
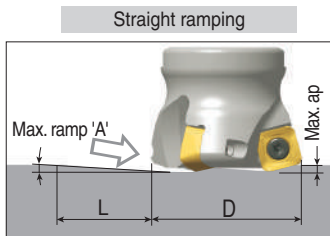
(unit: mm)

[illegible]

B: Un-machined

|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| SBMT 06 | 1.8          | 0             | 0.81             |
|         | 2.0          | 0             | 0.77             |
|         | 2.2          | 0.01          | 0.73             |

**Recommended program 'R'**

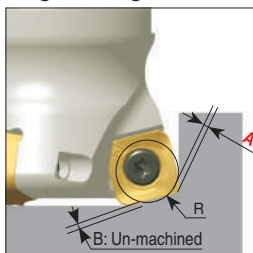


## SBMT 09

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø25            | 1.6                | 1.2     | 43              | 36                |               | 1               |
|                |                    |         |                 |                   | 50            | 1.2             |
| Ø26            | 1.7                | 1.2     | 40              | 38                |               | 1.1             |
|                |                    |         |                 |                   | 52            | 1.2             |
| Ø30            | 3.1                | 1.2     | 22              | 46                |               | 1.2             |
|                |                    |         |                 |                   | 60            | 1.2             |
| Ø32            | 3.9                | 1.2     | 18              | 50                |               | 1.2             |
|                |                    |         |                 |                   | 64            | 1.2             |
| Ø33            | 3.7                | 1.2     | 19              | 52                |               | 1.2             |
|                |                    |         |                 |                   | 66            | 1.2             |
| Ø35            | 3.4                | 1.2     | 18              | 56                |               | 1.2             |
|                |                    |         |                 |                   | 70            | 1.2             |
| Ø40            | 2.8                | 1.2     | 25              | 66                |               | 1.2             |
|                |                    |         |                 |                   | 80            | 1.2             |
| Ø42            | 2.6                | 1.2     | 26              | 70                |               | 1.2             |
|                |                    |         |                 |                   | 84            | 1.2             |
| Ø50            | 2.0                | 1.2     | 34              | 86                |               | 1.2             |
|                |                    |         |                 |                   | 100           | 1.2             |
| Ø52            | 1.9                | 1.2     | 38              | 90                |               | 1.2             |
|                |                    |         |                 |                   | 104           | 1.2             |
| Ø63            | 1.5                | 1.2     | 43              | 112               |               | 1.2             |
|                |                    |         |                 |                   | 126           | 1.2             |
| Ø66            | 1.1                | 1.2     | 63              | 118               |               | 1.2             |
|                |                    |         |                 |                   | 132           | 1.2             |
| Ø80            | 1.2                | 1.2     | 63              | 146               |               | 1.2             |
|                |                    |         |                 |                   | 160           | 1.2             |
|                |                    |         |                 |                   |               |                 |
|                |                    |         |                 |                   |               |                 |

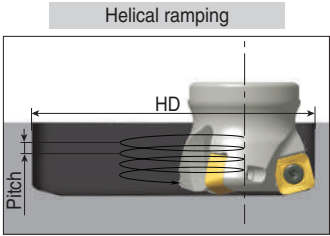
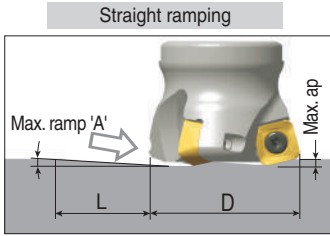
## Programming technical data



|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| SBMT 09 | 3.5          | 0.1           | 0.81             |
|         | 3            | 0             | 0.9              |
|         | 2.5          | 0             | 0.98             |
|         | 2            | 0             | 1.1              |

  :Recommended program 'R'

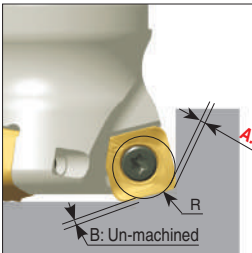
# Ramping Data



**SBMT 13** (unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø32            | 7.0                | 2.0     | 16              | 47                | 64            | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø33            | 6.9                | 2.0     | 17              | 49                | 66            | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø35            | 6.4                | 2.0     | 18              | 53                | 70            | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø40            | 5.3                | 2.0     | 22              | 63                | 80            | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø42            | 4.4                | 2.0     | 26              | 67                | 84            | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø50            | 4.3                | 2.0     | 27              | 83                | 100           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø52            | 4.0                | 2.0     | 29              | 87                | 104           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø63            | 2.9                | 2.0     | 40              | 109               | 126           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø80            | 2.0                | 2.0     | 57              | 143               | 160           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø100           | 1.5                | 2.0     | 76              | 183               | 200           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø125           | 1.1                | 2.0     | 104             | 233               | 250           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø160           | 0.8                | 2.0     | 104             | 303               | 320           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø200           | 0.6                | 2.0     | 127             | 383               | 400           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |
| Ø250           | 0.5                | 2.0     | 164             | 483               | 500           | 2.0             |
|                |                    |         |                 |                   |               | 2.0             |

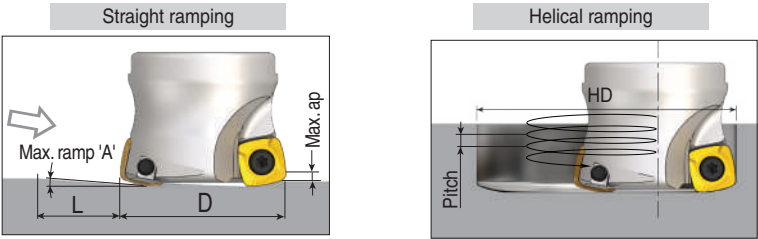
## Programming technical data



|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| SBMT 13 | 4.0          | 0             | 1.62             |
|         | 4.5          | 0             | 1.51             |
|         | 5.0          | 0.04          | 1.4              |
|         | 5.5          | 0.14          | 1.29             |
|         | 6.0          | 0.28          | 1.18             |

Yellow box: Recommended program 'R'

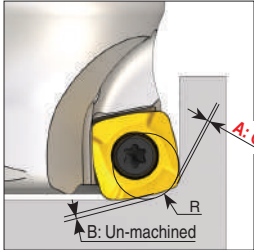
# Ramping Data



**SRMT 07** (unit: mm)

| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. |
| Ø16             | 1.2                | 0.7     | 32.1            | 23.8              |                | 0.5             |
|                 |                    |         |                 |                   | 32             | 0.7             |
| Ø17             | 1.6                | 0.7     | 25              | 25.8              |                | 0.7             |
|                 |                    |         |                 |                   | 34             | 0.7             |
| Ø20             | 7.3                | 0.7     | 5.4             | 31.8              |                | 0.7             |
|                 |                    |         |                 |                   | 40             | 0.7             |
| Ø21             | 6.6                | 0.7     | 6               | 33.8              |                | 0.7             |
|                 |                    |         |                 |                   | 42             | 0.7             |
| Ø25             | 4.7                | 0.7     | 8.5             | 41.8              |                | 0.7             |
|                 |                    |         |                 |                   | 50             | 0.7             |
| Ø26             | 4.3                | 0.7     | 9.3             | 43.8              |                | 0.7             |
|                 |                    |         |                 |                   | 52             | 0.7             |
| Ø32             | 3.1                | 0.7     | 12.9            | 55.8              |                | 0.7             |
|                 |                    |         |                 |                   | 64             | 0.7             |
| Ø33             | 2.9                | 0.7     | 13.8            | 57.8              |                | 0.7             |
|                 |                    |         |                 |                   | 66             | 0.7             |
| Ø40             | 2.2                | 0.7     | 18.2            | 71.8              |                | 0.7             |
|                 |                    |         |                 |                   | 80             | 0.7             |
| Ø50             | 1.6                | 0.7     | 25              | 91.8              |                | 0.7             |
|                 |                    |         |                 |                   | 100            | 0.7             |
| Ø63             | 1.2                | 0.7     | 33.4            | 117.8             |                | 0.7             |
|                 |                    |         |                 |                   | 126            | 0.7             |

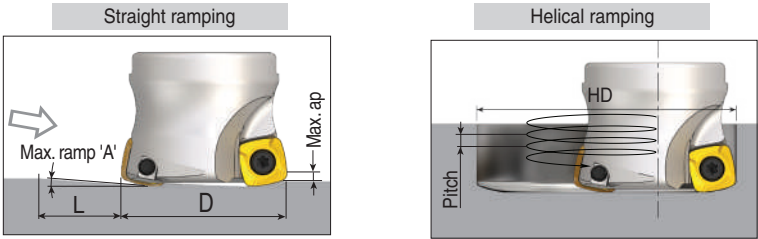
## Programming technical data



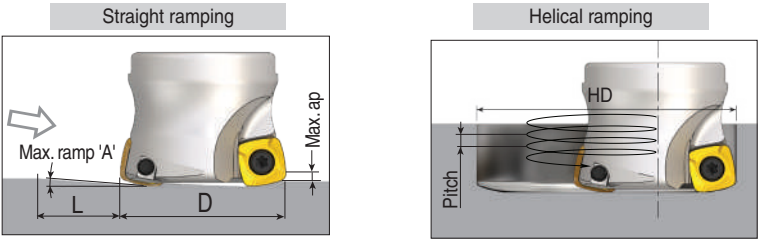
|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| SRMT 07 | 1.5          | 0             | 0.5              |
|         | 1.6          | 0             | 0.48             |
|         | 1.7          | 0.01          | 0.45             |
|         | 1.8          | 0.02          | 0.43             |
|         | 1.9          | 0.04          | 0.41             |
|         | 2.0          | 0.07          | 0.39             |

  :Recommended program 'R'

# Ramping Data



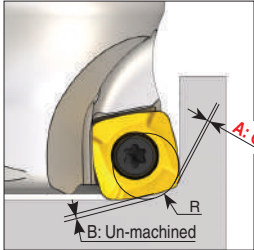
# Ramping Data



**SRMT 14** (unit: mm)

| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. |
| Ø32             | 1.0                | 2.0     | 107             | 45                |                | 0.7             |
|                 |                    |         |                 |                   | 64             | 1.8             |
| Ø33             | 1.2                | 2.0     | 92              | 46.8              |                | 0.9             |
|                 |                    |         |                 |                   | 66             | 2.0             |
| Ø35             | 1.6                | 2.0     | 71              | 50.8              |                | 1.3             |
|                 |                    |         |                 |                   | 70             | 2.0             |
| Ø40             | 2.5                | 2.0     | 44              | 60.8              |                | 2.0             |
|                 |                    |         |                 |                   | 80             | 2.0             |
| Ø42             | 3.4                | 2.0     | 33              | 64.8              |                | 2.0             |
|                 |                    |         |                 |                   | 84             | 2.0             |
| Ø50             | 5.5                | 2.0     | 20              | 80.8              |                | 2.0             |
|                 |                    |         |                 |                   | 100            | 2.0             |
| Ø52             | 5.1                | 2.0     | 22              | 84.6              |                | 2.0             |
|                 |                    |         |                 |                   | 104            | 2.0             |
| Ø63             | 2.9                | 2.0     | 39              | 106.8             |                | 2.0             |
|                 |                    |         |                 |                   | 126            | 2.0             |
| Ø66             | 2.6                | 2.0     | 44              | 112.6             |                | 2.0             |
|                 |                    |         |                 |                   | 132            | 2.0             |
| Ø80             | 2.0                | 2.0     | 57              | 140.6             |                | 2.0             |
|                 |                    |         |                 |                   | 160            | 2.0             |
| Ø100            | 1.4                | 2.0     | 81              | 180.6             |                | 2.0             |
|                 |                    |         |                 |                   | 200            | 2.0             |
| Ø125            | 1.1                | 2.0     | 104             | 230.6             |                | 2.0             |
|                 |                    |         |                 |                   | 250            | 2.0             |
| Ø160            | 1.0                | 2.0     | 114             | 300.6             |                | 2.0             |
|                 |                    |         |                 |                   | 320            | 2.0             |
| Ø200            | 0.8                | 2.0     | 143             | 380.6             |                | 2.0             |
|                 |                    |         |                 |                   | 400            | 2.0             |

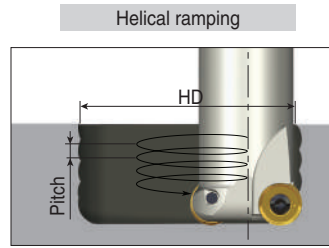
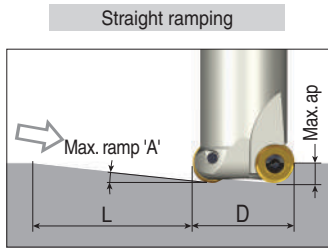
## Programming technical data



|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| SRMT 14 | 3.0          | 0             | 1.31             |
|         | 3.5          | 0             | 1.18             |
|         | 3.6          | 0             | 1.15             |
|         | 3.7          | 0.01          | 1.13             |
|         | 4.0          | 0.03          | 1.05             |

     :Recommended program 'R'

# Ramping Data



## RNMU 10

(unit: mm)

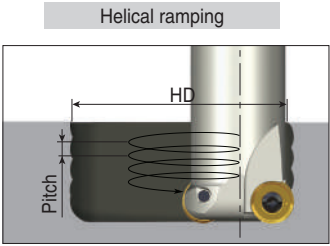
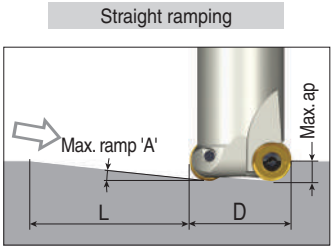
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø25            | 1.1                | 5.0     | 261             | 33                |               | 0.4             |
|                |                    |         |                 |                   | 50            | 1.3             |
| Ø26            | 1.1                | 5.0     | 261             | 35                |               | 0.5             |
|                |                    |         |                 |                   | 52            | 1.3             |
| Ø32            | 0.9                | 5.0     | 318             | 47                |               | 0.6             |
|                |                    |         |                 |                   | 64            | 1.3             |
| Ø33            | 0.9                | 5.0     | 318             | 49                |               | 0.7             |
|                |                    |         |                 |                   | 66            | 1.4             |
| Ø40            | 0.9                | 5.0     | 318             | 63                |               | 1.0             |
|                |                    |         |                 |                   | 80            | 1.7             |
| Ø42            | 0.9                | 5.0     | 318             | 67                |               | 1.0             |
|                |                    |         |                 |                   | 84            | 1.8             |
| Ø50            | 0.7                | 5.0     | 409             | 83                |               | 1.1             |
|                |                    |         |                 |                   | 100           | 1.6             |
| Ø52            | 0.8                | 5.0     | 358             | 87                |               | 1.3             |
|                |                    |         |                 |                   | 104           | 1.9             |

## RNMU 12

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø32            | 1.4                | 6.0     | 246             | 42                |               | 0.7             |
|                |                    |         |                 |                   | 64            | 2.1             |
| Ø33            | 1.4                | 6.0     | 246             | 44                |               | 0.7             |
|                |                    |         |                 |                   | 66            | 2.2             |
| Ø40            | 1.3                | 6.0     | 265             | 58                |               | 1.1             |
|                |                    |         |                 |                   | 80            | 2.4             |
| Ø50            | 1.0                | 6.0     | 344             | 78                |               | 1.3             |
|                |                    |         |                 |                   | 100           | 2.3             |
| Ø52            | 1.0                | 6.0     | 344             | 82                |               | 1.4             |
|                |                    |         |                 |                   | 104           | 2.4             |
| Ø63            | 1.0                | 6.0     | 344             | 104               |               | 1.9             |
|                |                    |         |                 |                   | 126           | 2.9             |
| Ø66            | 1.0                | 6.0     | 344             | 110               |               | 2.0             |
|                |                    |         |                 |                   | 132           | 3.1             |
| Ø80            | 0.9                | 6.0     | 382             | 138               |               | 2.4             |
|                |                    |         |                 |                   | 160           | 3.4             |
| Ø100           | 0.7                | 6.0     | 491             | 178               |               | 2.5             |
|                |                    |         |                 |                   | 200           | 3.3             |



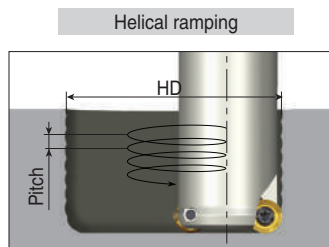
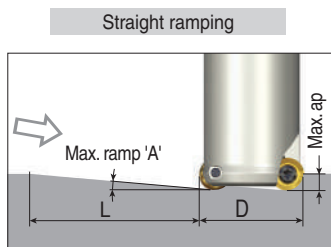


RNMU 16

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø40            | 1.4                | 8.0     | 328             | 52                | 80            | 0.8             |
| Ø42            | 1.4                | 8.0     | 328             | 56                | 84            | 0.9             |
| Ø50            | 1.3                | 8.0     | 353             | 72                | 100           | 1.3             |
| Ø52            | 1.0                | 8.0     | 459             | 76                | 104           | 1.1             |
| Ø63            | 1.0                | 8.0     | 459             | 98                | 126           | 1.6             |
| Ø66            | 1.0                | 8.0     | 459             | 104               | 132           | 1.8             |
| Ø80            | 1.0                | 8.0     | 459             | 132               | 160           | 2.4             |
| Ø100           | 0.9                | 8.0     | 510             | 172               | 200           | 3.7             |
| Ø125           | 0.9                | 8.0     | 510             | 222               | 250           | 4.2             |

# Ramping Data



## RYM(H)X-08

(unit: mm)

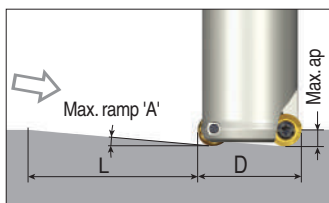
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø16            | 2.5                | 4.0     | 92              | 18                |               | 0.2             |
|                |                    |         |                 |                   | 32            | 1.9             |
| Ø17            | 2.5                | 4.0     | 92              | 20                |               | 0.3             |
|                |                    |         |                 |                   | 34            | 2.0             |
| Ø18            | 2.5                | 4.0     | 92              | 22                |               | 0.5             |
|                |                    |         |                 |                   | 36            | 2.1             |
| Ø20            | 4.0                | 4.0     | 57              | 26                |               | 1.1             |
|                |                    |         |                 |                   | 40            | 3.4             |
| Ø21            | 4.0                | 4.0     | 57              | 28                |               | 1.3             |
|                |                    |         |                 |                   | 42            | 3.4             |
| Ø25            | 4.0                | 4.0     | 57              | 36                |               | 2.1             |
|                |                    |         |                 |                   | 50            | 3.4             |
| Ø26            | 4.0                | 4.0     | 57              | 38                |               | 2.2             |
|                |                    |         |                 |                   | 52            | 3.4             |
| Ø32            | 4.0                | 4.0     | 57              | 50                |               | 3.4             |
|                |                    |         |                 |                   | 64            | 3.4             |
| Ø40            | 7.0                | 4.0     | 33              | 66                |               | 3.4             |
|                |                    |         |                 |                   | 80            | 3.4             |

## RYMX-10

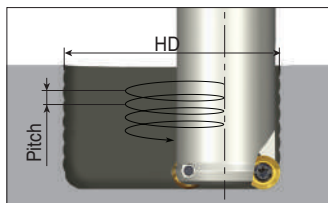
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø20            | 4.5                | 5.0     | 64              | 22                |               | 0.4             |
|                |                    |         |                 |                   | 40            | 4.2             |
| Ø21            | 4.5                | 5.0     | 64              | 24                |               | 0.6             |
|                |                    |         |                 |                   | 42            | 4.4             |
| Ø25            | 5.0                | 5.0     | 57              | 32                |               | 1.6             |
|                |                    |         |                 |                   | 50            | 4.3             |
| Ø26            | 5.0                | 5.0     | 57              | 34                |               | 1.9             |
|                |                    |         |                 |                   | 52            | 4.3             |
| Ø32            | 5.0                | 5.0     | 57              | 46                |               | 3.3             |
|                |                    |         |                 |                   | 64            | 4.3             |
| Ø35            | 5.0                | 5.0     | 57              | 52                |               | 4.0             |
|                |                    |         |                 |                   | 70            | 4.3             |
| Ø40            | 5.0                | 5.0     | 57              | 62                |               | 4.3             |
|                |                    |         |                 |                   | 80            | 4.3             |
| Ø42            | 5.0                | 5.0     | 57              | 66                |               | 4.3             |
|                |                    |         |                 |                   | 84            | 4.3             |
| Ø50            | 6.5                | 5.0     | 44              | 82                |               | 4.3             |
|                |                    |         |                 |                   | 100           | 4.3             |
| Ø52            | 6.0                | 5.0     | 48              | 86                |               | 4.3             |
|                |                    |         |                 |                   | 104           | 4.3             |
| Ø66            | 4.5                | 5.0     | 64              | 114               |               | 4.3             |
|                |                    |         |                 |                   | 132           | 4.3             |

Straight ramping



Helical ramping

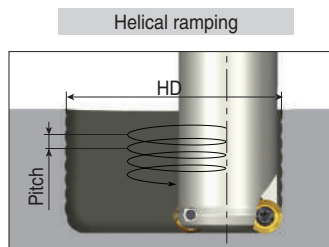
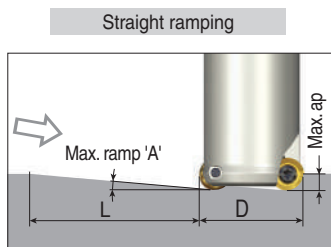


## RYMX-12

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø25            | 6.0                | 6.0     | 57              | 28                |               | 0.8             |
|                |                    |         |                 |                   | 50            | 5.1             |
| Ø26            | 6.0                | 6.0     | 57              | 30                |               | 1.1             |
|                |                    |         |                 |                   | 52            | 5.1             |
| Ø32            | 12.0               | 6.0     | 28              | 42                |               | 5.1             |
|                |                    |         |                 |                   | 64            | 5.1             |
| Ø33            | 12.0               | 6.0     | 28              | 44                |               | 5.1             |
|                |                    |         |                 |                   | 66            | 5.1             |
| Ø35            | 12.0               | 6.0     | 28              | 48                |               | 5.1             |
|                |                    |         |                 |                   | 70            | 5.1             |
| Ø40            | 10.0               | 6.0     | 34              | 58                |               | 5.1             |
|                |                    |         |                 |                   | 80            | 5.1             |
| Ø42            | 12.0               | 6.0     | 28              | 62                |               | 5.1             |
|                |                    |         |                 |                   | 84            | 5.1             |
| Ø50            | 9.0                | 6.0     | 38              | 78                |               | 5.1             |
|                |                    |         |                 |                   | 100           | 5.1             |
| Ø52            | 8.0                | 6.0     | 43              | 82                |               | 5.1             |
|                |                    |         |                 |                   | 104           | 5.1             |
| Ø55            | 8.0                | 6.0     | 43              | 88                |               | 5.1             |
|                |                    |         |                 |                   | 110           | 5.1             |
| Ø63            | 7.0                | 6.0     | 49              | 104               |               | 5.1             |
|                |                    |         |                 |                   | 126           | 5.1             |
| Ø66            | 6.5                | 6.0     | 53              | 110               |               | 5.1             |
|                |                    |         |                 |                   | 132           | 5.1             |
| Ø80            | 4.5                | 6.0     | 76              | 138               |               | 5.1             |
|                |                    |         |                 |                   | 160           | 5.1             |
| Ø100           | 3.5                | 6.0     | 98              | 178               |               | 5.1             |
|                |                    |         |                 |                   | 200           | 5.1             |
| Ø125           | 2.5                | 6.0     | 137             | 228               |               | 5.1             |
|                |                    |         |                 |                   | 250           | 5.1             |

# Ramping Data



## RYMX-16

(unit: mm)

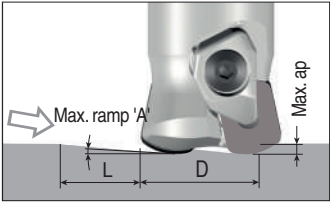
| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø32            | 8.0                | 8.0     | 57              | 34                | 64            | 0.7             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø40            | 9.5                | 8.0     | 48              | 50                | 80            | 4.5             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø42            | 9.0                | 8.0     | 51              | 54                | 84            | 5.1             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø50            | 9.0                | 8.0     | 51              | 70                | 100           | 6.8             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø52            | 9.0                | 8.0     | 51              | 74                | 104           | 6.8             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø63            | 8.5                | 8.0     | 54              | 96                | 126           | 6.8             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø66            | 8.5                | 8.0     | 54              | 102               | 132           | 6.8             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø80            | 6.0                | 8.0     | 76              | 130               | 160           | 6.8             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø100           | 5.0                | 8.0     | 91              | 170               | 200           | 6.8             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø125           | 3.5                | 8.0     | 131             | 220               | 250           | 6.8             |
|                |                    |         |                 |                   |               | 6.8             |
| Ø160           | 3.5                | 8.0     | 131             | 290               | 320           | 6.8             |
|                |                    |         |                 |                   |               | 6.8             |

## RYMX-20

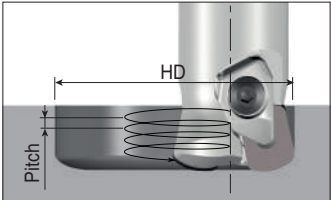
(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø50            | 8.0                | 10.0    | 71              | 62                | 100           | 4.5             |
|                |                    |         |                 |                   |               | 8.5             |
| Ø63            | 12.5               | 10.0    | 45              | 88                | 126           | 8.5             |
|                |                    |         |                 |                   |               | 8.5             |
| Ø80            | 8.5                | 10.0    | 67              | 122               | 160           | 8.5             |
|                |                    |         |                 |                   |               | 8.5             |
| Ø100           | 6.5                | 10.0    | 88              | 162               | 200           | 8.5             |
|                |                    |         |                 |                   |               | 8.5             |
| Ø125           | 4.5                | 10.0    | 127             | 212               | 250           | 8.5             |
|                |                    |         |                 |                   |               | 8.5             |
| Ø160           | 4.0                | 10.0    | 143             | 282               | 320           | 8.5             |
|                |                    |         |                 |                   |               | 8.5             |
| Ø200           | 2.5                | 10.0    | 229             | 362               | 400           | 8.5             |
|                |                    |         |                 |                   |               | 8.5             |
| Ø250           | 2.4                | 10.0    | 239             | 462               | 500           | 8.5             |
|                |                    |         |                 |                   |               | 8.5             |

Straight ramping



Helical ramping



**BNGX 06**

(unit: mm)

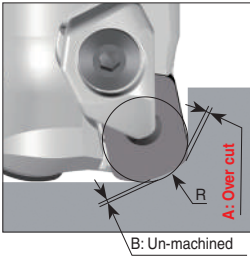
| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. |
| Ø16             | 0.5                | 1.0     | 115             | 25.6              |                | 0.2             |
|                 |                    |         |                 |                   | 32             | 0.4             |
| Ø20             | 0.5                | 1.0     | 115             | 33.4              |                | 0.3             |
|                 |                    |         |                 |                   | 40             | 0.5             |
| Ø25             | 0.4                | 1.0     | 144             | 43.4              |                | 0.4             |
|                 |                    |         |                 |                   | 50             | 0.5             |
| Ø32             | 0.3                | 1.0     | 191             | 57.3              |                | 0.4             |
|                 |                    |         |                 |                   | 64             | 0.6             |

**BNGX 09**

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø25            | 1.2                | 1.5     | 55              | 39                |               | 0.9             |
|                |                    |         |                 |                   | 50            | 1.1             |
| Ø32            | 0.6                | 1.5     | 132             | 53                |               | 0.6             |
|                |                    |         |                 |                   | 64            | 0.7             |
| Ø40            | 0.6                | 1.5     | 143             | 69                |               | 0.7             |
|                |                    |         |                 |                   | 80            | 0.8             |
| Ø50            | 0.5                | 1.5     | 156             | 89                |               | 0.9             |
|                |                    |         |                 |                   | 100           | 1.0             |

**Programming technical data**

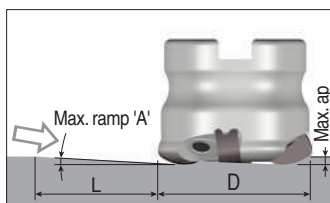


|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| BNGX 06 | 1.5          | 0.00          | 0.60             |
|         | 2.0          | 0.00          | 0.42             |
|         | 2.5          | 0.10          | 0.27             |
| BNGX 09 | 3.0          | 0.00          | 0.61             |
|         | 3.4          | 0.00          | 0.46             |
|         | 3.5          | 0.01          | 0.43             |
|         | 4.0          | 0.12          | 0.26             |

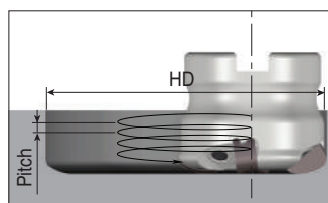
**Recommended program 'R'**

# Ramping Data

Straight ramping



Helical ramping

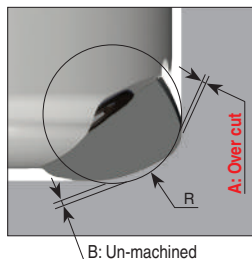


## BNGX 12

(unit: mm)

| Cutter dia.(D) | Straight ramp down |         |                 | Helical ramp down |               |                 |
|----------------|--------------------|---------|-----------------|-------------------|---------------|-----------------|
|                | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia.(HD)     | Max. dia.(HD) | Max. pitch/rev. |
| Ø50            | 0.6                | 2.5     | 239             | 84                |               | 1.1             |
|                |                    |         |                 |                   | 100           | 1.0             |
| Ø63            | 0.5                | 2.5     | 287             | 110               |               | 1.1             |
|                |                    |         |                 |                   | 126           | 1.1             |
| Ø80            | 0.4                | 2.5     | 318             | 144               |               | 1.3             |
|                |                    |         |                 |                   | 160           | 1.3             |

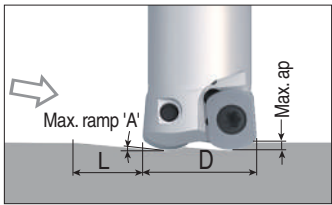
## Programming technical data



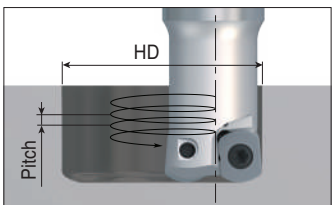
|         | R<br>Program | A<br>Over cut | B<br>Un-machined |
|---------|--------------|---------------|------------------|
| BNGX 12 | 4.0          | 0.00          | 1.18             |
|         | 4.5          | 0.00          | 1.00             |
|         | 5.0          | 0.03          | 0.84             |

**Yellow background:** Recommended program 'R'

Straight ramping



Helical ramping

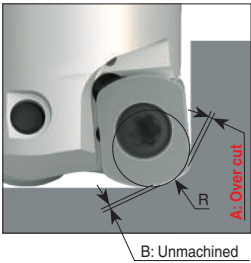


## BNGT 06

(unit: mm)

| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. |
| Ø16             | 0.4                | 1.0     | 143.3           | 26.4              |                | 0.23            |
|                 |                    |         |                 |                   | 32             | 0.35            |
| Ø20             | 0.4                | 1.0     | 143.3           | 34.0              |                | 0.31            |
|                 |                    |         |                 |                   | 40             | 0.44            |
| Ø25             | 0.5                | 1.0     | 114.6           | 44.0              |                | 0.52            |
|                 |                    |         |                 |                   | 50             | 0.68            |
| Ø32             | 0.5                | 1.0     | 114.6           | 58.0              |                | 0.71            |
|                 |                    |         |                 |                   | 64             | 0.88            |
|                 |                    |         |                 |                   |                |                 |
|                 |                    |         |                 |                   |                |                 |
|                 |                    |         |                 |                   |                |                 |
|                 |                    |         |                 |                   |                |                 |

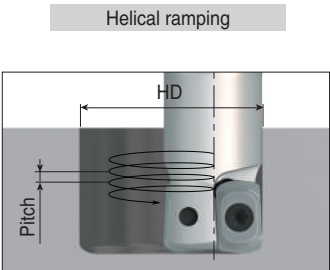
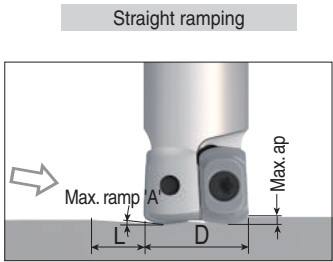
## Programming technical data



|                   | R<br>Program | A<br>Over cut | B<br>Un-machined |
|-------------------|--------------|---------------|------------------|
| BNGT 06<br>(D16)  | 1.7          | 0.00          | 0.419            |
|                   | 1.8          | 0.00          | 0.384            |
|                   | 1.9          | 0.001         | 0.349            |
|                   | 2.0          | 0.011         | 0.314            |
| BNGT 06<br>(D20-) | 1.9          | 0.00          | 0.431            |
|                   | 2.0          | 0.00          | 0.396            |
|                   | 2.1          | 0.007         | 0.360            |

Yellow background: Recommended program 'R'

# Ramping Data

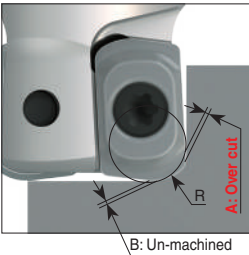


## BCGT 04

(unit: mm)

| Cutter dia. (D) | Straight ramp down |         |                 | Helical ramp down |                |                 |
|-----------------|--------------------|---------|-----------------|-------------------|----------------|-----------------|
|                 | Max. ramp (A°)     | Max. ap | Min. length (L) | Min. dia. (HD)    | Max. dia. (HD) | Max. pitch/rev. |
| Ø10             | 1.5                | 0.5     | 19.1            | 17.7              |                | 0.50            |
|                 |                    |         |                 |                   | 20             | 0.50            |
| Ø12             | 3.0                | 0.5     | 9.5             | 21.7              |                | 0.50            |
|                 |                    |         |                 |                   | 24             | 0.50            |
| Ø16             | 0.8                | 0.5     | 33.7            | 29.5              |                | 0.50            |
|                 |                    |         |                 |                   | 32             | 0.50            |
| Ø20             | 0.6                | 0.5     | 44.1            | 37.5              |                | 0.50            |
|                 |                    |         |                 |                   | 40             | 0.50            |
| Ø25             | 0.5                | 0.5     | 57.3            | 47.5              |                | 0.50            |
|                 |                    |         |                 |                   | 50             | 0.50            |
| Ø32             | 0.4                | 0.5     | 71.7            | 61.5              |                | 0.50            |
|                 |                    |         |                 |                   | 64             | 0.50            |
| Ø40             | 0.36               | 0.5     | 95.5            | 77.5              |                | 0.50            |
|                 |                    |         |                 |                   | 80             | 0.50            |

## Programming technical data



|                   | R<br>Program | A<br>Over cut | B<br>Un-machined |
|-------------------|--------------|---------------|------------------|
| BCGT 04<br>(-D12) | 1.0          | 0.00          | 0.158            |
|                   | 1.1          | 0.00          | 0.124            |
|                   | 1.2          | 0.018         | 0.091            |
| BCGT 04<br>(D16-) | 1.0          | 0.00          | 0.186            |
|                   | 1.1          | 0.00          | 0.152            |
|                   | 1.2          | 0.009         | 0.118            |

Yellow background: Recommended program 'R'





# SOLID END MILLS

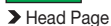




## MAXI-RUSH Line

[illegible]

## Guide to Icons



## Solid End Mill Line

[illegible]

# Tool Selection Guide



## Modular solid carbide end mill heads

|                     | MXDM                                                                              | MXEE-03                                                                           | MXEE(D)-04                                                                        | MXEE-03                                                                           | MXEE-I04                                                                          | MXES-R                                                                             |
|---------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Series              |  |  |  |  |  |  |
| Type                | Flat                                                                              | Flat                                                                              | Corner R                                                                          | Corner R                                                                          | Corner R/Ch                                                                       | Flat                                                                               |
| Flute               |  |  |  |  |  |  |
| Grades              | TT5523                                                                            | TT5523                                                                            | TT5523                                                                            | TT5523                                                                            | TT5523                                                                            | TT5523                                                                             |
| Material            |  |  |  |  |  |  |
| Diameter range (mm) | Ø10-Ø20                                                                           | Ø8-Ø12                                                                            | Ø5-Ø20                                                                            | Ø7.7-Ø19.7                                                                        | Ø8-Ø25                                                                            | Ø8-Ø25                                                                             |
| Pages               | F17                                                                               | F17                                                                               | F18                                                                               | F20                                                                               | F20                                                                               | F21                                                                                |

|                     | MXEE-R                                                                              | MXEE-R-1.5D                                                                         | MXEE-C04                                                                            | MXEE-A02                                                                            | MXEE-A03                                                                            | MXEE-RA03                                                                            |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Series              |   |   |   |   |   |   |
| Type                | Corner Ch                                                                           | Corner Ch                                                                           | Corner Ch                                                                           | Corner R                                                                            | Corner R                                                                            | Flat                                                                                 |
| Flute               |  |  |  |  |  |  |
| Grades              | TT5523                                                                              | TT5523                                                                              | TT5523                                                                              | UF10/TTA101                                                                         | UF10/TTA101                                                                         | UF10                                                                                 |
| Material            |  |  |  |  |  |  |
| Diameter range (mm) | Ø8-Ø25                                                                              | Ø8-Ø20                                                                              | Ø8-Ø25                                                                              | Ø10-Ø12                                                                             | Ø8-Ø20                                                                              | Ø8-Ø20                                                                               |
| Pages               | F22                                                                                 | F22                                                                                 | F23                                                                                 | F23                                                                                 | F24                                                                                 | F24                                                                                  |

● Recommended, ○ Suitable

# Tool Selection Guide



## Modular solid carbide end mill heads

|                     | MXCRF                                                                                                                                                | MXEE(D)-06                                                                        | MXED-08/10                                                                        | MXED-107/109-1.5D                                                                 | MXRB-02                                                                           | MXRD-06                                                                            |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---|--|--|--|--|---|--|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|--|---|---|---|--|---|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|--|---|---|---|--|---|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|--|---|---|---|--|---|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|--|---|---|---|--|---|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|--|---|---|---|--|---|
| Series              |                                                                     |  |  |  |  |  |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| Type                | Corner R                                                                                                                                             | Corner R                                                                          | Corner R                                                                          | Corner R                                                                          | Radius                                                                            | Radius                                                                             |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| Flute               |                                                                     |  |  |  |  |   |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| Grades              | TC3030                                                                                                                                               | TT5523                                                                            | TT5523                                                                            | TT5523                                                                            | TT5523                                                                            | TT5523                                                                             |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| Material            | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td></td><td></td><td></td><td></td><td>●</td><td></td></tr></table> | P                                                                                 | M                                                                                 | K                                                                                 | N                                                                                 | S                                                                                  | H |  |  |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td></td><td>●</td><td>○</td><td>●</td><td></td><td>●</td></tr></table> | P | M | K | N | S | H |  | ● | ○ | ● |  | ● | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td></td><td>●</td><td>○</td><td>●</td><td></td><td>○</td></tr></table> | P | M | K | N | S | H |  | ● | ○ | ● |  | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td></td><td>●</td><td>○</td><td>●</td><td></td><td>○</td></tr></table> | P | M | K | N | S | H |  | ● | ○ | ● |  | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td></td><td>●</td><td>○</td><td>●</td><td></td><td>○</td></tr></table> | P | M | K | N | S | H |  | ● | ○ | ● |  | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td></td><td>●</td><td>○</td><td>●</td><td></td><td>○</td></tr></table> | P | M | K | N | S | H |  | ● | ○ | ● |  | ○ |
| P                   | M                                                                                                                                                    | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
|                     |                                                                                                                                                      |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| P                   | M                                                                                                                                                    | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
|                     | ●                                                                                                                                                    | ○                                                                                 | ●                                                                                 |                                                                                   | ●                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| P                   | M                                                                                                                                                    | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
|                     | ●                                                                                                                                                    | ○                                                                                 | ●                                                                                 |                                                                                   | ○                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| P                   | M                                                                                                                                                    | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
|                     | ●                                                                                                                                                    | ○                                                                                 | ●                                                                                 |                                                                                   | ○                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| P                   | M                                                                                                                                                    | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
|                     | ●                                                                                                                                                    | ○                                                                                 | ●                                                                                 |                                                                                   | ○                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| P                   | M                                                                                                                                                    | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
|                     | ●                                                                                                                                                    | ○                                                                                 | ●                                                                                 |                                                                                   | ○                                                                                 |                                                                                    |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| Diameter range (mm) | Ø10-Ø16                                                                                                                                              | Ø8-Ø12                                                                            | Ø16-Ø25                                                                           | Ø10-Ø20                                                                           | Ø20                                                                               | Ø8-Ø16                                                                             |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |
| Pages               | F25                                                                                                                                                  | F25                                                                               | F26                                                                               | F26                                                                               | F27                                                                               | F27                                                                                |   |  |  |  |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |                                                                                                                                                         |   |   |   |   |   |   |  |   |   |   |  |   |

|                     | MXFX-02                                                                                                                                                 | MXFX-04/06                                                                          | MXBD-BG-02                                                                          | MXBD(E)-BG-04                                                                       | MXBE-BH-04                                                                          | MXBB-SG-02                                                                          |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|---|---|---|--|---|--|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|--|---|--|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|--|---|--|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|--|---|--|-------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|--|---|--|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|--|---|--|
| Series              |                                                                       |   |   |   |   |  |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| Type                | High Feed                                                                                                                                               | High Feed                                                                           | Ball                                                                                | Ball                                                                                | Ball                                                                                | Ball (Spherical)                                                                    |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| Flute               |                                                                      |  |  |  |  |  |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| Grades              | TT5523                                                                                                                                                  | TT5513/TT5523                                                                       | TT5523                                                                              | TT5523                                                                              | TT5513                                                                              | TT5523                                                                              |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| Material            | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td></td><td>○</td><td></td></tr></table> | P                                                                                   | M                                                                                   | K                                                                                   | N                                                                                   | S                                                                                   | H | ● | ○ | ● |  | ○ |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td></td><td>○</td><td></td></tr></table> | P | M | K | N | S | H | ● | ○ | ● |  | ○ |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td></td><td>○</td><td></td></tr></table> | P | M | K | N | S | H | ● | ○ | ● |  | ○ |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td></td><td>○</td><td></td></tr></table> | P | M | K | N | S | H | ● | ○ | ● |  | ○ |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td></td><td>●</td><td></td><td></td><td></td></tr></table> | P | M | K | N | S | H | ● |  | ● |  |  |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td></td><td>○</td><td></td></tr></table> | P | M | K | N | S | H | ● | ○ | ● |  | ○ |  |
| P                   | M                                                                                                                                                       | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| ●                   | ○                                                                                                                                                       | ●                                                                                   |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| P                   | M                                                                                                                                                       | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| ●                   | ○                                                                                                                                                       | ●                                                                                   |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| P                   | M                                                                                                                                                       | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| ●                   | ○                                                                                                                                                       | ●                                                                                   |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| P                   | M                                                                                                                                                       | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| ●                   | ○                                                                                                                                                       | ●                                                                                   |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| P                   | M                                                                                                                                                       | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| ●                   |                                                                                                                                                         | ●                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| P                   | M                                                                                                                                                       | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| ●                   | ○                                                                                                                                                       | ●                                                                                   |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| Diameter range (mm) | Ø10-Ø20                                                                                                                                                 | Ø8-Ø25                                                                              | Ø8-Ø16                                                                              | Ø5-Ø25                                                                              | Ø8-Ø20                                                                              | Ø8-Ø25                                                                              |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |
| Pages               | F28                                                                                                                                                     | F28                                                                                 | F29                                                                                 | F29                                                                                 | F30                                                                                 | F30                                                                                 |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                         |   |   |   |   |   |   |   |   |   |  |   |  |

● Recommended, ○ Suitable

# Tool Selection Guide



## Modular solid carbide end mill heads

|                     | MXBE-BGA02  | MXCP-02     | MXCA-04/06  | MXCW-02     | MXCR-02     | MXCS-04     |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Series              |             |             |             |             |             |             |
| Type                | Ball        | Chamfer     | Chamfer     | Chamfer     | Concave     | Chamfer     |
| Flute               |             |             |             |             |             |             |
| Grades              | UF10/TTA101 | TT5523      | TT5523      | TT5523      | TT5523      | TT5523      |
| Material            | P M K N S H | P M K N S H | P M K N S H | P M K N S H | P M K N S H | P M K N S H |
| Diameter range (mm) | Ø8-Ø20      | Ø8-Ø16.5    | Ø10-Ø20     | Ø9.8-Ø15.7  | Ø8-Ø20      | Ø7.7        |
| Pages               | F31         | F32         | F33         | F33         | F34         | F35         |

|                     | MXDP-02      | MXGC-02        | MXDS-02         | MXEG-01     | MXDG-04     | MXCSL       |
|---------------------|--------------|----------------|-----------------|-------------|-------------|-------------|
| Series              |              |                |                 |             |             |             |
| Type                | Center Drill | Counter Boring | Drill & Chamfer | Engraving   | Grooving    | Lens Shape  |
| Flute               |              |                |                 |             |             |             |
| Grades              | TT5523       | TT5523         | TT5523          | TT5523      | TT5523      | TT5523      |
| Material            | P M K N S H  | P M K N S H    | P M K N S H     | P M K N S H | P M K N S H | P M K N S H |
| Diameter range (mm) | Ø1.07-Ø6.46  | Ø8-Ø16         | Ø6-Ø16          | Ø6-Ø8       | Ø15.5-Ø24.5 | Ø8-Ø16      |
| Pages               | F35          | F36            | F36             | F37         | F37         | F38         |

● Recommended, O Suitable

# Tool Selection Guide



## Modular solid carbide end mill heads

| Series              | MXCS0                                                                                                                                                     | MXFM-I06                                                                          | TTRD-A60                                                                          | TTRD-W55                                                                          | TDT-06                                                                             |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
|                     |                                                                          |  |  |  |  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Type                | Oval Shape                                                                                                                                                | Milling                                                                           | Thread                                                                            | Thread                                                                            | Dovetail                                                                           |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Flute               |                                                                          |  |  |  |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Grades              | TT5523                                                                                                                                                    | TT5523                                                                            | TT5543                                                                            | TT5543                                                                            | TT5523                                                                             |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Material            | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td>○</td><td>○</td><td>○</td></tr></table> | P                                                                                 | M                                                                                 | K                                                                                 | N                                                                                  | S | H | ● | ○ | ● | ○ | ○ | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td>○</td><td>○</td><td>○</td></tr></table> | P | M | K | N | S | H | ● | ○ | ● | ○ | ○ | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table> | P | M | K | N | S | H | ● | ○ | ○ | ○ | ○ | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table> | P | M | K | N | S | H | ● | ○ | ○ | ○ | ○ | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table> | P | M | K | N | S | H | ● | ○ | ○ | ○ | ○ | ○ |
| P                   | M                                                                                                                                                         | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ●                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| P                   | M                                                                                                                                                         | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ●                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| P                   | M                                                                                                                                                         | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ○                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| P                   | M                                                                                                                                                         | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ○                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| P                   | M                                                                                                                                                         | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ○                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Diameter range (mm) | Ø8-Ø16                                                                                                                                                    | Ø10-Ø25                                                                           | Ø15.7-Ø21.7                                                                       | Ø21.7                                                                             | Ø27.7                                                                              |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Pages               | F38                                                                                                                                                       | F39                                                                               | F40                                                                               | F40                                                                               | F41                                                                                |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |

## Modular solid carbide slotting heads

| Series              | TST-3                                                                                                                                                     | TST-4/6                                                                             | TST-A45                                                                             | TTB-04                                                                              | TTB-06                                                                              |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
|                     |                                                                         |   |   |   |  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Type                | Slot                                                                                                                                                      | Slot                                                                                | Slot Chamfer                                                                        | Slot                                                                                | Slot                                                                                |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Flute               |                                                                        |  |  |  |  |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Grades              | TT5543                                                                                                                                                    | TT5523/TT5543                                                                       | TT5523/TT5543                                                                       | TT5523                                                                              | TT5523/TT5543                                                                       |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Material            | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table> | P                                                                                   | M                                                                                   | K                                                                                   | N                                                                                   | S | H | ● | ○ | ○ | ○ | ○ | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td>○</td><td>○</td><td>○</td></tr></table> | P | M | K | N | S | H | ● | ○ | ● | ○ | ○ | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>●</td><td>○</td><td>○</td><td>○</td></tr></table> | P | M | K | N | S | H | ● | ○ | ● | ○ | ○ | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table> | P | M | K | N | S | H | ● | ○ | ○ | ○ | ○ | ○ | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table> | P | M | K | N | S | H | ● | ○ | ○ | ○ | ○ | ○ |
| P                   | M                                                                                                                                                         | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ○                                                                                   | ○                                                                                   | ○                                                                                   | ○                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| P                   | M                                                                                                                                                         | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ●                                                                                   | ○                                                                                   | ○                                                                                   | ○                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| P                   | M                                                                                                                                                         | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ●                                                                                   | ○                                                                                   | ○                                                                                   | ○                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| P                   | M                                                                                                                                                         | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ○                                                                                   | ○                                                                                   | ○                                                                                   | ○                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| P                   | M                                                                                                                                                         | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| ●                   | ○                                                                                                                                                         | ○                                                                                   | ○                                                                                   | ○                                                                                   | ○                                                                                   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Diameter range (mm) | Ø15.7-Ø17.7                                                                                                                                               | Ø21.7-Ø27.7                                                                         | Ø17.7-Ø27.7                                                                         | Ø7.7                                                                                | Ø10.5-Ø25                                                                           |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Width of cut (mm)   | CW 1.5-3.17                                                                                                                                               | CW 0.76-10                                                                          | CW 3.4-9.8                                                                          | CW 1-2                                                                              | CW 1.58-8                                                                           |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |
| Pages               | F42                                                                                                                                                       | F43                                                                                 | F44                                                                                 | F44                                                                                 | F45                                                                                 |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |                                                                                                                                                           |   |   |   |   |   |   |   |   |   |   |   |   |

● Recommended, ○ Suitable



# Tool Selection Guide



## Holders for MAXI-RUSH head

|                  | <u>MXSSD</u>                                                                      | <u>MXSSD-S</u>                                                                    | <u>MXSSD-C</u>                                                                    | <u>MXSSD-W</u>                                                                    | <u>MXTSD-S</u>                                                                     |
|------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Series           |  |  |  |  |  |
| Shank Type       | Short                                                                             | Step neck                                                                         | Step neck                                                                         | Step neck                                                                         | Taper neck                                                                         |
| Shank material   | Steel/Carbide                                                                     | Steel                                                                             | Carbide                                                                           | Tungsten                                                                          | Steel                                                                              |
| Internal coolant | X                                                                                 | ●/X                                                                               | ●/X                                                                               | ●/X                                                                               | X                                                                                  |
| Connection size  | S04-S15                                                                           | S05-S15                                                                           | S05-S15                                                                           | S05-S12                                                                           | S04-S15                                                                            |
| Shank range (mm) | Ø6-Ø32                                                                            | Ø8-Ø25                                                                            | Ø8-Ø25                                                                            | Ø8-Ø20                                                                            | Ø8-Ø32                                                                             |
| Pages            | F46                                                                               | F47                                                                               | F48                                                                               | F49                                                                               | F50                                                                                |

|                  | <u>MXTSD-C</u>                                                                     | <u>MXTSD-W-A</u>                                                                   | <u>MXSTD-S</u>                                                                     | <u>MXSC-C</u>                                                                      |  |
|------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--|
| Series           |  |  |  |  |  |
| Shank Type       | Taper neck                                                                         | Taper neck                                                                         | Straight                                                                           | Straight                                                                           |  |
| Shank material   | Carbide                                                                            | Tungsten                                                                           | Steel                                                                              | Carbide                                                                            |  |
| Internal coolant | X                                                                                  | ●                                                                                  | X                                                                                  | ●/X                                                                                |  |
| Connection size  | S05-S15                                                                            | S06                                                                                | S04-S10                                                                            | S06, S08                                                                           |  |
| Shank range (mm) | Ø12-Ø32                                                                            | Ø12-Ø16                                                                            | Ø6-Ø16                                                                             | Ø10-Ø12                                                                            |  |
| Pages            | F51                                                                                | F52                                                                                | F53                                                                                | F53                                                                                |  |

# Tool Selection Guide



Adaptor for MAXI-RUSH head

| Series           | MXAD-M                                                                            | MXER                                                                              |  |  |  |  |
|------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--|--|--|--|
|                  |  |  |  |  |  |  |
| Shank Type       | T-FLEXTEC                                                                         | ER Collet                                                                         |  |  |  |  |
| Shank material   | Steel                                                                             | Steel                                                                             |  |  |  |  |
| Internal coolant | X                                                                                 | X                                                                                 |  |  |  |  |
| Connection size  | S08                                                                               | S04-S08                                                                           |  |  |  |  |
| Shank range (mm) | M8 - M12                                                                          | ER11 - ER25                                                                       |  |  |  |  |
| Pages            | F54                                                                               | F55                                                                               |  |  |  |  |

## Solid end mill

| Series | APEX MILL                                                                          |  |  |  |  |     |                                                                                     |  |  |  |  |     |                                                                                     |  |  |  |  |     |                                                                                     |  |  |  |  |     |                                                                                     |  |  |  |  |     |                                                                                     |  |  |  |  |     |                                                                                      |  |  |  |  |  |
|--------|------------------------------------------------------------------------------------|--|--|--|--|-----|-------------------------------------------------------------------------------------|--|--|--|--|-----|-------------------------------------------------------------------------------------|--|--|--|--|-----|-------------------------------------------------------------------------------------|--|--|--|--|-----|-------------------------------------------------------------------------------------|--|--|--|--|-----|-------------------------------------------------------------------------------------|--|--|--|--|-----|--------------------------------------------------------------------------------------|--|--|--|--|--|
|        | SCSO                                                                               |  |  |  |  |     | SCST                                                                                |  |  |  |  |     | HTB 2.../3...                                                                       |  |  |  |  |     | HCEM 5                                                                              |  |  |  |  |     | HFM 2                                                                               |  |  |  |  |     | HFM 4                                                                               |  |  |  |  |     |                                                                                      |  |  |  |  |  |
|        |  |  |  |  |  |     |   |  |  |  |  |     |   |  |  |  |  |     |   |  |  |  |  |     |   |  |  |  |  |     |  |  |  |  |  |     |                                                                                      |  |  |  |  |  |
|        | Type                                                                               |  |  |  |  |     | Oval Shape                                                                          |  |  |  |  |     | Oval Shape                                                                          |  |  |  |  |     | Taper Ball                                                                          |  |  |  |  |     | Chamfer 45°                                                                         |  |  |  |  |     | High Feed                                                                           |  |  |  |  |     | High Feed                                                                            |  |  |  |  |  |
|        | Flute                                                                              |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |  |
|        | Length                                                                             |  |  |  |  |     | Medium                                                                              |  |  |  |  |     | Medium                                                                              |  |  |  |  |     | Medium                                                                              |  |  |  |  |     | Medium                                                                              |  |  |  |  |     | Medium                                                                              |  |  |  |  |     | Medium                                                                               |  |  |  |  |  |
|        | Grades                                                                             |  |  |  |  |     | TT5515                                                                              |  |  |  |  |     | TT5515                                                                              |  |  |  |  |     | TT5515                                                                              |  |  |  |  |     | TT5525                                                                              |  |  |  |  |     | TT5515                                                                              |  |  |  |  |     | TT5515                                                                               |  |  |  |  |  |
|        | Application                                                                        |  |  |  |  |     | Finishing                                                                           |  |  |  |  |     | Finishing                                                                           |  |  |  |  |     | General                                                                             |  |  |  |  |     | General                                                                             |  |  |  |  |     | * H.F.M                                                                             |  |  |  |  |     | * H.F.M                                                                              |  |  |  |  |  |
|        | Material                                                                           |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |     |  |  |  |  |  |  |
|        | Range                                                                              |  |  |  |  |     | Ø8-Ø12                                                                              |  |  |  |  |     | Ø8-Ø12                                                                              |  |  |  |  |     | Ø3-Ø8                                                                               |  |  |  |  |     | Ø8-Ø16                                                                              |  |  |  |  |     | Ø4-Ø12                                                                              |  |  |  |  |     | Ø6-Ø12                                                                               |  |  |  |  |  |
| Pages  |                                                                                    |  |  |  |  | F66 |                                                                                     |  |  |  |  | F66 |                                                                                     |  |  |  |  | F67 |                                                                                     |  |  |  |  | F67 |                                                                                     |  |  |  |  | F68 |                                                                                     |  |  |  |  | F68 |                                                                                      |  |  |  |  |  |

● Recommended, ○ Suitable

# Tool Selection Guide

## Solid end mill

| Series      | APEX MILL                                                                                                                                               |                                                                                   | STAR MILL                                                                         |                                                                                   |                                                                                   |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
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|             | CFM 4...M                                                                                                                                               | FSM 4...M                                                                         | SBT 3...U                                                                         | SBT 4...U                                                                         | SED 4                                                                             |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
|             |                                                                        |  |  |  |  |  |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| Type        | Corner Chamfer                                                                                                                                          | Corner Chamfer                                                                    | Ball                                                                              | Ball                                                                              | Flat                                                                              | Flat                                                                              |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| Flute       |                                                                        |  |  |  |  |  |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| Length      | Medium                                                                                                                                                  | Medium                                                                            | Medium                                                                            | Medium                                                                            | Medium                                                                            | Long                                                                              |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| Grades      | TT5525                                                                                                                                                  | TT5525                                                                            | TT5515                                                                            | TT5515                                                                            | TT5515                                                                            | TT5515                                                                            |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| Application | General                                                                                                                                                 | Roughing + Finishing                                                              | Difficult-to-cut                                                                  | Difficult-to-cut                                                                  | Difficult-to-cut                                                                  | Difficult-to-cut                                                                  |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| Material    | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td>●</td><td>○</td><td></td><td>●</td><td></td></tr></table> | P                                                                                 | M                                                                                 | K                                                                                 | N                                                                                 | S                                                                                 | H | ● | ● | ○ |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>●</td><td></td><td>○</td><td></td><td></td><td></td></tr></table> | P | M | K | N | S | H | ● |  | ○ |  |  |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H | ○ | ● |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H | ○ | ● |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H | ○ | ● |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H | ○ | ● |  |  | ● |  |
| P           | M                                                                                                                                                       | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| ●           | ●                                                                                                                                                       | ○                                                                                 |                                                                                   | ●                                                                                 |                                                                                   |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| P           | M                                                                                                                                                       | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| ●           |                                                                                                                                                         | ○                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| P           | M                                                                                                                                                       | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| ○           | ●                                                                                                                                                       |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| P           | M                                                                                                                                                       | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| ○           | ●                                                                                                                                                       |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| P           | M                                                                                                                                                       | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| ○           | ●                                                                                                                                                       |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| P           | M                                                                                                                                                       | K                                                                                 | N                                                                                 | S                                                                                 | H                                                                                 |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| ○           | ●                                                                                                                                                       |                                                                                   |                                                                                   | ●                                                                                 |                                                                                   |                                                                                   |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| Range       | Ø4-Ø25                                                                                                                                                  | Ø6-Ø25                                                                            | Ø4-Ø12                                                                            | Ø4-Ø12                                                                            | Ø3-Ø20                                                                            | Ø3-Ø12                                                                            |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |
| Pages       | F69                                                                                                                                                     | F69                                                                               | F70                                                                               | F70                                                                               | F71                                                                               | F72                                                                               |   |   |   |   |  |   |  |                                                                                                                                                       |   |   |   |   |   |   |   |  |   |  |  |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |

| Series      | STAR MILL                                                                                                                                              |                                                                                     |                                                                                     |                                                                                     | ALUMILL                                                                             |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|---|---|--|--|---|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|--|--|---|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|--|--|---|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|--|--|---|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|--|--|---|--|------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|--|--|--|--|---|--|
|             | SED 4                                                                                                                                                  |                                                                                     | SED 7                                                                               |                                                                                     | SER                                                                                 | AWE 3                                                                               |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
|             | SED 4...-R                                                                                                                                             | SED 4...-C                                                                          | SED 7                                                                               | SED 7...N                                                                           |                                                                                     |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
|             |                                                                      |   |   |   |   |  |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| Type        | Corner R                                                                                                                                               | Corner Chamfer                                                                      | Flat                                                                                | Flat                                                                                | Corner R                                                                            | Wave Flat                                                                           |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| Flute       |                                                                     |  |  |  |  |  |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| Length      | Medium                                                                                                                                                 | Medium                                                                              | Medium                                                                              | Medium                                                                              | Medium                                                                              | Medium                                                                              |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| Grades      | TT5515                                                                                                                                                 | TT5515                                                                              | TT5515                                                                              | TT5515                                                                              | TT5525                                                                              | UF10                                                                                |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| Application | Difficult-to-cut                                                                                                                                       | Difficult-to-cut                                                                    | Difficult-to-cut                                                                    | Difficult-to-cut                                                                    | Difficult-to-cut                                                                    | Aluminum                                                                            |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| Material    | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P                                                                                   | M                                                                                   | K                                                                                   | N                                                                                   | S                                                                                   | H | ○ | ● |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H | ○ | ● |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H | ○ | ● |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H | ○ | ● |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td>○</td><td>●</td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H | ○ | ● |  |  | ● |  | <table><tr><td>P</td><td>M</td><td>K</td><td>N</td><td>S</td><td>H</td></tr><tr><td></td><td></td><td></td><td></td><td>●</td><td></td></tr></table> | P | M | K | N | S | H |  |  |  |  | ● |  |
| P           | M                                                                                                                                                      | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| ○           | ●                                                                                                                                                      |                                                                                     |                                                                                     | ●                                                                                   |                                                                                     |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| P           | M                                                                                                                                                      | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| ○           | ●                                                                                                                                                      |                                                                                     |                                                                                     | ●                                                                                   |                                                                                     |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| P           | M                                                                                                                                                      | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| ○           | ●                                                                                                                                                      |                                                                                     |                                                                                     | ●                                                                                   |                                                                                     |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| P           | M                                                                                                                                                      | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| ○           | ●                                                                                                                                                      |                                                                                     |                                                                                     | ●                                                                                   |                                                                                     |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| P           | M                                                                                                                                                      | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| ○           | ●                                                                                                                                                      |                                                                                     |                                                                                     | ●                                                                                   |                                                                                     |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| P           | M                                                                                                                                                      | K                                                                                   | N                                                                                   | S                                                                                   | H                                                                                   |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
|             |                                                                                                                                                        |                                                                                     |                                                                                     | ●                                                                                   |                                                                                     |                                                                                     |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| Range       | Ø2-Ø16                                                                                                                                                 | Ø4-Ø12                                                                              | Ø6-Ø20                                                                              | Ø6-Ø20                                                                              | Ø3-Ø20                                                                              | Ø6-Ø20                                                                              |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |
| Pages       | F73                                                                                                                                                    | F74                                                                                 | F75                                                                                 | F76                                                                                 | F77                                                                                 | F78                                                                                 |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                        |   |   |   |   |   |   |   |   |  |  |   |  |                                                                                                                                                      |   |   |   |   |   |   |  |  |  |  |   |  |

● Recommended, ○ Suitable

# Tool Selection Guide

## Solid end mill

| Series      | ALUMILL                                                                           |                                                                                   | CERAMICSPEED                                                                      |                                                                                   |                                                                                   |                                                                                    |
|-------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|             | AWE 3...ML                                                                        | AWE 3...ML-R                                                                      | CRF 4                                                                             | CRF 6                                                                             | CRH 4                                                                             | CRFB 6                                                                             |
|             |  |  |  |  |  |  |
| Type        | Wave Flat                                                                         | Wave /Corner R                                                                    | Corner R                                                                          | Corner R                                                                          | High Feed                                                                         | Corner R                                                                           |
| Flute       |  |  |  |  |  |  |
| Length      | Long                                                                              | Long                                                                              | Medium                                                                            | Medium                                                                            | Medium                                                                            | Medium                                                                             |
| Grades      | UF10                                                                              | UF10                                                                              | TC3030                                                                            | TC3030                                                                            | TC3030                                                                            | TC3030                                                                             |
| Application | Aluminum                                                                          | Aluminum                                                                          | *H.S.M                                                                            | *H.S.M                                                                            | *H.F.M                                                                            | *H.S.M                                                                             |
| Material    | P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H           | P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H           | P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H           | P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H           | P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H           | P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H P M K N S H            |
| Range       | Ø6-Ø20                                                                            | Ø6-Ø20                                                                            | Ø6-Ø16                                                                            | Ø6-Ø16                                                                            | Ø6-Ø16                                                                            | Ø6-Ø16                                                                             |
| Pages       | F78                                                                               | F79                                                                               | F80                                                                               | F80                                                                               | F81                                                                               | F81                                                                                |

► \*H.S.M: High Speed Machining

► \*H.F.M: High Feed Machining

● Recommended, ○ Suitable

| Series      | DIAMILL                                                                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
|-------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|             | DMB 2                                                                               | DEB 2                                                                               |                                                                                     | DMR 2                                                                               | DER 3                                                                               |                                                                                      |
|             |   |   |   |   |   |   |
| Type        | Ball                                                                                | Ball                                                                                | Ball                                                                                | Corner R                                                                            | Corner R                                                                            | Corner R                                                                             |
| Flute       |  |  |  |  |  |  |
| Length      | Miniature                                                                           | Short                                                                               | Long                                                                                | Medium                                                                              | Short                                                                               | Long                                                                                 |
| Grades      | TTD620                                                                              | TTD620                                                                              | TTD620                                                                              | TTD620                                                                              | TTD620                                                                              | TTD620                                                                               |
| Application | Graphite                                                                            | Graphite                                                                            | Graphite                                                                            | Graphite                                                                            | Graphite                                                                            | Graphite                                                                             |
| Material    | Graphite                                                                            | Graphite                                                                            | Graphite                                                                            | Graphite                                                                            | Graphite                                                                            | Graphite                                                                             |
| Range       | Ø0.6-Ø2                                                                             | Ø3-Ø12                                                                              | Ø3-Ø12                                                                              | Ø0.6-Ø2                                                                             | Ø3-Ø12                                                                              | Ø4-Ø12                                                                               |
| Pages       | F82                                                                                 | F82                                                                                 | F83                                                                                 | F83                                                                                 | F84                                                                                 | F84                                                                                  |

# Tool Selection Guide

## Solid end mill

| Series      |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|             | RRFE                                                                              | RCFE                                                                              | RCME                                                                              | RCDE                                                                              | RCOM                                                                              |
|             |  |  |  |  |  |
| Type        | Flat                                                                              | Flat                                                                              | Flat                                                                              | Chamfer                                                                           | Flat                                                                              |
| Flute       |  | -                                                                                 | -                                                                                 | -                                                                                 |  |
| Grades      | TTD610                                                                            | TTD610                                                                            | TTD610                                                                            | TTD610                                                                            | TTD610                                                                            |
| Application | Roughing                                                                          | Roughing                                                                          | Medium                                                                            | Drilling + Medium                                                                 | Finishing                                                                         |
| Material    | Composite material                                                                | Composite material                                                                | Composite material                                                                | Composite material                                                                | Composite material                                                                |
| Range       | Ø4-Ø12                                                                            | Ø4-Ø12                                                                            | Ø4-Ø12                                                                            | Ø4-Ø12                                                                            | Ø6-Ø12                                                                            |
| Pages       | F85                                                                               | F85                                                                               | F86                                                                               | F86                                                                               | F87                                                                               |

| Series      |    |  |  |  |  |
|-------------|-------------------------------------------------------------------------------------|--|--|--|--|
|             | RDCF                                                                                |  |  |  |  |
|             |   |  |  |  |  |
| Type        | Flat                                                                                |  |  |  |  |
| Flute       |  |  |  |  |  |
| Grades      | TTD610                                                                              |  |  |  |  |
| Application | Finishing                                                                           |  |  |  |  |
| Material    | Composite material                                                                  |  |  |  |  |
| Range       | Ø4-Ø12                                                                              |  |  |  |  |
| Pages       | F87                                                                                 |  |  |  |  |

# Grades

## MAXI-RUSH grades

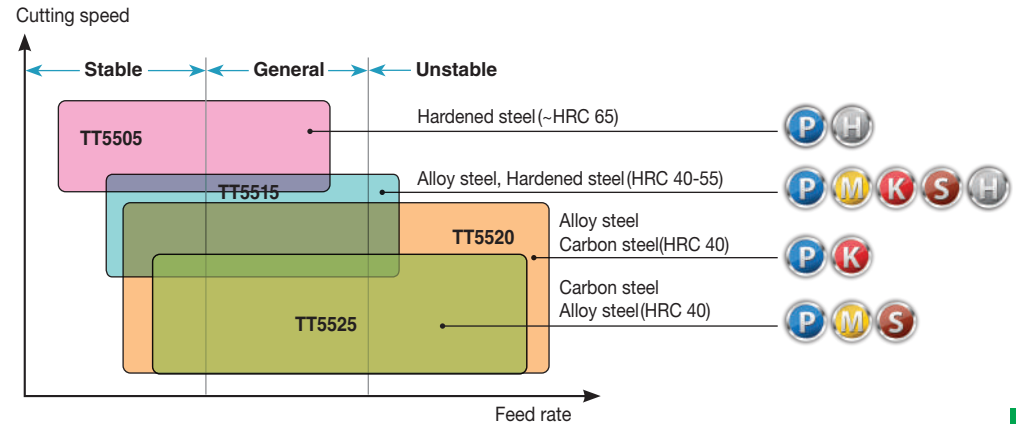
| Grades                      | ISO                                                            | Characteristics & applications                                                                                                                                                                                                                                                                                         |
|-----------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TT5513</b><br>PVD coated | <div>P10 – P30</div> <div>K10 – K30</div>                      | <ul style="list-style-type: none"> <li>•Excellent abrasion resistant with ultra-fine substrate and optimum toughness</li> <li>•Improved anti-chipping and Anti-abrasion PVD AlTiN coated layer</li> <li>•Suitable for mold steels and pre hardened steels</li> </ul>                                                   |
| <b>TT5523</b><br>PVD coated | <div>P20 – P40</div> <div>M20 – M40</div> <div>S20 – S40</div> | <ul style="list-style-type: none"> <li>•High speed milling of steel, stainless steed and high-temp alloy</li> </ul>                                                                                                                                                                                                    |
| <b>TT5543</b><br>PVD coated | <div>P30 – P50</div> <div>M30 – M50</div> <div>S30 – S50</div> | <ul style="list-style-type: none"> <li>•Interrupted and rough machining of steel, stainless steel and high-temp alloy</li> </ul>                                                                                                                                                                                       |
| <b>UF10</b><br>Uncoated     | <div>P25 – P35</div> <div>M25 – M35</div> <div>N25 – N35</div> | <ul style="list-style-type: none"> <li>•General machining of steel, aluminum alloys, non-ferrous materials</li> <li>•Submicron substrate</li> </ul>                                                                                                                                                                    |
| <b>TTA101</b><br>PVD coated | <div>P25 – P35</div> <div>M25 – M35</div> <div>N25 – N35</div> | <ul style="list-style-type: none"> <li>•Thin coating (less than 0.5µm)</li> <li>•Sharp edges even after coating</li> <li>•Low friction coefficient: minimizes built-up edges and promotes smooth chip evacuation</li> <li>•Hard coating (above HV 5000)</li> <li>•Oxidation resistance at high temperatures</li> </ul> |

# Grades

## Solid end mill grades

| Grades                                  | ISO                                                                                                                                 | Characteristics & applications                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TT5505</b><br>PVD coated             | <b>P05</b> – <b>P25</b><br><b>H05</b> – <b>H25</b>                                                                                  | <ul style="list-style-type: none"><li>• High wear and oxidation resistance that delivers exceptional productivity levels</li><li>• Hardened steel, pre-hardened steel (Hardness &lt; 65 HRC)</li><li>• High speed machining</li></ul>                                                                                                          |
| <b>TT5515</b><br>PVD coated             | <b>P10</b> – <b>P30</b><br><b>M15</b> – <b>M30</b><br><b>K10</b> – <b>K30</b><br><b>S10</b> – <b>S30</b><br><b>H10</b> – <b>H30</b> | <ul style="list-style-type: none"><li>• An ultra wear resistant high performance grade covering all ISO ranges</li><li>• Alloy steel, pre-hardened steel, stainless steel, high-temp alloy (45 &lt; HRC &lt; 55)</li><li>• Medium to high speed machining</li></ul>                                                                            |
| <b>TT5520</b><br>PVD coated             | <b>P10</b> – <b>P30</b><br><b>K10</b> – <b>K30</b>                                                                                  | <ul style="list-style-type: none"><li>• Anti-abrasion and chipping resistant PVD coated layer</li><li>• Single direction crystal aligned AlCrN layer<ul style="list-style-type: none"><li>- Excellent abrasion resistance with sub-micron substrate</li><li>- Anti-abrasion and oxidation resistant PVD AlCrN coated layer</li></ul></li></ul> |
| <b>TT5525</b><br>PVD coated             | <b>P20</b> – <b>P40</b><br><b>M20</b> – <b>M40</b><br><b>S20</b> – <b>S40</b>                                                       | <ul style="list-style-type: none"><li>• Optimally balanced with wear resistant and anti-chipping properties</li><li>• General machining of carbon steel, alloy steel, stainless steel, high-temp alloy (&lt; 40 HRC)</li><li>• Low to medium speed machining</li></ul>                                                                         |
| <b>TTD620</b><br>Diamond coated         | <b>Graphite</b>                                                                                                                     | <ul style="list-style-type: none"><li>• High hardness and excellent wear resistance</li><li>• Machining of graphite</li></ul>                                                                                                                                                                                                                  |
| <b>TTD610</b><br>Diamond coated         | <b>Composite material</b>                                                                                                           | <ul style="list-style-type: none"><li>• Advanced nano diamond coating provides longer tool life and stability of machining</li><li>• Excellent abrasive wear resistance (Hardness: more Hv 8000)</li><li>• Machining of composite material</li></ul>                                                                                           |
| <b>UF10N</b><br><b>UF10</b><br>Uncoated | <b>P25</b> – <b>P35</b><br><b>M25</b> – <b>M35</b><br><b>N25</b> – <b>N35</b>                                                       | <ul style="list-style-type: none"><li>• General machining of steel, aluminum alloys, non-ferrous materials</li><li>• Submicron substrate</li></ul>                                                                                                                                                                                             |
| <b>TC3030</b><br>Ceramic                | <b>S25</b> – <b>S35</b>                                                                                                             | <ul style="list-style-type: none"><li>• SiAlON ceramic grade</li><li>• High speed machining of nickel based super alloys</li></ul>                                                                                                                                                                                                             |

## Selection guide for solid end mill grades



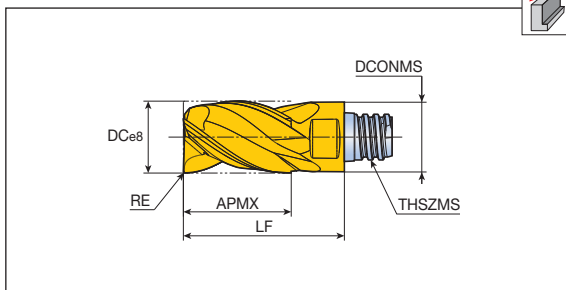
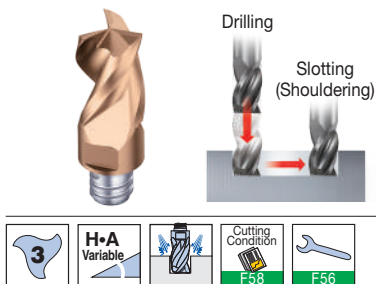


# MAXI-RUSH Line



# MXDM

## 3 flute, drill-mill heads



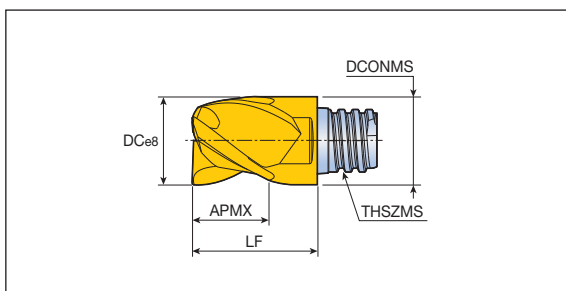
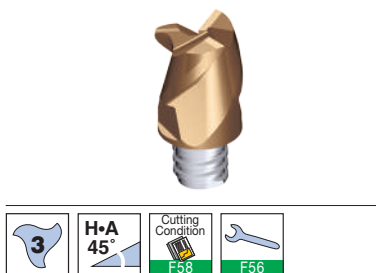
| Designation                 | Feed (mm/tooth) | Dimension (mm) |     |      |      |        |        | Grade |
|-----------------------------|-----------------|----------------|-----|------|------|--------|--------|-------|
|                             |                 | DC             | RE  | APMX | LF   | THSZMS | DCONMS |       |
| <b>MXDM 100L15R02-03S06</b> | 0.025-0.08      | 10             | 0.2 | 15   | 22   | S06    | 9.7    | ●     |
| <b>120L18R02-03S08</b>      | 0.025-0.10      | 12             | 0.2 | 18   | 27   | S08    | 11.7   | ●     |
| <b>160L24R02-03S10</b>      | 0.03-0.12       | 16             | 0.2 | 24   | 33.5 | S10    | 15.3   | ●     |
| <b>200L30R02-03S12</b>      | 0.04-0.16       | 20             | 0.2 | 30   | 41   | S12    | 18.45  | ●     |
|                             |                 |                |     |      |      |        |        |       |

► Wrench should be ordered separately

●: Standard items

# MXEE-03

## 3 flute, for general purpose



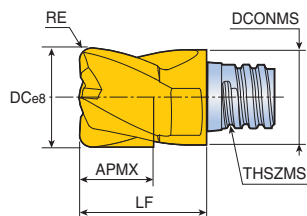
| Designation                 | Feed (mm/tooth) | Dimension (mm) |      |      |        |        | Grade |
|-----------------------------|-----------------|----------------|------|------|--------|--------|-------|
|                             |                 | DC             | APMX | LF   | THSZMS | DCONMS |       |
| <b>MXEE 080L05R00-03S05</b> | 0.03-0.09       | 8              | 5    | 10.0 | S05    | 7.7    | ●     |
| <b>100L07R00-03S06</b>      | 0.03-0.10       | 10             | 7    | 13.0 | S06    | 9.7    | ●     |
| <b>120L09R00-03S08</b>      | 0.04-0.11       | 12             | 9    | 16.5 | S08    | 11.7   | ●     |
|                             |                 |                |      |      |        |        |       |

► Wrench should be ordered separately

●: Standard items

# MXEE(D)-04

4 flute, for general purpose



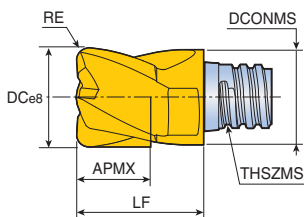
| Designation          | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |      |        |        | Grade<br>TT5523 |
|----------------------|--------------------|----------------|-----|-----|------|------|--------|--------|-----------------|
|                      |                    | DC             | RE  | FHA | APMX | LF   | THSZMS | DCONMS |                 |
| MXEE 050L04R05-04S04 | 0.02-0.06          | 5              | 0.5 | 45  | 4    | 8.5  | S04    | 6.0    | ●               |
| MXEE 050L07R00-04S05 | 0.02-0.06          | 5              | -   | 45  | 7    | 15.0 | S05    | 8.0    | ●               |
| MXEE 060L04R05-04S04 | 0.02-0.04          | 6              | 0.5 | 45  | 4    | 8.5  | S04    | 5.8    | ●               |
| MXEE 060L05R00-04S05 | 0.03-0.04          | 6              | -   | 45  | 5    | 10.0 | S05    | 8.0    | ●               |
| MXED 080L05R05-04S05 | 0.03-0.09          | 8              | 0.5 | 30  | 5    | 10.0 | S05    | 7.7    | ●               |
| MXED 080L05R10-04S05 | 0.03-0.09          | 8              | 1.0 | 30  | 5    | 10.0 | S05    | 7.7    | ●               |
| MXED 080L05R15-04S05 | 0.03-0.09          | 8              | 1.5 | 30  | 5    | 10.0 | S05    | 7.7    | ●               |
| MXED 080L09R05-04S05 | 0.03-0.09          | 8              | 0.5 | 30  | 9    | 15.0 | S05    | 7.7    | ●               |
| MXEE 080L05R00-04S05 | 0.03-0.09          | 8              | -   | 45  | 5    | 10.0 | S05    | 7.7    | ●               |
| MXEE 080L05R05-04S05 | 0.03-0.09          | 8              | 0.5 | 45  | 5    | 10.0 | S05    | 7.7    | ●               |
| MXEE 080L05R10-04S05 | 0.03-0.09          | 8              | 1.0 | 45  | 5    | 10.0 | S05    | 7.7    | ●               |
| MXEE 080L09R00-04S05 | 0.03-0.09          | 8              | -   | 45  | 9    | 15.0 | S05    | 7.7    | ●               |
| MXED 100L07R05-04S06 | 0.03-0.10          | 10             | 0.5 | 30  | 7    | 13.0 | S06    | 9.6    | ●               |
| MXED 100L07R10-04S06 | 0.03-0.10          | 10             | 1.0 | 30  | 7    | 13.0 | S06    | 9.6    | ●               |
| MXEE 100L07R00-04S06 | 0.03-0.10          | 10             | -   | 45  | 7    | 13.0 | S06    | 9.6    | ●               |
| MXEE 100L07R05-04S06 | 0.03-0.10          | 10             | 0.5 | 45  | 7    | 13.0 | S06    | 9.6    | ●               |
| MXEE 100L07R10-04S06 | 0.03-0.10          | 10             | 1.0 | 45  | 7    | 13.0 | S06    | 9.6    | ●               |
| MXEE 100L12R00-04S06 | 0.03-0.10          | 10             | -   | 45  | 12   | 19.0 | S06    | 9.6    | ●               |
| MXED 120L09R05-04S08 | 0.04-0.11          | 12             | 0.5 | 30  | 9    | 16.5 | S08    | 11.7   | ●               |
| MXED 120L09R10-04S08 | 0.04-0.11          | 12             | 1.0 | 30  | 9    | 16.5 | S08    | 11.7   | ●               |
| MXEE 120L09R00-04S08 | 0.04-0.11          | 12             | -   | 45  | 9    | 16.5 | S08    | 11.7   | ●               |
| MXEE 120L09R05-04S08 | 0.04-0.11          | 12             | 0.5 | 45  | 9    | 16.5 | S08    | 11.7   | ●               |
| MXEE 120L09R10-04S08 | 0.04-0.11          | 12             | 1.0 | 45  | 9    | 16.5 | S08    | 11.7   | ●               |
| MXEE 120L14R00-04S08 | 0.04-0.11          | 12             | -   | 45  | 14   | 23.0 | S08    | 11.7   | ●               |
| MXED 160L12R05-04S10 | 0.05-0.13          | 16             | 0.5 | 30  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXED 160L12R10-04S10 | 0.05-0.13          | 16             | 1.0 | 30  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXED 160L12R15-04S10 | 0.05-0.13          | 16             | 1.5 | 30  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXED 160L12R20-04S10 | 0.05-0.13          | 16             | 2.0 | 30  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXED 160L12R30-04S10 | 0.05-0.13          | 16             | 3.0 | 30  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXED 160L12R40-04S10 | 0.05-0.13          | 16             | 4.0 | 30  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXEE 160L12R00-04S10 | 0.05-0.13          | 16             | -   | 45  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXEE 160L12R05-04S10 | 0.05-0.13          | 16             | 0.5 | 45  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXEE 160L12R10-04S10 | 0.05-0.13          | 16             | 1.0 | 45  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXEE 160L12R15-04S10 | 0.05-0.13          | 16             | 1.5 | 45  | 12   | 20.5 | S10    | 15.3   | ●               |
| MXEE 160L12R20-04S10 | 0.05-0.13          | 16             | 2.0 | 45  | 12   | 20.5 | S10    | 15.3   | ●               |

- Wrench should be ordered separately
- FHA: Flute helix angle (MXEE-45°, MXED-30°)

●: Standard items

**MXEE(D)-04**

**4 flute, for general purpose**

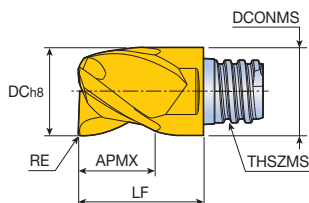
[illegible]

- ▶ Wrench should be ordered separately
- ▶ FHA: Flute helix angle (MXEE-45°, MXED-30°)

●: Standard items

# MXEE-03

3 flute, for keyways



| Designation                 | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |        |        | Grade<br>TT5523 |
|-----------------------------|--------------------|----------------|-----|------|------|--------|--------|-----------------|
|                             |                    | DC             | RE  | APMX | LF   | THSZMS | DCONMS |                 |
| <b>MXEE 077L04R02-03S05</b> | 0.03-0.08          | 7.7            | 0.2 | 4    | 10.0 | S05    | 7.7    | ●               |
| <b>097L05R03-03S06</b>      | 0.03-0.09          | 9.7            | 0.3 | 5    | 13.0 | S06    | 9.7    | ●               |
| <b>117L07R03-03S08</b>      | 0.03-0.10          | 11.7           | 0.3 | 7    | 16.5 | S08    | 11.7   | ●               |
| <b>157L08R03-03S10</b>      | 0.04-0.12          | 15.7           | 0.3 | 8    | 20.5 | S10    | 15.3   | ●               |
| <b>197L12R04-03S12</b>      | 0.05-0.13          | 19.7           | 0.4 | 12   | 25.5 | S12    | 18.3   | ●               |

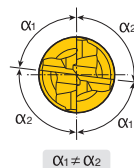
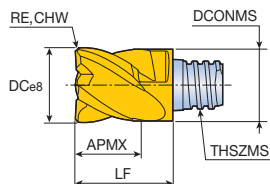
► Wrench should be ordered separately

●: Standard items

# MXEE-104



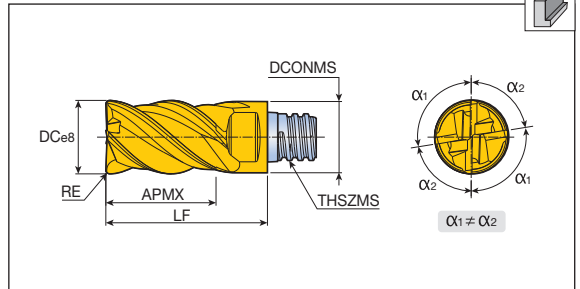
4 flute, unequal spacing of cutting edges (vibration free)



| Designation                 | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |      |        |        | Grade<br>TT5523 |
|-----------------------------|--------------------|----------------|-----|-----|------|------|--------|--------|-----------------|
|                             |                    | DC             | RE  | CHW | APMX | LF   | THSZMS | DCONMS |                 |
| <b>MXEE 080L05C30I04S05</b> | 0.03-0.09          | 8              | -   | 0.3 | 5    | 10.0 | S05    | 7.7    | ●               |
| <b>100L07C40I04S06</b>      | 0.03-0.10          | 10             | -   | 0.4 | 7    | 13.0 | S06    | 9.7    | ●               |
| <b>120L09C50I04S08</b>      | 0.04-0.11          | 12             | -   | 0.5 | 9    | 16.5 | S08    | 11.7   | ●               |
| <b>160L12C60I04S10</b>      | 0.05-0.13          | 16             | -   | 0.6 | 12   | 20.5 | S10    | 15.3   | ●               |
| <b>200L15C60I04S12</b>      | 0.05-0.17          | 20             | -   | 0.6 | 15   | 25.5 | S12    | 18.3   | ●               |
| <b>250L22C60I04S15</b>      | 0.06-0.17          | 25             | -   | 0.6 | 22   | 37.0 | S15    | 23.9   | ●               |
| <b>250L22R00I04S15</b>      | 0.06-0.17          | 25             | -   | -   | 22   | 37.0 | S15    | 23.9   | ●               |
| <b>250L22R05I04S15</b>      | 0.06-0.17          | 25             | 0.5 | -   | 22   | 37.0 | S15    | 23.9   | ●               |
| <b>250L22R10I04S15</b>      | 0.06-0.17          | 25             | 1.0 | -   | 22   | 37.0 | S15    | 23.9   | ●               |
| <b>250L22R20I04S15</b>      | 0.06-0.17          | 25             | 2.0 | -   | 22   | 37.0 | S15    | 23.9   | ●               |
| <b>250L22R30I04S15</b>      | 0.06-0.17          | 25             | 3.0 | -   | 22   | 37.0 | S15    | 23.9   | ●               |

► Wrench should be ordered separately

●: Standard items

[illegible]

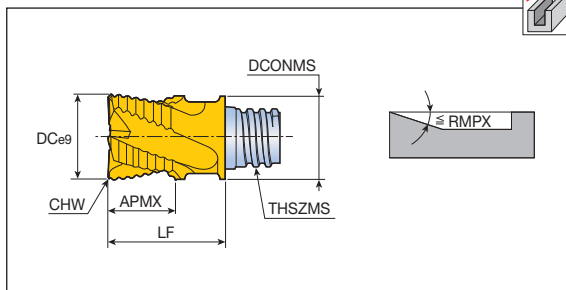
- ▶ Wrench should be ordered separately

●: Standard items

# MXEE-R



4-6 flute, for roughing



| Designation                 | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |      |        |        |      | Grade |
|-----------------------------|--------------------|----------------|-----|------|------|------|--------|--------|------|-------|
|                             |                    | DC             | NOF | CHW  | APMX | LF   | THSZMS | DCONMS | RMPX |       |
| <b>MXEE 080L05C25R04S05</b> | 0.03-0.08          | 8              | 4   | 0.25 | 5    | 10.0 | S05    | 7.7    | 5    | ●     |
| <b>100L07C30R04S06</b>      | 0.03-0.09          | 10             | 4   | 0.30 | 7    | 13.0 | S06    | 9.7    | 5    | ●     |
| <b>120L09C35R04S08</b>      | 0.04-0.10          | 12             | 4   | 0.35 | 9    | 16.5 | S08    | 11.7   | 5    | ●     |
| <b>160L12C40R05S10</b>      | 0.04-0.10          | 16             | 5   | 0.40 | 12   | 20.5 | S10    | 15.3   | 5    | ●     |
| <b>200L15C40R06S12</b>      | 0.05-0.11          | 20             | 6   | 0.40 | 15   | 25.5 | S12    | 18.3   | 3    | ●     |
| <b>250L22C50R06S15</b>      | 0.05-0.11          | 25             | 6   | 0.50 | 22   | 37.0 | S15    | 23.9   | 3    | ●     |

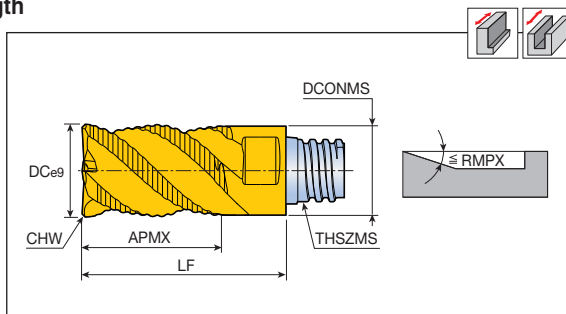
- Wrench should be ordered separately
- NOF: Number of flutes
- RMPX: Ramping angle maximum

●: Standard items

# MXEE-R-1.5D



4-6 flute, for roughing with 1.5D flute length



| Designation                 | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |      |        |        |      | Grade |
|-----------------------------|--------------------|----------------|-----|------|------|------|--------|--------|------|-------|
|                             |                    | DC             | NOF | CHW  | APMX | LF   | THSZMS | DCONMS | RMPX |       |
| <b>MXEE 080L12C25R04S05</b> | 0.03-0.08          | 8              | 4   | 0.25 | 12   | 18.0 | S05    | 7.7    | 5    | ●     |
| <b>100L15C30R04S06</b>      | 0.03-0.09          | 10             | 4   | 0.30 | 15   | 22.0 | S06    | 9.6    | 5    | ●     |
| <b>120L18C35R04S08</b>      | 0.04-0.10          | 12             | 4   | 0.35 | 18   | 27.0 | S08    | 11.7   | 5    | ●     |
| <b>160L24C40R05S10</b>      | 0.04-0.10          | 16             | 5   | 0.40 | 24   | 33.5 | S10    | 15.3   | 5    | ●     |
| <b>200L30C40R06S12</b>      | 0.05-0.11          | 20             | 6   | 0.40 | 30   | 41.0 | S12    | 18.5   | 3    | ●     |

- Wrench should be ordered separately
- NOF: Number of flutes
- RMPX: Ramping angle maximum

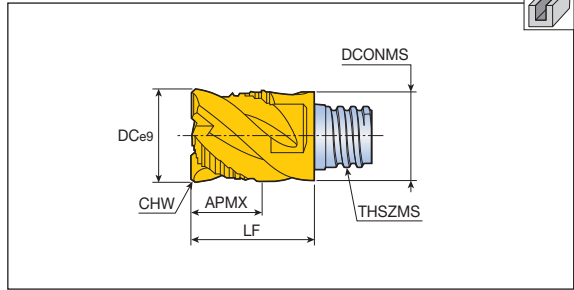
●: Standard items



# MXEE-C04



4 flute, combined edges for roughing & finishing



| Designation                 | Feed (mm/tooth) | Dimension (mm) |     |      |      |        |        | Grade  |  |
|-----------------------------|-----------------|----------------|-----|------|------|--------|--------|--------|--|
|                             |                 | DC             | CHW | APMX | LF   | THSZMS | DCONMS | TT5523 |  |
| <b>MXEE 080L05C30C04S05</b> | 0.03-0.08       | 8              | 0.3 | 5    | 10.0 | S05    | 7.7    | ●      |  |
| <b>100L07C30C04S06</b>      | 0.03-0.09       | 10             | 0.3 | 7    | 13.0 | S06    | 9.7    | ●      |  |
| <b>120L09C40C04S08</b>      | 0.04-0.10       | 12             | 0.4 | 9    | 16.5 | S08    | 11.7   | ●      |  |
| <b>160L12C60C04S10</b>      | 0.05-0.11       | 16             | 0.6 | 12   | 20.5 | S10    | 15.3   | ●      |  |
| <b>200L15C60C04S12</b>      | 0.05-0.11       | 20             | 0.6 | 15   | 25.5 | S12    | 18.3   | ●      |  |
| <b>250L22C60C04S15</b>      | 0.05-0.11       | 25             | 0.6 | 22   | 37.0 | S15    | 23.9   | ●      |  |

► Wrench should be ordered separately

●: Standard items

# MXEE-A02



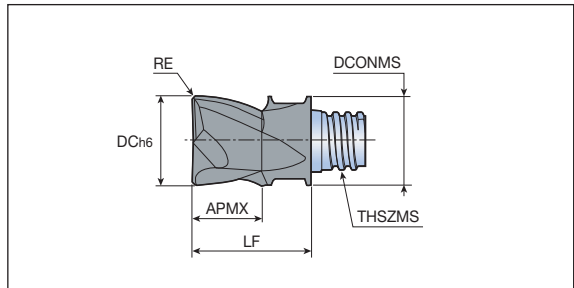
2 flute, for aluminum machining



UF10



TTA101



| Designation                 | Feed (mm/tooth) | Dimension (mm) |     |      |      |        |        | Grade |        |
|-----------------------------|-----------------|----------------|-----|------|------|--------|--------|-------|--------|
|                             |                 | DC             | RE  | APMX | LF   | THSZMS | DCONMS | UF10  | TTA101 |
| <b>MXEE 100L07R05A02S06</b> | 0.03-0.10       | 10             | 0.5 | 7    | 13.0 | S06    | 9.7    | ●     | ●      |
| <b>100L07R10A02S06</b>      | 0.03-0.10       | 10             | 1.0 | 7    | 13.0 | S06    | 9.7    | ●     | ●      |
| <b>120L09R05A02S08</b>      | 0.04-0.11       | 12             | 0.5 | 9    | 16.5 | S08    | 11.7   | ●     | ●      |
|                             |                 |                |     |      |      |        |        |       |        |
|                             |                 |                |     |      |      |        |        |       |        |

► Wrench should be ordered separately

●: Standard items



# MXEE-A03

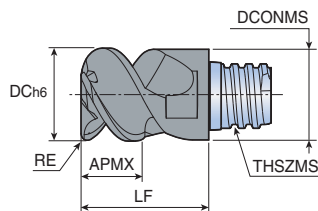
3 flute, for aluminum machining



UF10



TTA101



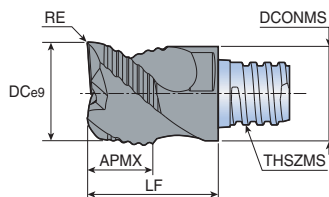
| Designation                 | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |        |        | Grade |        |
|-----------------------------|--------------------|----------------|-----|------|------|--------|--------|-------|--------|
|                             |                    | DC             | RE  | APMX | LF   | THSZMS | DCONMS | UF10  | TTA101 |
| <b>MXEE 080L05R05A03S05</b> | 0.03-0.09          | 8              | 0.5 | 5    | 10.0 | S05    | 7.7    | ●     | ●      |
| <b>100L06R05A03S06</b>      | 0.03-0.10          | 10             | 0.5 | 6    | 13.0 | S06    | 9.7    | ●     | ●      |
| <b>100L06R10A03S06</b>      | 0.03-0.10          | 10             | 1.0 | 6    | 13.0 | S06    | 9.7    | ●     | ●      |
| <b>120L08R05A03S08</b>      | 0.04-0.11          | 12             | 0.5 | 8    | 16.5 | S08    | 11.7   | ●     | ●      |
| <b>120L08R10A03S08</b>      | 0.04-0.11          | 12             | 1.0 | 8    | 16.5 | S08    | 11.7   | ●     | ●      |
| <b>160L10R00A03S10</b>      | 0.05-0.13          | 16             | -   | 10   | 20.5 | S10    | 15.3   | ●     | ●      |
| <b>160L10R10A03S10</b>      | 0.05-0.13          | 16             | 1.0 | 10   | 20.5 | S10    | 15.3   | ●     | ●      |
| <b>160L10R20A03S10</b>      | 0.05-0.13          | 16             | 2.0 | 10   | 20.5 | S10    | 15.3   | ●     | ●      |
| <b>200L12R05A03S12</b>      | 0.05-0.13          | 20             | 0.5 | 12   | 25.5 | S12    | 18.3   | ●     | ●      |
| <b>200L12R10A03S12</b>      | 0.05-0.13          | 20             | 1.0 | 12   | 25.5 | S12    | 18.3   | ●     | ●      |
| <b>200L12R20A03S12</b>      | 0.05-0.13          | 20             | 2.0 | 12   | 25.5 | S12    | 18.3   | ●     | ●      |

► Wrench should be ordered separately

●: Standard items

# MXEE-RA03

3 flute, for roughing with aluminum machining

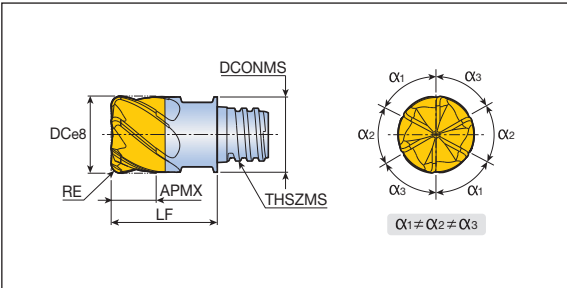


| Designation                  | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |        |        | Grade |  |
|------------------------------|--------------------|----------------|-----|------|------|--------|--------|-------|--|
|                              |                    | DC             | RE  | APMX | LF   | THSZMS | DCONMS | UF10  |  |
| <b>MXEE 080L05R02RA03S05</b> | 0.03-0.15          | 8              | 0.2 | 5    | 10.0 | S05    | 7.7    | ●     |  |
| <b>100L06R02RA03S06</b>      | 0.05-0.20          | 10             | 0.2 | 6    | 13.0 | S06    | 9.6    | ●     |  |
| <b>120L08R02RA03S08</b>      | 0.07-0.22          | 12             | 0.2 | 8    | 16.5 | S08    | 11.7   | ●     |  |
| <b>160L10R02RA03S10</b>      | 0.07-0.25          | 16             | 0.2 | 10   | 20.5 | S10    | 15.3   | ●     |  |
| <b>200L12R02RA03S12</b>      | 0.07-0.25          | 20             | 0.2 | 12   | 25.5 | S12    | 18.5   | ●     |  |

► Wrench should be ordered separately

●: Standard items

6 flute, ceramic brazed heads



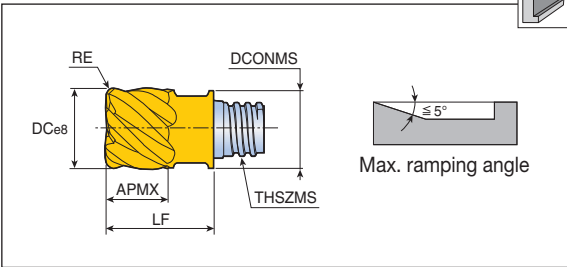
| Designation           | Feed (mm/tooth) | Dimension (mm) |     |      |      |        |        |        | Grade |
|-----------------------|-----------------|----------------|-----|------|------|--------|--------|--------|-------|
|                       |                 | DC             | RE  | APMX | LF   | THSZMS | DCONMS | TC3030 |       |
| MXCRF 100L07R10-06S06 | 0.02-0.04       | 10             | 1.0 | 7    | 13.0 | S06    | 9.7    | ●      |       |
| 120L07R15-06S08       | 0.03-0.05       | 12             | 1.5 | 7    | 16.5 | S08    | 11.7   | ●      |       |
| 160L09R20-06S10       | 0.03-0.05       | 16             | 2.0 | 9    | 20.5 | S10    | 15.3   | ●      |       |

► Wrench should be ordered separately ●: Standard items

MXEE(D)-06



6 flute, for difficult-to-cut material machining without central edge



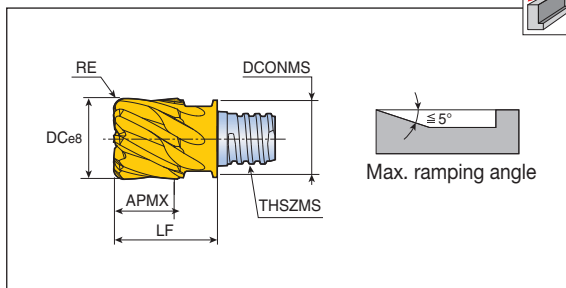
| Designation          | Feed (mm/tooth) | Dimension (mm) |     |     |      |      |        |        | Grade |
|----------------------|-----------------|----------------|-----|-----|------|------|--------|--------|-------|
|                      |                 | DC             | RE  | FHA | APMX | LF   | THSZMS | DCONMS |       |
| MXEE 080L05R05-06S05 | 0.03-0.10       | 8              | 0.5 | 45  | 5    | 10.0 | S05    | 7.7    | ●     |
| MXEE 080L05R10-06S05 | 0.03-0.10       | 8              | 1.0 | 45  | 5    | 10.0 | S05    | 7.7    | ●     |
| MXED 100L07R05-06S06 | 0.03-0.10       | 10             | 0.5 | 30  | 7    | 13.0 | S06    | 9.7    | ●     |
| MXED 100L07R10-06S06 | 0.03-0.10       | 10             | 1.0 | 30  | 7    | 13.0 | S06    | 9.7    | ●     |
| MXEE 100L07R05-06S06 | 0.04-0.10       | 10             | 0.5 | 45  | 7    | 13.0 | S06    | 9.7    | ●     |
| MXEE 100L07R10-06S06 | 0.04-0.10       | 10             | 1.0 | 45  | 7    | 13.0 | S06    | 9.7    | ●     |
| MXEE 100L07R15-06S06 | 0.03-0.10       | 10             | 1.5 | 45  | 7    | 13.0 | S06    | 9.7    | ●     |
| MXED 120L09R05-06S08 | 0.04-0.11       | 12             | 0.5 | 30  | 9    | 16.5 | S08    | 11.7   | ●     |
| MXEE 120L09R00-06S08 | 0.04-0.11       | 12             | -   | 45  | 9    | 16.5 | S08    | 11.7   | ●     |
| MXEE 120L09R10-06S08 | 0.04-0.11       | 12             | 1.0 | 45  | 9    | 16.5 | S08    | 11.7   | ●     |
| MXEE 120L09R15-06S08 | 0.04-0.11       | 12             | 1.5 | 45  | 9    | 16.5 | S08    | 11.7   | ●     |

► Wrench should be ordered separately ●: Standard items  
► FHA: Flute helix angle (MXEE-45°, MXED-30°)

# MXED-08/10



8, 10 flute, for difficult-to-cut material machining without central edge



| Designation                 | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |      |        |        | Grade  |  |
|-----------------------------|--------------------|----------------|-----|-----|------|------|--------|--------|--------|--|
|                             |                    | DC             | NOF | RE  | APMX | LF   | THSZMS | DCONMS | TT5523 |  |
| <b>MXED 160L12R05-08S10</b> | 0.05-0.13          | 16             | 8   | 0.5 | 12   | 20.5 | S10    | 15.3   | ●      |  |
| <b>160L12R10-08S10</b>      | 0.05-0.13          | 16             | 8   | 1.0 | 12   | 20.5 | S10    | 15.3   | ●      |  |
| <b>160L12R20-08S10</b>      | 0.05-0.13          | 16             | 8   | 2.0 | 12   | 20.5 | S10    | 15.3   | ●      |  |
| <b>200L15R10-10S12</b>      | 0.05-0.13          | 20             | 10  | 1.0 | 15   | 25.5 | S12    | 18.3   | ●      |  |
| <b>200L15R20-10S12</b>      | 0.05-0.13          | 20             | 10  | 2.0 | 15   | 25.5 | S12    | 18.3   | ●      |  |
| <b>250L22R10-10S15</b>      | 0.05-0.13          | 25             | 10  | 1.0 | 22   | 37.0 | S15    | 23.9   | ●      |  |
| <b>250L22R20-10S15</b>      | 0.05-0.13          | 25             | 10  | 2.0 | 22   | 37.0 | S15    | 23.9   | ●      |  |

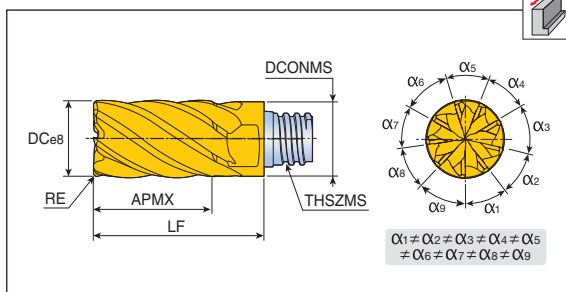
- Wrench should be ordered separately
- NOF: Number of flutes

●: Standard items

# MXED-I07/I09-1.5D



Long cutting edge 1.5D & 7,9 flutes & variable helix, pitch



| Designation                 | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |      |        |        |      | Grade  |  |
|-----------------------------|--------------------|----------------|-----|-----|------|------|--------|--------|------|--------|--|
|                             |                    | DC             | NOF | RE  | APMX | LF   | THSZMS | DCONMS | RMPX | TT5523 |  |
| <b>MXED 100L15R05I07S06</b> | 0.04-0.10          | 10             | 7   | 0.5 | 15   | 22.0 | S06    | 9.6    | 3    | ●      |  |
| <b>120L18R05I07S08</b>      | 0.04-0.10          | 12             | 7   | 0.5 | 18   | 27.0 | S08    | 11.7   | 3    | ●      |  |
| <b>160L24R08I09S10</b>      | 0.05-0.10          | 16             | 9   | 0.8 | 24   | 33.5 | S10    | 15.3   | 1    | ●      |  |
| <b>200L30R10I09S12</b>      | 0.05-0.10          | 20             | 9   | 1.0 | 30   | 41.0 | S12    | 18.5   | 1    | ●      |  |

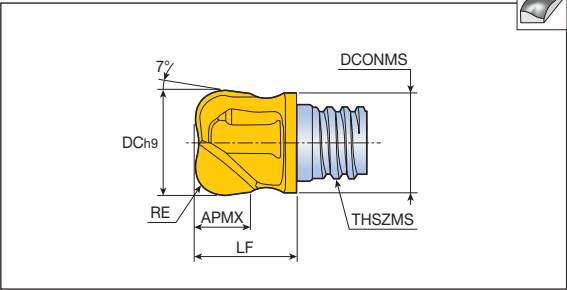
- Wrench should be ordered separately
- NOF: Number of flutes
- RMPX: Ramping angle maximum

●: Standard items

# MXRB-02



2 flute, 7° back taper flute



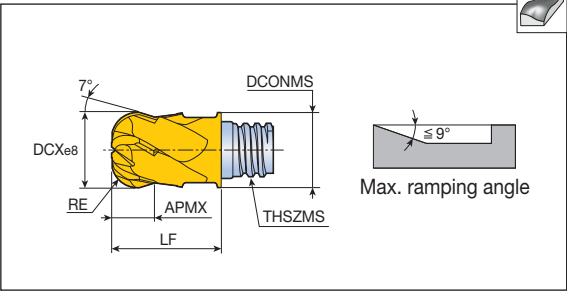
| Designation          | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |        |        | Grade<br>TT5523 |
|----------------------|--------------------|----------------|-----|------|------|--------|--------|-----------------|
|                      |                    | DC             | RE  | APMX | LF   | THSZMS | DCONMS |                 |
| MXRB 200L11R50-02S12 | 0.05-0.15          | 20             | 5.0 | 11.3 | 17.3 | S12    | 18.3   | ●               |
|                      |                    |                |     |      |      |        |        |                 |
|                      |                    |                |     |      |      |        |        |                 |
|                      |                    |                |     |      |      |        |        |                 |
|                      |                    |                |     |      |      |        |        |                 |
|                      |                    |                |     |      |      |        |        |                 |

► Wrench should be ordered separately ●: Standard items

# MXRD-06



6 flute, 7° back taper sided ground flute



| Designation          | Dimension (mm) |     |      |      |        |        | Grade<br>TT5523 |
|----------------------|----------------|-----|------|------|--------|--------|-----------------|
|                      | DCX            | RE  | APMX | LF   | THSZMS | DCONMS |                 |
| MXRD 080L04R20-06S05 | 8              | 2.0 | 4    | 10.0 | S05    | 7.7    | ●               |
| 100L05R30-06S06      | 10             | 3.0 | 5    | 13.0 | S06    | 9.7    | ●               |
| 120L07R40-06S08      | 12             | 4.0 | 7    | 16.5 | S08    | 11.7   | ●               |
| 160L09R50-06S10      | 16             | 5.0 | 9    | 20.5 | S10    | 15.3   | ●               |
|                      |                |     |      |      |        |        |                 |

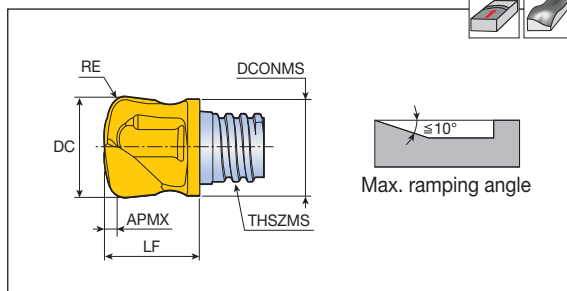
► Wrench should be ordered separately ●: Standard items

# MXFX-02

2 flute, for high feed milling



High Feed



| Designation                  | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |        |        |        | Grade |
|------------------------------|--------------------|----------------|-----|------|------|--------|--------|--------|-------|
|                              |                    | DC             | RE  | APMX | LF   | THSZMS | DCONMS | TT5523 |       |
| <b>MXFX 100L0.6R20-02S06</b> | 0.30-0.60          | 10             | 2.0 | 0.6  | 12.5 | S06    | 9.6    | ●      |       |
| <b>120L1.0R25-02S08</b>      | 0.50-1.00          | 12             | 2.5 | 0.68 | 11.1 | S08    | 11.5   | ●      |       |
| <b>160L1.1R30-02S10</b>      | 0.55-1.10          | 16             | 3.0 | 1.1  | 20.0 | S10    | 15.2   | ●      |       |
| <b>200L1.5R34-02S12</b>      | 0.75-1.50          | 20             | 3.4 | 1.5  | 17.4 | S12    | 18.3   | ●      |       |

► Wrench should be ordered separately

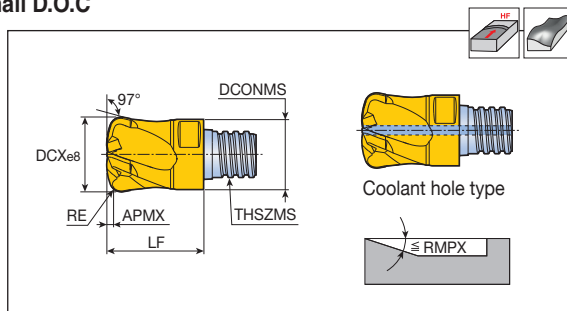
●: Standard items

# MXFX-04/06

4,6 flute, for high feed machining and small D.O.C



High Feed



| Designation                  | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |      |        |        |      |        | Coolant<br>hole | Grade  |  |
|------------------------------|--------------------|----------------|-----|------|------|------|--------|--------|------|--------|-----------------|--------|--|
|                              |                    | DC             | NOF | RE   | APMX | LF   | THSZMS | DCONMS | RMPX | TT5513 |                 | TT5523 |  |
| <b>MXFX 080L0.4R16-04S05</b> | 0.12-0.48          | 8              | 4   | 1.62 | 0.4  | 10.0 | S05    | 7.5    | 5    | x      | ●               |        |  |
| <b>100L0.5R20-04S06</b>      | 0.16-0.57          | 10             | 4   | 2.01 | 0.5  | 13.0 | S06    | 9.5    | 5    | x      | ●               |        |  |
| <b>100L0.4R10-06S06C</b>     | 0.16-0.47          | 10             | 6   | 1.00 | 0.45 | 10.0 | S06    | 9.5    | 3    | ●      | ●               |        |  |
| <b>120L0.6R18-04S08C</b>     | 0.16-0.67          | 12             | 4   | 1.80 | 0.6  | 16.5 | S08    | 11.5   | 5    | ●      |                 | ●      |  |
| <b>120L0.6R24-04S08</b>      | 0.16-0.67          | 12             | 4   | 2.47 | 0.6  | 16.5 | S08    | 11.5   | 5    | x      | ●               |        |  |
| <b>120L0.6R12-06S08C</b>     | 0.16-0.54          | 12             | 6   | 1.20 | 0.65 | 12.0 | S08    | 11.5   | 3    | ●      | ●               |        |  |
| <b>160L0.8R22-04S10C</b>     | 0.20-0.75          | 16             | 4   | 2.20 | 0.8  | 20.5 | S10    | 15.4   | 5    | ●      |                 | ●      |  |
| <b>160L0.8R32-04S10</b>      | 0.20-0.75          | 16             | 4   | 3.25 | 0.8  | 20.5 | S10    | 15.4   | 5    | x      | ●               |        |  |
| <b>200L1.0R40-04S12</b>      | 0.20-0.90          | 20             | 4   | 4.02 | 1.0  | 25.5 | S12    | 18.45  | 5    | x      | ●               |        |  |
| <b>250L1.2R31-06S15</b>      | 0.25-1.00          | 25             | 6   | 3.10 | 1.2  | 25.0 | S15    | 23.9   | 5    | x      | ●               |        |  |

► Wrench should be ordered separately

●: Standard items

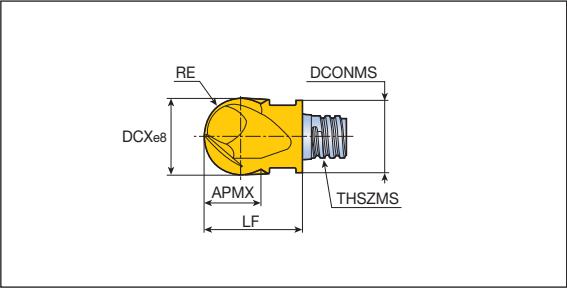
► NOF: Number of flutes

► RMPX: Ramping angle maximum

# MXBD-BG-02



2 flute, for high precision machining



| Designation                 | Dimension (mm) |                     |      |      |        |        | Grade  |
|-----------------------------|----------------|---------------------|------|------|--------|--------|--------|
|                             | DCX            | RE                  | APMX | LF   | THSZMS | DCONMS | TT5523 |
| <b>MXBD 080L05-BG-02S05</b> | 8              | 3.98 <sup>(1)</sup> | 5    | 10.0 | S05    | 7.7    | ●      |
| <b>100L07-BG-02S06</b>      | 10             | 4.98 <sup>(1)</sup> | 7    | 13.0 | S06    | 9.7    | ●      |
| <b>120L09-BG-02S08</b>      | 12             | 5.98 <sup>(2)</sup> | 9    | 16.5 | S08    | 11.7   | ●      |
| <b>160L09-BG-02S10</b>      | 16             | 7.98 <sup>(2)</sup> | 9    | 20.5 | S10    | 15.3   | ●      |

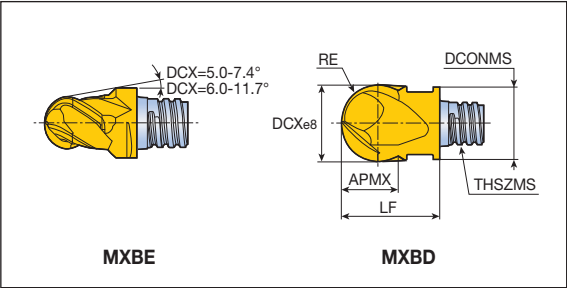
- ▶ Wrench should be ordered separately
- ▶ RE Tolerance: <sup>(1)</sup>± 0.01, <sup>(2)</sup>± 0.012

●: Standard items

# MXBD(E)-BG-04



4 flute, for high precision machining



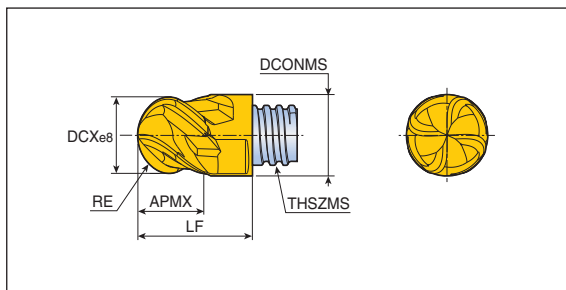
| Designation                 | Dimension (mm) |                      |     |      |      |        |        | Grade  |
|-----------------------------|----------------|----------------------|-----|------|------|--------|--------|--------|
|                             | DCX            | RE                   | FHA | APMX | LF   | THSZMS | DCONMS | TT5523 |
| <b>MXBE 050L07-BG-04S05</b> | 5              | 2.49 <sup>(1)</sup>  | 38  | 7.0  | 15.0 | S05    | 8.0    | ●      |
| <b>060L04-BG-04S04</b>      | 6              | 2.99 <sup>(1)</sup>  | 38  | 4.0  | 8.5  | S04    | 5.8    | ●      |
| <b>060L05-BG-04S05</b>      | 6              | 2.99 <sup>(1)</sup>  | 38  | 5.5  | 10.0 | S05    | 8.0    | ●      |
| <b>MXBD 080L05-BG-04S05</b> | 8              | 3.98 <sup>(1)</sup>  | 30  | 5.0  | 10.0 | S05    | 7.7    | ●      |
| <b>100L07-BG-04S06</b>      | 10             | 4.98 <sup>(1)</sup>  | 30  | 7.0  | 13.0 | S06    | 9.7    | ●      |
| <b>120L09-BG-04S08</b>      | 12             | 5.98 <sup>(2)</sup>  | 30  | 9.0  | 16.5 | S08    | 11.7   | ●      |
| <b>160L12-BG-04S10</b>      | 16             | 7.98 <sup>(2)</sup>  | 30  | 12.0 | 20.5 | S10    | 15.3   | ●      |
| <b>200L15-BG-04S12</b>      | 20             | 9.97 <sup>(2)</sup>  | 30  | 15.0 | 25.5 | S12    | 18.3   | ●      |
| <b>250L22-BG-04S15</b>      | 25             | 12.47 <sup>(3)</sup> | 30  | 22.0 | 37.0 | S15    | 23.9   | ●      |

- ▶ Wrench should be ordered separately
- ▶ RE Tolerance: <sup>(1)</sup>± 0.01, <sup>(2)</sup>± 0.012, <sup>(3)</sup>± 0.02
- ▶ FHA: Flute helix angle

●: Standard items

# MXBE-BH-04

4 flute, for high productivity on hard material



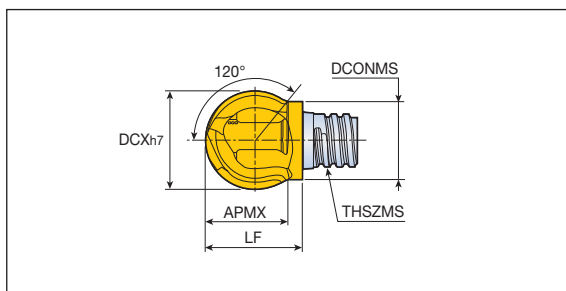
| Designation                 | Dimension (mm) |                     |      |      |        |        | Grade  |
|-----------------------------|----------------|---------------------|------|------|--------|--------|--------|
|                             | DCX            | RE                  | APMX | LF   | THSZMS | DCONMS | TT5513 |
| <b>MXBE 080L05-BH-04S05</b> | 8              | 3.98 <sup>(1)</sup> | 5.4  | 10.0 | S05    | 7.7    | ●      |
| <b>100L07-BH-04S06</b>      | 10             | 4.98 <sup>(1)</sup> | 7.4  | 13.0 | S06    | 9.6    | ●      |
| <b>120L09-BH-04S08</b>      | 12             | 5.98 <sup>(2)</sup> | 9.3  | 16.5 | S08    | 11.7   | ●      |
| <b>160L12-BH-04S10</b>      | 16             | 7.98 <sup>(2)</sup> | 12.4 | 20.5 | S10    | 15.3   | ●      |
| <b>200L16-BH-04S12</b>      | 20             | 9.97 <sup>(2)</sup> | 16.0 | 25.5 | S12    | 18.5   | ●      |

- Wrench should be ordered separately
- RE Tolerance: <sup>(1)</sup>± 0.01, <sup>(2)</sup>± 0.012

●: Standard items

# MXBB-SG-02

2 flute, spherical designed edge

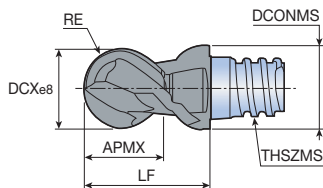


| Designation                 | Dimension (mm) |      |      |        |        | Key        | Grade  |
|-----------------------------|----------------|------|------|--------|--------|------------|--------|
|                             | DCX            | APMX | LF   | THSZMS | DCONMS |            | TT5523 |
| <b>MXBB 080L05-SG-02S04</b> | 8              | 5    | 8.2  | S04    | 5.8    | MX KEY-S04 | ●      |
| <b>100L07-SG-02S05</b>      | 10             | 7    | 10.0 | S05    | 7.6    | MX KEY-S05 | ●      |
| <b>120L09-SG-02S06</b>      | 12             | 9    | 11.6 | S06    | 9.5    | MX KEY-S08 | ●      |
| <b>160L12-SG-02S08</b>      | 16             | 12   | 15.4 | S08    | 12.2   | MX KEY-S10 | ●      |
| <b>200L15-SG-02S10</b>      | 20             | 15   | 18.4 | S10    | 15.2   | MX KEY-S10 | ●      |
| <b>250L18-SG-02S12</b>      | 25             | 18   | 23.2 | S12    | 18.3   | MX KEY-S12 | ●      |

- Wrench should be ordered separately

●: Standard items

# MAXIRUSH



- ▶ Wrench should be ordered separately
- ▶ RE Tolerance:  $^{(1)}\pm 0.01$ ,  $^{(2)}\pm 0.012$

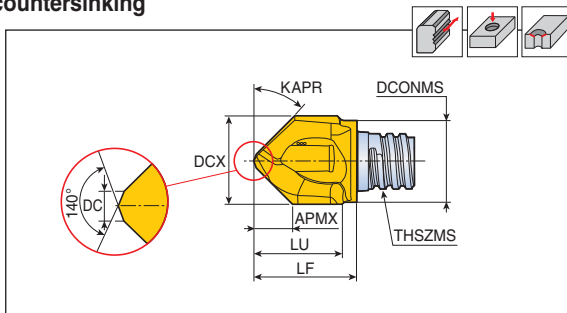
●: Standard items



## MXCP-02



**2 flute, for spot drilling, chamfering and countersinking**

[illegible]

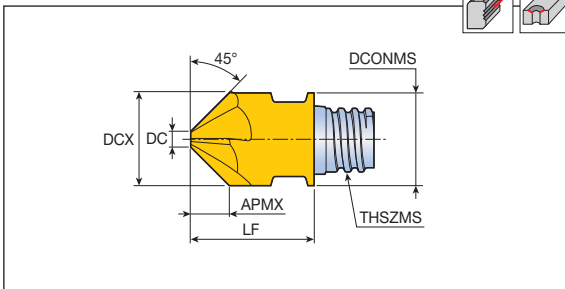
- ▶ Wrench should be ordered separately

●: Standard items

# MXCA-04/06



## 4, 6 flute, chamfering and countersinking without central edge



| Designation                 | Dimension (mm) |      |     |      |      |        |        | Grade |
|-----------------------------|----------------|------|-----|------|------|--------|--------|-------|
|                             | DCX            | DC   | NOF | APMX | LF   | THSZMS | DCONMS |       |
| <b>MXCA 100L04A45-04S06</b> | 10.0           | 1.95 | 4   | 4.0  | 13.0 | S06    | 10.0   | ●     |
| <b>120L05A45-04S08</b>      | 12.0           | 1.95 | 4   | 5.0  | 16.5 | S08    | 12.0   | ●     |
| <b>127L05A45-04S08</b>      | 12.7           | 1.98 | 4   | 5.3  | 16.5 | S08    | 12.7   | ●     |
| <b>160L06A45-06S10</b>      | 16.0           | 3.0  | 6   | 6.5  | 20.3 | S10    | 16.0   | ●     |
| <b>200L07A45-06S12</b>      | 20.0           | 5.0  | 6   | 7.5  | 25.5 | S12    | 20.0   | ●     |

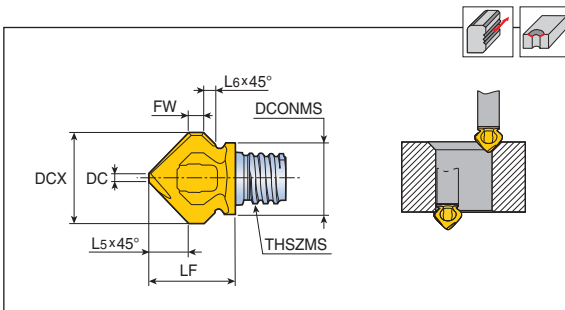
- Wrench should be ordered separately
- NOF: Number of flutes

●: Standard items

# MXCW-02



## 2 flute, for double chamfering



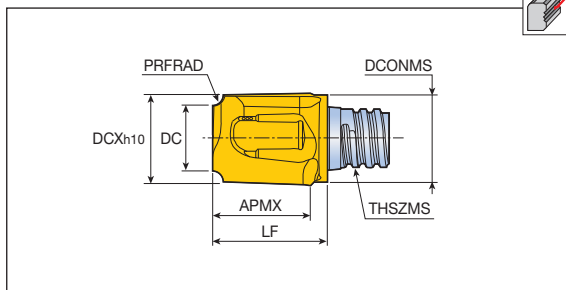
| Designation                 | Dimension (mm) |     |     |      |     |     |        |        | Key        | Grade |
|-----------------------------|----------------|-----|-----|------|-----|-----|--------|--------|------------|-------|
|                             | DCX            | DC  | L5  | LF   | FW  | L6  | THSZMS | DCONMS |            |       |
| <b>MXCW 098L04A45-02S05</b> | 9.8            | 1.2 | 4.3 | 10.8 | 2.5 | 1.2 | S05    | 7.6    | MX KEY-S06 | ●     |
| <b>118L05A45-02S06</b>      | 11.8           | 1.2 | 5.3 | 11.2 | 2.0 | 1.2 | S06    | 9.3    | MX KEY-S08 | ●     |
| <b>157L07A45-02S08</b>      | 15.7           | 1.5 | 7.1 | 14.0 | 2.0 | 1.2 | S08    | 11.5   | MX KEY-S10 | ●     |
|                             |                |     |     |      |     |     |        |        |            |       |
|                             |                |     |     |      |     |     |        |        |            |       |
|                             |                |     |     |      |     |     |        |        |            |       |

- Wrench should be ordered separately

●: Standard items

## MXCR-02

**2 flute, for concave radius milling**

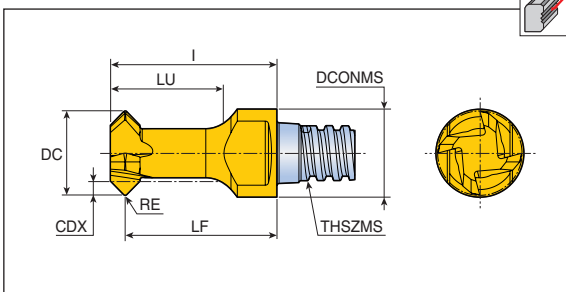
[illegible]

- ▶ Wrench should be ordered separately
- ▶ PRFRAD: Profile radius

- : Standard items

# MXCS-04

4 flute, for chamfering



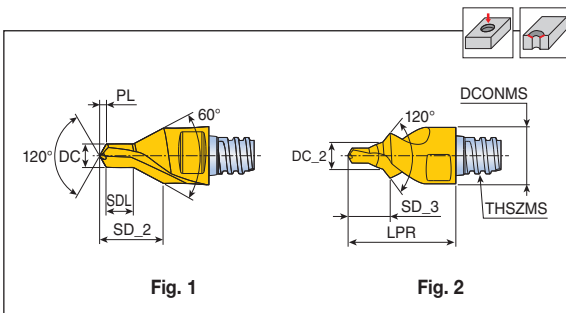
| Designation                 | Dimension (mm) |     |     |      |      |      |        |        | Grade |
|-----------------------------|----------------|-----|-----|------|------|------|--------|--------|-------|
|                             | DC             | CDX | RE  | LF   | LU   | I    | THSZMS | DCONMS |       |
| <b>MXCS 077L10A45-04S05</b> | 7.7            | 1.2 | 0.2 | 13.9 | 10.2 | 15.2 | S05    | 8.0    | ●     |

► Wrench should be ordered separately

●: Standard items

# MXDP-02

2 flute, for center drilling



| Designation                 | Dimension (mm) |       |      |       |       |      |        |        |      |     | Grade |
|-----------------------------|----------------|-------|------|-------|-------|------|--------|--------|------|-----|-------|
|                             | DC             | DC2   | SDL  | SD_2  | SD_3  | LPR  | THSZMS | DCONMS | PL   | Fig |       |
| <b>MXDP 107L01A30-02S04</b> | 1.07           | -     | 1.32 | 4.14  | -     | 10.0 | S04    | 6.0    | 0.28 | 1   | ●     |
| <b>165L02A30-02S04</b>      | 1.65           | -     | 1.97 | 4.45  | -     | 10.0 | S04    | 6.0    | 0.43 | 1   | ●     |
| <b>207L02A30-02S04</b>      | 2.07           | -     | 2.36 | 6.37  | -     | 10.0 | S04    | 6.0    | 0.54 | 1   | ●     |
| <b>328L04A30-02S05</b>      | 3.28           | -     | 3.75 | 8.76  | -     | 15.0 | S05    | 8.0    | 0.85 | 1   | ●     |
| <b>412L05A30-02S06</b>      | 4.12           | -     | 4.83 | 11.05 | -     | 19.0 | S06    | 10.0   | 1.07 | 1   | ●     |
| <b>513L07A30-02S08</b>      | 5.13           | -     | 5.88 | 13.23 | -     | 23.0 | S08    | 12.0   | 1.32 | 1   | ●     |
| <b>646L08A30-02S10</b>      | 6.46           | -     | 7.25 | 17.18 | -     | 28.0 | S10    | 16.0   | 1.65 | 1   | ●     |
| <b>MXDP 324L04B30-02S08</b> | 3.24           | 6.77  | 3.55 | 7.40  | 8.94  | 23.0 | S08    | 12.0   | 0.83 | 2   | ●     |
| <b>509L06B30-02S12</b>      | 5.09           | 10.69 | 5.56 | 11.70 | 14.17 | 25.5 | S12    | 18.5   | 1.33 | 2   | ●     |
| <b>641L08B30-02S12</b>      | 6.41           | 13.29 | 6.95 | 14.50 | 16.58 | 25.5 | S12    | 20.0   | 1.68 | 2   | ●     |

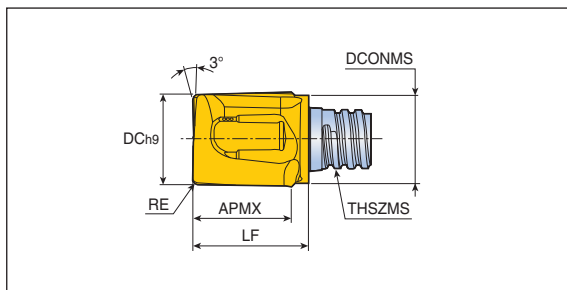
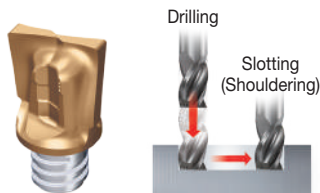
► Wrench should be ordered separately

●: Standard items

► SDL: Step diameter length

# MXGC-02

2 flute, for drilling and milling



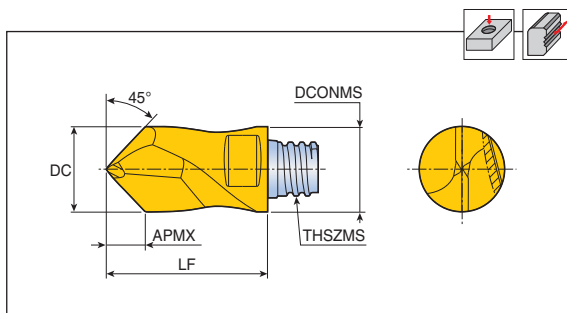
| Designation                 | Feed (mm/tooth) | Dimension (mm) |     |      |      |        |        | Grade |
|-----------------------------|-----------------|----------------|-----|------|------|--------|--------|-------|
|                             |                 | DC             | RE  | APMX | LF   | THSZMS | DCONMS |       |
| <b>MXGC 080L08R04-02S05</b> | 0.03-0.09       | 8              | 0.4 | 7.7  | 10.0 | S05    | 7.6    | ●     |
| <b>080L08R10-02S05</b>      | 0.03-0.09       | 8              | 1.0 | 7.7  | 10.0 | S05    | 7.6    | ●     |
| <b>100L09R04-02S06</b>      | 0.03-0.10       | 10             | 0.4 | 9.0  | 12.4 | S06    | 9.5    | ●     |
| <b>100L09R20-02S06</b>      | 0.03-0.10       | 10             | 2.0 | 9.0  | 12.4 | S06    | 9.5    | ●     |
| <b>120L10R04-02S08</b>      | 0.04-0.11       | 12             | 0.4 | 10.0 | 14.2 | S08    | 11.5   | ●     |
| <b>120L10R10-02S08</b>      | 0.04-0.11       | 12             | 1.0 | 10.0 | 14.2 | S08    | 11.5   | ●     |
| <b>120L10R20-02S08</b>      | 0.04-0.11       | 12             | 2.0 | 10.0 | 14.2 | S08    | 11.5   | ●     |
| <b>160L15R04-02S10</b>      | 0.05-0.13       | 16             | 0.4 | 14.9 | 19.0 | S10    | 15.2   | ●     |

► Wrench should be ordered separately

●: Standard items

# MXDS-02

2 flute, for spot drill & chamfer



| Designation              | Dimension (mm) |      |      |        |        | Grade |
|--------------------------|----------------|------|------|--------|--------|-------|
|                          | DC             | APMX | LF   | THSZMS | DCONMS |       |
| <b>MXDS 060A45-02S04</b> | 6              | 2.7  | 11.0 | S04    | 5.7    | ●     |
| <b>080A45-02S05</b>      | 8              | 3.7  | 15.0 | S05    | 7.7    | ●     |
| <b>100A45-02S06</b>      | 10             | 4.4  | 19.0 | S06    | 9.7    | ●     |
| <b>120A45-02S08</b>      | 12             | 5.4  | 23.0 | S08    | 11.7   | ●     |
| <b>160A45-02S10</b>      | 16             | 7.1  | 28.0 | S10    | 15.3   | ●     |

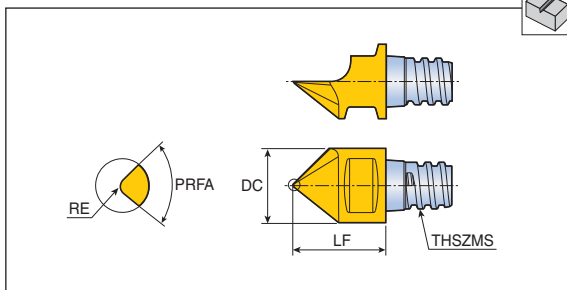
► Wrench should be ordered separately

●: Standard items

# MXEG-01

**MAXIRUSH**  
UNDEFEATABLE SOLID PRECAST

Single flute, for engraving



| Designation              | Dimension (mm) |     |      |      |        | Grade  |
|--------------------------|----------------|-----|------|------|--------|--------|
|                          | DC             | RE  | PRFA | LF   | THSZMS | TT5523 |
| <b>MXEG 060A60-01S04</b> | 6              | 0.2 | 60   | 8.5  | S04    | ●      |
| <b>080A30-01S05</b>      | 8              | 0.2 | 30   | 10.0 | S05    | ●      |
| <b>080A45-01S05</b>      | 8              | 0.2 | 45   | 10.0 | S05    | ●      |
| <b>080A60-01S05</b>      | 8              | 0.2 | 60   | 10.0 | S05    | ●      |
| <b>080A90-01S05</b>      | 8              | 0.2 | 90   | 10.0 | S05    | ●      |
|                          |                |     |      |      |        |        |
|                          |                |     |      |      |        |        |

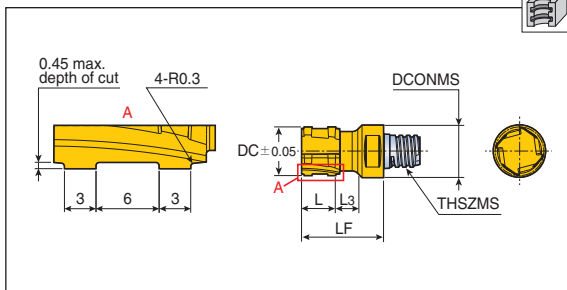
► Wrench should be ordered separately

●: Standard items

# MXDG-04

**MAXIRUSH**  
UNDEFEATABLE SOLID PRECAST

4 flute, internal grooving for heat exchanger tube sheets



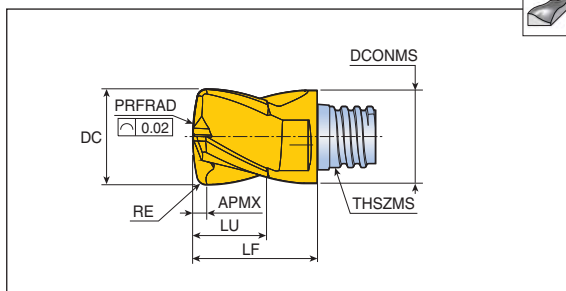
| Designation                | Dimension (mm) |      |      |      |        |        |       | Key        | Grade |
|----------------------------|----------------|------|------|------|--------|--------|-------|------------|-------|
|                            | DC             | L    | L3   | LF   | THSZMS | DCONMS | DMIN  |            |       |
| <b>MXDG 155-04S10-8238</b> | 15.5           | 14.2 | 17.8 | 33.7 | S10    | 16.0   | 15.88 | MX KEY-S08 | ●     |
| <b>185-04S12-8239</b>      | 18.5           | 14.5 | 18.3 | 34.5 | S12    | 18.5   | 19.05 | MX KEY-S10 | ●     |
| <b>245-04S15-8240</b>      | 24.5           | 14.4 | 11.0 | 37.2 | S15    | 23.8   | 25.40 | MX KEY-S15 | ●     |
|                            |                |      |      |      |        |        |       |            |       |
|                            |                |      |      |      |        |        |       |            |       |

► Wrench should be ordered separately

●: Standard items

# MXCSL

4 flute, lens shape for 5-axis profiling



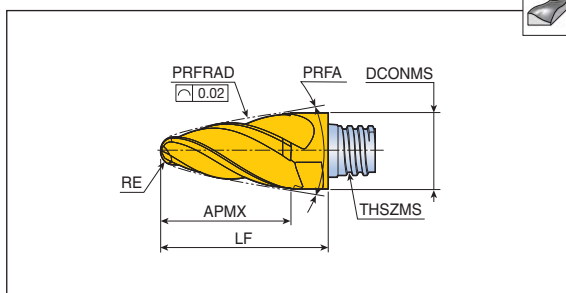
| Designation               | Feed<br>(mm/tooth) | Dimension (mm) |        |     |      |      |      |        |        | Grade<br>TT5523 |
|---------------------------|--------------------|----------------|--------|-----|------|------|------|--------|--------|-----------------|
|                           |                    | DC             | PRFRAD | RE  | APMX | LU   | LF   | THSZMS | DCONMS |                 |
| <b>MXCSL 4080R016-S05</b> | 0.02-0.08          | 8              | 16     | 0.5 | 0.9  | 5.5  | 10.0 | S05    | 8      | ●               |
| <b>4100R020-S06</b>       | 0.03-0.09          | 10             | 20     | 1.0 | 1.4  | 7.5  | 13.0 | S06    | 10     | ●               |
| <b>4120R024-S08</b>       | 0.03-0.10          | 12             | 24     | 1.0 | 1.6  | 9.0  | 16.5 | S08    | 12     | ●               |
| <b>4160R032-S10</b>       | 0.04-0.12          | 16             | 32     | 1.0 | 1.8  | 12.0 | 20.5 | S10    | 16     | ●               |
|                           |                    |                |        |     |      |      |      |        |        |                 |

- Wrench should be ordered separately
- PRFRAD: Profile radius

●: Standard items

# MXCSO

4 flute, oval shape(barrel) for 5-axis profiling



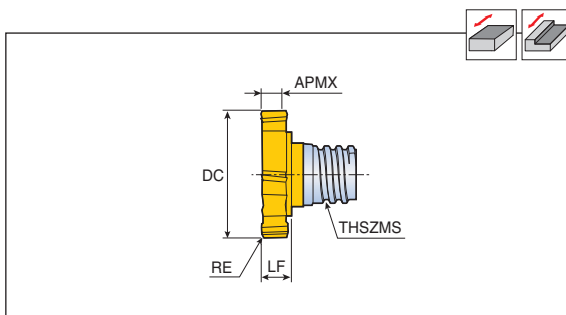
| Designation               | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |      |        |        |        | Grade<br>TT5523 |
|---------------------------|--------------------|----------------|-----|------|------|------|--------|--------|--------|-----------------|
|                           |                    | PRFRAD         | RE  | APMX | LF   | PRFA | THSZMS | DCONMS | TT5523 |                 |
| <b>MXCSO 4080R080-S05</b> | 0.02-0.08          | 80             | 1.5 | 14.2 | 18.0 | 24   | S05    | 8      | ●      |                 |
| <b>4100R085-S06</b>       | 0.03-0.09          | 85             | 2.0 | 16.5 | 22.0 | 24   | S06    | 10     | ●      |                 |
| <b>4120R075-S08</b>       | 0.03-0.10          | 75             | 2.0 | 21.3 | 27.0 | 24   | S08    | 12     | ●      |                 |
| <b>4160R075-S10</b>       | 0.04-0.12          | 75             | 3.0 | 27.0 | 33.4 | 24   | S10    | 16     | ●      |                 |
|                           |                    |                |     |      |      |      |        |        |        |                 |

- Wrench should be ordered separately
- PRFRAD: Profile radius

●: Standard items

# MXFM-106

**6 flute, for face milling**

[illegible]

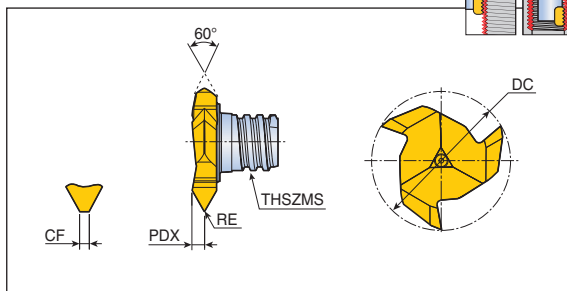
- ▶ Wrench should be ordered separately

●: Standard items



# TTRD-A60

3, 4 flute, ISO threading



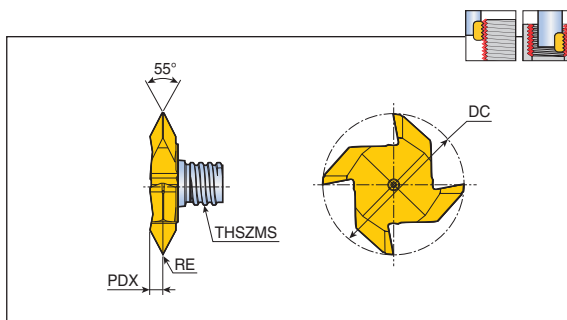
| Designation                 | TP      | Dimension (mm) |     |     |      |      |       |        | Grade |
|-----------------------------|---------|----------------|-----|-----|------|------|-------|--------|-------|
|                             |         | DC             | NOF | PDX | RE   | CF   | RANGE | THSZMS |       |
| <b>TTRD 16A60-0.5P-3S06</b> | 0.5-2.0 | 15.7           | 3   | 1.4 | -    | 0.05 | M20   | S06    | ●     |
| <b>16A60-1.5P-3S06</b>      | 1.5-2.0 | 15.7           | 3   | 1.4 | 0.05 | -    | M22   | S06    | ●     |
| <b>22A60-3.0P-4S08</b>      | 3.0-4.5 | 21.7           | 4   | 2.4 | 0.20 | -    | M36   | S08    | ●     |
|                             |         |                |     |     |      |      |       |        |       |

- Wrench should be ordered separately
- NOF: Number of flutes
- TP: Threads per inch

●: Standard items

# TTRD-W55

4 flute, BSW threading

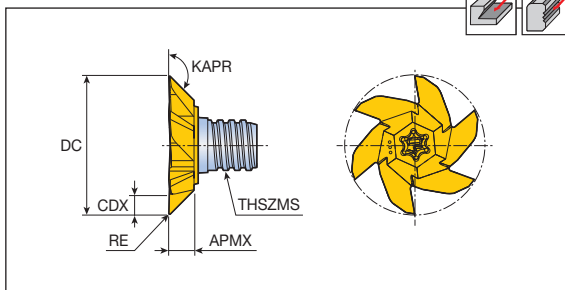
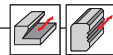


| Designation                | TPI   | Dimension (mm) |     |     |       |        | Grade |
|----------------------------|-------|----------------|-----|-----|-------|--------|-------|
|                            |       | DC             | PDX | RE  | RANGE | THSZMS |       |
| <b>TTRD 22W55-14P-4S08</b> | 14-11 | 21.7           | 2.0 | 0.2 | 3/4   | S08    | ●     |
|                            |       |                |     |     |       |        |       |
|                            |       |                |     |     |       |        |       |

- Wrench should be ordered separately
- TPI: Threads per inch

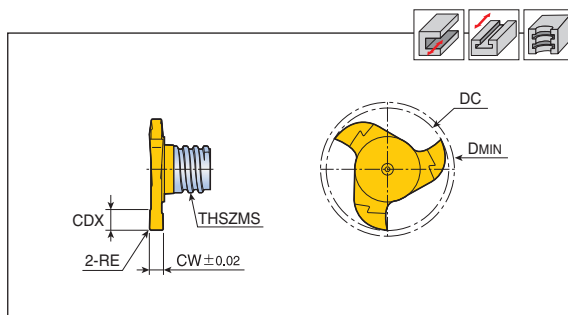
●: Standard items

**6 flute, dovetail**

[illegible]

●: Standard items

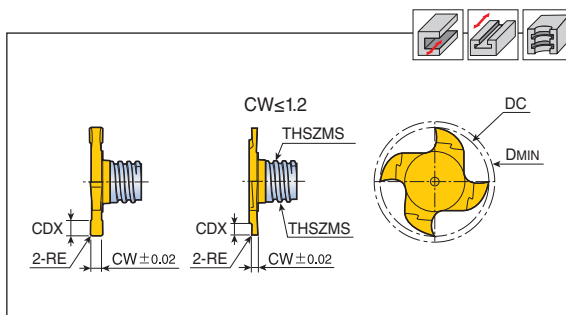
### 3 flute, for slotting



► Wrench should be ordered separately  
► <sup>(1)</sup> CW for circle clips according to DIN 471/472

●: Standard items

**4, 6 flute, for slotting**

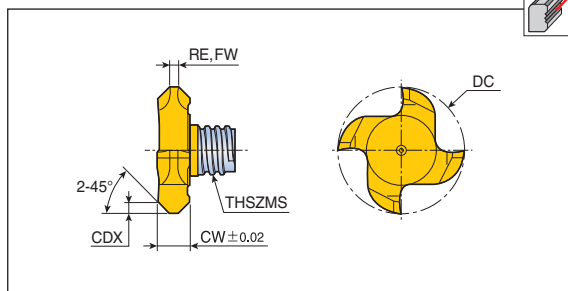


- ▶ Wrench should be ordered separately
- ▶ NOF: Number of flutes
- ▶ <sup>(1)</sup> CW for circle clips according to DIN 471/472

●: Standard items

# TST-A45

3-6 flute, for chamfering



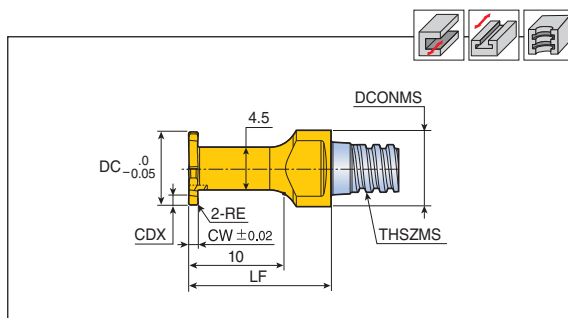
| Designation                  | Feed<br>(mm/tooth) | Dimension (mm) |     |     |     |     |     |        |      | Grade  |        |
|------------------------------|--------------------|----------------|-----|-----|-----|-----|-----|--------|------|--------|--------|
|                              |                    | DC             | NOF | CW  | CDX | RE  | FW  | THSZMS | Torx | TT5523 | TT5543 |
| <b>TST 177L01.40A45-3S06</b> | 0.03-0.15          | 17.7           | 3   | 3.4 | 1.4 | 0.1 | -   | S06    | -    |        | ●      |
| <b>217L01.70A45-4S08</b>     | 0.03-0.17          | 21.7           | 4   | 5.5 | 1.7 | -   | 1.5 | S08    | -    |        | ●      |
| <b>277L04.00A45-6S10</b>     | 0.03-0.17          | 27.7           | 6   | 9.8 | 4.0 | -   | 0.5 | S10    | T40  | ●      |        |
|                              |                    |                |     |     |     |     |     |        |      |        |        |

- Wrench should be ordered separately
- NOF: Number of flutes
- FW: Flat width

●: Standard items

# TTB-04

4 flute, for slotting

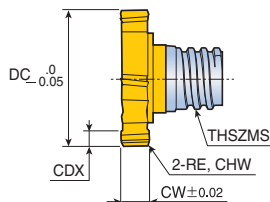
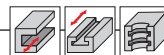


| Designation                 | Feed<br>(mm/tooth) | Dimension (mm) |     |     |     |    |        |        | Grade  |  |
|-----------------------------|--------------------|----------------|-----|-----|-----|----|--------|--------|--------|--|
|                             |                    | DC             | CW  | CDX | RE  | LF | THSZMS | DCONMS | TT5523 |  |
| <b>TTB 077W1.0R02-04S05</b> | 0.02-0.08          | 7.7            | 1.0 | 1.2 | 0.2 | 15 | S05    | 8.0    | ●      |  |
| <b>077W1.5R02-04S05</b>     | 0.02-0.08          | 7.7            | 1.5 | 1.2 | 0.2 | 15 | S05    | 8.0    | ●      |  |
| <b>077W2.0R02-04S05</b>     | 0.02-0.08          | 7.7            | 2.0 | 1.2 | 0.2 | 15 | S05    | 8.0    | ●      |  |
|                             |                    |                |     |     |     |    |        |        |        |  |

- Wrench should be ordered separately

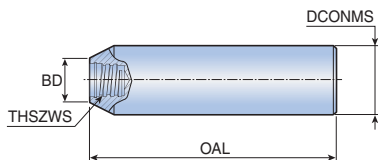
●: Standard items

6 flute, for slotting



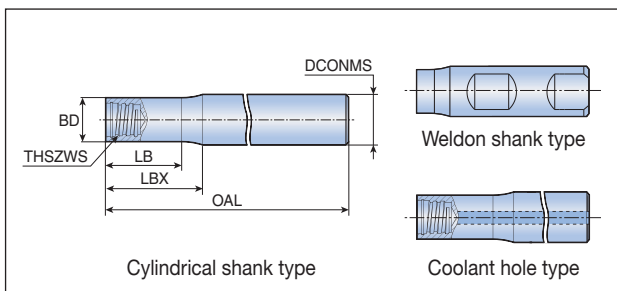
- ▶ Wrench should be ordered separately

●: Standard items

[illegible]

► THSZWS: Connection thread size

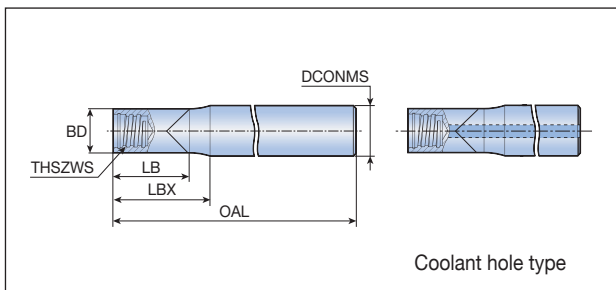
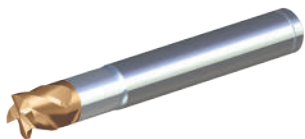
# MAXIRUSH

[illegible]

► THSZWS: Connection thread size



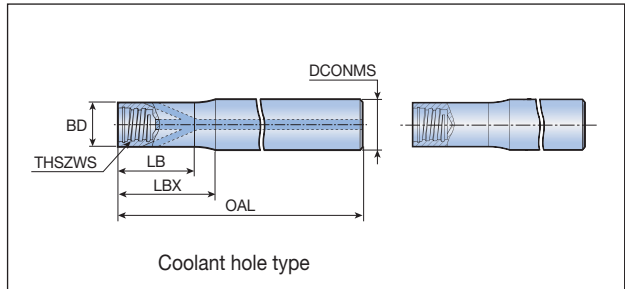
## Carbide shanks with step neck & internal coolant hole



| Designation              | Dimension (mm) |        |      |     |      |     | Coolant hole | Shank material |
|--------------------------|----------------|--------|------|-----|------|-----|--------------|----------------|
|                          | THSZWS         | DCONMS | BD   | OAL | LB   | LBX |              |                |
| <b>MXSSD 08L070S05-C</b> | S05            | 8      | 7.6  | 70  | 19   | 20  | x            | Carbide        |
| <b>08L090S05-C</b>       | S05            | 8      | 7.6  | 90  | 39   | 40  | x            | Carbide        |
| <b>08L110S05-C</b>       | S05            | 8      | 7.6  | 110 | 59   | 60  | x            | Carbide        |
| <b>10L070S06-C</b>       | S06            | 10     | 9.6  | 70  | 18.5 | 20  | x            | Carbide        |
| <b>10L090S06-C</b>       | S06            | 10     | 9.6  | 90  | 38.5 | 40  | x            | Carbide        |
| <b>10L110S06-C</b>       | S06            | 10     | 9.6  | 110 | 58.5 | 60  | x            | Carbide        |
| <b>10L150S06-C</b>       | S06            | 10     | 9.6  | 150 | 98.5 | 100 | x            | Carbide        |
| <b>12L070S08-C</b>       | S08            | 12     | 11.6 | 70  | 17   | 20  | x            | Carbide        |
| <b>12L070S08-C-A</b>     | S08            | 12     | 11.6 | 70  | 17   | 20  | ●            | Carbide        |
| <b>12L090S08-C</b>       | S08            | 12     | 11.6 | 90  | 37   | 40  | x            | Carbide        |
| <b>12L090LS08-C-A</b>    | S08            | 12     | 11.6 | 90  | 37   | 40  | ●            | Carbide        |
| <b>12L110S08-C</b>       | S08            | 12     | 11.6 | 110 | 57   | 60  | x            | Carbide        |
| <b>12L110S08-C-A</b>     | S08            | 12     | 11.6 | 110 | 57   | 60  | ●            | Carbide        |
| <b>12L130S08-C</b>       | S08            | 12     | 11.6 | 130 | 77   | 80  | x            | Carbide        |
| <b>12L130S08-C-A</b>     | S08            | 12     | 11.6 | 130 | 77   | 80  | ●            | Carbide        |
| <b>16L090S10-C</b>       | S10            | 16     | 15.3 | 90  | 38   | 40  | x            | Carbide        |
| <b>16L090S10-C-A</b>     | S10            | 16     | 15.3 | 90  | 38   | 40  | ●            | Carbide        |
| <b>16L110S10-C</b>       | S10            | 16     | 15.3 | 110 | 58   | 60  | x            | Carbide        |
| <b>16L110S10-C-A</b>     | S10            | 16     | 15.3 | 110 | 58   | 60  | ●            | Carbide        |
| <b>16L130S10-C</b>       | S10            | 16     | 15.3 | 130 | 78   | 80  | x            | Carbide        |
| <b>16L130S10-C-A</b>     | S10            | 16     | 15.3 | 130 | 78   | 80  | ●            | Carbide        |
| <b>16L150S10-C</b>       | S10            | 16     | 15.3 | 150 | 98   | 100 | x            | Carbide        |
| <b>20L090S12-C</b>       | S12            | 20     | 18.3 | 90  | 37   | 40  | x            | Carbide        |
| <b>20L130S12-C</b>       | S12            | 20     | 18.3 | 130 | 77   | 80  | x            | Carbide        |
| <b>20L200S12-C</b>       | S12            | 20     | 18.3 | 200 | 117  | 120 | x            | Carbide        |
| <b>25L120S15-C</b>       | S15            | 25     | 23.9 | 120 | 58   | 60  | x            | Carbide        |
| <b>25L170S15-C</b>       | S15            | 25     | 23.9 | 170 | 98   | 100 | x            | Carbide        |
| <b>25L250S15-C</b>       | S15            | 25     | 23.9 | 250 | 148  | 150 | x            | Carbide        |
|                          |                |        |      |     |      |     |              |                |
|                          |                |        |      |     |      |     |              |                |
|                          |                |        |      |     |      |     |              |                |
|                          |                |        |      |     |      |     |              |                |
|                          |                |        |      |     |      |     |              |                |
|                          |                |        |      |     |      |     |              |                |

► THSZWS: Connection thread size

### Tungsten shanks with step neck & internal coolant hole

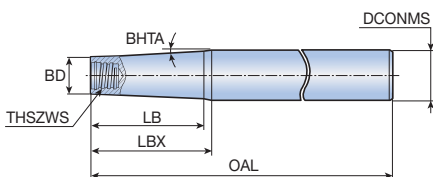
[illegible]

► THSZWS: Connection thread size

# MXTSD-S



### Steel shanks with taper neck

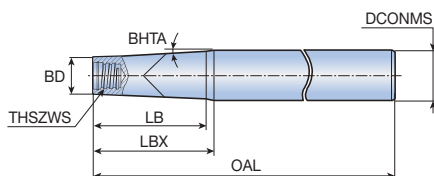
[illegible]

► THSZWS: Connection thread size

# MXTSD-C



### Carbide shanks with taper neck

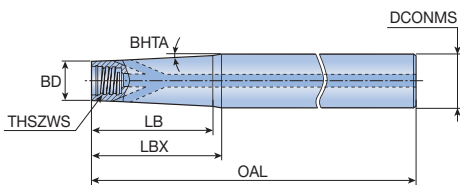
[illegible]

► THSZWS: Connection thread size

**MXTSD-W-A**



### Tungsten shanks with taper neck & internal coolant hole

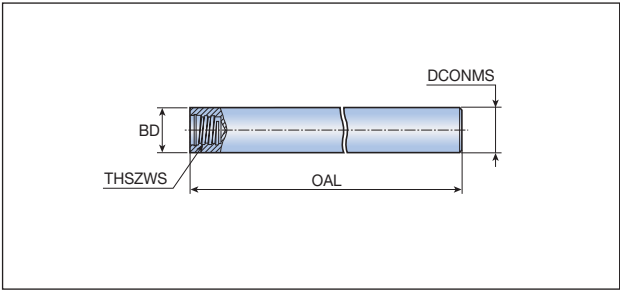
[illegible]

► THSZWS: Connection thread size

# MXSTD-S



## Straight steel shanks



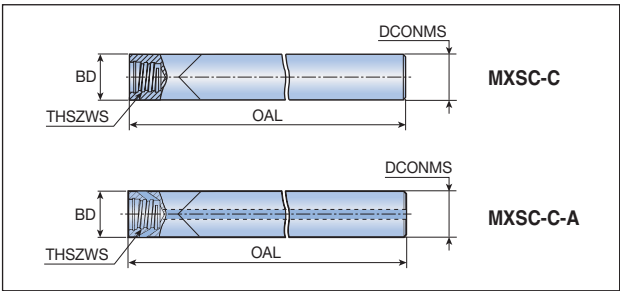
| Designation              | Dimension (mm) |        |    |     | Shank material |
|--------------------------|----------------|--------|----|-----|----------------|
|                          | THSZWS         | DCONMS | BD | OAL |                |
| <b>MXSTD 06L070S04-S</b> | S04            | 6      | 6  | 70  | Steel          |
| <b>08L050S05-S</b>       | S05            | 8      | 8  | 50  | Steel          |
| <b>08L070S05-S</b>       | S05            | 8      | 8  | 70  | Steel          |
| <b>10L050S06-S</b>       | S06            | 10     | 10 | 50  | Steel          |
| <b>10L080S06-S</b>       | S06            | 10     | 10 | 80  | Steel          |
| <b>12L090S08-S</b>       | S08            | 12     | 12 | 90  | Steel          |
| <b>16L100S10-S</b>       | S10            | 16     | 16 | 100 | Steel          |

► THSZWS: Connection thread size

# MXSC-C



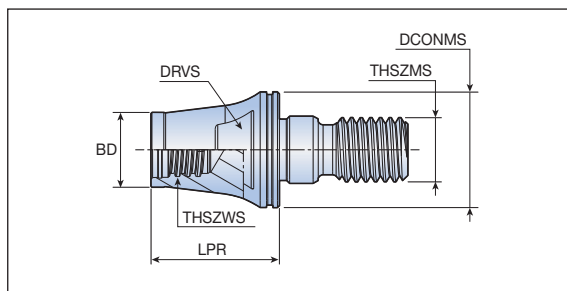
## Straight carbide shanks



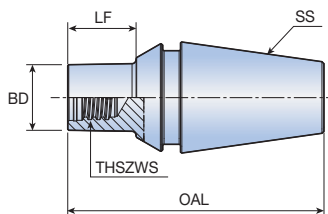
| Designation              | Dimension (mm) |        |    |     | Coolant hole | Shank material |
|--------------------------|----------------|--------|----|-----|--------------|----------------|
|                          | THSZWS         | DCONMS | BD | OAL |              |                |
| <b>MXSC 100L100S06-C</b> | S06            | 10     | 10 | 100 | x            | Carbide        |
| <b>120L100S08-C-A</b>    | S08            | 12     | 12 | 100 | •            | Carbide        |
|                          |                |        |    |     |              |                |
|                          |                |        |    |     |              |                |
|                          |                |        |    |     |              |                |
|                          |                |        |    |     |              |                |

► THSZWS: Connection thread size

## A close-up photograph of a diamond drill bit. The bit has a black body and a silver-colored, multi-fluted cutting edge. The tip is sharp and pointed.

[illegible]

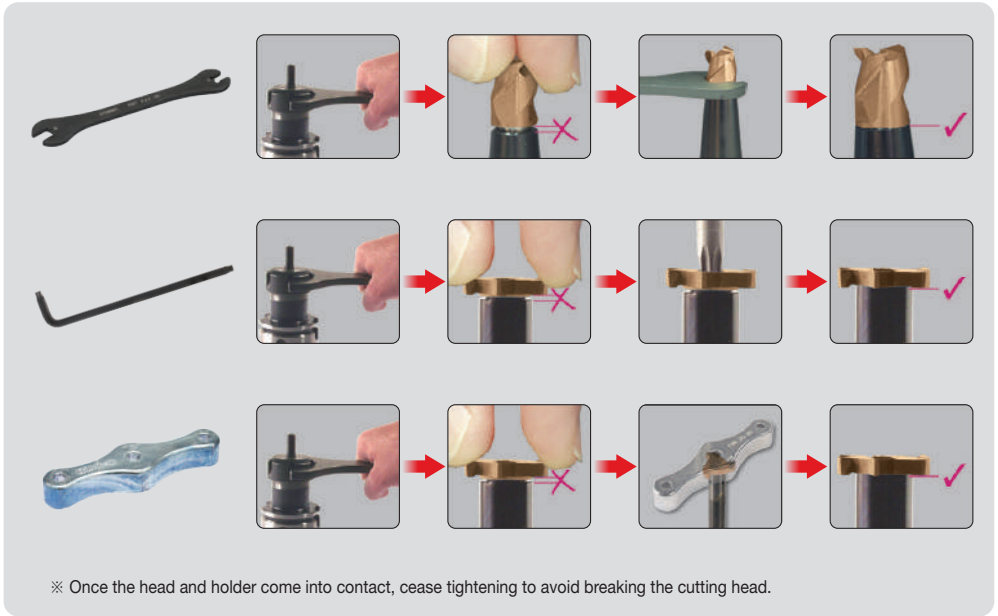
- F
- 
- 54

[illegible]



## Wrench

| Head designation                                      | Head type                                                                         | Wrench type                                                                       | Designation  | Thread size | Torque (N.m) |
|-------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------|-------------|--------------|
| Cylindrical & 2 flute eco type<br>• MX...<br>• TTB-04 |  |  | MX KEY-S04   | S04         | 4            |
|                                                       |                                                                                   |                                                                                   | MX KEY-S05   | S05         | 7            |
|                                                       |                                                                                   |                                                                                   | MX KEY-S06   | S06         | 10           |
|                                                       |                                                                                   |                                                                                   | MX KEY-S08   | S08         | 15           |
|                                                       |                                                                                   |                                                                                   | MX KEY-S10   | S10         | 28           |
|                                                       |                                                                                   |                                                                                   | MX KEY-S12   | S12         | 28           |
|                                                       |                                                                                   |                                                                                   | MX KEY-S15   | S15         | 40           |
| T-cutter type<br>• T...<br>• MXFM                     |  |  | MX SKEY-T15  | S04         | 4            |
|                                                       |                                                                                   |                                                                                   | MX SKEY-T20  | S05, S06    | 7, 10        |
|                                                       |                                                                                   |                                                                                   | MX SKEY-T25  | S06         | 10           |
|                                                       |                                                                                   |                                                                                   | MX SKEY-T30L | S08         | 15           |
|                                                       |                                                                                   |                                                                                   | MX SKEY-T40L | S08, S10    | 15, 28       |
|                                                       |                                                                                   |                                                                                   | MX SKEY-T50L | S08, S10    | 15, 28       |
|                                                       |  |  | MX SKEY-S06  | S06         | 10           |
|                                                       |                                                                                   |                                                                                   | MX SKEY-S08  | S08         | 15           |

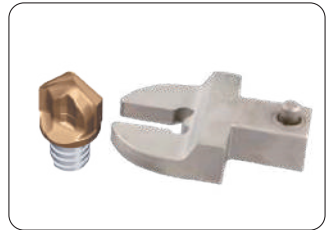
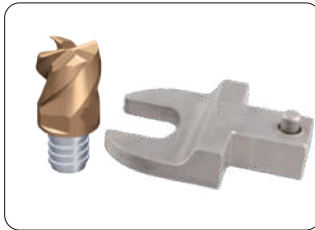
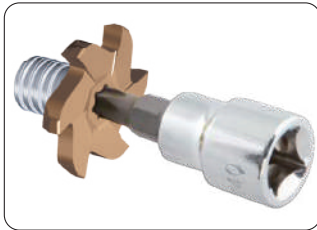


► Wrench should be ordered separately

## Torque wrench

| Handle                                                                            |                           |             |              |
|-----------------------------------------------------------------------------------|---------------------------|-------------|--------------|
| Handle appearance                                                                 | Designation               | Thread size | Torque (N.m) |
|  | TORQUE WRENCH 3-25NM 9X12 | S04-S08     | 3-25         |
|   | TORQUE WRENCH 5-50NM 9X12 | S05-S15     | 5-50         |

| Wrenches and Torx bits                                    |                                                                                   |                                                                                    |                      |               |              |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------|---------------|--------------|
| Head designation                                          | Head type                                                                         | Wrench type                                                                        | Designation          | Thread size   | Torque (N.m) |
| Cylindrical & 2 flute eco type<br><br>• MX...<br>• TTB-04 |  |   | MX WRENCH 6-05       | S04, S05      | 4, 7         |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 8-06       | S06           | 10           |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 10-08      | S08           | 15           |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 13-10      | S10           | 28           |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 16-12      | S12           | 28           |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 20-15      | S15           | 40           |
|                                                           |  |   | MX WRENCH 4E-05      | S05           | 7            |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 5E-06      | S06           | 10           |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 7E-08      | S08           | 15           |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 8E-10      | S10           | 28           |
|                                                           |                                                                                   |                                                                                    | MX WRENCH 9E-12      | S12           | 28           |
| T-cutter type<br><br>• T...<br>• MXFM                     |  |   | INSERT TOOL 9X12MM   | -             | -            |
|                                                           |                                                                                   |  | BIT SOCKET T20 DRIVE | S04, S05, S06 | 4, 7, 10     |
|                                                           |                                                                                   |                                                                                    | BIT SOCKET T25 DRIVE | S06           | 10           |
|                                                           |                                                                                   |                                                                                    | BIT SOCKET T30 DRIVE | S08           | 15           |
|                                                           |                                                                                   |                                                                                    | BIT SOCKET T40 DRIVE | S08, S10      | 15, 28       |
|                                                           |                                                                                   |                                                                                    | BIT SOCKET T50 DRIVE | S08, S10      | 15, 28       |



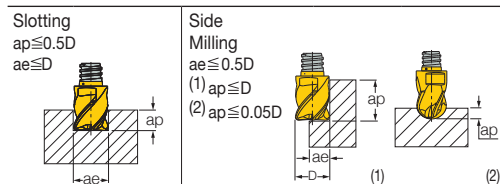
# Recommended Cutting Conditions



## Machining data for MAXI-RUSH

### fz for Square & Round heads

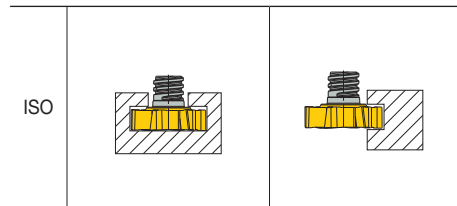
(mm/tooth)



| D (mm) | fz (mm/tooth) | D (mm) | fz (mm/tooth) |
|--------|---------------|--------|---------------|
| 6      | 0.027-0.05    | 6      | 0.027-0.06    |
| 8      | 0.032-0.07    | 8      | 0.032-0.08    |
| 10     | 0.034-0.08    | 10     | 0.034-0.09    |
| 12     | 0.036-0.10    | 12     | 0.036-0.11    |
| 16     | 0.050-0.12    | 16     | 0.05 - 0.13   |
| 20     | 0.052-0.14    | 20     | 0.052-0.15    |
| 25     | 0.062-0.15    | 25     | 0.062-0.17    |

### fz for Slotting heads

(mm/tooth)



| ISO      | fz (mm/tooth) | fz (mm/tooth) |
|----------|---------------|---------------|
| <b>P</b> | 0.025-0.12    | 0.035-0.15    |
| <b>M</b> | 0.025-0.10    | 0.025-0.12    |
| <b>K</b> | 0.025-0.15    | 0.035-0.17    |

### Recommended Cutting Speed

| ISO      | Material No. | Hardness HB | Vc m/min |
|----------|--------------|-------------|----------|
| <b>P</b> | 1            | 125         | 220-240  |
|          | 2            | 190         | 170-200  |
|          | 3-6          | 200         | 140-160  |
|          | 7-8          | 300         | 110-130  |
|          | 9-11         | 200         | 100-130  |
| <b>M</b> | 12-13        | 240         | 90-150   |
|          | 14           | 180         | 70-100   |
| <b>K</b> | 15           | 180         | 70-240   |
|          | 16           | 260         | 110-220  |
|          | 17           | 170         | 130-250  |
|          | 19           | 130         | 130-230  |
|          | 20           | 230         | 100-200  |
| <b>N</b> | 21-24        | 90          | 600-700  |
| <b>S</b> | 33-35        | 350         | 10-20    |
|          | 36-37        | -           | 30-50    |
| <b>H</b> | 38           | HRC55       | 30-40    |
|          | 39           | HRC60       | 25-30    |

### High feed milling - MXFX Only

| ISO      | Material No. | Depth of cut (ap) | Width of cut (ae) | fz (mm/tooth) vs. Tool Diameter D(mm) |      |      |      |      |      |  |
|----------|--------------|-------------------|-------------------|---------------------------------------|------|------|------|------|------|--|
|          |              |                   |                   | Ø8                                    | Ø10  | Ø12  | Ø16  | Ø20  | Ø25  |  |
| <b>P</b> | 1            | 0.045xD           | 0.7xD             | 0.50                                  | 0.60 | 0.70 | 0.80 | 0.95 | 1.05 |  |
|          | 2            | 0.045xD           | 0.7xD             | 0.50                                  | 0.60 | 0.70 | 0.80 | 0.95 | 1.05 |  |
|          | 3            | 0.045xD           | 0.7xD             | 0.50                                  | 0.60 | 0.70 | 0.80 | 0.95 | 1.05 |  |
|          | 4            | 0.045xD           | 0.7xD             | 0.50                                  | 0.60 | 0.70 | 0.80 | 0.95 | 1.05 |  |
|          | 5            | 0.045xD           | 0.7xD             | 0.45                                  | 0.55 | 0.60 | 0.70 | 0.80 | 0.90 |  |
|          | 6            | 0.045xD           | 0.7xD             | 0.35                                  | 0.45 | 0.50 | 0.60 | 0.70 | 0.80 |  |
|          | 7            | 0.045xD           | 0.7xD             | 0.35                                  | 0.45 | 0.50 | 0.60 | 0.70 | 0.80 |  |
|          | 8            | 0.045xD           | 0.7xD             | 0.35                                  | 0.40 | 0.45 | 0.55 | 0.65 | 0.75 |  |
|          | 9            | 0.045xD           | 0.7xD             | 0.35                                  | 0.40 | 0.45 | 0.55 | 0.65 | 0.75 |  |
|          | 10           | 0.04xD            | 0.6xD             | 0.30                                  | 0.35 | 0.40 | 0.50 | 0.6  | 0.70 |  |
|          | 11           | 0.04xD            | 0.6xD             | 0.30                                  | 0.35 | 0.40 | 0.45 | 0.55 | 0.65 |  |
| <b>M</b> | 12-14        | 0.04xD            | 0.6xD             | 0.35                                  | 0.40 | 0.45 | 0.55 | 0.65 | 0.75 |  |
| <b>K</b> | 15-16        | Apmax             | 0.7xD             | 0.50                                  | 0.55 | 0.65 | 0.75 | 0.85 | 0.95 |  |
|          | 17-20        | Apmax             | 0.7xD             | 0.40                                  | 0.50 | 0.55 | 0.65 | 0.75 | 0.85 |  |
| <b>H</b> | 38.1         | 0.035xD           | 0.45xD            | 0.25                                  | 0.30 | 0.35 | 0.45 | 0.50 | 0.60 |  |
|          | 38.2         | 0.03xD            | 0.3xD             | 0.20                                  | 0.25 | 0.35 | 0.40 | 0.50 | 0.55 |  |
|          | 39           | 0.02xD            | 0.25xD            | 0.15                                  | 0.20 | 0.20 | 0.25 | 0.25 | 0.30 |  |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel ■ Stainless steel ■ Cast iron ■ Nonferrous ■ High temp. alloys ■ Hardened steel

# **Solid End Mill Line**



# Designation System

**SLIKSOLID**

**UHP** **4** **100** x **25** x **72** **R0.5**  
**1** **2** **3** **4** **5** **6**

## 1 End mill type

UHP Flat



UHP\_R Corner radius



## 2 No. of flute

4 4 Flutes



6 6 Flutes



## 3 Cutting diameter

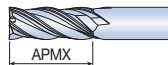
100 10.0 mm

DC

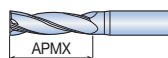


## 4 Length of cut

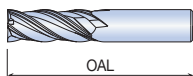
6 6 mm



40 40 mm



## 5 Tool length



## 6 Corner radius

-R□□ Corner radius

RE



# Designation System



## 1 End mill type

|             |               |  |
|-------------|---------------|--|
| HSB/SBT/DEB | Ball nose     |  |
| SED         | Flat          |  |
| DER         | Corner radius |  |
| SCSO/SCST   | Taper         |  |

## 2 No. of flute

|            |  |
|------------|--|
| 2 2 Flutes |  |
| 4 4 Flutes |  |
| 6 6 Flutes |  |

## 3 Cutting diameter

|     |         |
|-----|---------|
| 010 | 1.0 mm  |
| 100 | 10.0 mm |

## 4 Overall length

|    |                   |  |
|----|-------------------|--|
| S  | Short length      |  |
| M  | Medium length     |  |
| L  | Long length       |  |
| XL | Extra long length |  |

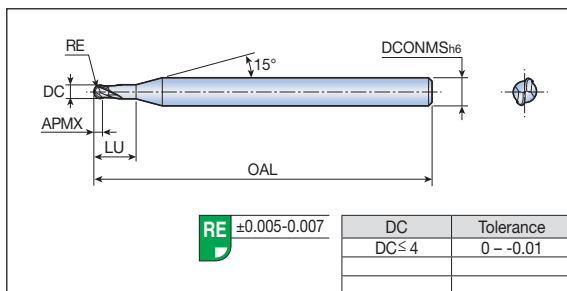
## 5 Others

|      |                |
|------|----------------|
| -□   | Shank diameter |
| -R□□ | Corner radius  |

## 5\* Length of cut

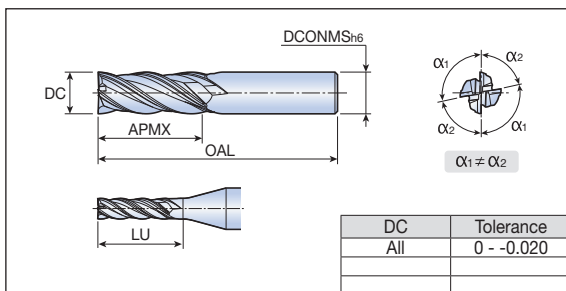
|                  |       |
|------------------|-------|
| SCSO / SCST type |       |
| 24               | 24 mm |

**2 flute CBN ball**

[illegible]

●: Standard items

## 4 flute medium flat

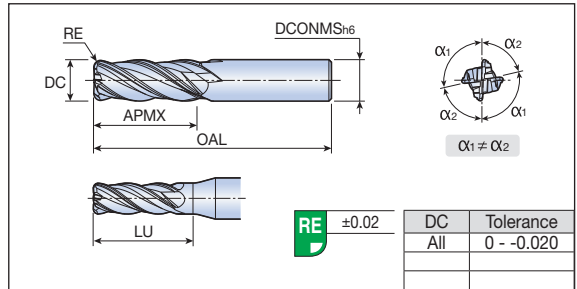


●: Standard items



## UHP 4...R

4 flute medium corner radius

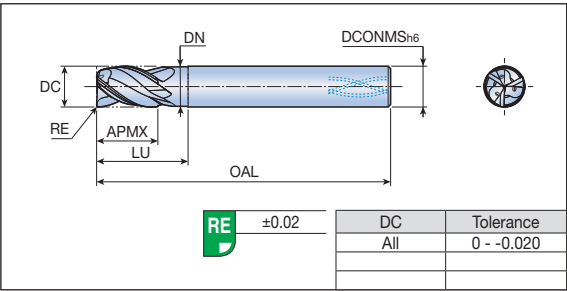
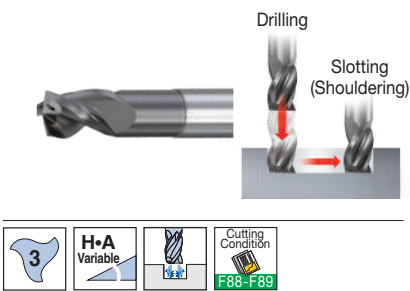
[illegible]

●: Standard items

SDM 3



3 flute, drill-mills



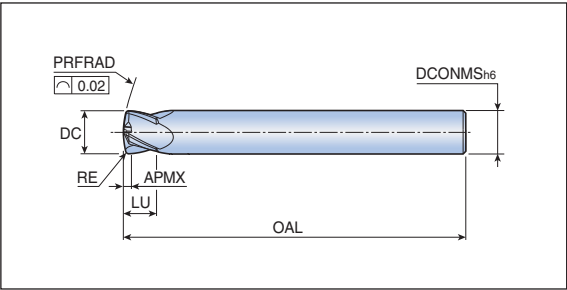
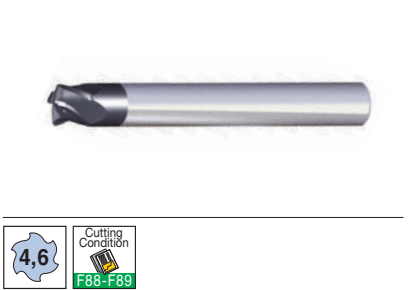
| Designation        | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |    |      |        | Coolant<br>hole | Grade<br>TT5525 |
|--------------------|--------------------|----------------|-----|-----|------|----|------|--------|-----------------|-----------------|
|                    |                    | DC             | RE  | OAL | APMX | LU | DN   | DCONMS |                 |                 |
| SDM 3100X15X72R0.2 | 0.025-0.08         | 10             | 0.2 | 72  | 15   | 30 | 9.6  | 10     | ●               | ●               |
| 3120X18X83R0.2     | 0.025-0.10         | 12             | 0.2 | 83  | 18   | 36 | 11.7 | 12     | ●               | ●               |
| 3160X24X92R0.2     | 0.03-0.12          | 16             | 0.2 | 92  | 24   | 40 | 15.3 | 16     | ●               | ●               |
| 3200X30X110R0.2    | 0.04-0.16          | 20             | 0.2 | 110 | 30   | 55 | 18.3 | 20     | ●               | ●               |
|                    |                    |                |     |     |      |    |      |        |                 |                 |
|                    |                    |                |     |     |      |    |      |        |                 |                 |

●: Standard items

SCSL



4, 6 flute, lens shape for 5-axis profiling

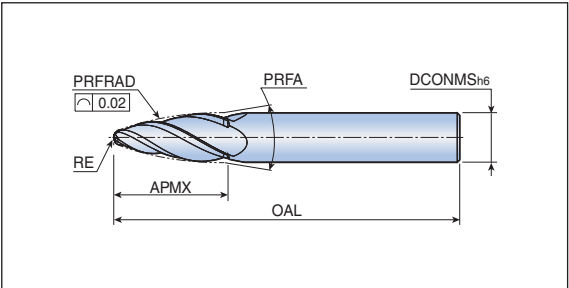


| Designation      | Feed<br>(mm/tooth) | Dimension (mm) |     |        |      |      |     |        |     | Grade<br>TT5515 |
|------------------|--------------------|----------------|-----|--------|------|------|-----|--------|-----|-----------------|
|                  |                    | DC             | NOF | PRFRAD | RE   | APMX | LU  | DCONMS | OAL |                 |
| SCSL 4080R015X05 | 0.02-0.08          | 8              | 4   | 15     | 0.75 | 1.1  | 5.0 | 8      | 63  | ●               |
| 6100R020X07      | 0.03-0.09          | 10             | 6   | 20     | 1.0  | 1.4  | 7.0 | 10     | 72  | ●               |
| 6120R025X09      | 0.03-0.10          | 12             | 6   | 25     | 1.0  | 1.5  | 9.0 | 12     | 83  | ●               |
|                  |                    |                |     |        |      |      |     |        |     |                 |
|                  |                    |                |     |        |      |      |     |        |     |                 |

▶ PRFRAD: Profile radius

●: Standard items

## 4 flute, oval shape(barrel) for 5-axis profiling



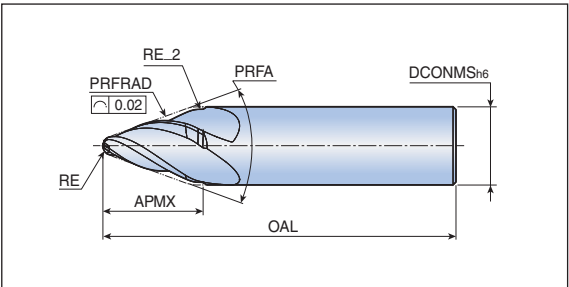
| Designation             | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |        |     | Grade<br>TT5515 |
|-------------------------|--------------------|----------------|-----|------|------|--------|-----|-----------------|
|                         |                    | PRFRAD         | RE  | APMX | PRFA | DCONMS | OAL |                 |
| <b>SCSO 4080R090X24</b> | 0.02-0.08          | 90             | 1.0 | 24.8 | 14.9 | 8      | 63  | ●               |
| <b>4100R085X26</b>      | 0.03-0.09          | 85             | 2.0 | 26.6 | 15.5 | 10     | 72  | ●               |
| <b>4120R080X27</b>      | 0.03-0.10          | 80             | 2.0 | 27.1 | 18.4 | 12     | 83  | ●               |
|                         |                    |                |     |      |      |        |     |                 |
|                         |                    |                |     |      |      |        |     |                 |

► PRFRAD: Profile radius

●: Standard items

# SCST

## 4 flute, tapered shape(barrel) for 5-axis profiling



| Designation                | Feed<br>(mm/tooth) | Dimension (mm) |     |      |      |      |        |     | Grade  |
|----------------------------|--------------------|----------------|-----|------|------|------|--------|-----|--------|
|                            |                    | PRFRAD         | RE  | RE_2 | APMX | PRFA | DCONMS | OAL | TT5515 |
| <b>SCST 4080R250A40X10</b> | 0.02-0.08          | 250            | 1.0 | 4.0  | 10   | 40   | 8      | 63  | ●      |
| <b>4100R250A40X11</b>      | 0.03-0.09          | 250            | 2.0 | 5.0  | 11   | 40   | 10     | 63  | ●      |
| <b>4120R250A40X12</b>      | 0.03-0.10          | 250            | 3.0 | 6.0  | 12   | 40   | 12     | 63  | ●      |
|                            |                    |                |     |      |      |      |        |     |        |
|                            |                    |                |     |      |      |      |        |     |        |
|                            |                    |                |     |      |      |      |        |     |        |

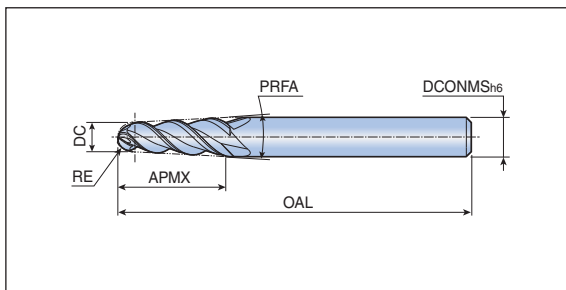
► PRFRAD: Profile radius

●: Standard items

# HTB 2.../3...



2, 3 flute, taper ball shape



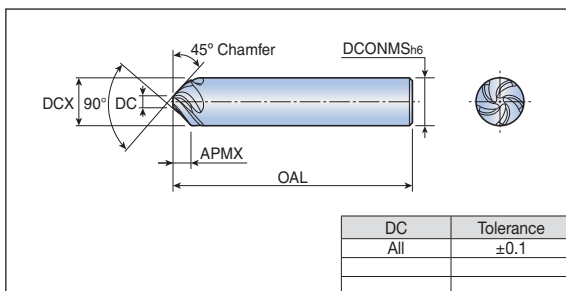
| Designation           | Dimension (mm) |     |     |      |      |        |     | Grade  |
|-----------------------|----------------|-----|-----|------|------|--------|-----|--------|
|                       | DC             | NOF | RE  | APMX | PRFA | DCONMS | OAL | TT5515 |
| <b>HTB 2030TA4-06</b> | 3              | 2   | 1.5 | 22   | 8    | 6      | 70  | ●      |
| <b>3040TA4-08</b>     | 4              | 3   | 2.0 | 30   | 8    | 8      | 75  | ●      |
| <b>3040TA4-10</b>     | 4              | 3   | 2.0 | 44   | 8    | 10     | 95  | ●      |
| <b>3050TA4-12</b>     | 5              | 3   | 2.5 | 52   | 8    | 12     | 110 | ●      |
| <b>3060TA3-12</b>     | 6              | 3   | 3.0 | 60   | 6    | 12     | 120 | ●      |
| <b>3080TA3-16</b>     | 8              | 3   | 4.0 | 80   | 6    | 16     | 150 | ●      |

●: Standard items

# HCEM 5



5 flute, 45° chamfering



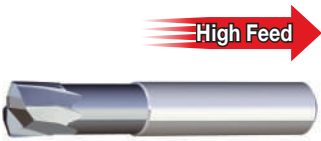
| DC  | Tolerance |
|-----|-----------|
| All | ±0.1      |
|     |           |
|     |           |

| Designation      | Feed (mm/tooth) | Dimension (mm) |     |     |      |        | Grade  |
|------------------|-----------------|----------------|-----|-----|------|--------|--------|
|                  |                 | DCX            | DC  | OAL | APMX | DCONMS | TT5525 |
| <b>HCEM 5080</b> | 0.02-0.06       | 8              | 2   | 63  | 3.0  | 8      | ●      |
| <b>5100</b>      | 0.03-0.07       | 10             | 2.5 | 72  | 3.8  | 10     | ●      |
| <b>5120</b>      | 0.03-0.08       | 12             | 3   | 83  | 4.5  | 12     | ●      |
| <b>5160</b>      | 0.04-0.10       | 16             | 4   | 92  | 6.0  | 16     | ●      |
|                  |                 |                |     |     |      |        |        |
|                  |                 |                |     |     |      |        |        |

●: Standard items

# HFM 2

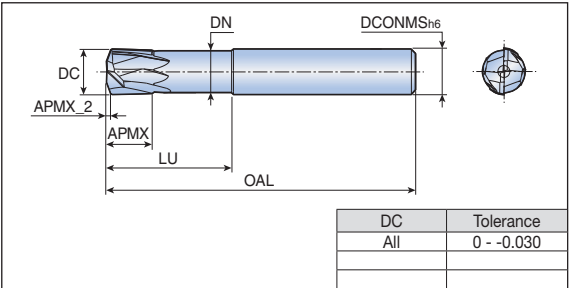
## 2 flute high feed flat



- High Feed Machining (H.F.M)

**H·A**  
10°

Cutting Condition

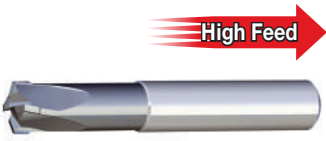


| Designation     | Feed (mm/tooth) | Dimension (mm) |     |      |         |    |      |        | Grade TT5515 |
|-----------------|-----------------|----------------|-----|------|---------|----|------|--------|--------------|
|                 |                 | DC             | OAL | APMX | APMX_2* | LU | DN   | DCONMS |              |
| <b>HFM 2040</b> | 0.2-0.4         | 4              | 47  | 4    | 0.3     | 10 | 3.9  | 6      | ●            |
| <b>2060</b>     | 0.3-0.6         | 6              | 52  | 6    | 0.5     | 16 | 5.5  | 6      | ●            |
| <b>2080</b>     | 0.4-0.7         | 8              | 60  | 8    | 0.75    | 22 | 7.3  | 8      | ●            |
| <b>2100</b>     | 0.5-0.9         | 10             | 68  | 10   | 1.0     | 28 | 9.2  | 10     | ●            |
| <b>2120</b>     | 0.5-1.0         | 12             | 76  | 12   | 1.1     | 33 | 11.0 | 12     | ●            |
|                 |                 |                |     |      |         |    |      |        |              |
|                 |                 |                |     |      |         |    |      |        |              |

► \*: Maximum D.O.C for high feed milling ●: Standard items

# HFM 4

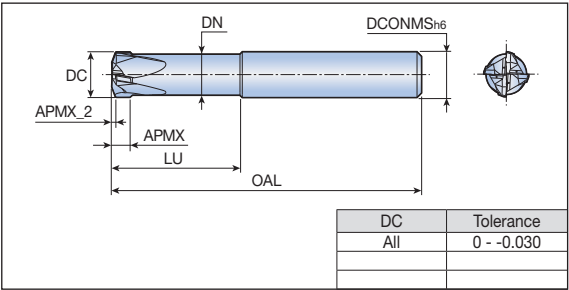
## 4 flute high feed flat



- High Feed Machining (H.F.M)

**H·A**  
10°

Cutting Condition



| Designation     | Feed (mm/tooth) | Dimension (mm) |     |      |         |    |      |        | Grade TT5515 |
|-----------------|-----------------|----------------|-----|------|---------|----|------|--------|--------------|
|                 |                 | DC             | OAL | APMX | APMX_2* | LU | DN   | DCONMS |              |
| <b>HFM 4060</b> | 0.3-0.5         | 6              | 52  | 2.5  | 0.5     | 16 | 5.4  | 6      | ●            |
| <b>4080</b>     | 0.3-0.6         | 8              | 60  | 3.5  | 0.7     | 24 | 7.2  | 8      | ●            |
| <b>4100</b>     | 0.4-0.8         | 10             | 68  | 4.0  | 0.75    | 28 | 9.2  | 10     | ●            |
| <b>4120</b>     | 0.4-1.0         | 12             | 76  | 5.0  | 1.05    | 33 | 11.0 | 12     | ●            |
|                 |                 |                |     |      |         |    |      |        |              |
|                 |                 |                |     |      |         |    |      |        |              |
|                 |                 |                |     |      |         |    |      |        |              |

► \*: Maximum D.O.C for high feed milling ●: Standard items

# CFM 4...M



## 4 flute corner chamfer



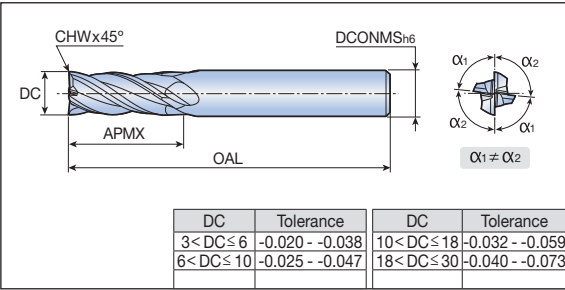
• Vibration free mill



**H•A**  
38°



F88-F89



| DC          | Tolerance       | DC           | Tolerance       |
|-------------|-----------------|--------------|-----------------|
| 3 < DC ≤ 6  | -0.020 - -0.038 | 10 < DC ≤ 18 | -0.032 - -0.059 |
| 6 < DC ≤ 10 | -0.025 - -0.047 | 18 < DC ≤ 30 | -0.040 - -0.073 |

| Designation | Feed<br>(mm/tooth) | Dimension (mm) |      |     |      |        | Grade<br>TT5525 |
|-------------|--------------------|----------------|------|-----|------|--------|-----------------|
|             |                    | DC             | CHW  | OAL | APMX | DCONMS |                 |
| CFM 4060M   | 0.03-0.07          | 4              | 0.15 | 57  | 10   | 6      | ●               |
| 4060M       | 0.03-0.07          | 6              | 0.25 | 57  | 14   | 6      | ●               |
| 4080M       | 0.03-0.08          | 8              | 0.3  | 63  | 18   | 8      | ●               |
| 4100M       | 0.03-0.10          | 10             | 0.4  | 72  | 22   | 10     | ●               |
| 4120M       | 0.04-0.11          | 12             | 0.5  | 83  | 26   | 12     | ●               |
| 4160M       | 0.05-0.13          | 16             | 0.6  | 100 | 34   | 16     | ●               |
| 4200M       | 0.05-0.17          | 20             | 0.6  | 110 | 42   | 20     | ●               |
| 4250M       | 0.06-0.20          | 25             | 0.6  | 121 | 52   | 25     | ●               |

●: Standard items

# FSM 4...M



## 4 flute medium corner chamfer



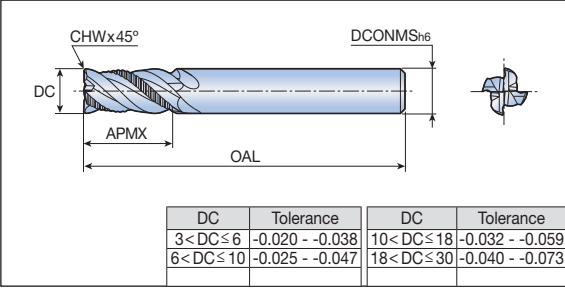
• MULTIMILL (Rough + Finish)



**H•A**  
45°



F88-F89



| DC          | Tolerance       | DC           | Tolerance       |
|-------------|-----------------|--------------|-----------------|
| 3 < DC ≤ 6  | -0.020 - -0.038 | 10 < DC ≤ 18 | -0.032 - -0.059 |
| 6 < DC ≤ 10 | -0.025 - -0.047 | 18 < DC ≤ 30 | -0.040 - -0.073 |

| Designation | Feed<br>(mm/tooth) | Dimension (mm) |      |     |      |        | Grade<br>TT5525 |
|-------------|--------------------|----------------|------|-----|------|--------|-----------------|
|             |                    | DC             | CHW  | OAL | APMX | DCONMS |                 |
| FSM 4060M   | 0.03-0.06          | 6              | 0.25 | 57  | 14   | 6      | ●               |
| 4080M       | 0.03-0.08          | 8              | 0.3  | 63  | 18   | 8      | ●               |
| 4100M       | 0.03-0.09          | 10             | 0.3  | 72  | 22   | 10     | ●               |
| 4120M       | 0.04-0.11          | 12             | 0.4  | 83  | 26   | 12     | ●               |
| 4140M       | 0.04-0.11          | 14             | 0.4  | 83  | 30   | 14     | ●               |
| 4160M       | 0.05-0.11          | 16             | 0.6  | 92  | 34   | 16     | ●               |
| 4200M       | 0.05-0.11          | 20             | 0.6  | 104 | 42   | 20     | ●               |
| 4250M       | 0.06-0.11          | 25             | 0.6  | 121 | 52   | 25     | ●               |

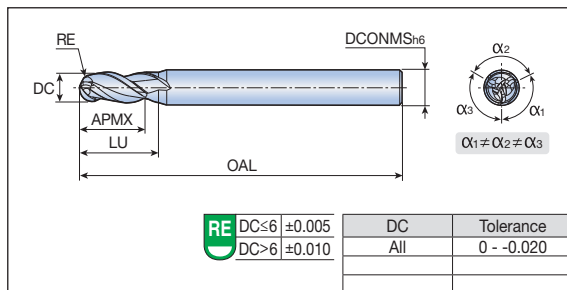
●: Standard items

# SBT 3...U

## 3 flute medium ball



- Excellent chatter damping due to unequal spacing of cutting edges



| Designation      | Dimension (mm) |    |     |      |    |        | Grade  |
|------------------|----------------|----|-----|------|----|--------|--------|
|                  | DC             | RE | OAL | APMX | LU | DCONMS | TT5515 |
| <b>SBT 3040U</b> | 4              | 2  | 70  | 8    | 10 | 6      | ●      |
| <b>3060U</b>     | 6              | 3  | 80  | 12   | -  | 6      | ●      |
| <b>3080U</b>     | 8              | 4  | 90  | 16   | -  | 8      | ●      |
| <b>3100U</b>     | 10             | 5  | 100 | 20   | -  | 10     | ●      |
| <b>3120U</b>     | 12             | 6  | 110 | 25   | -  | 12     | ●      |

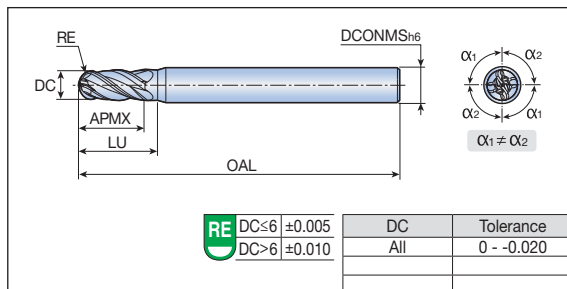
- Standard items

# SBT 4...U

## 4 flute medium ball



- Excellent chatter damping due to unequal spacing of cutting edges



| Designation      | Dimension (mm) |     |     |      |    |        | Grade  |
|------------------|----------------|-----|-----|------|----|--------|--------|
|                  | DC             | RE  | OAL | APMX | LU | DCONMS | TT5515 |
| <b>SBT 4030U</b> | 3              | 1.5 | 70  | 8    | 10 | 6      | ●      |
| <b>4040U</b>     | 4              | 2   | 70  | 8    | 10 | 6      | ●      |
| <b>4050U</b>     | 5              | 2.5 | 80  | 10   | 12 | 6      | ●      |
| <b>4060U</b>     | 6              | 3   | 80  | 12   | -  | 6      | ●      |
| <b>4080U</b>     | 8              | 4   | 90  | 16   | -  | 8      | ●      |
| <b>4100U</b>     | 10             | 5   | 100 | 20   | -  | 10     | ●      |
| <b>4120U</b>     | 12             | 6   | 110 | 25   | -  | 12     | ●      |
| <b>4160U</b>     | 16             | 8   | 125 | 35   | -  | 16     | ●      |
| <b>4200U</b>     | 20             | 10  | 150 | 40   | -  | 20     | ●      |

- Standard items

**4 flute medium flat**



- 
- Technical drawing of a double-flute drill bit. The main view shows the drill bit with dimensions: DC (cutting diameter), APMX (flute length), LU (length of the cutting edge), and OAL (overall length). The drill bit is labeled DCONMSH6. A cross-section view on the right shows the double-flute design with angles  $\alpha_1$  and  $\alpha_2$ , and a note  $\alpha_1 \neq \alpha_2$ .
- | DC  | Tolerance  |
|-----|------------|
| All | 0 - -0.020 |
|     |            |
|     |            |



| DC  | Tolerance  |
|-----|------------|
| All | 0 - -0.020 |
|     |            |
|     |            |

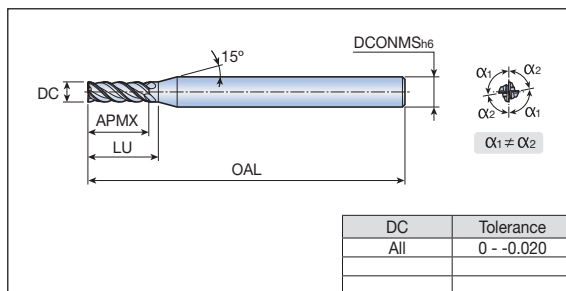
[illegible]



4 flute long flat



- 4



●: Standard items

## 4 flute medium corner radius



- 
- Technical drawing of a double-flute drill bit. The drawing shows the side view and a cross-section. Dimensions and labels include:
- RE**: Chamfer radius at the tip.
  - DC**: Drill diameter.
  - APMX**: Axial distance from the tip to the start of the double-flute section.
  - LU**: Length of the double-flute section.
  - OAL**: Overall length of the drill.
  - DCONMSH6**: Drill diameter tolerance class.
  - Flute Angles**: The cross-section shows four flutes with angles  $\alpha_1$  and  $\alpha_2$ . A note indicates  $\alpha_1 \neq \alpha_2$ .
- | RE  | ±0.02      |
|-----|------------|
| DC  | Tolerance  |
| All | 0 - -0.020 |
|     |            |
|     |            |

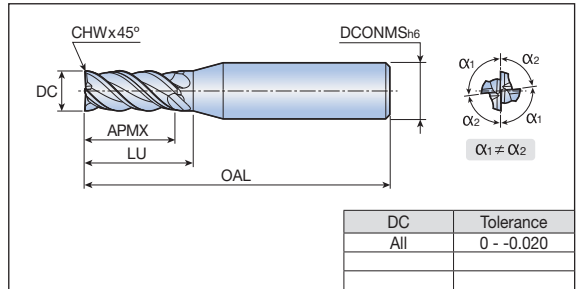


●: Standard items

#### 4 flute medium corner chamfer



- Excellent chatter damping credit to unequal spacing of cutting edges

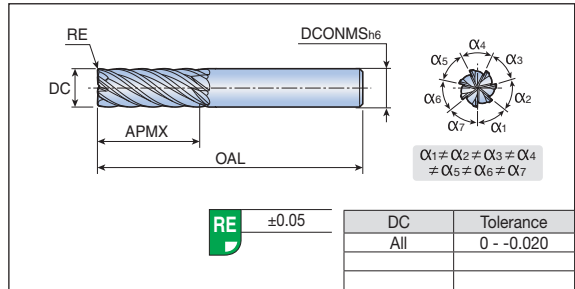
[illegible]

●: Standard items

### 7 flute medium corner radius



- Excellent chatter damping credit to unequal spacing of cutting edges
- For trochoidal operation

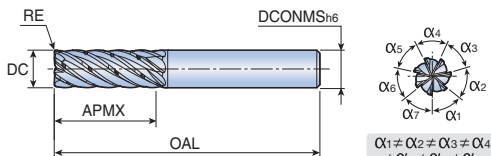
[illegible]

●: Standard items

**STAR MILL**



- 

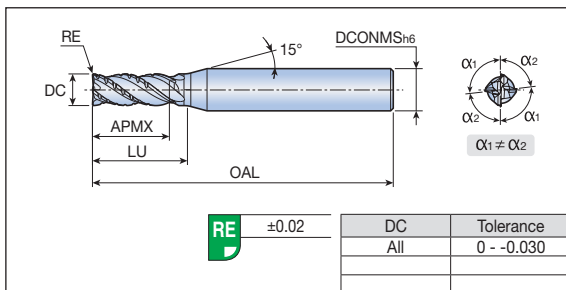


|    |            |
|----|------------|
| RE | $\pm 0.05$ |
|----|------------|

| DC  | Tolerance  |
|-----|------------|
| All | 0 - -0.020 |
|     |            |
|     |            |

► N: Chip splitter type

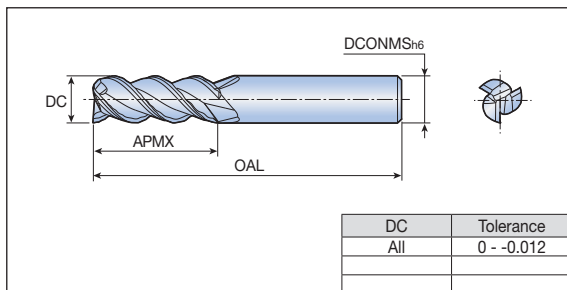
●: Standard items

[illegible]

## 3 flute wave flat



- Wave cutting edge



| Designation     | Feed<br>(mm/tooth) | Dimension (mm) |     |      |        | Grade<br>UF10 |
|-----------------|--------------------|----------------|-----|------|--------|---------------|
|                 |                    | DC             | OAL | APMX | DCONMS |               |
| <b>AWE 3060</b> | 0.03-0.07          | 6              | 52  | 14   | 6      | ●             |
| <b>3080</b>     | 0.03-0.09          | 8              | 60  | 14   | 8      | ●             |
| <b>3100</b>     | 0.03-0.10          | 10             | 68  | 19   | 10     | ●             |
| <b>3120</b>     | 0.03-0.12          | 12             | 76  | 22   | 12     | ●             |
| <b>3140</b>     | 0.05-0.14          | 14             | 85  | 24   | 14     | ●             |
| <b>3160</b>     | 0.05-0.14          | 16             | 90  | 30   | 16     | ●             |
| <b>3180</b>     | 0.05-0.15          | 18             | 110 | 34   | 18     | ●             |
| <b>3200</b>     | 0.05-0.15          | 20             | 110 | 38   | 20     | ●             |

●: Standard items

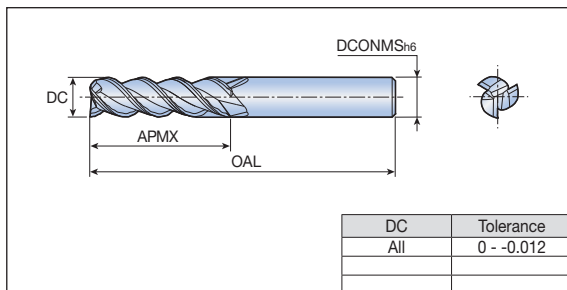
## AWE 3...ML



## 3 flute wave long flat



- Wave cutting edge



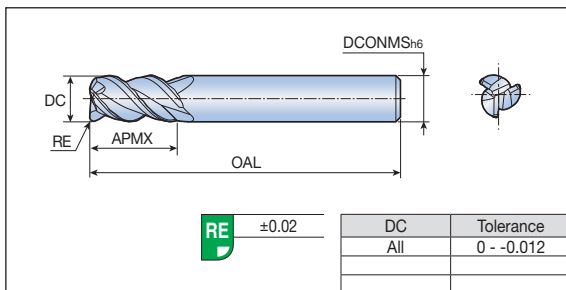
| Designation       | Feed<br>(mm/tooth) | Dimension (mm) |     |      |        | Grade<br>UF10 |
|-------------------|--------------------|----------------|-----|------|--------|---------------|
|                   |                    | DC             | OAL | APMX | DCONMS |               |
| <b>AWE 3060ML</b> | 0.03-0.07          | 6              | 65  | 20   | 6      | ●             |
| <b>3080ML</b>     | 0.03-0.09          | 8              | 75  | 20   | 8      | ●             |
| <b>3100ML</b>     | 0.03-0.10          | 10             | 80  | 25   | 10     | ●             |
| <b>3120ML</b>     | 0.03-0.12          | 12             | 95  | 30   | 12     | ●             |
| <b>3140ML</b>     | 0.03-0.12          | 14             | 110 | 35   | 14     | ●             |
| <b>3160ML</b>     | 0.05-0.14          | 16             | 110 | 40   | 16     | ●             |
| <b>3180ML</b>     | 0.05-0.15          | 18             | 125 | 45   | 18     | ●             |
| <b>3200ML</b>     | 0.05-0.15          | 20             | 125 | 45   | 20     | ●             |

●: Standard items

### 3 flute wave long corner radius



- Wave cutting edge

[illegible]

●: Standard items

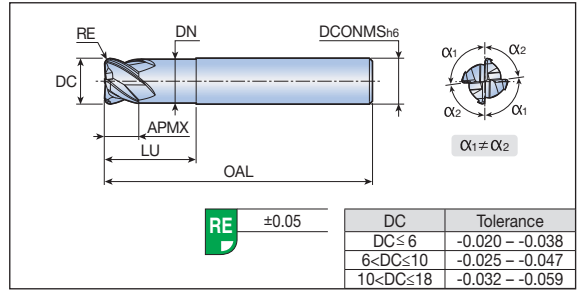


# CRF 4

## 4 flute, Ceramic end mills



**Ceramic**



| Designation             | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |    |      |        | Grade<br>TC3030 |
|-------------------------|--------------------|----------------|-----|-----|------|----|------|--------|-----------------|
|                         |                    | DC             | RE  | OAL | APMX | LU | DN   | DCONMS |                 |
| <b>CRF 4060 050 120</b> | 0.02-0.03          | 6              | 0.5 | 50  | 4.5  | 12 | 5.8  | 6      | ●               |
| <b>4080 100 160</b>     | 0.02-0.03          | 8              | 1.0 | 57  | 6.0  | 16 | 7.7  | 8      | ●               |
| <b>4100 100 200</b>     | 0.02-0.04          | 10             | 1.0 | 63  | 7.5  | 20 | 9.6  | 10     | ●               |
| <b>4120 150 240</b>     | 0.03-0.05          | 12             | 1.5 | 70  | 9.0  | 24 | 11.5 | 12     | ●               |
| <b>4160 200 320</b>     | 0.03-0.05          | 16             | 2.0 | 83  | 12.0 | 32 | 15.5 | 16     | ●               |
|                         |                    |                |     |     |      |    |      |        |                 |
|                         |                    |                |     |     |      |    |      |        |                 |

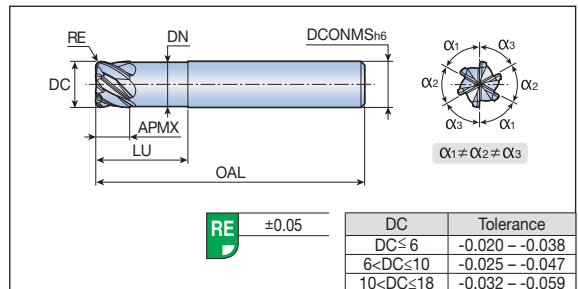
●: Standard items

# CRF 6

## 6 flute, Ceramic end mills



**Ceramic**



| Designation             | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |    |      |        | Grade<br>TC3030 |
|-------------------------|--------------------|----------------|-----|-----|------|----|------|--------|-----------------|
|                         |                    | DC             | RE  | OAL | APMX | LU | DN   | DCONMS |                 |
| <b>CRF 6060 050 120</b> | 0.02-0.03          | 6              | 0.5 | 50  | 4.5  | 12 | 5.8  | 6      | ●               |
| <b>6080 100 160</b>     | 0.02-0.03          | 8              | 1.0 | 57  | 6.0  | 16 | 7.7  | 8      | ●               |
| <b>6100 100 200</b>     | 0.02-0.04          | 10             | 1.0 | 63  | 7.5  | 20 | 9.6  | 10     | ●               |
| <b>6120 150 240</b>     | 0.03-0.05          | 12             | 1.5 | 70  | 9.0  | 24 | 11.5 | 12     | ●               |
| <b>6160 200 320</b>     | 0.03-0.05          | 16             | 2.0 | 83  | 12.0 | 32 | 15.5 | 16     | ●               |
|                         |                    |                |     |     |      |    |      |        |                 |
|                         |                    |                |     |     |      |    |      |        |                 |

●: Standard items

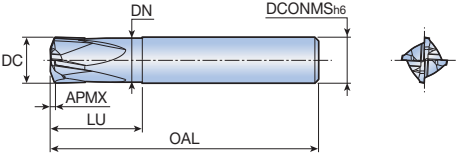
CRH 4



4 flute, ceramic end mills for high feed milling



**Ceramic**



**RE** ±0.1

| DC           | Tolerance       |
|--------------|-----------------|
| DC ≤ 6       | -0.020 - -0.038 |
| 6 < DC ≤ 10  | -0.025 - -0.047 |
| 10 < DC ≤ 18 | -0.032 - -0.059 |



| Designation | Feed<br>(mm/tooth) | Dimension (mm) |     |      |    |      |        | Grade<br>TC3030 |
|-------------|--------------------|----------------|-----|------|----|------|--------|-----------------|
|             |                    | DC             | OAL | APMX | LU | DN   | DCONMS |                 |
| CRH 4060    | 0.1-0.15           | 6              | 50  | 0.55 | 12 | 5.8  | 6      | ●               |
| 4080        | 0.1-0.2            | 8              | 57  | 0.75 | 16 | 7.7  | 8      | ●               |
| 4100        | 0.1-0.2            | 10             | 63  | 0.85 | 20 | 9.6  | 10     | ●               |
| 4120        | 0.1-0.3            | 12             | 70  | 1.15 | 24 | 11.5 | 12     | ●               |
| 4160        | 0.1-0.3            | 16             | 83  | 1.55 | 32 | 15.5 | 16     | ●               |
|             |                    |                |     |      |    |      |        |                 |
|             |                    |                |     |      |    |      |        |                 |

●: Standard items

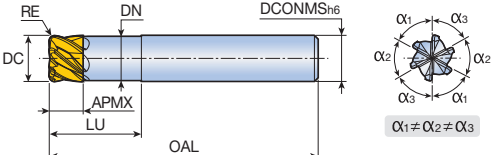
CRFB 6



6 flute, ceramic brazed end mills



**Ceramic**



**RE** ±0.05

| DC           | Tolerance       |
|--------------|-----------------|
| DC ≤ 6       | -0.020 - -0.038 |
| 6 < DC ≤ 10  | -0.025 - -0.047 |
| 10 < DC ≤ 18 | -0.032 - -0.059 |



| Designation       | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |    |      |        | Grade<br>TC3030 |
|-------------------|--------------------|----------------|-----|-----|------|----|------|--------|-----------------|
|                   |                    | DC             | RE  | OAL | APMX | LU | DN   | DCONMS |                 |
| CRFB 6060 050 120 | 0.02-0.03          | 6              | 0.5 | 50  | 4.5  | 12 | 5.8  | 6      | ●               |
| 6080 100 160      | 0.02-0.03          | 8              | 1.0 | 57  | 6.0  | 16 | 7.7  | 8      | ●               |
| 6100 100 200      | 0.02-0.04          | 10             | 1.0 | 63  | 7.5  | 20 | 9.6  | 10     | ●               |
| 6120 150 240      | 0.03-0.05          | 12             | 1.5 | 70  | 9.0  | 24 | 11.5 | 12     | ●               |
| 6160 200 320      | 0.03-0.05          | 16             | 2.0 | 83  | 12.0 | 32 | 15.5 | 16     | ●               |
|                   |                    |                |     |     |      |    |      |        |                 |
|                   |                    |                |     |     |      |    |      |        |                 |

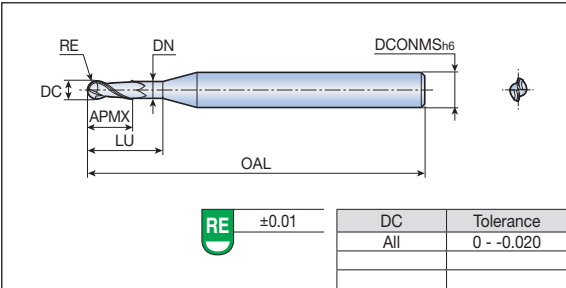
●: Standard items

DMB 2



2 flute miniature ball





 ±0.01

| DC  | Tolerance  |
|-----|------------|
| All | 0 - -0.020 |
|     |            |
|     |            |



**H•A**  
30°

  
F88-F89

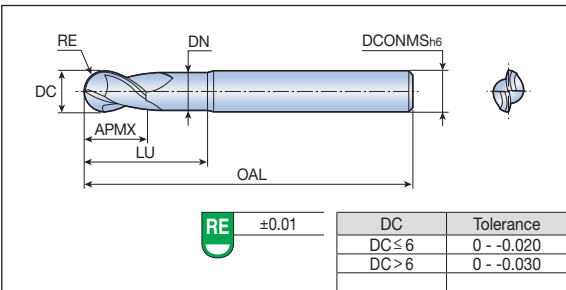
| Designation             | Dimension (mm) |      |     |      |      |      |        | Grade  |
|-------------------------|----------------|------|-----|------|------|------|--------|--------|
|                         | DC             | RE   | OAL | APMX | LU   | DN   | DCONMS | TTD620 |
| <b>DMB 2006-0.6x3.0</b> | 0.6            | 0.3  | 40  | 0.6  | 3.0  | 0.55 | 3      | ●      |
| <b>2010-1.0x5.0</b>     | 1.0            | 0.5  | 40  | 1.0  | 5.0  | 0.95 | 3      | ●      |
| <b>2010-1.0x8.5</b>     | 1.0            | 0.5  | 40  | 1.0  | 8.5  | 0.95 | 3      | ●      |
| <b>2015-1.5x7.5</b>     | 1.5            | 0.75 | 50  | 1.5  | 7.5  | 1.4  | 3      | ●      |
| <b>2015-1.5x12.0</b>    | 1.5            | 0.75 | 50  | 1.5  | 12.0 | 1.4  | 3      | ●      |
| <b>2020-2.2x10.0</b>    | 2.0            | 1.0  | 60  | 2.2  | 10.0 | 1.9  | 3      | ●      |
| <b>2020-2.2x16.0</b>    | 2.0            | 1.0  | 60  | 2.2  | 16.0 | 1.9  | 3      | ●      |

●: Standard items

DEB 2...S

2 flute short ball





 ±0.01

| DC     | Tolerance  |
|--------|------------|
| DC ≤ 6 | 0 - -0.020 |
| DC > 6 | 0 - -0.030 |



**H•A**  
30°

  
F88-F89

| Designation      | Dimension (mm) |     |     |      |      |      |        | Grade  |
|------------------|----------------|-----|-----|------|------|------|--------|--------|
|                  | DC             | RE  | OAL | APMX | LU   | DN   | DCONMS | TTD620 |
| <b>DEB 2030S</b> | 3              | 1.5 | 60  | 4.5  | 6.5  | 2.8  | 6      | ●      |
| <b>2040S</b>     | 4              | 2.0 | 65  | 6.0  | 8.0  | 3.7  | 6      | ●      |
| <b>2060S</b>     | 6              | 3.0 | 75  | 9.0  | 12.0 | 5.6  | 6      | ●      |
| <b>2120S</b>     | 12             | 6.0 | 90  | 18.0 | 36.0 | 11.4 | 12     | ●      |
|                  |                |     |     |      |      |      |        |        |
|                  |                |     |     |      |      |      |        |        |

●: Standard items

F

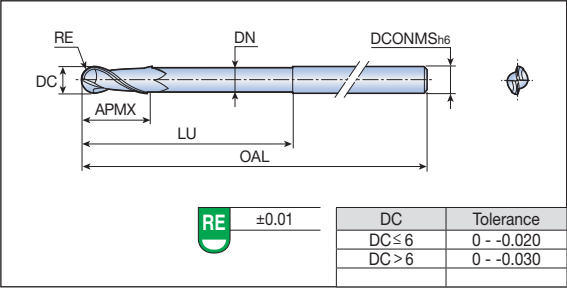
82

**ADVANCE CUTTING**  
TaeguTec

# DEB 2...L



## 2 flute long neck ball



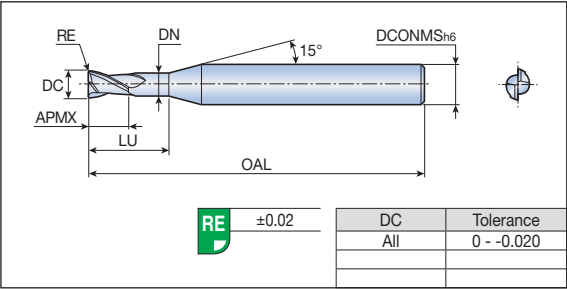
| Designation | Dimension (mm) |     |     |      |    |      |        | Grade |
|-------------|----------------|-----|-----|------|----|------|--------|-------|
|             | DC             | RE  | OAL | APMX | LU | DN   | DCONMS |       |
| DEB 2030L-4 | 3              | 1.5 | 80  | 15   | 25 | 2.9  | 4      | ●     |
| 2040L-4     | 4              | 2.0 | 80  | 20   | 30 | 3.9  | 4      | ●     |
| 2060L       | 6              | 3.0 | 100 | 30   | 50 | 5.5  | 6      | ●     |
| 2080L       | 8              | 4.0 | 110 | 40   | 60 | 7.5  | 8      | ●     |
| 2100L       | 10             | 5.0 | 120 | 50   | 70 | 9.5  | 10     | ●     |
| 2120L       | 12             | 6.0 | 130 | 55   | 75 | 11.5 | 12     | ●     |

●: Standard items

# DMR 2



## 2 flute miniature corner radius



| Designation      | Feed (mm/tooth) | Dimension (mm) |      |     |      |      |      |        | Grade |
|------------------|-----------------|----------------|------|-----|------|------|------|--------|-------|
|                  |                 | DC             | RE   | OAL | APMX | LU   | DN   | DCONMS |       |
| DMR 2006-0.9x3.0 | 0.006-0.010     | 0.6            | 0.05 | 40  | 0.9  | 3.0  | 0.55 | 3      | ●     |
| 2008-1.2x4.0     | 0.008-0.015     | 0.8            | 0.05 | 40  | 1.2  | 4.0  | 0.75 | 3      | ●     |
| 2010-1.5x5.0     | 0.010-0.020     | 1.0            | 0.1  | 40  | 1.5  | 5.0  | 0.95 | 3      | ●     |
| 2010-1.5x8.5     | 0.010-0.020     | 1.0            | 0.1  | 40  | 1.5  | 8.5  | 0.95 | 3      | ●     |
| 2012-1.8x6.0     | 0.010-0.025     | 1.2            | 0.1  | 50  | 1.8  | 6.0  | 1.15 | 3      | ●     |
| 2015-2.2x7.5     | 0.015-0.035     | 1.5            | 0.15 | 50  | 2.2  | 7.5  | 1.4  | 3      | ●     |
| 2015-2.2x12.0    | 0.015-0.030     | 1.5            | 0.15 | 50  | 2.2  | 12.0 | 1.4  | 3      | ●     |
| 2020-2.2x10.0    | 0.015-0.040     | 2.0            | 0.15 | 60  | 2.2  | 10.0 | 1.9  | 3      | ●     |
| 2020-2.2x16.0    | 0.015-0.035     | 2.0            | 0.15 | 60  | 2.2  | 16.0 | 1.9  | 3      | ●     |

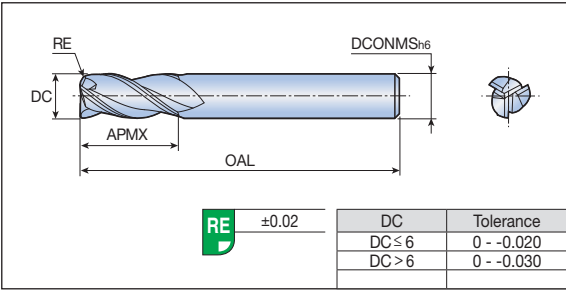
●: Standard items



# DER 3...S



3 flute short corner radius



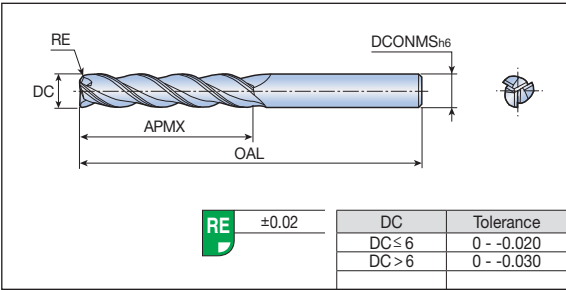
| Designation        | Feed<br>(mm/tooth) | Dimension (mm) |      |     |      |        | Grade<br>TTD620 |
|--------------------|--------------------|----------------|------|-----|------|--------|-----------------|
|                    |                    | DC             | RE   | OAL | APMX | DCONMS |                 |
| <b>DER 3030S-3</b> | 0.025-0.05         | 3              | 0.15 | 40  | 12   | 3      | ●               |
| <b>3040S-4</b>     | 0.04-0.06          | 4              | 0.2  | 50  | 14   | 4      | ●               |
| <b>3050S-5</b>     | 0.05-0.08          | 5              | 0.3  | 50  | 16   | 5      | ●               |
| <b>3060S</b>       | 0.06-0.09          | 6              | 0.3  | 65  | 20   | 6      | ●               |
| <b>3080S</b>       | 0.07-0.10          | 8              | 0.5  | 65  | 20   | 8      | ●               |
| <b>3100S</b>       | 0.08-0.13          | 10             | 0.5  | 75  | 25   | 10     | ●               |
| <b>3120S</b>       | 0.10-0.15          | 12             | 0.5  | 75  | 25   | 12     | ●               |

●: Standard items

# DER 3...L



3 flute long corner radius



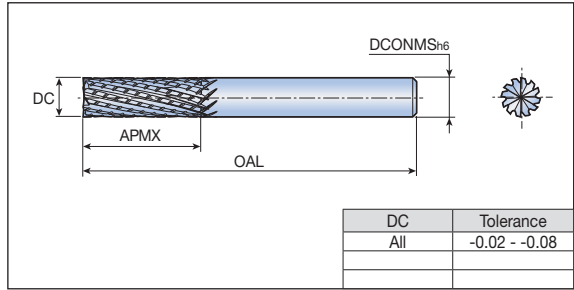
| Designation        | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |        | Grade<br>TTD620 |
|--------------------|--------------------|----------------|-----|-----|------|--------|-----------------|
|                    |                    | DC             | RE  | OAL | APMX | DCONMS |                 |
| <b>DER 3040L-4</b> | 0.03-0.05          | 4              | 0.2 | 60  | 30   | 4      | ●               |
| <b>3050L-5</b>     | 0.04-0.07          | 5              | 0.3 | 70  | 35   | 5      | ●               |
| <b>3060L</b>       | 0.05-0.08          | 6              | 0.3 | 100 | 40   | 6      | ●               |
| <b>3080L</b>       | 0.06-0.09          | 8              | 0.5 | 100 | 40   | 8      | ●               |
| <b>3100L</b>       | 0.07-0.12          | 10             | 0.5 | 100 | 40   | 10     | ●               |
| <b>3120L</b>       | 0.09-0.14          | 12             | 0.5 | 100 | 45   | 12     | ●               |

●: Standard items

# RRFE



## Roughing for composite material (Chip splitter)



| Designation     | Feed (mm/tooth) | Dimension (mm) |     |     |      |        | Grade  |
|-----------------|-----------------|----------------|-----|-----|------|--------|--------|
|                 |                 | DC             | NOF | OAL | APMX | DCONMS | TTD610 |
| <b>RRFE 040</b> | 0.01-0.02       | 4              | 6   | 50  | 12   | 4      | ●      |
| <b>060</b>      | 0.01-0.02       | 6              | 8   | 65  | 18   | 6      | ●      |
| <b>080</b>      | 0.01-0.03       | 8              | 10  | 75  | 24   | 8      | ●      |
| <b>100</b>      | 0.02-0.04       | 10             | 12  | 85  | 30   | 10     | ●      |
| <b>120</b>      | 0.02-0.05       | 12             | 12  | 100 | 36   | 12     | ●      |
|                 |                 |                |     |     |      |        |        |

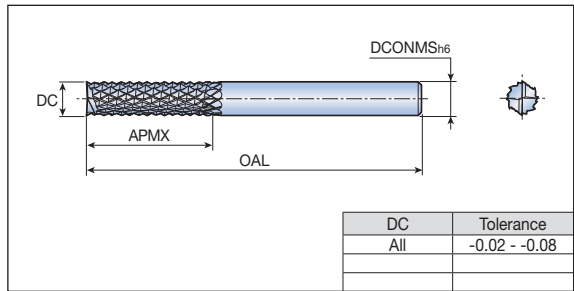
► NOF: Number of flutes

●: Standard items

# RCFE



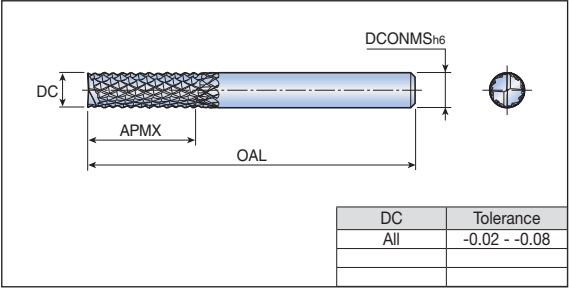
## Roughing for composite material (Multi-flute)



| Designation     | Feed (mm/rev) | Dimension (mm) |     |      |        | Grade  |
|-----------------|---------------|----------------|-----|------|--------|--------|
|                 |               | DC             | OAL | APMX | DCONMS | TTD610 |
| <b>RCFE 040</b> | 0.03-0.06     | 4              | 50  | 12   | 4      | ●      |
| <b>060</b>      | 0.07-0.15     | 6              | 65  | 18   | 6      | ●      |
| <b>080</b>      | 0.10-0.20     | 8              | 75  | 24   | 8      | ●      |
| <b>100</b>      | 0.15-0.30     | 10             | 85  | 30   | 10     | ●      |
| <b>120</b>      | 0.20-0.40     | 12             | 100 | 36   | 12     | ●      |
|                 |               |                |     |      |        |        |

●: Standard items

## Medium to finishing for composite materials (Multi-flute)

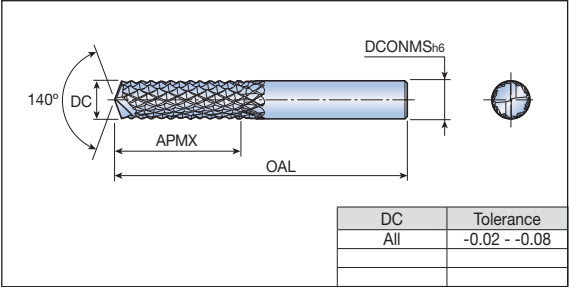


| Designation     | Feed<br>(mm/rev) | Dimension (mm) |     |      |        | Grade  |
|-----------------|------------------|----------------|-----|------|--------|--------|
|                 |                  | DC             | OAL | APMX | DCONMS | TTD610 |
| <b>RCME 040</b> | 0.03-0.06        | 4              | 50  | 12   | 4      | ●      |
| <b>060</b>      | 0.07-0.15        | 6              | 65  | 18   | 6      | ●      |
| <b>080</b>      | 0.10-0.20        | 8              | 75  | 24   | 8      | ●      |
| <b>100</b>      | 0.15-0.30        | 10             | 85  | 30   | 10     | ●      |
| <b>120</b>      | 0.20-0.40        | 12             | 100 | 36   | 12     | ●      |

●: Standard items

# RCDE

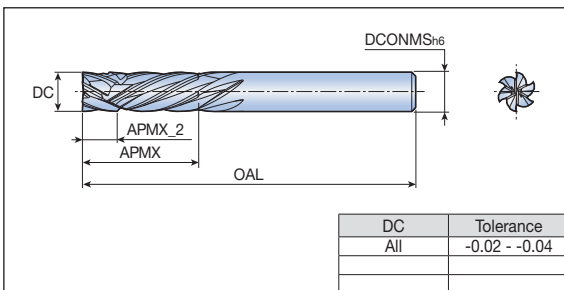
## Medium to finishing for composite materials (Cutting edge for drilling + multi-flute)



| Designation     | Feed<br>(mm/rev) | Dimension (mm) |     |      |        | Grade  |
|-----------------|------------------|----------------|-----|------|--------|--------|
|                 |                  | DC             | OAL | APMX | DCONMS | TTD610 |
| <b>RCDE 040</b> | 0.03-0.06        | 4              | 50  | 12   | 4      | ●      |
| <b>060</b>      | 0.07-0.15        | 6              | 65  | 18   | 6      | ●      |
| <b>080</b>      | 0.10-0.20        | 8              | 75  | 24   | 8      | ●      |
| <b>100</b>      | 0.15-0.30        | 10             | 85  | 30   | 10     | ●      |
| <b>120</b>      | 0.20-0.40        | 12             | 100 | 36   | 12     | ●      |

●: Standard items

## 4 and 6 flute for finishing of composite materials (Left and right hand helix type)



| Designation      | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |        |        | Grade<br>TTD610 |
|------------------|--------------------|----------------|-----|-----|------|--------|--------|-----------------|
|                  |                    | DC             | NOF | OAL | APMX | APMX_2 | DCONMS |                 |
| <b>RCOM 4060</b> | 0.02-0.04          | 6              | 4   | 65  | 18   | 6.7    | 6      | ●               |
| <b>4080</b>      | 0.02-0.05          | 8              | 4   | 75  | 24   | 9.2    | 8      | ●               |
| <b>6100</b>      | 0.03-0.06          | 10             | 6   | 85  | 30   | 7.9    | 10     | ●               |
| <b>6120</b>      | 0.04-0.08          | 12             | 6   | 100 | 36   | 9.2    | 12     | ●               |

► NOF: Number of flutes

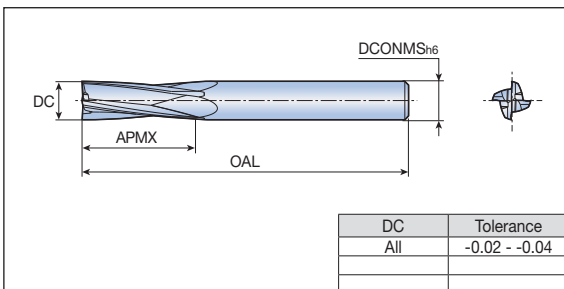
●: Standard items

► Notice: For best machining performance, the end mill's intersection point (APMX\_2) should be positioned at the center of the workpiece thickness.

# RDCF



## 4-8 flute for finishing of composite materials (Low helix angle)



| Designation      | Feed<br>(mm/tooth) | Dimension (mm) |     |     |      |        | Grade<br>TTD610 |
|------------------|--------------------|----------------|-----|-----|------|--------|-----------------|
|                  |                    | DC             | NOF | OAL | APMX | DCONMS |                 |
| <b>RDCF 4040</b> | 0.01-0.03          | 4              | 4   | 50  | 12   | 4      | ●               |
| <b>6040</b>      | 0.01-0.03          | 4              | 6   | 50  | 12   | 4      | ●               |
| <b>4060</b>      | 0.02-0.04          | 6              | 4   | 65  | 18   | 6      | ●               |
| <b>6060</b>      | 0.02-0.04          | 6              | 6   | 65  | 18   | 6      | ●               |
| <b>4080</b>      | 0.03-0.05          | 8              | 4   | 75  | 24   | 8      | ●               |
| <b>6080</b>      | 0.03-0.05          | 8              | 6   | 75  | 24   | 8      | ●               |
| <b>4100</b>      | 0.04-0.06          | 10             | 4   | 85  | 30   | 10     | ●               |
| <b>8100</b>      | 0.04-0.06          | 10             | 8   | 85  | 30   | 10     | ●               |
| <b>4120</b>      | 0.04-0.08          | 12             | 4   | 100 | 36   | 12     | ●               |
| <b>8120</b>      | 0.04-0.08          | 12             | 8   | 100 | 36   | 12     | ●               |

► NOF: Number of flutes

●: Standard items



# Recommended Cutting Conditions

## Machining data for solid end mill

| ISO | Material                                                           |                | Condition               | Tensile strength (N/mm <sup>2</sup> ) | Hardness HB | Material No. |
|-----|--------------------------------------------------------------------|----------------|-------------------------|---------------------------------------|-------------|--------------|
| P   | Non-alloy steel, cast steel, free cutting steel                    | <0.25%C        | Annealed                | 420                                   | 125         | 1            |
|     |                                                                    | >=0.25%C       | Annealed                | 650                                   | 190         | 2            |
|     |                                                                    | <0.55%C        | Quenched and tempered   | 850                                   | 250         | 3            |
|     |                                                                    | >=0.55%C       | Annealed                | 750                                   | 220         | 4            |
|     |                                                                    |                | Quenched and tempered   | 1000                                  | 300         | 5            |
|     | Low alloy steel and cast steel (less than 5% of alloying elements) |                | Annealed                | 600                                   | 200         | 6            |
|     |                                                                    |                |                         | 930                                   | 275         | 7            |
|     |                                                                    |                | Quenched and tempered   | 1000                                  | 300         | 8            |
|     |                                                                    |                |                         | 1200                                  | 350         | 9            |
|     | High alloy steel, cast steel and tool steel                        |                | Annealed                | 680                                   | 200         | 10           |
|     |                                                                    |                | Quenched and tempered   | 1100                                  | 325         | 11           |
| M   | Stainless steel and cast steel                                     |                | Ferritic / martensitic  | 680                                   | 200         | 12           |
|     |                                                                    |                | Martensitic             | 820                                   | 240         | 13           |
|     |                                                                    |                | Austenitic              | 600                                   | 180         | 14           |
| K   | Gray cast iron (GG)                                                |                | Ferritic                |                                       | 160         | 15           |
|     |                                                                    |                | Pearlitic               |                                       | 250         | 16           |
|     | Cast iron nodular (GGG)                                            |                | Ferritic                |                                       | 180         | 17           |
|     |                                                                    |                | Pearlitic               |                                       | 260         | 18           |
|     | Malleable cast iron                                                |                | Ferritic                |                                       | 130         | 19           |
|     |                                                                    |                | Pearlitic               |                                       | 230         | 20           |
| N   | Aluminum - Wrought alloy                                           |                | Not cureable            |                                       | 60          | 21           |
|     |                                                                    |                | Cured                   |                                       | 100         | 22           |
|     | Aluminum-cast, alloyed                                             | <=12% Si       | Not cureable            |                                       | 75          | 23           |
|     |                                                                    |                | Cured                   |                                       | 90          | 24           |
|     |                                                                    | >12% Si        | High temp.              |                                       | 130         | 25           |
|     | Copper alloys                                                      | >1% Pb         | Free cutting            |                                       | 110         | 26           |
|     |                                                                    |                | Brass                   |                                       | 90          | 27           |
|     |                                                                    |                | Electrolitic copper     |                                       | 100         | 28           |
|     | Non-metallic                                                       |                | Duroplastics, graphite  |                                       | 70 Shore D  | 29           |
|     |                                                                    |                | Hard rubber             |                                       | 55 Shore D  | 30           |
| S   | High temp. alloys                                                  | Fe based       | Annealed                |                                       | 200         | 31           |
|     |                                                                    |                | Cured                   |                                       | 280         | 32           |
|     |                                                                    | Ni or Co based | Annealed                |                                       | 250         | 33           |
|     |                                                                    |                | Cured                   |                                       | 350         | 34           |
|     | Titanium, Ti alloys                                                |                | Cast                    |                                       | 320         | 35           |
|     |                                                                    |                | Pure                    | Rm 400                                | 190         | 36           |
| H   | Hardened steel                                                     |                | Alpha+beta alloys cured | Rm 1050                               | 310         | 37           |
|     |                                                                    |                |                         |                                       |             |              |
|     | Chilled cast iron                                                  |                | Hardened                |                                       | 55HRC       | 38           |
|     |                                                                    |                | Hardened                |                                       | 60HRC       | 39           |
|     | Cast iron nodular                                                  |                | Cast                    |                                       | 400         | 40           |
|     |                                                                    |                | Hardened                |                                       | 55HRC       | 41           |

► For more information of material groups, see the materials & grades "material conversion table"

■ Steel 
 ■ Stainless steel 
 ■ Cast iron 
 ■ Nonferrous 
 ■ High temp. alloys 
 ■ Hardened steel

# Recommended Cutting Conditions

## Machining data for solid end mill

| Cutting speed Vc(m/min) |         |         |               |               |         |         |            |          |
|-------------------------|---------|---------|---------------|---------------|---------|---------|------------|----------|
| CBN                     | Coated  |         |               |               |         |         | Uncoated   | Ceramic  |
| TB7015                  | TT5505  | TT5515  | TT5520/TT5513 | TT5525/TT5523 | TT5543  | TTA101  | UF10N/UF10 | TC3030   |
|                         | 260-300 | 260-280 | 210-270       | 210-220       | 170-200 |         | 140-200    |          |
|                         | 200-250 | 200-230 | 160-220       | 160-180       | 140-170 |         | 120-160    |          |
|                         | 160-230 | 160-220 | 130-200       | 130-180       | 120-150 |         | 100-150    |          |
|                         | 160-230 | 160-220 | 130-200       | 130-180       | 100-140 |         | 100-140    |          |
|                         | 140-200 | 140-180 | 110-160       | 110-140       | 90-130  |         | 90-130     |          |
|                         | 160-230 | 160-220 | 130-200       | 130-180       | 100-150 |         | 110-150    |          |
|                         | 120-200 | 120-180 | 100-160       | 100-140       | 90-130  |         | 80-130     |          |
|                         | 140-200 | 130-180 | 100-160       | 100-140       | 90-130  |         | 90-130     |          |
|                         | 140-200 | 140-180 | 110-160       | 110-140       | 90-130  |         | 100-130    |          |
|                         | 140-200 | 130-180 | 100-160       | 100-140       | 90-130  |         | 90-130     |          |
|                         | 80-150  | 70-120  | 60-110        | 60-100        | 50-90   |         | 50-80      |          |
|                         |         | 80-160  | 60-140        | 60-130        | 50-110  |         | 60-110     |          |
|                         |         | 60-150  | 50-130        | 50-120        | 40-100  |         | 40-100     |          |
|                         |         | 60-120  | 50-110        | 50-100        | 40-80   |         | 40-80      |          |
|                         | 100-300 | 80-260  | 60-240        | 60-210        | 50-180  |         | 60-180     |          |
|                         | 130-280 | 130-240 | 100-220       | 100-190       | 100-170 |         | 90-170     |          |
|                         | 150-280 | 150-270 | 120-240       | 120-220       | 110-200 |         | 100-200    |          |
|                         | 90-280  | 90-270  | 70-240        | 70-220        | 110-200 |         | 60-200     |          |
|                         | 150-280 | 150-270 | 120-240       | 120-220       | 110-200 |         | 100-200    |          |
|                         | 140-250 | 140-240 | 110-220       | 110-190       | 100-180 |         | 100-170    |          |
|                         |         |         |               |               |         | 800-900 | 800-900    |          |
|                         |         |         |               |               |         | 700-800 | 700-800    |          |
|                         |         |         |               |               |         | 800-900 | 800-900    |          |
|                         |         |         |               |               |         | 750-850 | 750-850    |          |
|                         |         |         |               |               |         | 400-450 | 400-450    |          |
|                         |         |         |               |               |         | 500-550 | 500-550    |          |
|                         |         |         |               |               |         | 500-550 | 500-550    |          |
|                         |         |         |               |               |         | 350-380 | 350-380    |          |
|                         |         |         |               |               |         |         |            |          |
|                         |         |         |               |               |         |         |            |          |
|                         | 20-40   | 20-40   | 20-30         | 20-30         | 20-30   |         | 10-20      |          |
|                         | 20-30   | 20-30   | 20-30         | 20-30         | 20-30   |         | 10-20      |          |
|                         | 20-30   | 20-30   | 20-30         | 20-30         | 20-30   |         | 20-50      | 300-1000 |
|                         | 20-30   | 20-30   | 20-30         | 20-30         | 20-30   |         | 20-50      | 300-1000 |
|                         | 30-80   | 30-70   | 20-60         | 20-60         | 20-60   |         | 20-50      | 300-1000 |
|                         |         | 30-70   | 20-60         | 20-60         | 20-60   |         | 20-30      |          |
|                         |         | 30-70   | 20-60         | 20-60         | 20-60   |         | 20-30      |          |
| 100-210                 | 30-60   |         |               |               |         |         | 40-60      |          |
| 90-200                  | 30-40   |         |               |               |         |         | 20-30      |          |
| 120-200                 | 70-90   | 60-80   | 40-70         |               |         |         | 65-75      |          |
| 120-200                 | 30-60   | 30-50   | 20-40         |               |         |         | 40-45      |          |

# Recommended Cutting Conditions



## Machining data for ceramic end mill

### CRF/CRFB 4 teeth & 6 teeth

(Unit: mm)

| Diameter | Cutting speed<br>(m/min) | Feed<br>(mm/tooth) | Shouldering, profiling |        | Slotting |
|----------|--------------------------|--------------------|------------------------|--------|----------|
|          |                          |                    | ap                     | ae     | ae       |
| Ø6       | 300-1000                 | 0.02-0.03          | -0.6xD                 | -0.1xD | -0.05xD  |
| Ø8       | 300-1000                 | 0.02-0.03          | -0.6xD                 | -0.1xD | -0.05xD  |
| Ø10      | 300-1000                 | 0.02-0.04          | -0.6xD                 | -0.1xD | -0.05xD  |
| Ø12      | 300-1000                 | 0.03-0.05          | -0.6xD                 | -0.1xD | -0.05xD  |
| Ø16      | 300-1000                 | 0.03-0.05          | -0.6xD                 | -0.1xD | -0.05xD  |

▶ ae must not exceed a maximum 1 mm

ap: axial direction DOC    ae: radial direction DOC

▶ Apply a 30% reduction in feed during slotting, ramping (less 2.5°)

### CRH 4 teeth

(Unit: mm)

| Diameter | Cutting speed<br>(m/min) | Feed<br>(mm/tooth) | Shouldering, profiling |        |
|----------|--------------------------|--------------------|------------------------|--------|
|          |                          |                    | ap                     | ae     |
| Ø6       | 300-1000                 | 0.1-0.15           | -0.05xD                | -0.6xD |
| Ø8       | 300-1000                 | 0.1-0.2            | -0.05xD                | -0.6xD |
| Ø10      | 300-1000                 | 0.1-0.2            | -0.05xD                | -0.6xD |
| Ø12      | 300-1000                 | 0.1-0.3            | -0.05xD                | -0.6xD |
| Ø16      | 300-1000                 | 0.1-0.3            | -0.05xD                | -0.6xD |

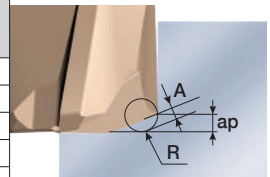
▶ ae must not exceed a maximum 1 mm

ap: axial direction DOC    ae: radial direction DOC

▶ Apply a 30% reduction in feed during ramping (less 2.5°)

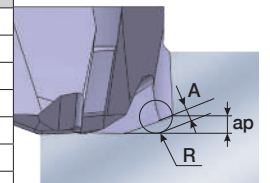
### Programming tip - CRH

| Diameter<br>(CRH 4 teeth) | R<br>(Program) | A<br>Un-machined<br>material thickness |
|---------------------------|----------------|----------------------------------------|
| Ø6                        | 0.7            | 0.35                                   |
| Ø8                        | 0.9            | 0.47                                   |
| Ø10                       | 1.0            | 0.50                                   |
| Ø12                       | 1.4            | 0.70                                   |
| Ø16                       | 1.8            | 0.95                                   |



### Programming tip - HFM 2 / HFM 4

| Designation | Diameter | R<br>(Program) | A<br>(Un-machined) | ap<br>(Max) |
|-------------|----------|----------------|--------------------|-------------|
| HFM 2040    | Ø4       | 0.38           | 0.25               | 0.3         |
| HFM 2060    | Ø6       | 0.65           | 0.43               | 0.5         |
| HFM 2080    | Ø8       | 0.87           | 0.57               | 0.75        |
| HFM 2100    | Ø10      | 1.09           | 0.71               | 1           |
| HFM 2120    | Ø12      | 1.3            | 0.86               | 1.1         |
| HFM 4060    | Ø6       | 0.59           | 0.38               | 0.5         |
| HFM 4080    | Ø8       | 0.78           | 0.51               | 0.7         |
| HFM 4100    | Ø10      | 0.85           | 0.55               | 0.75        |
| HFM 4120    | Ø12      | 1.17           | 0.77               | 1.05        |



# Recommended Cutting Conditions



## Machining data for composite material

Grade: TTD610

| Material |           | Cutting Speed Vc(m/min) |          |             |          |             |          |
|----------|-----------|-------------------------|----------|-------------|----------|-------------|----------|
|          |           | RRFE                    |          | RCFE        |          | RCDE        |          |
|          |           | Shouldering             | Slotting | Shouldering | Slotting | Shouldering | Slotting |
| CFRP     | CFRP      | 100-300                 | 50-120   | 100-300     | 50-120   | 80-250      | 50-120   |
|          | Honeycomb | 150-250                 | 100-200  | 150-250     | 100-200  | 120-200     | 100-200  |
| GFRP     | GFRP      | 50-150                  | 30-70    | 50-150      | 30-70    | 50-130      | 30-70    |
|          | Honeycomb | 150-250                 | 100-200  | 150-250     | 100-200  | 120-200     | 100-200  |

| Material |           | Cutting Speed Vc(m/min) |          |             |          |             |          |
|----------|-----------|-------------------------|----------|-------------|----------|-------------|----------|
|          |           | RCME                    |          | RCOM        |          | RDCF        |          |
|          |           | Shouldering             | Slotting | Shouldering | Slotting | Shouldering | Slotting |
| CFRP     | CFRP      | 80-250                  | 50-120   | 50-200      | 50-120   | 100-300     | 50-120   |
|          | Honeycomb | 120-200                 | 100-200  | -           | -        | -           | -        |
| GFRP     | GFRP      | 50-130                  | 30-70    | 50-100      | 30-70    | 50-150      | 30-70    |
|          | Honeycomb | 120-200                 | 100-200  | -           | -        | -           | -        |

| Material |  | RCDE & H-Drill              |                                       |           |            |             |
|----------|--|-----------------------------|---------------------------------------|-----------|------------|-------------|
|          |  | Drilling                    |                                       |           |            |             |
|          |  | Cutting speed<br>Vc (m/min) | Drill diameter (mm) vs. Feed (mm/rev) |           |            |             |
|          |  |                             | Ø3.0-Ø6.0                             | Ø6.1-Ø8.0 | Ø8.1-Ø10.0 | Ø10.1-Ø12.7 |
| CFRP     |  | 50-150                      | 0.02-0.07                             | 0.03-0.08 | 0.03-0.08  | 0.04-0.10   |
| GFRP     |  | 40-120                      | 0.02-0.07                             | 0.03-0.08 | 0.03-0.08  | 0.04-0.10   |



# TOOLING SYSTEM



# TOOLING SYSTEM

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| <b>C-ADAPTER</b>                        | G108 |
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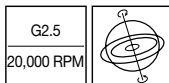
## Guide to Icons



➤ Run-out



➤ Surface Hardness



➤ Balance Grade



➤ Taper Shank Grade



➤ Surface Finish Grade



➤ Technical Data Page



➤ ER Collet Page



➤ TSK Collet Page



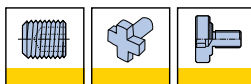
➤ Straight Collet Page



➤ Pull Stud Page



➤ Preset Screw Page



➤ Lock Screw Page



➤ ER-SRK Page



➤ Nut Page



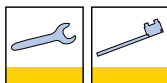
➤ Tap Adapter Page



➤ Cooling Tube Page



➤ Tube Wrench Page



➤ Wrench Page



➤ Driving Ring Page



➤ Induction Heating Unit Page



➤ Thermal Heating Unit Page





# Tool Selection Guide

## Tooling system

### Milling chuck

- DIN69871 G15
- HSK G41
- BT MAS-403 G71
- DIN2080 G100



Collet (NCSR) G164-G166



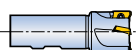
ST shank G123-G127



Collet (ER) G151-G159



GTIN collet G172-G1734



### Collet chuck

- DIN69871 G10-G12
- HSK G35-G39
- BT MAS-403 G65-G68
- DIN2080 G99
- C-ADAPTER G110-G111
- ST shank G123-G127
- MT shank G138



Collet (ER) G151-G159



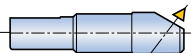
T-SHRINK Collet G167-G170



T-FLEX collet G171



GTIN collet G172-G173



### TSK collet chuck

- DIN69871 G13
- HSK G40
- BT MAS-403 G69



TSK collet G160-G161



### TSHRINK chuck

- DIN69871 G19-G20
- HSK G45-G47
- BT MAS-403 G77-G80
- C-ADAPTER G118-G119



- DIN69871 G21
- HSK G48-G50
- BT MAS-403 G81-G82
- ST shank G136



### THCHUCK chuck

- DIN69871 G22-G23
- HSK G51-G53
- BT MAS-403 G83-G84
- ST Shank G128



THC collet G162-G163

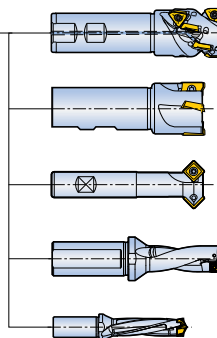


# Tool Selection Guide

## Tooling system

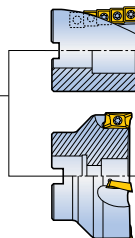
### End mill holder

- DIN69871 G16-G18
- HSK G42-G44
- BT MAS-403 G72-G76
- DIN2080 G101
- C-ADAPTER G112-G114



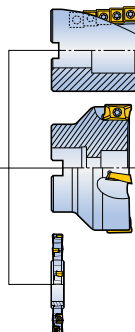
### Face mill / Shell end mill arbor

- DIN69871 G24-G25, G27
- HSK G54-G56, G58
- BT MAS-403 G86-G90, G92
- DIN2080 G102-G103
- C-ADAPTER G115, G117



### Combi face mill / Combi shell end mill arbor

- DIN69871 G26
- HSK G57
- BT MAS-403 G91
- DIN2080 G104
- C-ADAPTER G116



### Slotting cutter arbor

- DIN69871 G28
- BT MAS-403 G85



### Centering plug

- DIN2080 G107

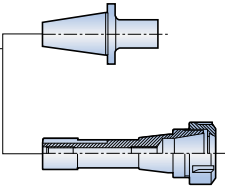


# Tool Selection Guide

## Tooling system

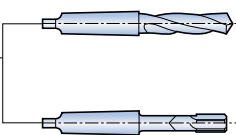
### Adapter

- DIN69871 G31
- BT MAS-403 G94



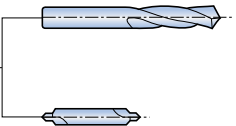
### Morse taper adapter

- DIN69871 G29-G30
- HSK G59
- BT MAS-403 G93-G94
- DIN2080 G105-G106



### Drill chuck arbor

- BT MAS-403 G95
- DIN2080 G107



### Tap chuck (GTI)

- DIN69871 G14
- BT MAS-403 G70



- GTI ER collet chuck G137



Collet (ER) G151-G159

- DIN69871 G14
- BT MAS-403 G70
- MTA G139



Tap adapter G174



# Tool Selection Guide

## Tooling system

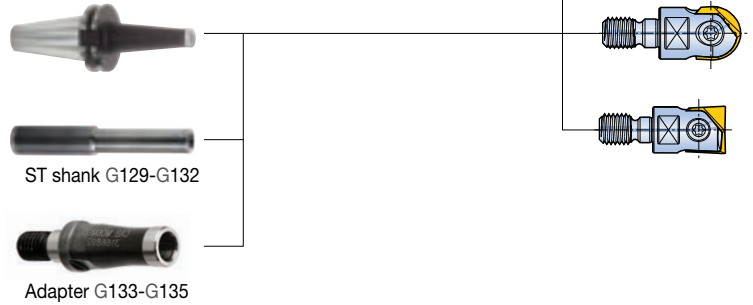
### GFI floating reamer chuck (GFI)

- ST shank G138



### T-FLEXTEC

- DIN69871 G32
- HSK G60-G61
- BT MAS-403 G96
- C-ADAPTER G120
- ST shank G129-G132



### Blank

- HSK G62
- C-ADAPTER G121



### GREEN Typhoon

- ER shank G141
- BT MAS-403 G142
- HSK G143
- C-ADAPTER G144
- ST shank G145



### HPC Typhoon

- BT MAS-403 G146
- HSK G147



Collet (ER11 SPR EX..AA)  
G152, G157, G159

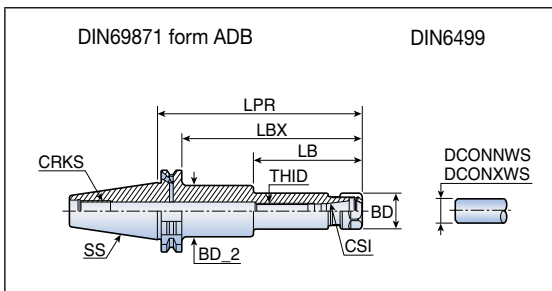
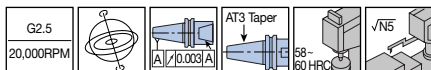
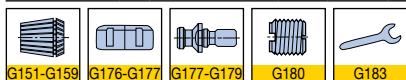


# DIN 69871





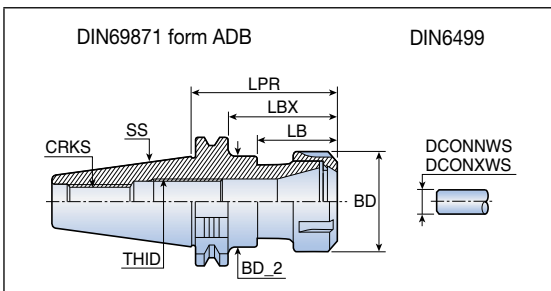
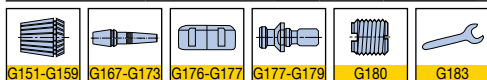
## ER collet chucks

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► Add B for coolant through flange

► <sup>(1)</sup> Balance to G6.3 at 12,000RPM

## ER collet chucks

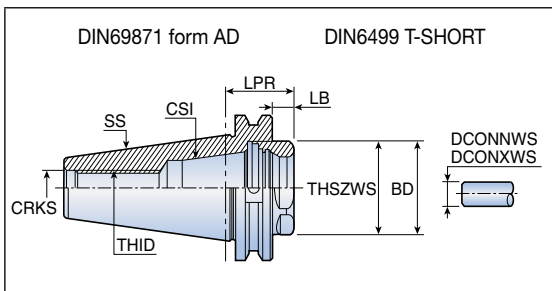
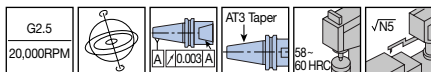
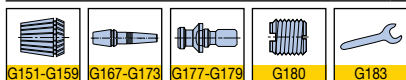
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► Add B for coolant through flange

- <sup>(1)</sup> Balance to G6.3 at 12,000RPM



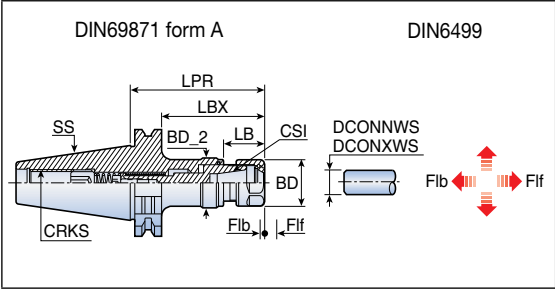
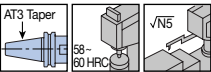
# TSHORT

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# GTI DIN69871-ER

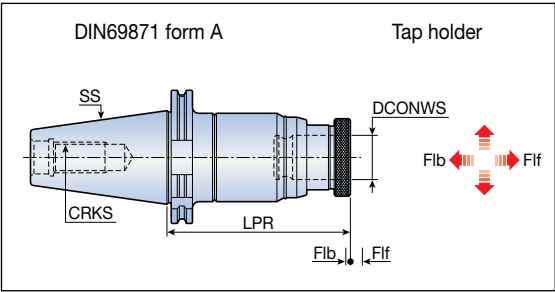
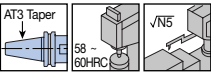
## GTI tap attachments



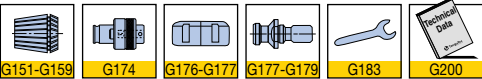
| Designation           | Dimension (mm) |      |        |        |         |         |      |    |       |       |      |     |     |      |
|-----------------------|----------------|------|--------|--------|---------|---------|------|----|-------|-------|------|-----|-----|------|
|                       | SS             | CSI  | Tapmin | Tapmax | DCONNWS | DCONXWS | BD_2 | BD | LPR   | LBX   | LB   | Fib | FIf | CRKS |
| GTI DIN69871 40 ER 16 | 40             | ER16 | M3     | M10    | 0.5     | 10.0    | 29.5 | 28 | 81.2  | 62.1  | 24.6 | 3   | 8   | M16  |
|                       | 40             | ER32 | M6     | M20    | 2.0     | 20.0    | 56.5 | 50 | 112.6 | 93.5  | 33.0 | 4   | 9   | M16  |
|                       | 40             | ER40 | M6     | M28    | 3.0     | 26.0    | 56.5 | 63 | 130.6 | 111.5 | 51.0 | 4   | 9   | M16  |
| GTI DIN69871 50 ER 16 | 50             | ER16 | M3     | M10    | 0.5     | 10.0    | 29.5 | 28 | 106.8 | 87.7  | 24.6 | 3   | 8   | M24  |
|                       | 50             | ER32 | M6     | M20    | 2.0     | 20.0    | 56.5 | 50 | 115.3 | 96.2  | 33.0 | 4   | 9   | M24  |
|                       | 50             | ER40 | M6     | M28    | 3.0     | 26.0    | 56.5 | 63 | 133.3 | 114.2 | 51.0 | 4   | 9   | M24  |
|                       |                |      |        |        |         |         |      |    |       |       |      |     |     |      |
|                       |                |      |        |        |         |         |      |    |       |       |      |     |     |      |

# DIN69871-TC

## Tap holders

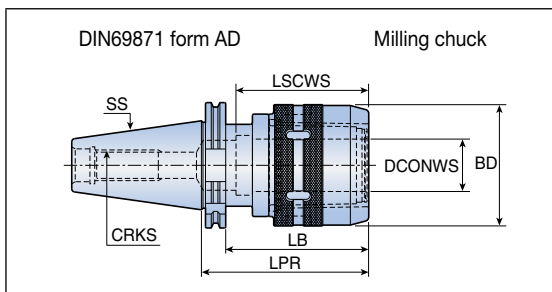
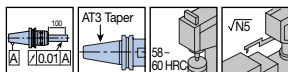
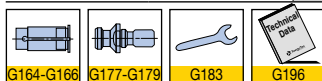


| Designation           | Dimension (mm) |                    |                    |        |     |      |      |             |      |
|-----------------------|----------------|--------------------|--------------------|--------|-----|------|------|-------------|------|
|                       | SS             | Tap <sub>min</sub> | Tap <sub>max</sub> | DCONWS | LPR | Fib  | Fif  | Tap adapter | CRKS |
| DIN69871 40 TC 12-90  | 40             | M3                 | M12                | 19     | 90  | 6.5  | 12   | TA1         | M16  |
|                       | TC 22-142      | 40                 | M6                 | M24    | 31  | 142  | 14.5 | 13          | TA2  |
| DIN69871 50 TC 12-130 | 50             | M3                 | M12                | 19     | 130 | 6.5  | 12   | TA1         | M24  |
|                       | TC 22-142      | 50                 | M6                 | M24    | 31  | 142  | 14.5 | 13          | TA2  |
| TC 38-190             | 50             | M18                | M38                | 48     | 190 | 20.0 | 20   | TA3         | M24  |
|                       |                |                    |                    |        |     |      |      |             |      |
|                       |                |                    |                    |        |     |      |      |             |      |
|                       |                |                    |                    |        |     |      |      |             |      |

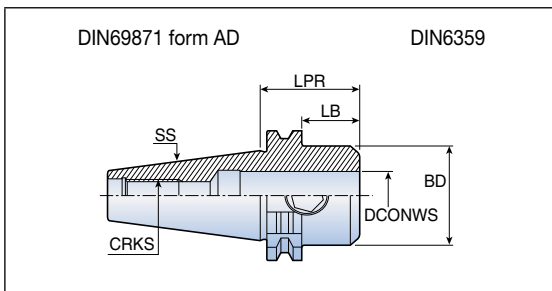
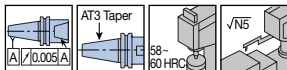
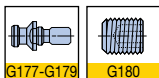


► Torque control system

## Milling chucks

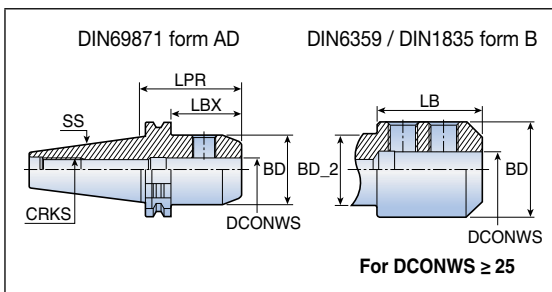
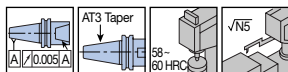
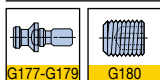
[illegible]

### Short end mill holders

[illegible]

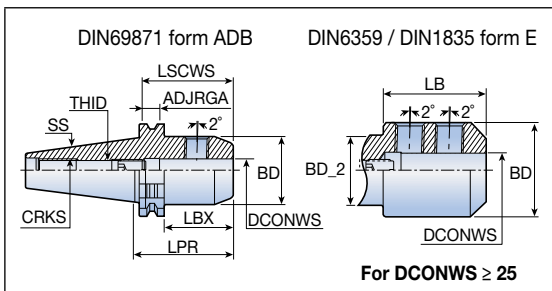
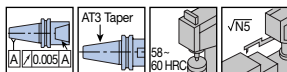
- ▶ Add B for coolant through flange

## End mill holders

[illegible]

► Add B for coolant through flange except DIN69871 30

## End mill holders - Whistle notch

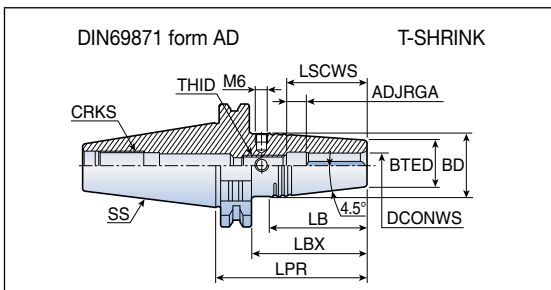
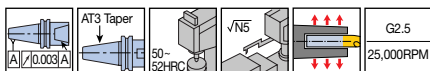
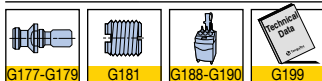


G177-G179



- ▶ The adjustment screw has an internal coolant hole
- ▶ Add B for coolant through the flange

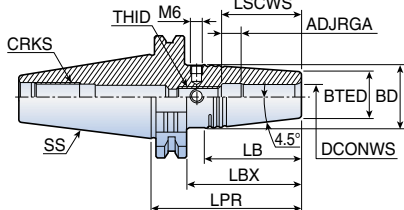
**TSHRINK**

[illegible]

- ▶ Only use inductive heating device for T-SHRINK holders
- ▶ <sup>(1)</sup> Balance to G2.5 at 20.000RPM

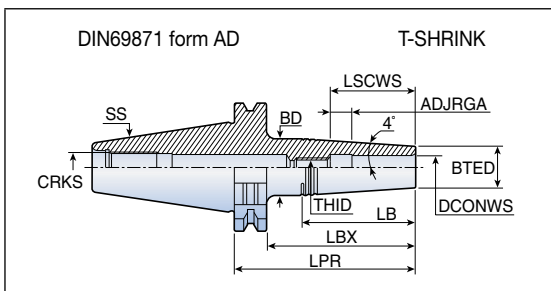
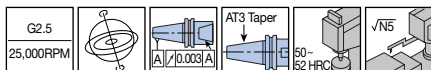


**TSHRINK**



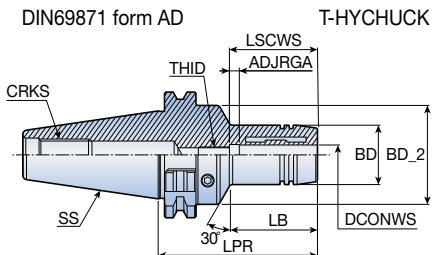
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| <b>G177-G179</b>                                                                    | <b>G181</b>                                                                         | <b>G188-G190</b>                                                                    | <b>G199</b>                                                                         |

- ▶ Only use inductive heating device for T-SHRINK holders
- ▶ Add B for coolant through flange
- ▶ <sup>(1)</sup> Balance to G2.5 at 20.000RPM

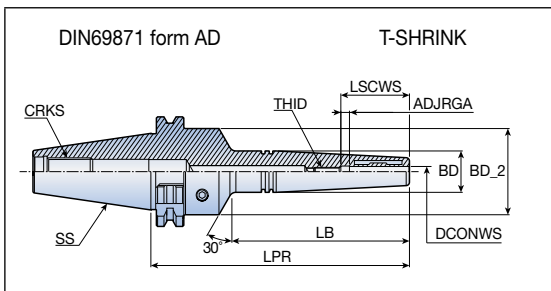
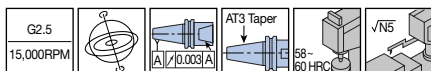
**TSHRINK**[illegible]

- ▶ Add B for coolant through the flange

# THYCHUCK



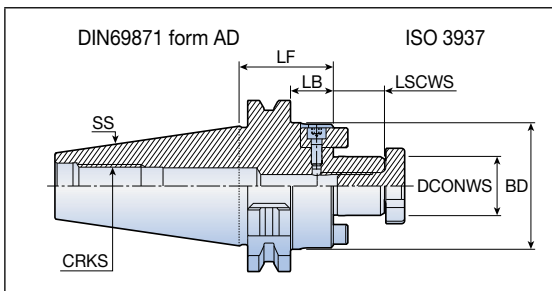
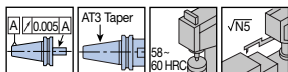
|                                                                                    |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| <b>G162-G163</b>                                                                   | <b>G177-G179</b>                                                                    | <b>G197-G198</b>                                                                    |

**TSHRINK**

G162-G163      G177-G179      G197-G198

- ▶ Consult the user guide for relevant information including: insertion depth and proper use
- ▶ Clamping wrench should be ordered separately

## Face mill arbors

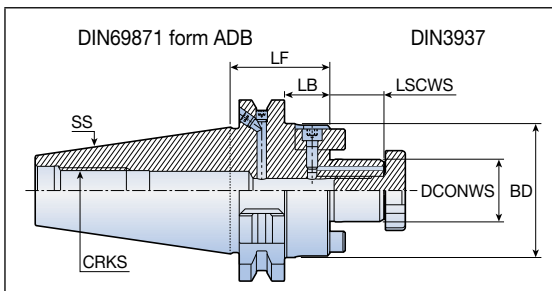
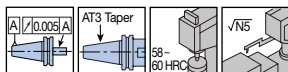


| Designation                  | Dimension (mm)   |        |    |     |      |       |      |     |
|------------------------------|------------------|--------|----|-----|------|-------|------|-----|
|                              | SS               | DCONWS | BD | LF  | LB   | LSCWS | CRKS |     |
| <b>DIN69871 30 SEM 22x50</b> | 30               | 22     | 47 | 50  | 30.9 | 19    | M12  |     |
|                              | <b>SEM 27x50</b> | 30     | 27 | 58  | 50   | 30.9  | 21   | M12 |
| <b>DIN69871 40 SEM 16x35</b> | <b>SEM 22x35</b> | 40     | 16 | 38  | 35   | 15.9  | 17   | M16 |
|                              | <b>SEM 27x60</b> | 40     | 22 | 47  | 35   | 15.9  | 19   | M16 |
|                              | <b>SEM 32x60</b> | 40     | 27 | 58  | 60   | 40.9  | 21   | M16 |
|                              | <b>SEM 40x60</b> | 40     | 32 | 66  | 60   | 40.9  | 24   | M16 |
|                              | <b>SEM 50x60</b> | 40     | 40 | 82  | 60   | 40.9  | 27   | M16 |
|                              | <b>SEM 60x60</b> | 40     | 50 | 95  | 60   | 40.9  | 30   | M16 |
| <b>DIN69871 50 SEM 16x35</b> | <b>SEM 22x35</b> | 50     | 16 | 38  | 35   | 15.9  | 17   | M24 |
|                              | <b>SEM 27x35</b> | 50     | 22 | 47  | 35   | 15.9  | 19   | M24 |
|                              | <b>SEM 32x35</b> | 50     | 27 | 58  | 35   | 15.9  | 21   | M24 |
|                              | <b>SEM 40x35</b> | 50     | 32 | 66  | 35   | 15.9  | 24   | M24 |
|                              | <b>SEM 50x35</b> | 50     | 40 | 82  | 35   | 15.9  | 27   | M24 |
|                              | <b>SEM 60x35</b> | 50     | 50 | 95  | 35   | 15.9  | 30   | M24 |
|                              | <b>SEM 16x50</b> | 50     | 16 | 38  | 50   | 30.9  | 19   | M24 |
|                              | <b>SEM 22x50</b> | 50     | 22 | 47  | 50   | 30.9  | 21   | M24 |
|                              | <b>SEM 27x50</b> | 50     | 27 | 58  | 50   | 30.9  | 24   | M24 |
|                              | <b>SEM 32x50</b> | 50     | 32 | 66  | 50   | 30.9  | 27   | M24 |
|                              | <b>SEM 40x50</b> | 50     | 40 | 82  | 50   | 30.9  | 30   | M24 |
|                              | <b>SEM 50x50</b> | 50     | 50 | 95  | 50   | 30.9  | 33   | M24 |
|                              | <b>SEM 60x50</b> | 50     | 60 | 112 | 50   | 30.9  | 36   | M24 |
|                              | <b>SEM 70x50</b> | 50     | 70 | 129 | 50   | 30.9  | 39   | M24 |



► Wrench not included

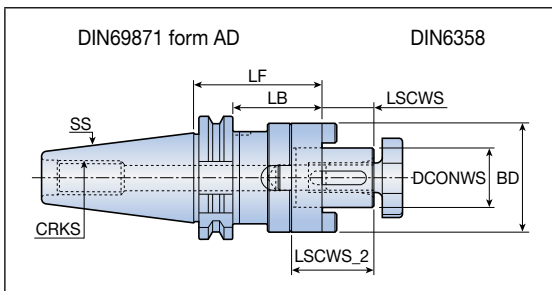
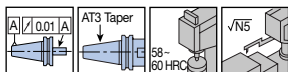
### Face mill arbors with coolant hole



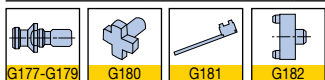
|                                                                                    |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| G177-G179                                                                          | G180                                                                                | G181                                                                                |

- ▶ If the “B type” option is required, the plug screw must be removed from the flange cooling hole (Use a 2mm hex key)
- ▶ Wrench not included

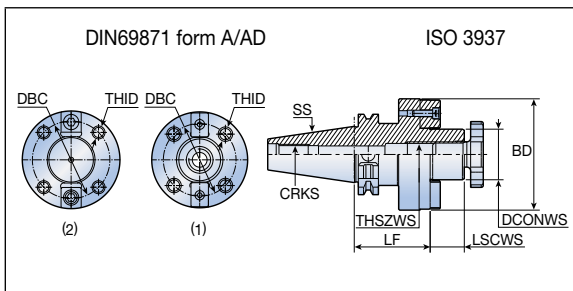
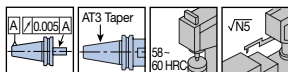
## Combi shell end mill arbors



► Wrench not included



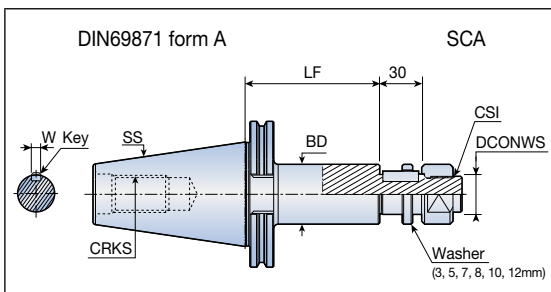
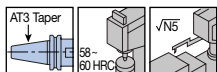
## Face mill arbors

[illegible]

- ▶ 4 pcs of mounting screws are included
- ▶ (1) Form AD
- ▶ (2) Form A



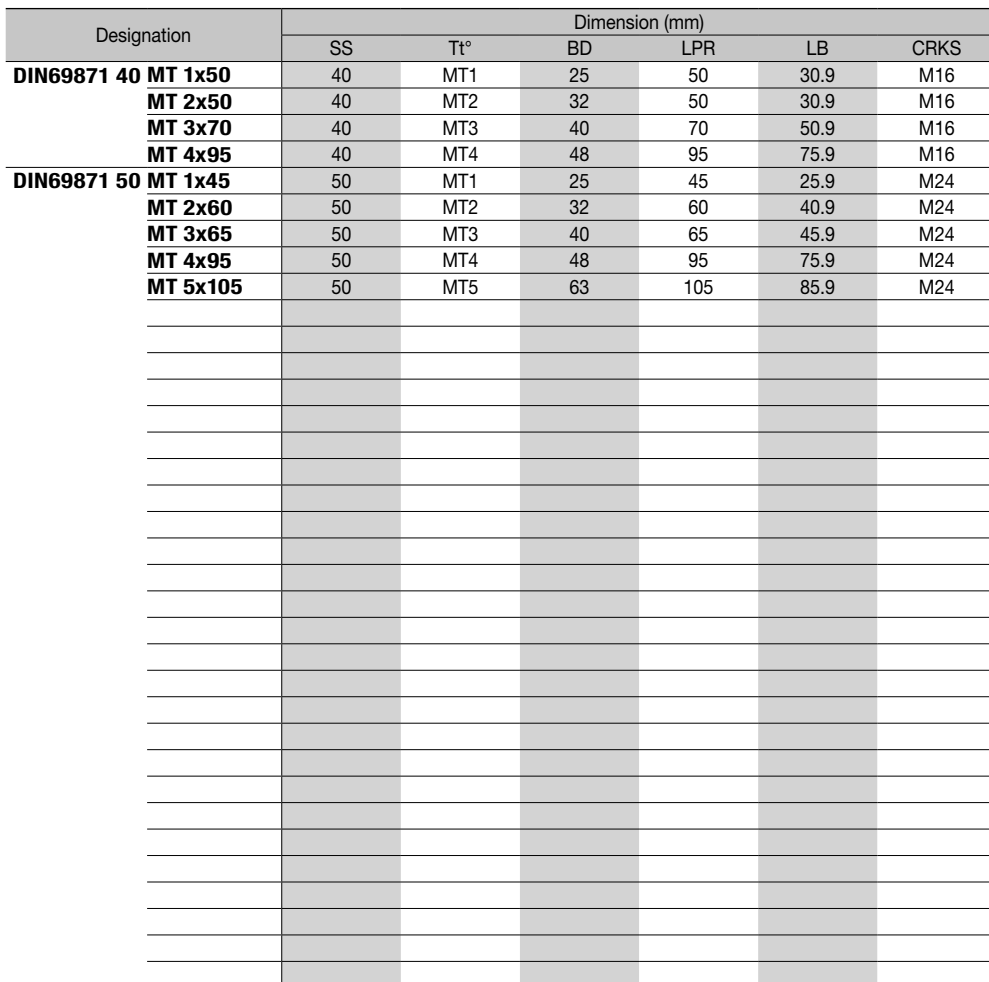
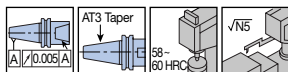
## Slotting cutter arbors



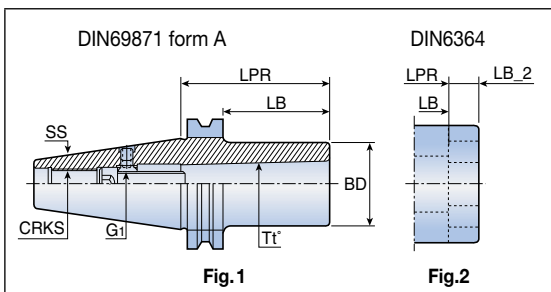
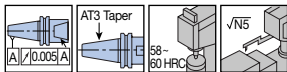
G177-G179

► Washers & key are included (Each 3, 5, 7, 8, 10, 12mm)

### Morse taper adapters

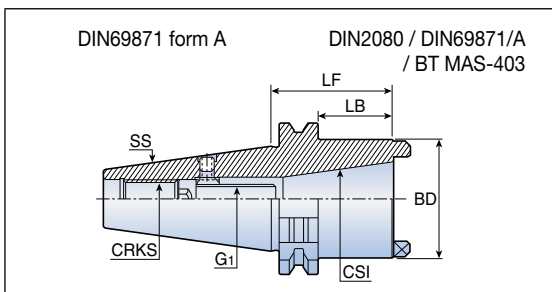
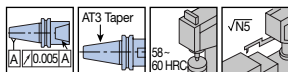


### Morse taper draw bar adapters

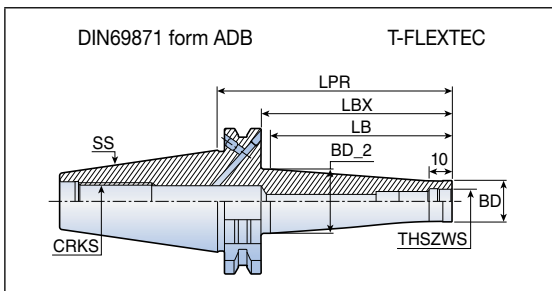
[illegible]

► <sup>(1)</sup> DIN2201

## Adapters

[illegible]

G177-G179



G177-G179

- ▶ <sup>(1)</sup> Balance to G6.3 at 12,000RPM

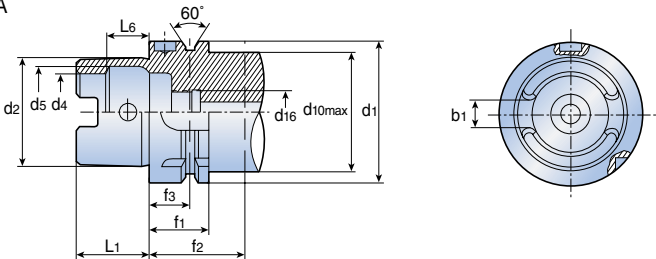
# HSK



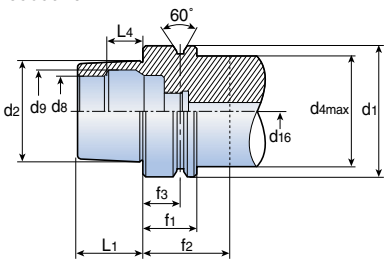
# DIN69893 Form A/E/F

## Standard toolholder

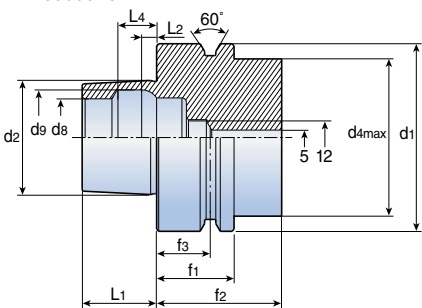
DIN69893 form A



DIN69893 form E



DIN69893 form F



DIN69893 form A

| HSK-A | d1 h10 | d2 | d4 H10 | d5 H11 | d10max | d16     | L1 -0.2 | L6 JS10 | b1 ±0.04     | f1 -0.1 | f2min | f3 ±0.1 |
|-------|--------|----|--------|--------|--------|---------|---------|---------|--------------|---------|-------|---------|
| 40    | 40     | 30 | 21     | 25.5   | 34     | M12x1   | 20      | 11.42   | 8.05         | 20      | 35    | 16      |
| 50    | 50     | 38 | 26     | 32.0   | 42     | M16x1   | 25      | 14.13   | 10.54        | 26      | 42    | 18      |
| 63    | 63     | 48 | 34     | 40.0   | 53     | M18x1   | 32      | 18.13   | 12.54(12.42) | 26      | 42    | 18      |
| 80    | 80     | 60 | 42     | 50.0   | 67     | M20x1.5 | 40      | 22.85   | 16.04        | 26      | 42    | 18      |
| 100   | 100    | 75 | 53     | 63.0   | 85     | M24x1.5 | 50      | 28.56   | 20.02 (19.9) | 29      | 45    | 20      |

DIN69893 form E

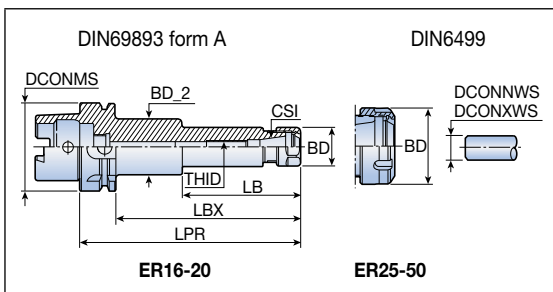
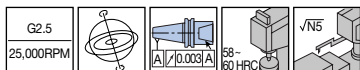
| HSK-E | d1 h10 | d2 | d4max | d8 H10 | d9 H11 | d16   | L1 -0.2 | L4 JS10 | f1 -0.1 | f2min | f3 ±0.1 |
|-------|--------|----|-------|--------|--------|-------|---------|---------|---------|-------|---------|
| 32    | 32     | 24 | 26    | 17     | 19.0   | M10x1 | 16      | 8.92    | 20      | 35    | 16      |
| 40    | 40     | 30 | 34    | 21     | 25.5   | M12x1 | 20      | 11.42   | 20      | 35    | 16      |
| 50    | 50     | 38 | 42    | 26     | 32.0   | M16x1 | 25      | 14.13   | 26      | 42    | 18      |
| 63    | 63     | 48 | 53    | 34     | 40.0   | M18x1 | 32      | 18.13   | 26      | 42    | 18      |

DIN69893 form F

| HSK-F | d1 h10 | d2 | d4max | d8 H10 | d9 H11 | L1 -0.2 | L2  | L4 JS10 | f1 -0.1 | f2min | f3 ±0.1 |
|-------|--------|----|-------|--------|--------|---------|-----|---------|---------|-------|---------|
| 63    | 63     | 38 | 53    | 26     | 32     | 25      | 5.0 | 14.13   | 26      | 42    | 18      |

- Without crosshole
- For non-stock items: Supply condition is subject to availability  
If not available in stock then MOQ (Minimum order qty) will be applicable

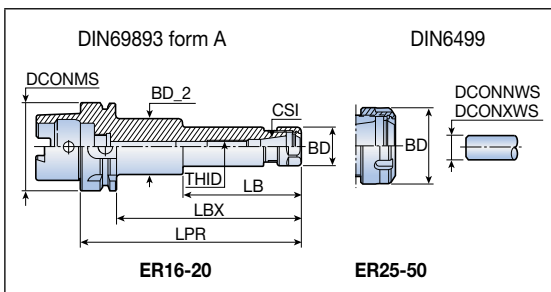
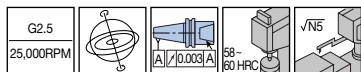
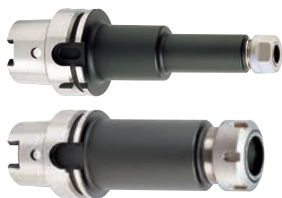
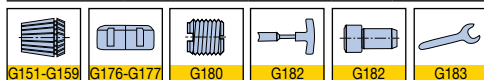
## ER collet chucks



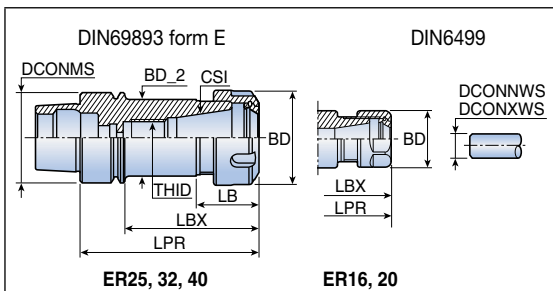
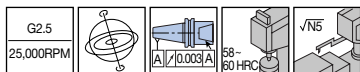
|                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| G151-G159                                                                          | G176-G177                                                                           | G180                                                                                | G182                                                                                | G182                                                                                | G183                                                                                |



## ER collet chucks

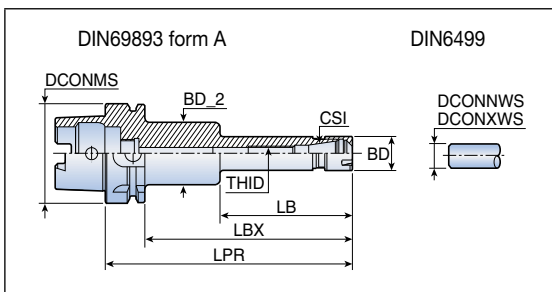
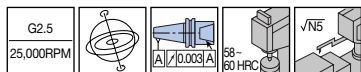
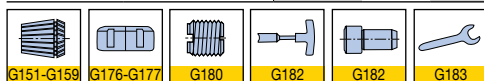
[illegible]

## ER collet chucks

[illegible]

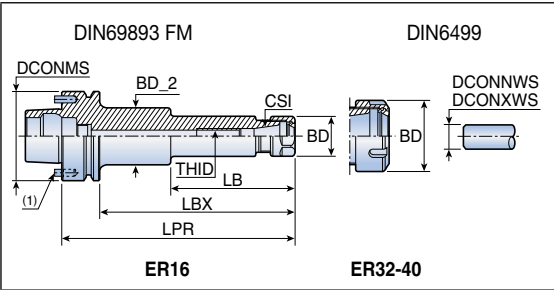
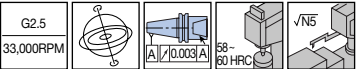
► <sup>(1)</sup> Equipped with nut ER16 MINI

## ER mini collet chucks

[illegible]

# HSK FM-ER

## ER collet chucks



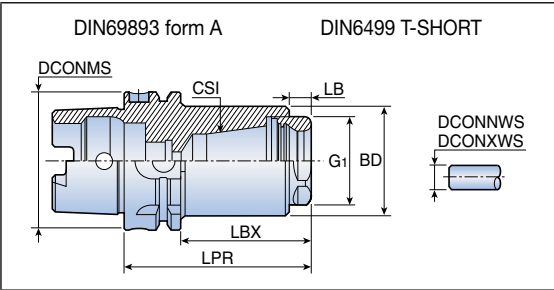
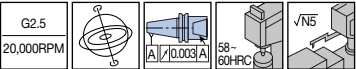
| Designation               | Dimension (mm) |      |         |         |    |      |     |     |      |         |
|---------------------------|----------------|------|---------|---------|----|------|-----|-----|------|---------|
|                           | DCONMS         | CSI  | DCONNWS | DCONXWS | BD | BD_2 | LPR | LBX | LB   | THID    |
| <b>HSK FM 63 ER 16x80</b> | 63             | ER16 | 0.5     | 10.0    | 28 | -    | 80  | 54  | -    | M10     |
| <b>ER 16x100</b>          | 63             | ER16 | 0.5     | 10.0    | 28 | -    | 100 | 74  | -    | M10     |
| <b>ER 16x120</b>          | 63             | ER16 | 0.5     | 10.0    | 28 | -    | 120 | 94  | -    | M10     |
| <b>ER 16x160</b>          | 63             | ER16 | 0.5     | 10.0    | 28 | 40   | 160 | 134 | 85.6 | M10     |
| <b>ER 32x80</b>           | 63             | ER32 | 2.0     | 20.0    | 50 | -    | 80  | 54  | -    | -       |
| <b>ER 32x100</b>          | 63             | ER32 | 2.0     | 20.0    | 50 | -    | 100 | 74  | -    | M22x1.5 |
| <b>ER 40x80</b>           | 63             | ER40 | 3.0     | 26.0    | 63 | 50   | 80  | 54  | 32.0 | -       |
| <b>ER 40x100</b>          | 63             | ER40 | 3.0     | 26.0    | 63 | 50   | 100 | 74  | 32.0 | M28x1.5 |

► <sup>(1)</sup> The driving pins can be removed to turn the toolholder into a standard HSK F 63 type

# HSK A-ER-SHORT



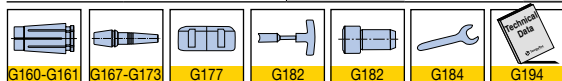
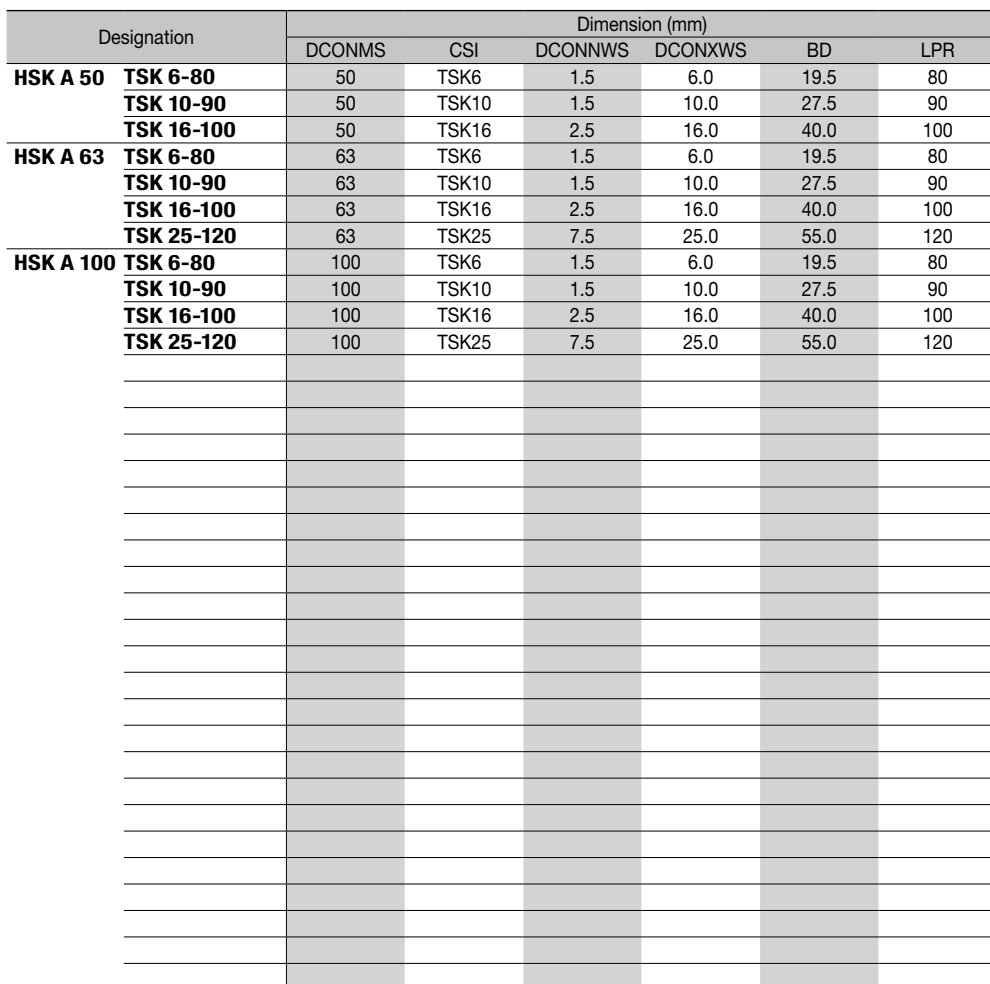
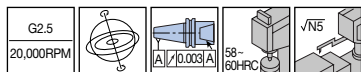
## Short ER collet chucks



| Designation                  | Dimension (mm) |      |         |         |    |       |      |     |         |
|------------------------------|----------------|------|---------|---------|----|-------|------|-----|---------|
|                              | DCONMS         | CSI  | DCONNWS | DCONXWS | BD | LPR   | LBX  | LB  | G1      |
| <b>HSK A 63 ER 32 SHORT</b>  | 63             | ER32 | 2.0     | 20.0    | 50 | 81.0  | 55.0 | 9.5 | M40x1.5 |
| <b>HSK A 100 ER 32 SHORT</b> | 100            | ER32 | 2.0     | 20.0    | 50 | 89.5  | 60.5 | 9.5 | M40x1.5 |
| <b>ER 40 SHORT</b>           | 100            | ER40 | 3.0     | 26.0    | 70 | 104.5 | 75.5 | 9.5 | M50x1.5 |
|                              |                |      |         |         |    |       |      |     |         |
|                              |                |      |         |         |    |       |      |     |         |

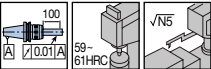
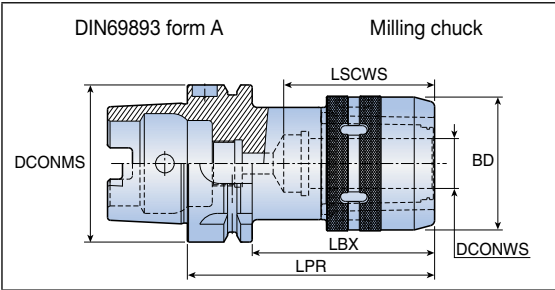


## TSK collet chucks

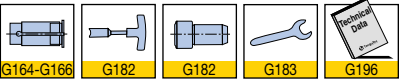


# HSK A-NTMC

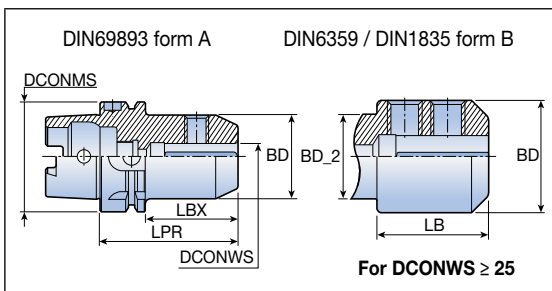
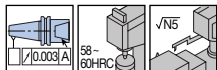
## Milling chucks



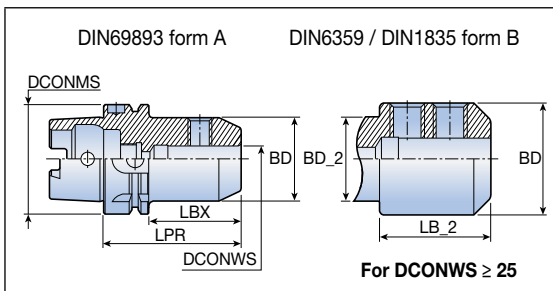
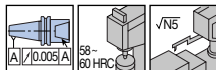
| Designation |             | Dimension (mm) |        |    |     |     |       |
|-------------|-------------|----------------|--------|----|-----|-----|-------|
|             |             | DCONMS         | DCONWS | BD | LPR | LBX | LSCWS |
| HSK A 63    | NTMC 20-105 | 63             | 20     | 53 | 105 | 79  | 76    |
|             | NTMC 25-105 | 63             | 25     | 62 | 105 | 79  | 77    |
|             | NTMC 32-130 | 63             | 32     | 72 | 130 | 104 | 100   |
| HSK A 100   | NTMC 20-105 | 100            | 20     | 53 | 105 | 76  | 77    |
|             | NTMC 25-135 | 100            | 25     | 62 | 135 | 106 | 80    |
|             | NTMC 32-135 | 100            | 32     | 74 | 135 | 106 | 102   |
|             | NTMC 42-135 | 100            | 42     | 94 | 135 | 106 | 112   |
|             |             |                |        |    |     |     |       |
|             |             |                |        |    |     |     |       |
|             |             |                |        |    |     |     |       |
|             |             |                |        |    |     |     |       |
|             |             |                |        |    |     |     |       |
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|             |             |                |        |    |     |     |       |
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|             |             |                |        |    |     |     |       |
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|             |             |                |        |    |     |     |       |
|             |             |                |        |    |     |     |       |
|             |             |                |        |    |     |     |       |



## CX coolant type end mill holders

[illegible]

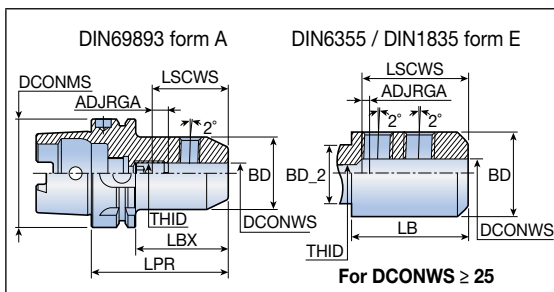
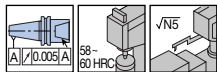
## End mill holders



|                                                                                   |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| G180                                                                              | G182                                                                                | G182                                                                                |

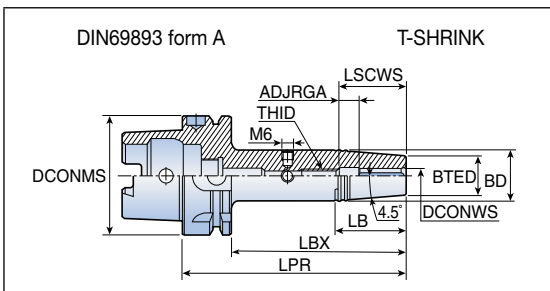


### End mill holders - Whistle notch



|                                                                                    |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| G180                                                                               | G182                                                                                | G182                                                                                |

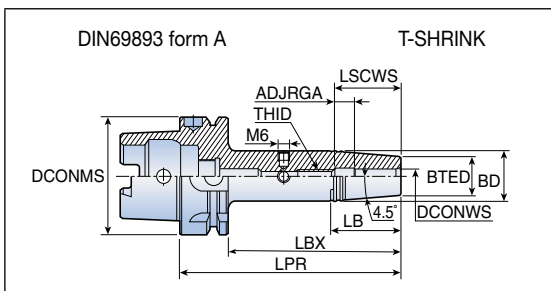
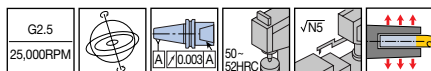
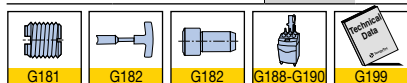
**TSHRINK**



|                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |
| G181                                                                               | G182                                                                                | G182                                                                                | G188-G190                                                                           | G199                                                                                |

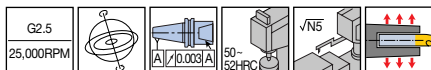
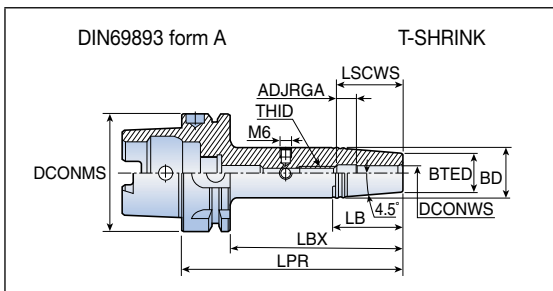
► <sup>(1)</sup> Balance to G2.5 at 20,000RPM

## Thermal shrinking chucks

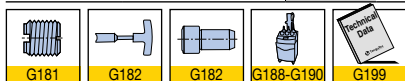
[illegible]

► Use only inductive heating device for T-SHRINK holders

## Thermal shrinking chucks



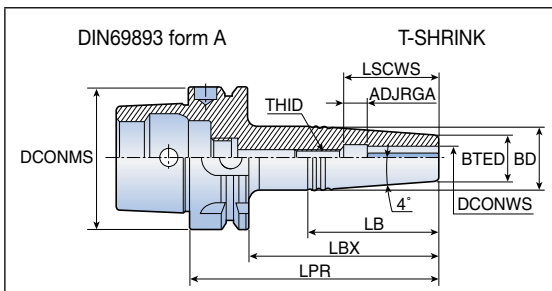
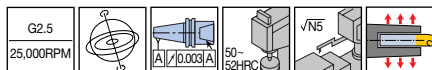
| Designation      |                                   | Dimension (mm) |        |      |    |     |     |    |        |       |      |         |
|------------------|-----------------------------------|----------------|--------|------|----|-----|-----|----|--------|-------|------|---------|
|                  |                                   | DCONMS         | DCONWS | BTED | BD | LPR | LBX | LB | ADJRGA | LSCWS | THID | Hex key |
| <b>HSK A 63</b>  | <b>SRKIN 25x115</b>               | 63             | 25     | 44   | 53 | 115 | 89  | 55 | 11     | 58    | M16  | 8.0     |
|                  | <b>SRKIN 32x85</b>                | 63             | 32     | 44   | 53 | 85  | 59  | -  | 11     | 58    | -    | -       |
|                  | <b>SRKIN 32x120</b>               | 63             | 32     | 44   | 53 | 120 | 94  | 55 | 11     | 58    | M16  | 8.0     |
| <b>HSK A 100</b> | <b>SRKIN 6x85<sup>(1)</sup></b>   | 100            | 6      | 21   | 27 | 85  | 56  | 38 | 14.5   | 36.5  | M5   | 2.5     |
|                  | <b>SRKIN 6x120<sup>(1)</sup></b>  | 100            | 6      | 21   | 27 | 120 | 91  | 38 | 11     | 36    | M5   | 2.5     |
|                  | <b>SRKIN 6x160<sup>(1)</sup></b>  | 100            | 6      | 21   | 27 | 160 | 131 | 38 | 14.5   | 36.5  | M5   | 3.0     |
|                  | <b>SRKIN 8x85<sup>(1)</sup></b>   | 100            | 8      | 21   | 27 | 85  | 56  | 38 | 10.5   | 36.5  | M6   | 3.0     |
|                  | <b>SRKIN 8x120<sup>(1)</sup></b>  | 100            | 8      | 21   | 27 | 120 | 91  | 38 | 11     | 36    | M6   | 3.0     |
|                  | <b>SRKIN 8x160<sup>(1)</sup></b>  | 100            | 8      | 21   | 27 | 160 | 131 | 38 | 11     | 36    | M6   | 3.0     |
|                  | <b>SRKIN 10x90<sup>(1)</sup></b>  | 100            | 10     | 24   | 32 | 90  | 61  | 51 | 11     | 42    | M8   | 4.0     |
|                  | <b>SRKIN 10x120<sup>(1)</sup></b> | 100            | 10     | 24   | 32 | 120 | 91  | 51 | 11     | 42    | M8   | 4.0     |
|                  | <b>SRKIN 10x160<sup>(1)</sup></b> | 100            | 10     | 24   | 32 | 160 | 131 | 51 | 11     | 42    | M8   | 4.0     |
|                  | <b>SRKIN 12x95<sup>(1)</sup></b>  | 100            | 12     | 24   | 32 | 95  | 66  | 51 | 11     | 47    | M10  | 5.0     |
|                  | <b>SRKIN 12x120<sup>(1)</sup></b> | 100            | 12     | 24   | 32 | 120 | 91  | 51 | 11.5   | 47.5  | M10  | 5.0     |
|                  | <b>SRKIN 12x160<sup>(1)</sup></b> | 100            | 12     | 24   | 32 | 160 | 131 | 51 | 11     | 47    | M10  | 5.0     |
|                  | <b>SRKIN 14x95<sup>(1)</sup></b>  | 100            | 14     | 27   | 34 | 95  | 66  | 45 | 11     | 47    | M10  | 5.0     |
|                  | <b>SRKIN 14x120<sup>(1)</sup></b> | 100            | 14     | 27   | 34 | 120 | 91  | 45 | 11     | 47    | M10  | 5.0     |
|                  | <b>SRKIN 14x160<sup>(1)</sup></b> | 100            | 14     | 27   | 34 | 160 | 131 | 45 | 11     | 47    | M10  | 5.0     |
|                  | <b>SRKIN 16x100<sup>(1)</sup></b> | 100            | 16     | 27   | 34 | 100 | 71  | 45 | 11     | 50    | M12  | 6.0     |
|                  | <b>SRKIN 16x120<sup>(1)</sup></b> | 100            | 16     | 27   | 34 | 120 | 91  | 45 | 11     | 50    | M12  | 6.0     |
|                  | <b>SRKIN 16x160<sup>(1)</sup></b> | 100            | 16     | 27   | 34 | 160 | 131 | 45 | 11     | 50.5  | M12  | 6.0     |
|                  | <b>SRKIN 18x100<sup>(1)</sup></b> | 100            | 18     | 33   | 42 | 100 | 71  | 57 | 11     | 50.5  | M12  | 6.0     |
|                  | <b>SRKIN 20x105<sup>(1)</sup></b> | 100            | 20     | 33   | 42 | 105 | 76  | 57 | 11     | 52.5  | M16  | 8.0     |
|                  | <b>SRKIN 20x160<sup>(1)</sup></b> | 100            | 20     | 33   | 42 | 160 | 131 | 57 | 11     | 52    | M16  | 8.0     |
|                  | <b>SRKIN 25x115<sup>(1)</sup></b> | 100            | 25     | 44   | 53 | 115 | 86  | 57 | 11     | 58    | M16  | 8.0     |
|                  | <b>SRKIN 32x120<sup>(1)</sup></b> | 100            | 32     | 44   | 53 | 120 | 91  | 57 | 11     | 62    | M16  | 8.0     |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |
|                  |                                   |                |        |      |    |     |     |    |        |       |      |         |



► Use only inductive heating device for T-SHRINK holders

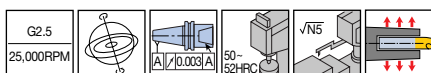
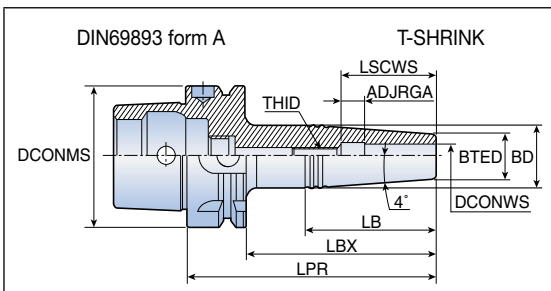
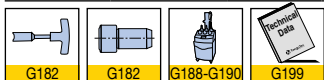
► <sup>(1)</sup> Balance to G2.5 at 20,000RPM

**TSHRINK**



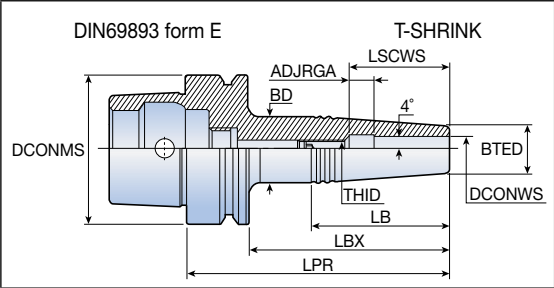
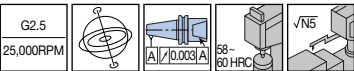
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| G182                                                                                | G182                                                                                | G188-G190                                                                           | G199                                                                                |

## Thermal shrinking chucks

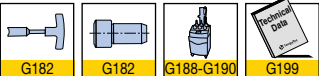
[illegible]

► Only use inductive heating device for T-SHRINK holders

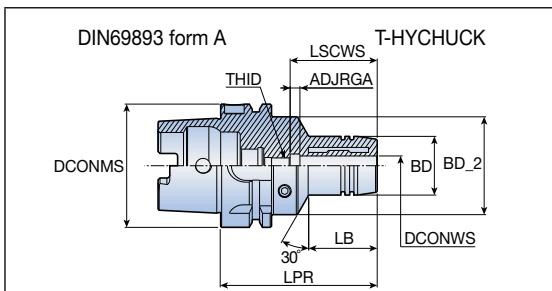
Thermal shrinking chucks



| Designation |           | Dimension (mm) |        |      |    |     |     |      |        |       |      |         |
|-------------|-----------|----------------|--------|------|----|-----|-----|------|--------|-------|------|---------|
|             |           | DCONMS         | DCONWS | BTED | BD | LPR | LBX | LB   | ADJRGA | LSCWS | THID | Hex key |
| HSK E 32    | SRK 3x45  | 32             | 3      | 10   | 13 | 65  | 45  | 30.0 | 6      | 16    | M4   | 2.0     |
|             | SRK 4x45  | 32             | 4      | 10   | 15 | 65  | 45  | 35.0 | 6      | 18    | M4   | 2.0     |
|             | SRK 6x45  | 32             | 6      | 11   | 16 | 65  | 45  | 35.0 | 10     | 28    | M4   | 2.0     |
|             | SRK 10x45 | 32             | 12     | 16   | 22 | 65  | 45  | 42.0 | 10     | 40    | M4   | 2.0     |
| HSK E 40    | SRK 3x45  | 40             | 3      | 10   | 13 | 65  | 45  | 30.0 | 6      | 16    | M5   | 2.5     |
|             | SRK 3x80  | 40             | 3      | 10   | 19 | 100 | 80  | 64.0 | 6      | 16    | M5   | 2.5     |
|             | SRK 4x45  | 40             | 4      | 10   | 15 | 65  | 45  | 35.0 | 6      | 18    | M5   | 2.5     |
|             | SRK 4x80  | 40             | 4      | 10   | 19 | 100 | 80  | 64.0 | 6      | 18    | M5   | 2.5     |
|             | SRK 5x45  | 40             | 5      | 10   | 15 | 65  | 45  | 35.0 | 10     | 25    | M4   | 2.0     |
|             | SRK 5x80  | 40             | 5      | 10   | 19 | 100 | 80  | 64.0 | 10     | 25    | M4   | 2.0     |
|             | SRK 6x45  | 40             | 6      | 11   | 16 | 65  | 45  | 35.0 | 10     | 28    | M5   | 2.5     |
|             | SRK 6x80  | 40             | 6      | 11   | 20 | 100 | 80  | 64.0 | 10     | 28    | M5   | 2.5     |
|             | SRK 8x45  | 40             | 8      | 14   | 20 | 65  | 45  | 42.0 | 10     | 35    | M5   | 2.5     |
|             | SRK 8x80  | 40             | 8      | 14   | 23 | 100 | 80  | 64.0 | 10     | 35    | M6   | 3.0     |
|             | SRK 10x45 | 40             | 10     | 16   | 22 | 65  | 45  | 42.0 | 10     | 40    | M5   | 2.5     |
|             | SRK 10x80 | 40             | 10     | 16   | 24 | 100 | 80  | 60.0 | 10     | 40    | M8   | 4.0     |
|             | SRK 12x45 | 40             | 12     | 20   | 26 | 65  | 45  | 42.0 | 10     | 42    | M5   | 2.5     |
|             | SRK 12x80 | 40             | 12     | 20   | 28 | 100 | 80  | 56.0 | 10     | 42    | M10  | 5.0     |
| HSK E 50    | SRK 3x45  | 50             | 3      | 10   | 15 | 71  | 45  | 36.0 | 6      | 16    | M5   | 2.5     |
|             | SRK 3x80  | 50             | 3      | 10   | 19 | 106 | 80  | 64.0 | 6      | 16    | M5   | 2.5     |
|             | SRK 4x45  | 50             | 4      | 10   | 15 | 71  | 45  | 36.0 | 6      | 18    | M5   | 2.5     |
|             | SRK 4x80  | 50             | 4      | 10   | 19 | 106 | 80  | 64.0 | 6      | 18    | M5   | 2.5     |
|             | SRK 6x45  | 50             | 6      | 11   | 16 | 71  | 45  | 36.0 | 10     | 28    | M5   | 2.5     |
|             | SRK 6x80  | 50             | 6      | 11   | 20 | 106 | 80  | 64.0 | 10     | 28    | M5   | 2.5     |
|             | SRK 8x45  | 50             | 8      | 14   | 20 | 71  | 45  | 43.0 | 10     | 35    | M6   | 3.0     |
|             | SRK 8x80  | 50             | 8      | 14   | 23 | 106 | 80  | 64.0 | 10     | 35    | M6   | 3.0     |
|             | SRK 10x45 | 50             | 10     | 16   | 22 | 71  | 45  | 42.0 | 7      | 37    | M6   | 3.0     |
|             | SRK 10x80 | 50             | 10     | 16   | 24 | 106 | 80  | 60.0 | 10     | 40    | M8   | 4.0     |
|             | SRK 12x45 | 50             | 12     | 20   | 26 | 71  | 45  | 42.0 | 7      | 39    | M6   | 3.0     |
|             |           |                |        |      |    |     |     |      |        |       |      |         |
|             |           |                |        |      |    |     |     |      |        |       |      |         |
|             |           |                |        |      |    |     |     |      |        |       |      |         |
|             |           |                |        |      |    |     |     |      |        |       |      |         |
|             |           |                |        |      |    |     |     |      |        |       |      |         |
|             |           |                |        |      |    |     |     |      |        |       |      |         |



# THYCHUCK

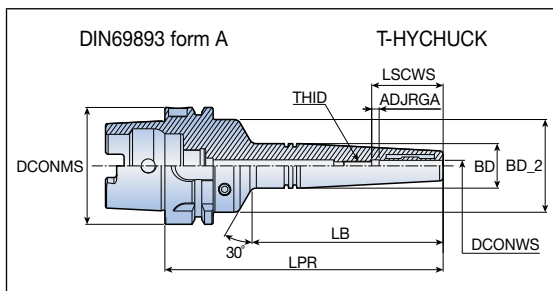
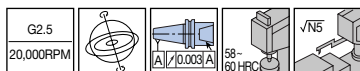
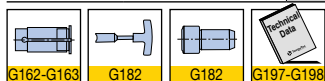


|                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| G162-G163                                                                          | G182                                                                                | G182                                                                                | G197-G198                                                                           |

- ▶ Consult the user guide for relevant information including: insertion depth and proper use
- ▶ Clamping wrench should be ordered separately

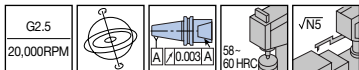
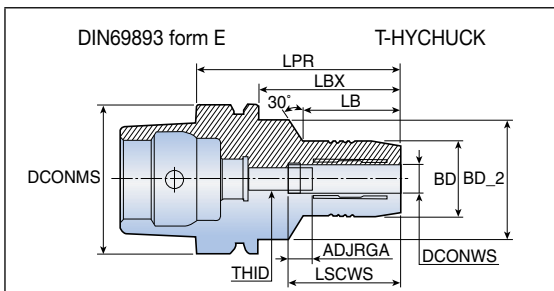
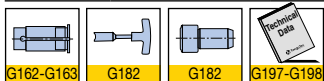


## Slim hydraulic chucks

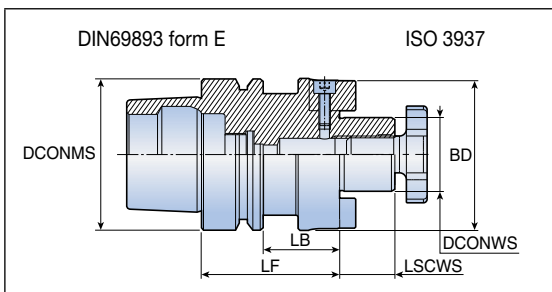
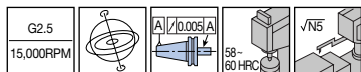
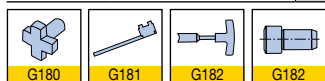
[illegible]

- ▶ Consult the user guide for relevant information including: insertion depth and proper use
- ▶ Clamping wrench should be ordered separately

## Hydraulic chucks

[illegible]

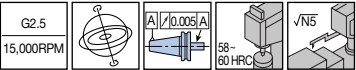
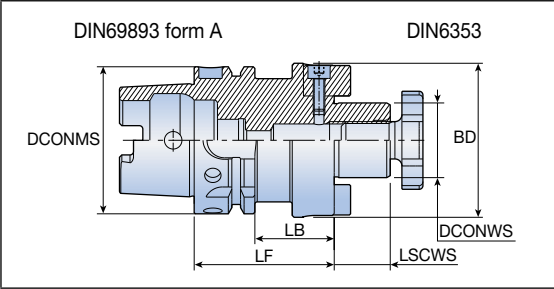
## Face mill arbors

[illegible]

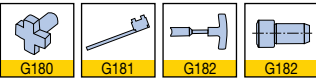
► Wrench not included

# HSK A-SEM

Face mill arbors



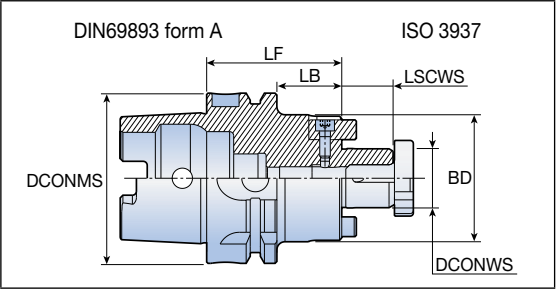
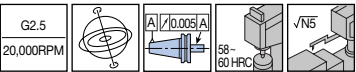
| Designation |           | Dimension (mm) |        |    |    |    |       |
|-------------|-----------|----------------|--------|----|----|----|-------|
|             |           | DCONMS         | DCONWS | BD | LF | LB | LSCWS |
| HSK A 63    | SEM 16x50 | 63             | 16     | 38 | 50 | 24 | 17    |
|             | SEM 22x50 | 63             | 22     | 47 | 50 | 24 | 19    |
|             | SEM 27x60 | 63             | 27     | 58 | 60 | 34 | 21    |
|             | SEM 32x60 | 63             | 32     | 66 | 60 | 34 | 24    |
|             | SEM 40x60 | 63             | 40     | 82 | 60 | 24 | 27    |
| HSK A 100   | SEM 22x50 | 100            | 22     | 47 | 50 | 21 | 19    |
|             | SEM 27x50 | 100            | 27     | 58 | 50 | 21 | 21    |
|             | SEM 32x50 | 100            | 32     | 66 | 50 | 21 | 24    |
|             | SEM 40x60 | 100            | 40     | 82 | 60 | 31 | 27    |
|             | SEM 50x70 | 100            | 50     | 95 | 70 | 41 | 30    |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |
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|             |           |                |        |    |    |    |       |
|             |           |                |        |    |    |    |       |



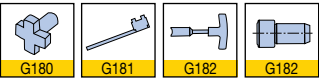
► Wrench not included

# HSK A-SEM-C

Face mill arbors with internal coolant hole

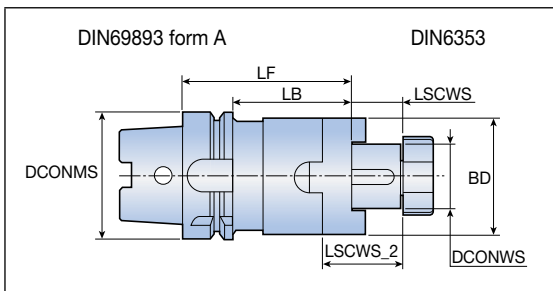
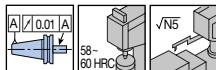
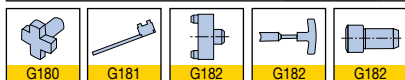


| Designation |              | Dimension (mm) |        |    |     |    |       |
|-------------|--------------|----------------|--------|----|-----|----|-------|
|             |              | DCONMS         | DCONWS | BD | LF  | LB | LSCWS |
| HSK A 63    | SEM 16x50 C  | 63             | 16     | 38 | 50  | 24 | 17    |
|             | SEM 16x100 C | 63             | 16     | 38 | 100 | 74 | 17    |
|             | SEM 22x50 C  | 63             | 22     | 47 | 50  | 24 | 19    |
|             | SEM 22x100 C | 63             | 22     | 47 | 100 | 74 | 19    |
|             | SEM 27x60 C  | 63             | 27     | 58 | 60  | 34 | 21    |
|             | SEM 27x100 C | 63             | 27     | 58 | 100 | 74 | 21    |
|             | SEM 32x60 C  | 63             | 32     | 66 | 60  | 34 | 24    |
| HSK A 100   | SEM 16x50 C  | 100            | 16     | 38 | 50  | 21 | 17    |
|             | SEM 16x100 C | 100            | 16     | 38 | 100 | 71 | 17    |
|             | SEM 22x50 C  | 100            | 22     | 47 | 50  | 21 | 19    |
|             | SEM 22x100 C | 100            | 22     | 47 | 100 | 71 | 19    |
|             | SEM 27x50 C  | 100            | 27     | 58 | 50  | 21 | 21    |
|             | SEM 27x100 C | 100            | 27     | 58 | 100 | 71 | 21    |
|             | SEM 32x50 C  | 100            | 32     | 66 | 50  | 21 | 24    |
|             | SEM 32x100 C | 100            | 32     | 66 | 100 | 71 | 24    |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |
|             |              |                |        |    |     |    |       |



► Wrench not included

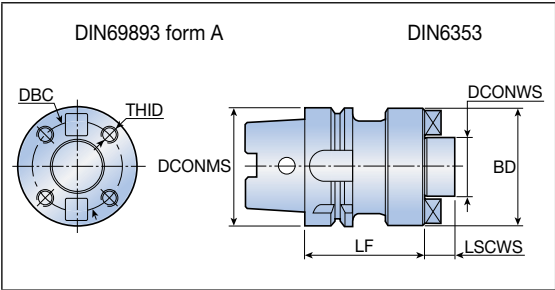
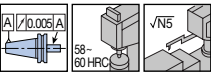
## Combi shell end mill arbors

[illegible]

► Wrench not included

# HSK A-FM

## Face mill arbors

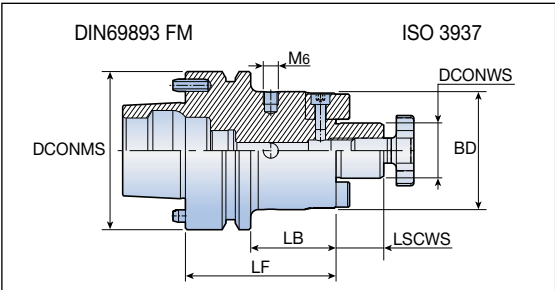
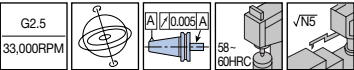


| Designation        | Dimension (mm) |        |     |       |    |       |      |
|--------------------|----------------|--------|-----|-------|----|-------|------|
|                    | DCONMS         | DCONWS | BD  | DBC   | LF | LSCWS | THID |
| HSK A 100 FM 60x70 | 100            | 60     | 128 | 101.6 | 70 | 40    | M16  |
|                    |                |        |     |       |    |       |      |
|                    |                |        |     |       |    |       |      |
|                    |                |        |     |       |    |       |      |

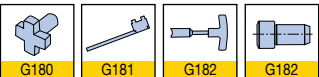
► Wrench not included

# HSK FM-SEM

## Face mill arbors - HSK high torque

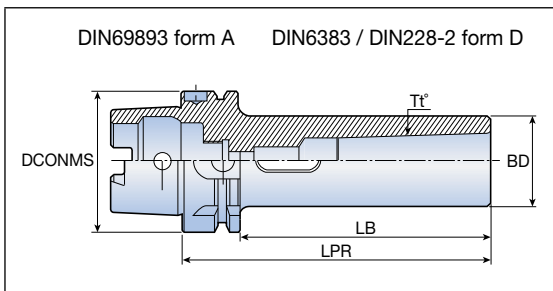
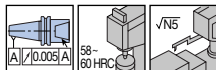
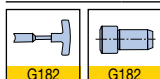


| Designation         | Dimension (mm) |        |    |    |    |       |
|---------------------|----------------|--------|----|----|----|-------|
|                     | DCONMS         | DCONWS | BD | LF | LB | LSCWS |
| HSK FM 63 SEM 22x60 | 63             | 22     | 47 | 60 | 34 | 19    |
|                     |                |        |    |    |    |       |
|                     |                |        |    |    |    |       |
|                     |                |        |    |    |    |       |

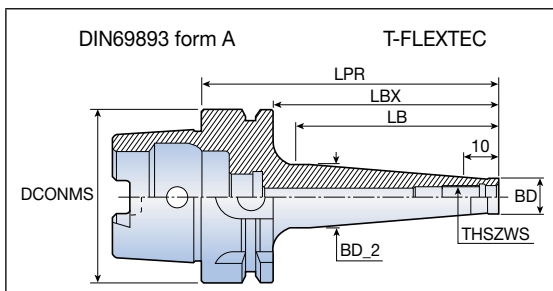


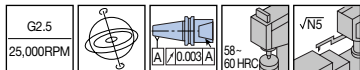
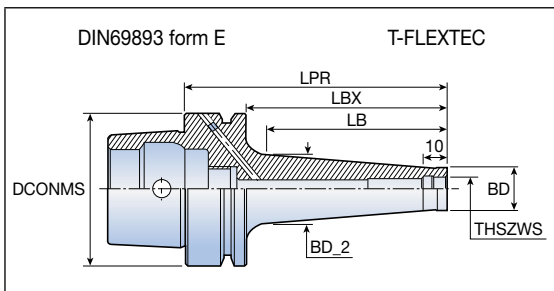
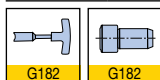
► The driving pins can be removed to turn the toolholder into a standard HSK F 63 type

### Morse taper adapters

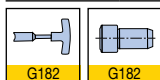
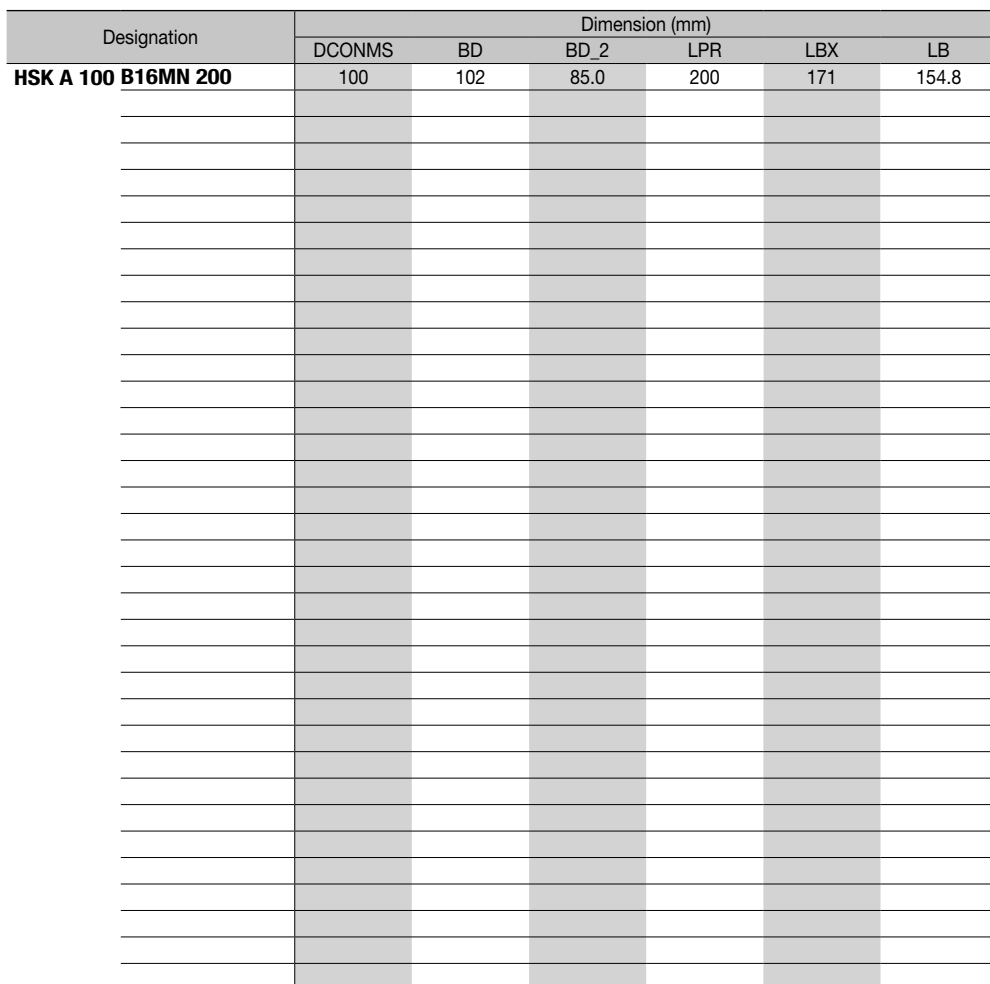
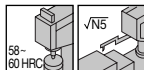
[illegible]





[illegible]

## HSK blanks



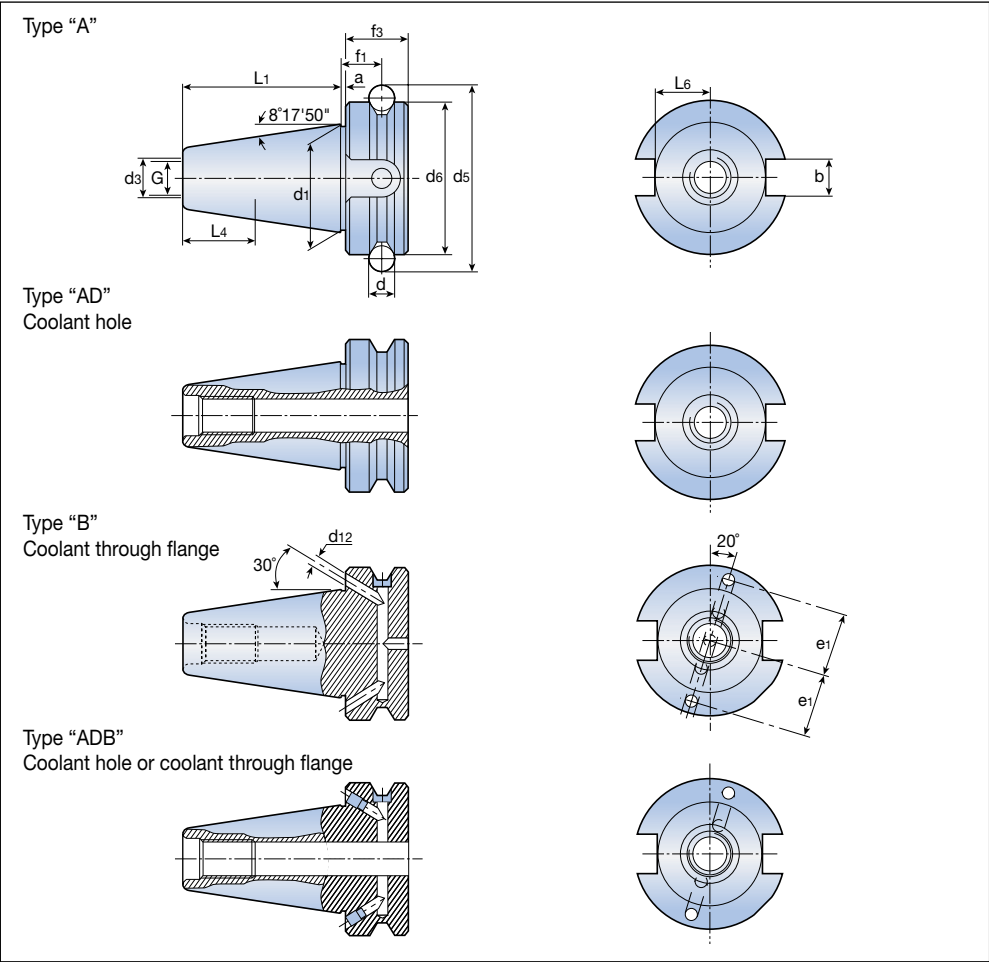
- Material: Case hardened alloy steel
- Shank hardness 57-60 HRC minimum
- Nose hardness 22-30 HRC

# BT MAS



# BT MAS 403 Form A/AD/B/ADB

## Standard toolholder



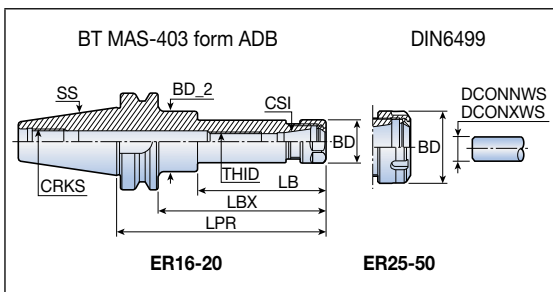
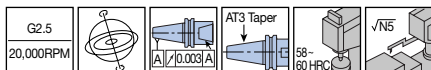
| Shank | a ±0.1 | b (H12) | d  | d1    | G   | d3 (H8) | d5      | d6 (H8) |
|-------|--------|---------|----|-------|-----|---------|---------|---------|
| 30    | 2      | 16.1    | 8  | 31.75 | M12 | 12.5    | 56.144  | 46      |
| 40    | 2      | 16.1    | 10 | 44.45 | M16 | 17.0    | 75.679  | 63      |
| 50    | 3      | 25.7    | 15 | 69.85 | M24 | 25.0    | 119.020 | 100     |

| Shank | f1 ±0.1 | f3 | L1 ±0.2 | L4min | L6 -0.2 | e1 ±0.1 | d12 | Taper AT3 |
|-------|---------|----|---------|-------|---------|---------|-----|-----------|
| 30    | 13.6    | 20 | 48.4    | 24    | 16.3    | 21      | 4   | 0.002     |
| 40    | 16.6    | 25 | 65.4    | 30    | 22.6    | 27      | 4   | 0.003     |
| 50    | 23.2    | 35 | 101.8   | 45    | 35.4    | 42      | 6   | 0.004     |

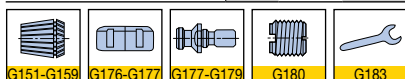
► For non-stock items: Supply condition is subject to availability  
If not available in stock then MOQ (Minimum order qty) will be applicable

# BT-ER

## ER collet chucks



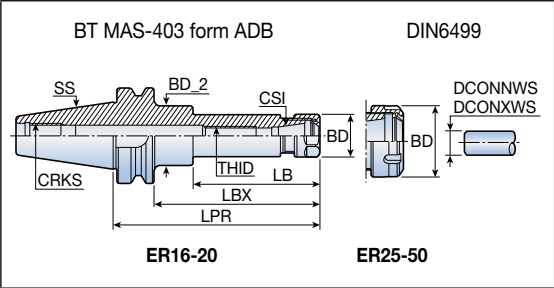
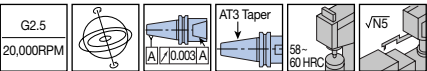
| Designation              | Dimension (mm)           |      |         |         |      |      |     |     |     |      |      |         |
|--------------------------|--------------------------|------|---------|---------|------|------|-----|-----|-----|------|------|---------|
|                          | SS                       | CSI  | DCONNWS | DCONXWS | BD   | BD_2 | LPR | LBX | LB  | CRKS | THID |         |
| BT30 ER 16x70            | 30                       | ER16 | 0.5     | 10.0    | 28   | -    | 70  | 48  | -   | M12  | M10  |         |
|                          | ER 16x100                | 30   | ER16    | 0.5     | 10.0 | 28   | -   | 100 | 78  | -    | M12  | M10     |
|                          | ER 20x70                 | 30   | ER20    | 1.0     | 13.0 | 34   | -   | 70  | 48  | -    | M12  | M12     |
|                          | ER 25x60                 | 30   | ER25    | 1.0     | 16.0 | 42   | -   | 60  | 38  | -    | M12  | M16     |
|                          | ER 32x60                 | 30   | ER32    | 2.0     | 20.0 | 50   | -   | 60  | 38  | -    | M12  | M18x1.5 |
| BT40 ER 16x70            | 40                       | ER16 | 0.5     | 10.0    | 28   | -    | 70  | 43  | -   | M16  | M10  |         |
|                          | ER 16x100                | 40   | ER16    | 0.5     | 10.0 | 28   | -   | 100 | 73  | -    | M16  | M10     |
|                          | ER 16x150                | 40   | ER16    | 0.5     | 10.0 | 28   | 40  | 150 | 123 | 85   | M16  | M10     |
|                          | ER 16x200 <sup>(1)</sup> | 40   | ER16    | 0.5     | 10.0 | 28   | 40  | 200 | 173 | 85   | M16  | M10     |
|                          | ER 20x70                 | 40   | ER20    | 1.0     | 13.0 | 34   | -   | 70  | 43  | -    | M16  | M12     |
|                          | ER 20x100                | 40   | ER20    | 1.0     | 13.0 | 34   | -   | 100 | 73  | -    | M16  | M12     |
|                          | ER 20x120                | 40   | ER20    | 1.0     | 13.0 | 34   | -   | 120 | 93  | -    | M16  | M12     |
|                          | ER 20x150                | 40   | ER20    | 1.0     | 13.0 | 34   | -   | 150 | 123 | -    | M16  | M12     |
|                          | ER 25x60                 | 40   | ER25    | 1.0     | 13.0 | 42   | -   | 60  | 33  | -    | M16  | M16     |
|                          | ER 25x100                | 40   | ER25    | 1.0     | 16.0 | 42   | -   | 100 | 73  | -    | M16  | M16     |
|                          | ER 25x150                | 40   | ER25    | 1.0     | 16.0 | 42   | -   | 150 | 123 | -    | M16  | M16     |
|                          | ER 32x60                 | 40   | ER32    | 2.0     | 20.0 | 50   | -   | 60  | 33  | -    | M16  | M22x1.5 |
|                          | ER 32x100                | 40   | ER32    | 2.0     | 20.0 | 50   | -   | 100 | 73  | -    | M16  | M22x1.5 |
|                          | ER 32x150                | 40   | ER32    | 2.0     | 20.0 | 50   | -   | 150 | 123 | -    | M16  | M22x1.5 |
|                          | ER 32x200 <sup>(1)</sup> | 40   | ER32    | 2.0     | 20.0 | 50   | -   | 200 | 162 | -    | M16  | M22x1.6 |
|                          | ER 40x80                 | 40   | ER40    | 3.0     | 26.0 | 63   | -   | 80  | 53  | -    | M16  | M28x1.5 |
|                          | ER 40x100                | 40   | ER40    | 3.0     | 26.0 | 63   | -   | 100 | 73  | -    | M16  | M28x1.5 |
|                          | ER 40x150                | 40   | ER40    | 3.0     | 26.0 | 63   | -   | 150 | 123 | -    | M16  | M28x1.5 |
|                          | ER 50x90                 | 40   | ER50    | 10.0    | 34.0 | 78   | -   | 90  | 63  | -    | M16  | M28x1.5 |
|                          | BT50 ER 16x100           | 50   | ER16    | 0.5     | 10.0 | 28   | -   | 100 | 62  | -    | M24  | M10     |
| ER 16x125                |                          | 50   | ER16    | 0.5     | 10.0 | 28   | -   | 125 | 87  | -    | M24  | M10     |
| ER 16x150                |                          | 50   | ER16    | 0.5     | 10.0 | 28   | -   | 150 | 112 | -    | M24  | M10     |
| ER 16x200 <sup>(1)</sup> |                          | 50   | ER16    | 0.5     | 10.0 | 28   | 40  | 200 | 162 | 85   | M24  | M10     |
| ER 20x100                |                          | 50   | ER20    | 1.0     | 10.0 | 34   | -   | 100 | 62  | -    | M24  | M12     |
| ER 20x125                |                          | 50   | ER20    | 1.0     | 13.0 | 34   | -   | 125 | 87  | -    | M24  | M12     |
| ER 20x150                |                          | 50   | ER20    | 1.0     | 13.0 | 34   | -   | 150 | 112 | -    | M24  | M12     |
| ER 20x200 <sup>(1)</sup> | 50                       | ER20 | 1.0     | 13.0    | 34   | 50   | 200 | 162 | 86  | M24  | M12  |         |
|                          |                          |      |         |         |      |      |     |     |     |      |      |         |
|                          |                          |      |         |         |      |      |     |     |     |      |      |         |



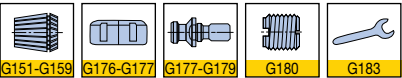
► <sup>(1)</sup> Balance to G6.3 at 12,000RPM

# BT-ER

## ER collet chucks



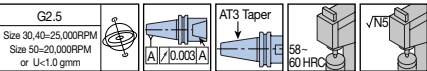
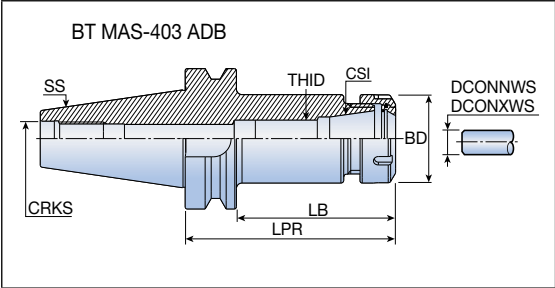
| Designation |                          | Dimension (mm) |      |         |         |    |      |     |     |    |      |         |
|-------------|--------------------------|----------------|------|---------|---------|----|------|-----|-----|----|------|---------|
|             |                          | SS             | CSI  | DCONNWS | DCONXWS | BD | BD_2 | LPR | LBX | LB | CRKS | THID    |
| BT50        | ER 25x100                | 50             | ER25 | 1.0     | 16.0    | 42 | -    | 100 | 62  | -  | M24  | M16     |
|             | ER 25x150                | 50             | ER25 | 1.0     | 16.0    | 42 | -    | 150 | 112 | -  | M24  | M16     |
|             | ER 25x200 <sup>(1)</sup> | 50             | ER25 | 1.0     | 16.0    | 42 | 55   | 200 | 162 | 87 | M24  | M16     |
|             | ER 32x100                | 50             | ER32 | 2.0     | 20.0    | 50 | -    | 100 | 62  | -  | M24  | M22x1.5 |
|             | ER 32x125                | 50             | ER32 | 2.0     | 20.0    | 50 | -    | 125 | 87  | -  | M24  | M22x1.5 |
|             | ER 32x150                | 50             | ER32 | 2.0     | 20.0    | 50 | -    | 150 | 112 | -  | M24  | M22x1.5 |
|             | ER 32x200 <sup>(1)</sup> | 50             | ER32 | 2.0     | 20.0    | 50 | 63   | 200 | 162 | 88 | M24  | M22x1.5 |
|             | ER 40x100                | 50             | ER40 | 3.0     | 26.0    | 63 | -    | 100 | 62  | -  | M24  | M28x1.5 |
|             | ER 40x150                | 50             | ER40 | 3.0     | 26.0    | 63 | -    | 150 | 112 | -  | M24  | M28x1.5 |
|             | ER 40x200 <sup>(1)</sup> | 50             | ER40 | 3.0     | 26.0    | 63 | -    | 200 | 162 | -  | M24  | M28x1.5 |
|             | ER 50x100                | 50             | ER50 | 3.0     | 26.0    | 78 | -    | 100 | 62  | -  | M24  | M36x1.5 |
|             | ER 50x150                | 50             | ER50 | 10.0    | 34.0    | 78 | -    | 150 | 112 | -  | M24  | M36x1.5 |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |
|             |                          |                |      |         |         |    |      |     |     |    |      |         |



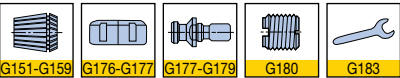
► <sup>(1)</sup> Balance to G6.3 at 12,000RPM

# BT-FC-ER

## ER collet chucks

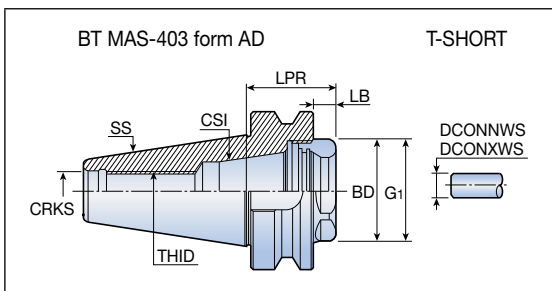


| Designation      | Dimension (mm) |      |         |         |    |     |       |      |         |  |
|------------------|----------------|------|---------|---------|----|-----|-------|------|---------|--|
|                  | SS             | CSI  | DCONNWS | DCONXWS | BD | LPR | LB    | CRKS | THID    |  |
| BT30 FC ER16x70  | 30             | ER16 | 0.5     | 10.0    | 28 | 70  | 48    | M12  | M10     |  |
|                  | 30             | ER16 | 0.5     | 10.0    | 28 | 100 | 79    | M12  | M10     |  |
|                  | 30             | ER20 | 1.0     | 13.0    | 34 | 70  | 48    | M12  | M12     |  |
|                  | 30             | ER25 | 1.0     | 16.0    | 42 | 60  | 38    | M12  | M16     |  |
|                  | 30             | ER32 | 2.0     | 20.0    | 50 | 60  | 38    | M12  | M18     |  |
| BT40 FC ER16x70  | 40             | ER16 | 0.5     | 10.0    | 28 | 70  | 44    | M16  | M12     |  |
|                  | 40             | ER16 | 0.5     | 10.0    | 28 | 100 | 74    | M16  | M12     |  |
|                  | 40             | ER32 | 2.0     | 20.0    | 50 | 60  | 34    | M16  | M22X1.5 |  |
|                  | 40             | ER32 | 2.0     | 20.0    | 50 | 100 | 74    | M16  | M22X1.5 |  |
|                  | 40             | ER40 | 3.0     | 26.0    | 63 | 80  | 54    | M16  | M28X1.5 |  |
| BT50 FC ER16x100 | 50             | ER16 | 0.5     | 10.0    | 28 | 100 | 63.5  | M24  | M12     |  |
|                  | 50             | ER16 | 0.5     | 10.0    | 28 | 150 | 113.5 | M24  | M12     |  |
|                  | 50             | ER32 | 2.0     | 20.0    | 50 | 100 | 63.5  | M24  | M22X1.5 |  |
|                  | 50             | ER32 | 2.0     | 20.0    | 50 | 150 | 113.5 | M24  | M22X1.5 |  |
|                  | 50             | ER40 | 3.0     | 26.0    | 63 | 100 | 63.5  | M24  | M28X1.5 |  |
| BT50 FC ER40x150 | 50             | ER40 | 3.0     | 26.0    | 63 | 150 | 113.5 | M24  | M28X1.5 |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |
|                  |                |      |         |         |    |     |       |      |         |  |





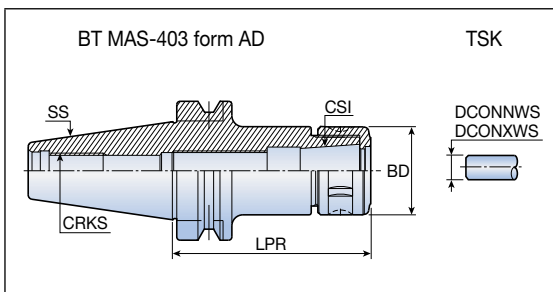
## Short ER collet chucks



|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| G151-G159                                                                           | G167-G173                                                                           | G176-G177                                                                           | G177-G179                                                                           | G180                                                                                | G183                                                                                |

68

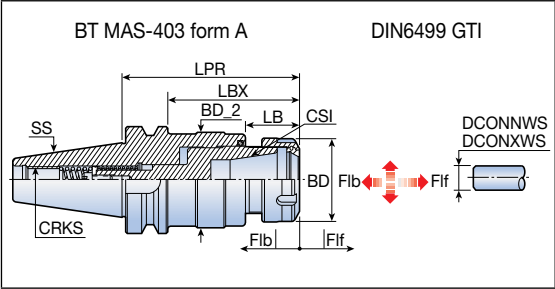
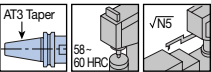
## TSK collet chucks

[illegible]

- ▶ Add B for coolant through flange
- ▶ <sup>(1)</sup> Balance to G6.3 at 20,000RPM

# GTI BT-ER

## GTI tap attachments

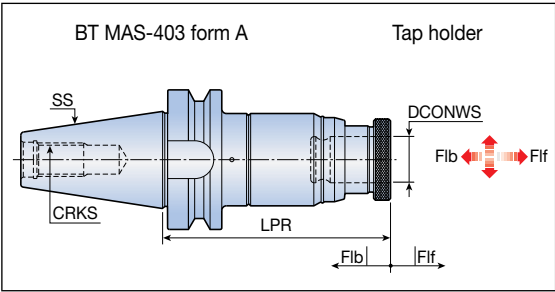
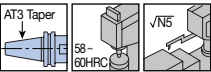


| Designation   | Dimension (mm) |      |        |        |         |         |    |      |       |      |      |     |      |      |
|---------------|----------------|------|--------|--------|---------|---------|----|------|-------|------|------|-----|------|------|
|               | SS             | CSI  | Tapmin | Tapmax | DCONNWS | DCONXWS | BD | BD_2 | LPR   | LBX  | LB   | Flf | Flib | CRKS |
| GTI BT40 ER16 | 40             | ER16 | M3     | M10    | 0.5     | 10.0    | 28 | 29.5 | 84.2  | 52.7 | 24.6 | 8   | 3    | M16  |
|               | 40             | ER32 | M6     | M20    | 2.0     | 20.0    | 50 | 56.5 | 106.8 | 79.8 | 33.0 | 9   | 4    | M16  |
|               | 40             | ER40 | M6     | M28    | 3.0     | 26.0    | 63 | 56.5 | 124.8 | 97.8 | 51.0 | 9   | 4    | M16  |
| GTI BT50 ER16 | 50             | ER16 | M3     | M10    | 0.5     | 10.0    | 28 | 29.5 | 106.8 | 68.8 | 24.6 | 8   | 3    | M24  |
|               | 50             | ER32 | M6     | M20    | 2.0     | 20.0    | 50 | 56.5 | 114.2 | 77.2 | 33.0 | 9   | 4    | M24  |
|               | 50             | ER40 | M6     | M28    | 3.0     | 26.0    | 63 | 56.5 | 133.2 | 95.2 | 51.0 | 9   | 4    | M24  |

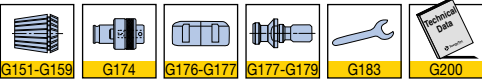
► No coolant should be induced through the tap chuck as it will cause malfunctioning of the mechanism

# BT-TC

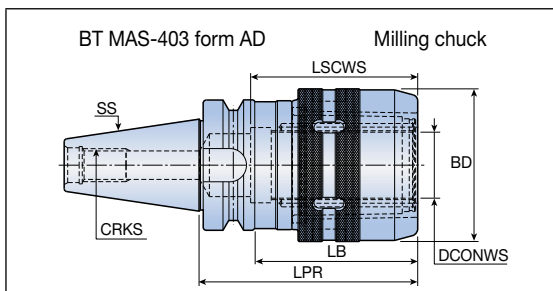
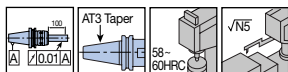
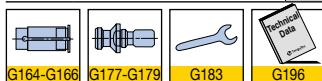
## Tap holders



| Designation    | Dimension (mm) |        |        |        |     |      |     |             |      |
|----------------|----------------|--------|--------|--------|-----|------|-----|-------------|------|
|                | SS             | Tapmin | Tapmax | DCONWS | LPR | Flib | Flf | Tap adapter | CRKS |
| BT30 TC 12-105 | 30             | M3     | M12    | 19     | 105 | 6.5  | 12  | TA1         | M12  |
| BT40 TC 12-95  | 40             | M3     | M12    | 19     | 95  | 6.5  | 12  | TA1         | M16  |
| TC 12-110      | 40             | M3     | M12    | 19     | 110 | 6.5  | 12  | TA1         | M16  |
| TC 22-127      | 40             | M6     | M24    | 31     | 127 | 14.5 | 13  | TA2         | M16  |
| BT50 TC 12-125 | 50             | M6     | M12    | 19     | 125 | 6.5  | 12  | TA1         | M24  |
| TC 22-142      | 50             | M6     | M24    | 31     | 142 | 14.5 | 13  | TA2         | M24  |
| TC 38-195      | 50             | M18    | M38    | 48     | 195 | 20.0 | 20  | TA3         | M24  |

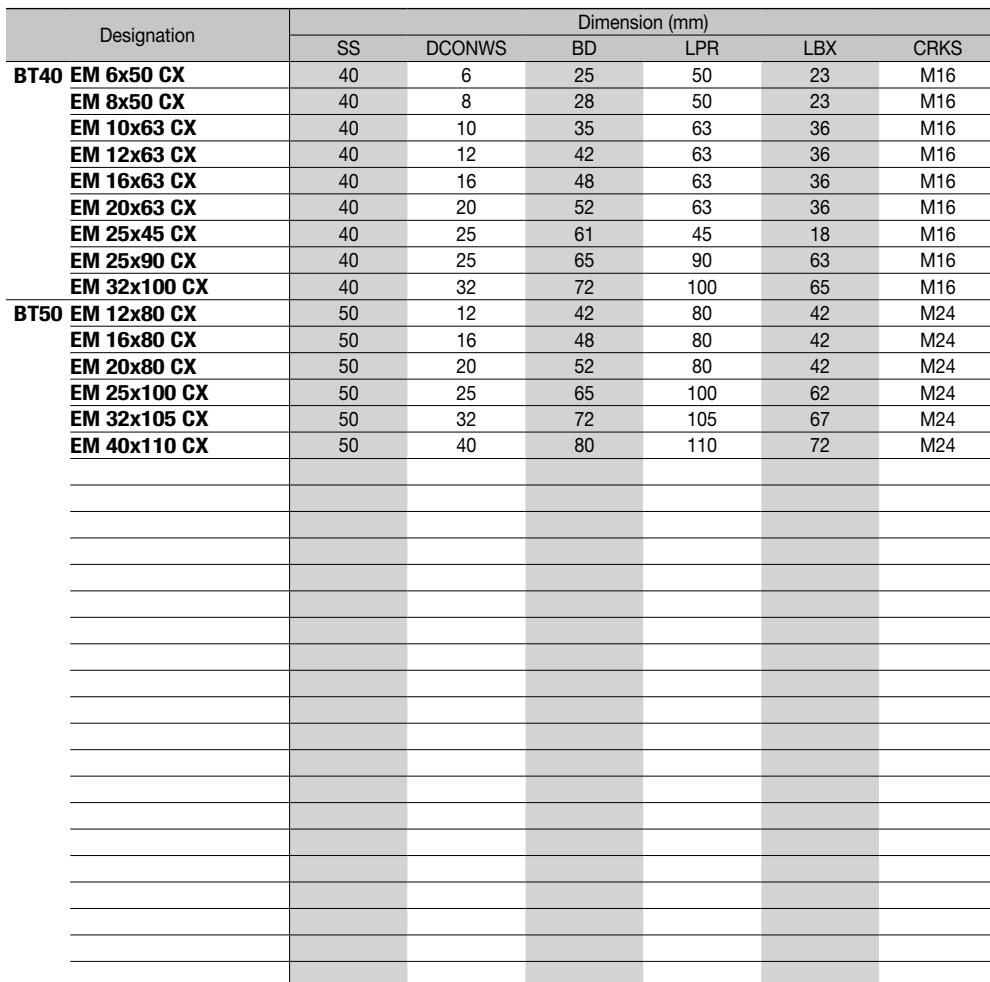
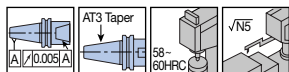


## Milling chucks

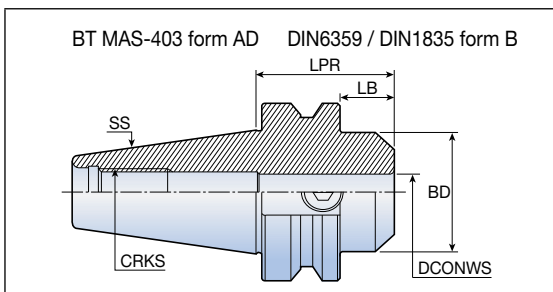
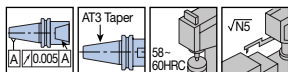
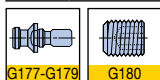
[illegible]

► Spanner not included

## CX coolant type end mill holders



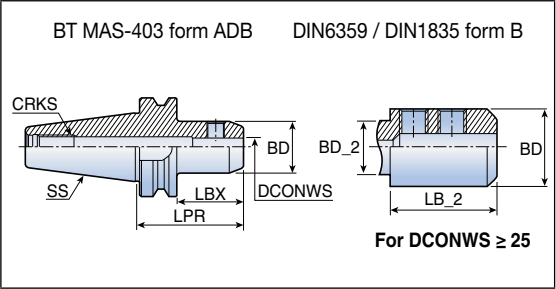
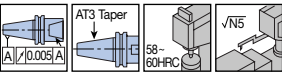
### Short end mill holders

[illegible]

- ▶ Add B for coolant through flange

# BT-EM

## End mill holders



| Designation         | Dimension (mm) |        |     |      |     |     |      |      |
|---------------------|----------------|--------|-----|------|-----|-----|------|------|
|                     | SS             | DCONWS | BD  | BD_2 | LPR | LBX | LB_2 | CRKS |
| <b>BT30 EM 6x50</b> | 30             | 6      | 25  | -    | 50  | 28  | -    | M12  |
| <b>EM 8x60</b>      | 30             | 8      | 28  | -    | 60  | 38  | -    | M12  |
| <b>EM 10x60</b>     | 30             | 10     | 35  | -    | 60  | 38  | -    | M12  |
| <b>EM 12x60</b>     | 30             | 12     | 42  | -    | 60  | 38  | -    | M12  |
| <b>EM 16x60</b>     | 30             | 16     | 46  | -    | 60  | 38  | -    | M12  |
| <b>EM 20x80</b>     | 30             | 20     | 52  | -    | 80  | 58  | -    | M12  |
| <b>BT40 EM 6x50</b> | 40             | 6      | 25  | -    | 50  | 23  | -    | M16  |
| <b>EM 8x50</b>      | 40             | 8      | 28  | -    | 50  | 23  | -    | M16  |
| <b>EM 10x65</b>     | 40             | 10     | 35  | -    | 65  | 38  | -    | M16  |
| <b>EM 12x65</b>     | 40             | 12     | 42  | -    | 65  | 38  | -    | M16  |
| <b>EM 14x65</b>     | 40             | 14     | 44  | -    | 65  | 38  | -    | M16  |
| <b>EM 16x65</b>     | 40             | 16     | 48  | -    | 65  | 38  | -    | M16  |
| <b>EM 20x75</b>     | 40             | 20     | 52  | -    | 75  | 48  | -    | M16  |
| <b>EM 20X120</b>    | 40             | 20     | 52  | -    | 120 | 93  | -    | M16  |
| <b>EM 25x105</b>    | 40             | 25     | 65  | 61   | 105 | 78  | 68   | M16  |
| <b>EM 32x110</b>    | 40             | 32     | 72  | 61   | 110 | 83  | 73   | M16  |
| <b>BT50 EM 6x70</b> | 50             | 6      | 25  | -    | 70  | 32  | -    | M24  |
| <b>EM 8x70</b>      | 50             | 8      | 28  | -    | 70  | 32  | -    | M24  |
| <b>EM 10x70</b>     | 50             | 10     | 35  | -    | 70  | 32  | -    | M24  |
| <b>EM 12x100</b>    | 50             | 12     | 42  | -    | 100 | 62  | -    | M24  |
| <b>EM 14x100</b>    | 50             | 14     | 44  | -    | 100 | 62  | -    | M24  |
| <b>EM 16x100</b>    | 50             | 16     | 48  | -    | 100 | 62  | -    | M24  |
| <b>EM 18x100</b>    | 50             | 18     | 50  | -    | 100 | 62  | -    | M24  |
| <b>EM 20x100</b>    | 50             | 20     | 52  | -    | 100 | 62  | -    | M24  |
| <b>EM 25x115</b>    | 50             | 25     | 65  | -    | 115 | 77  | -    | M24  |
| <b>EM 32x115</b>    | 50             | 32     | 72  | -    | 115 | 77  | -    | M24  |
| <b>EM 40x115</b>    | 50             | 40     | 90  | -    | 115 | 77  | -    | M24  |
| <b>EM 50x125</b>    | 50             | 50     | 100 | -    | 125 | 87  | -    | M24  |
|                     |                |        |     |      |     |     |      |      |
|                     |                |        |     |      |     |     |      |      |
|                     |                |        |     |      |     |     |      |      |
|                     |                |        |     |      |     |     |      |      |
|                     |                |        |     |      |     |     |      |      |
|                     |                |        |     |      |     |     |      |      |
|                     |                |        |     |      |     |     |      |      |
|                     |                |        |     |      |     |     |      |      |

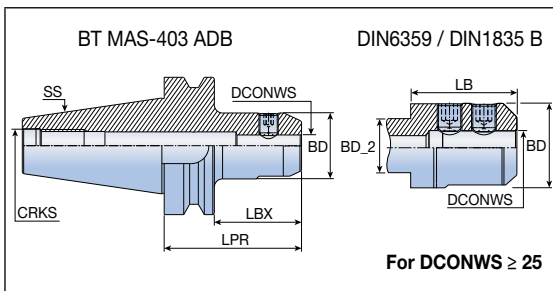
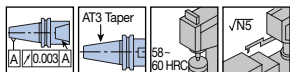
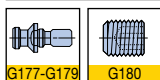


G177-G179



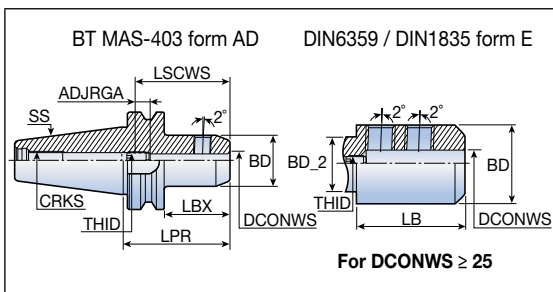
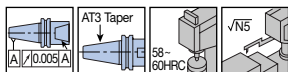
G180

## End mill holders

[illegible]



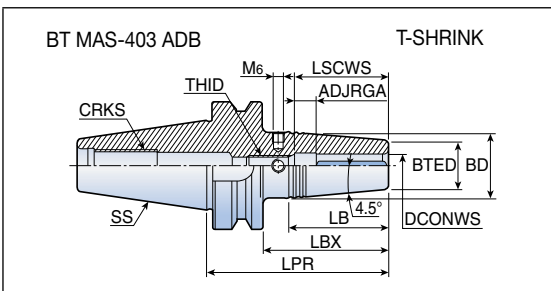
### End mill holders - Whistle notch



|                                                                                    |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |
| G177-G179                                                                          | G180                                                                                |

- ▶ Add B for coolant through flange

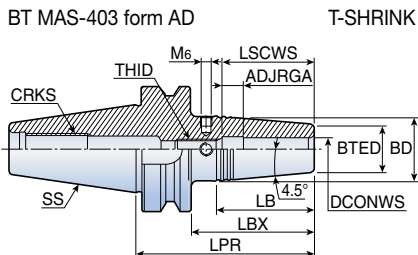
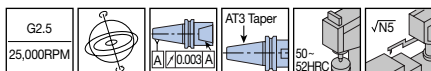
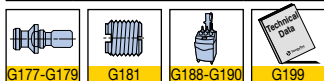
**TSHRINK**



|                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| <b>G177-G179</b>                                                                   | <b>G181</b>                                                                         | <b>G188-G190</b>                                                                    | <b>G199</b>                                                                         |

- 

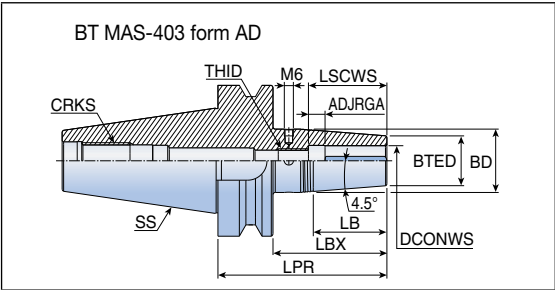
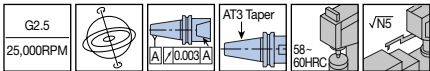
## Thermal shrinking chucks

[illegible]

► Only use inductive heating device for T-SHRINK holders

- ▶ <sup>(1)</sup> Balance to G2.5 at 20,000RPM

CX coolant type thermal shrinking chucks

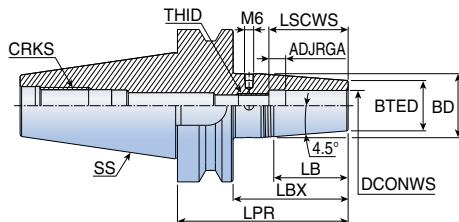
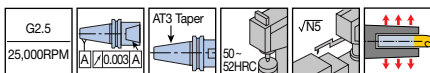


| Designation |                 | Dimension (mm) |        |      |    |     |     |      |       |       |      |      |
|-------------|-----------------|----------------|--------|------|----|-----|-----|------|-------|-------|------|------|
|             |                 | SS             | DCONWS | BTED | BD | LPR | LBX | LB   | ADJRG | LSCWS | CRKS | THID |
| BT40 FC     | SRKIN 6x90 CX   | 40             | 6      | 21   | 27 | 90  | 64  | 30.1 | 9     | 34    | M16  | M5   |
|             | SRKIN 8x90 CX   | 40             | 8      | 21   | 27 | 90  | 64  | 30.1 | 10    | 34    | M16  | M6   |
|             | SRKIN 10x90 CX  | 40             | 10     | 24   | 32 | 90  | 64  | 42.8 | 9     | 40    | M16  | M8   |
|             | SRKIN 12x90 CX  | 40             | 12     | 24   | 32 | 90  | 64  | 42.8 | 9     | 45    | M16  | M10  |
|             | SRKIN 14x90 CX  | 40             | 14     | 27   | 34 | 90  | 64  | 36.5 | 9     | 45    | M16  | M10  |
|             | SRKIN 16x90 CX  | 40             | 16     | 27   | 34 | 90  | 64  | 36.5 | 9     | 48    | M16  | M12  |
|             | SRKIN 20x90 CX  | 40             | 20     | 33   | 42 | 90  | 64  | 49.2 | 9     | 49    | M16  | M16  |
|             | SRKIN 25x110 CX | 40             | 25     | 44   | 53 | 110 | 84  | 49.2 | 9     | 55    | M16  | M16  |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |
|             |                 |                |        |      |    |     |     |      |       |       |      |      |
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|             |                 |                |        |      |    |     |     |      |       |       |      |      |



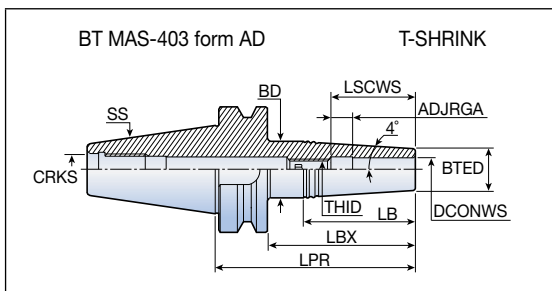
► Only use inductive heating device for T-SHRINK holders

**TSHRINK**



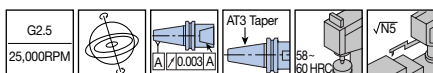
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| <b>G177-G179</b>                                                                    | <b>G181</b>                                                                         | <b>G188-G190</b>                                                                    | <b>G199</b>                                                                         |

- 80 G

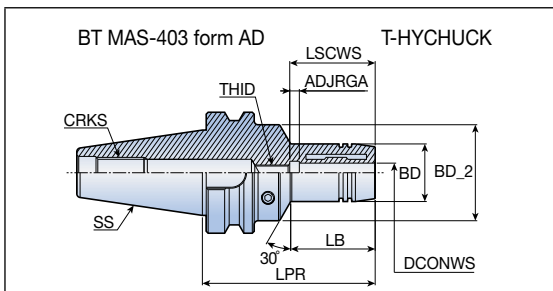
[illegible]

G199

**TSHRINK**

[illegible]

# THUNDERBOLT

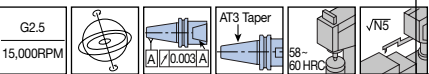
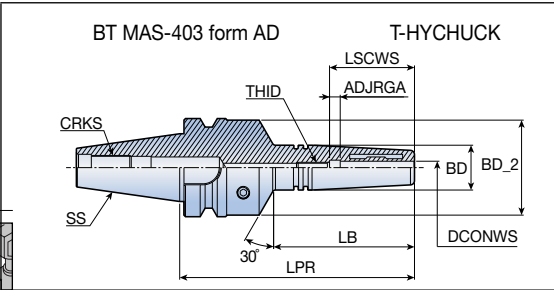


|                                                                                    |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| G162-G163                                                                          | G177-G179                                                                           | G197-G198                                                                           |

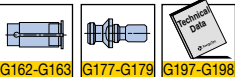
- 
- TaeguTec**  
Member IMC Group



Slim hydraulic chucks

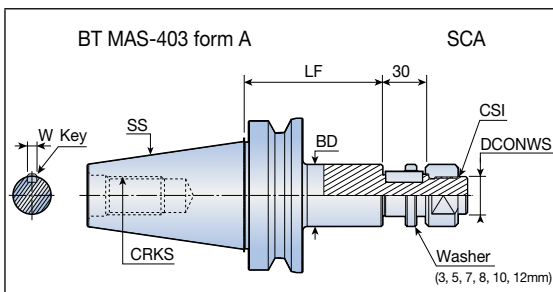
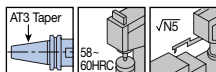


| Designation |             | Dimension (mm) |        |    |      |     |     |        |       |         |         |
|-------------|-------------|----------------|--------|----|------|-----|-----|--------|-------|---------|---------|
|             |             | SS             | DCONWS | BD | BD_2 | LPR | LB  | ADJRGA | LSCWS | THID    | Hex key |
| BT30        | THCS 6-110  | 30             | 6      | 21 | 44.5 | 110 | 66  | 10     | 37.5  | M5X0.8  | 4.0     |
|             | THCS 8-110  | 30             | 8      | 23 | 44.5 | 110 | 66  | 10     | 37.5  | M6X1.0  | 4.0     |
|             | THCS 10-110 | 30             | 10     | 25 | 44.5 | 110 | 67  | 10     | 42.5  | M8X1.0  | 4.0     |
|             | THCS 12-110 | 30             | 12     | 27 | 44.5 | 110 | 67  | 10     | 47.5  | M8X1.0  | 4.0     |
| BT40        | THCS 6-150  | 40             | 6      | 24 | 50   | 150 | 103 | 10     | 37.5  | M5X0.8  | 4.0     |
|             | THCS 10-150 | 40             | 10     | 28 | 50   | 150 | 104 | 10     | 42.5  | M8X1.0  | 4.0     |
|             | THCS 12-150 | 40             | 12     | 30 | 50   | 150 | 105 | 10     | 47.5  | M10X1.0 | 4.0     |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |
|             |             |                |        |    |      |     |     |        |       |         |         |



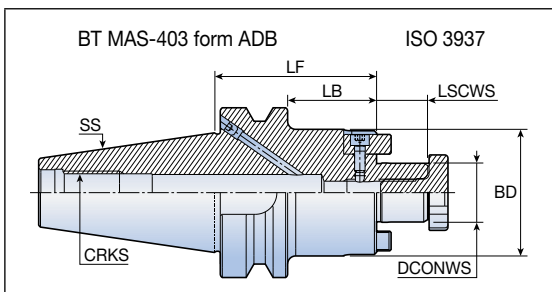
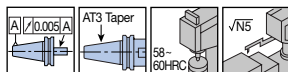
► Consult the user guide for relevant information including: insertion depth and proper use  
► Clamping wrench should be ordered separately

## Slotting cutter arbors

[illegible]

► Washers & key are included (Each 3, 5, 7, 8, 10, 12mm)

## Face mill arbors

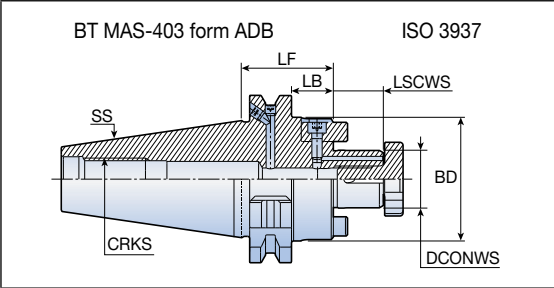
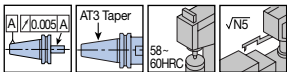


|                                                                                    |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| G177-G179                                                                          | G180                                                                                | G181                                                                                |

► Wrench not included

# BT-SEM-C

## Face mill arbors with internal coolant hole

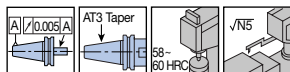


| Designation |                | Dimension (mm) |        |    |     |     |      |
|-------------|----------------|----------------|--------|----|-----|-----|------|
|             |                | SS             | DCONWS | BD | LF  | LB  | CRKS |
| BT40        | SEM 16x60C     | 40             | 16     | 38 | 60  | 33  | M16  |
|             | SEM 16x100C    | 40             | 16     | 38 | 100 | 73  | M16  |
|             | SEM 22x60C     | 40             | 22     | 47 | 60  | 33  | M16  |
|             | SEM 22x100C    | 40             | 22     | 47 | 100 | 73  | M16  |
|             | SEM 27x45C     | 40             | 27     | 58 | 45  | 18  | M16  |
|             | SEM 27x100C    | 40             | 27     | 58 | 100 | 73  | M16  |
|             | SEM 32x60C     | 40             | 32     | 66 | 60  | 33  | M16  |
| BT50        | SEM 16x75C     | 50             | 16     | 38 | 75  | 37  | M24  |
|             | SEM 16x100C    | 50             | 16     | 38 | 100 | 62  | M24  |
|             | SEM 22x75C     | 50             | 22     | 47 | 75  | 37  | M24  |
|             | SEM 22x100C    | 50             | 22     | 47 | 100 | 62  | M24  |
|             | SEM 27x60C     | 50             | 27     | 58 | 60  | 22  | M24  |
|             | SEM 27x100C    | 50             | 27     | 58 | 100 | 62  | M24  |
|             | SEM 32x75C     | 50             | 32     | 66 | 75  | 37  | M24  |
| BT50        | SEM 32x100C    | 50             | 32     | 66 | 100 | 62  | M24  |
|             | SEM 22x48x220C | 50             | 22     | 48 | 220 | 182 | M24  |
|             | SEM 22x61x320C | 50             | 22     | 61 | 320 | 282 | M24  |
|             | SEM 27x61x320C | 50             | 27     | 61 | 320 | 282 | M24  |
|             | SEM 32x78x390C | 50             | 32     | 78 | 390 | 352 | M24  |
|             |                |                |        |    |     |     |      |
|             |                |                |        |    |     |     |      |
|             |                |                |        |    |     |     |      |
|             |                |                |        |    |     |     |      |
|             |                |                |        |    |     |     |      |
|             |                |                |        |    |     |     |      |
|             |                |                |        |    |     |     |      |
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|             |                |                |        |    |     |     |      |

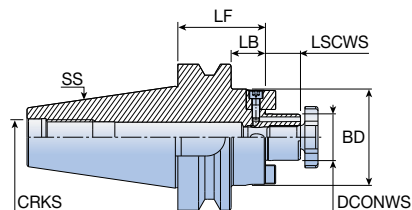
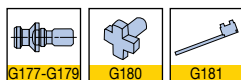


- ▶ If the “B type” option is required, the plug screw must be removed from the flange cooling hole (Use a 2mm hex key)
- ▶ Wrench not included

### Face mill arbors with internal coolant hole

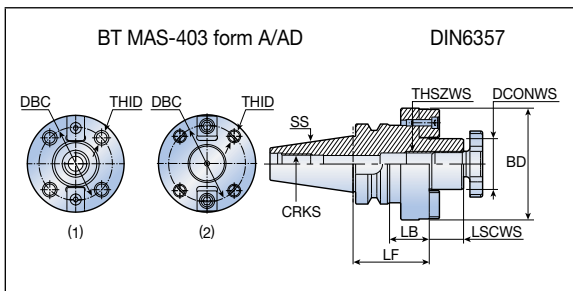
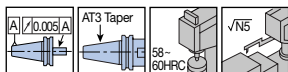


BT MAS-403 ADB

[illegible]

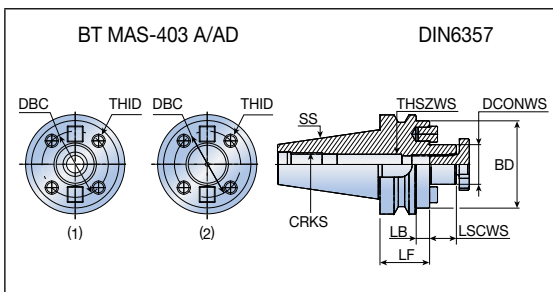
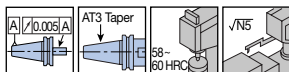
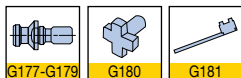
► Wrench not included

## Face mill arbors

[illegible]

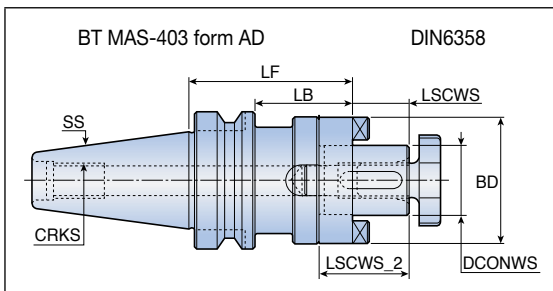
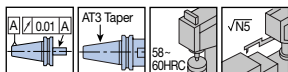
- ▶ Wrench not included
- ▶ (1) Form AD
- ▶ (2) Form A

## Face mill arbors

[illegible]

- ▶ Wrench not included
- ▶ (1) Form AD
- ▶ (2) Form A

## Combi shell end mill arbors

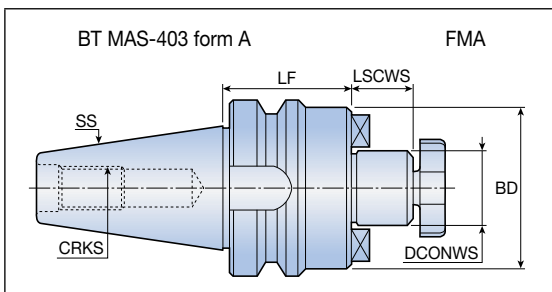
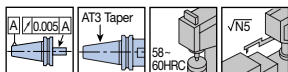
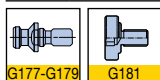


|                                                                                    |                                                                                     |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| G177-G179                                                                          | G180                                                                                | G181                                                                                | G182                                                                                |

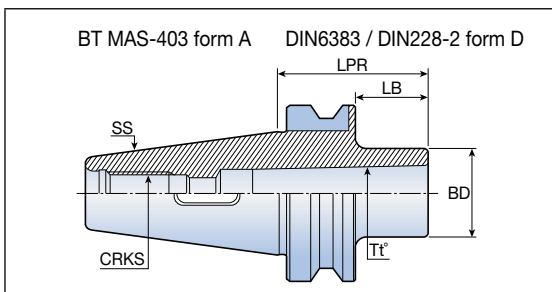
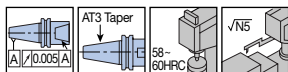
► Wrench not included



**Face mill arbors(Type inch)**

[illegible]

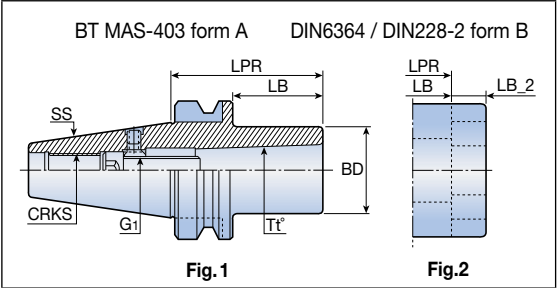
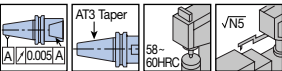
### Morse taper adapters

[illegible]

G177-G179

# BT-MT-DRW

## Morse taper adapters

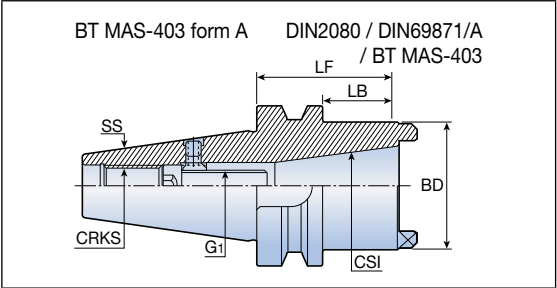
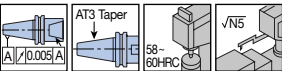


| Designation                  | Dimension (mm) |     |    |     |    |      |      |     | Fig. |
|------------------------------|----------------|-----|----|-----|----|------|------|-----|------|
|                              | SS             | Tt° | BD | LPR | LB | LB_2 | CRKS | G1  |      |
| <b>BT40 MT1 DRW</b>          | 40             | MT1 | 25 | 50  | 23 | -    | M16  | M6  | 1    |
| <b>MT2 DRW</b>               | 40             | MT2 | 32 | 50  | 23 | -    | M16  | M10 | 1    |
| <b>MT3 DRW</b>               | 40             | MT3 | 40 | 70  | 43 | -    | M16  | M12 | 1    |
| <b>MT4 DRW<sup>(1)</sup></b> | 40             | MT4 | 63 | 95  | 68 | 15   | M16  | M16 | 2    |
| <b>BT50 MT1 DRW</b>          | 50             | MT1 | 25 | 45  | 7  | -    | M24  | M6  | 1    |
| <b>MT2 DRW</b>               | 50             | MT2 | 32 | 60  | 22 | -    | M24  | M10 | 1    |
| <b>MT3 DRW</b>               | 50             | MT3 | 40 | 65  | 27 | -    | M24  | M12 | 1    |
| <b>MT4 DRW<sup>(1)</sup></b> | 50             | MT4 | 63 | 70  | 32 | 15   | M24  | M16 | 2    |
| <b>MT5 DRW<sup>(1)</sup></b> | 50             | MT5 | 78 | 100 | 62 | 18   | M24  | M20 | 2    |

► <sup>(1)</sup> DIN2201

# BT-AD

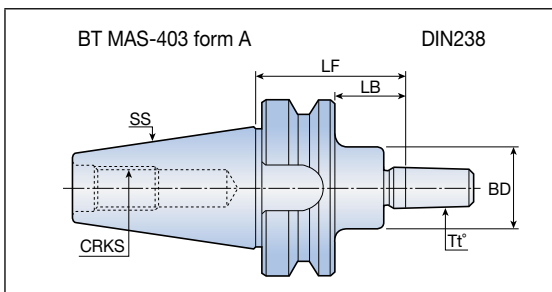
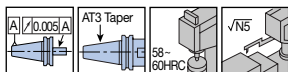
## Adapters



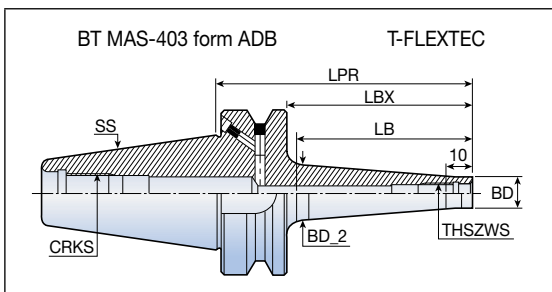
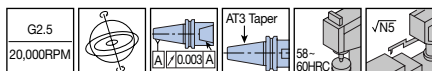
| Designation        | Dimension (mm) |                     |    |    |    |      |     |
|--------------------|----------------|---------------------|----|----|----|------|-----|
|                    | SS             | CSI                 | BD | LF | LB | CRKS | G1  |
| <b>BT50 AD 40</b>  | 50             | DIN 2080            | 63 | 75 | 32 | M24  | M16 |
| <b>AD BT/SK 40</b> | 50             | DIN 69871/A, BT MAS | 66 | 75 | 37 | M24  | M16 |
|                    |                |                     |    |    |    |      |     |
|                    |                |                     |    |    |    |      |     |



### Drill chuck arbors - Jacobs taper arbors

[illegible]

► Drill chuck not included

[illegible]

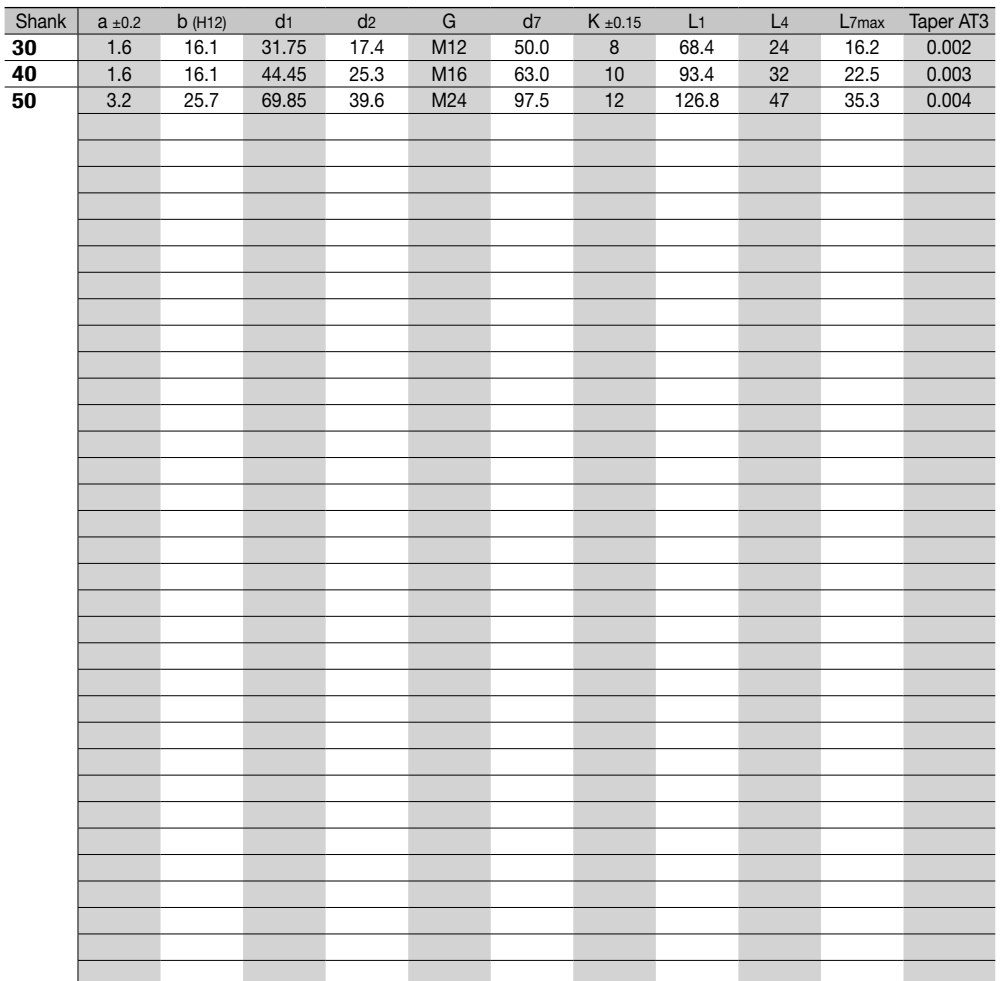
► If the “B type” option is required, the plug screw must be removed from the flange cooling hole (Use a 2mm hex key)

► <sup>(1)</sup> Balance to G6.3 at 12,000RPM

# DIN2080

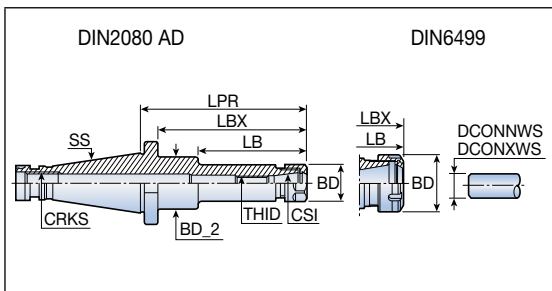
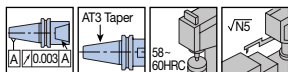
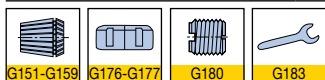


### Standard toolholder



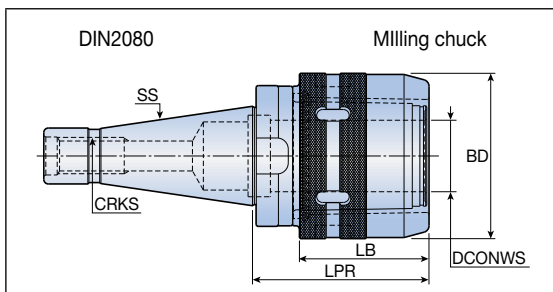
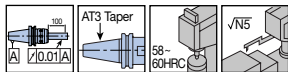
**G**  
**98**

## ER collet chucks

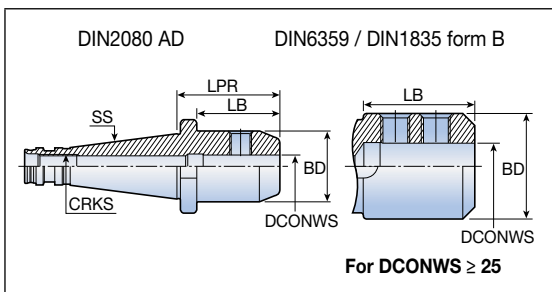
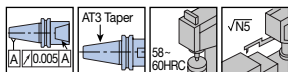
[illegible]



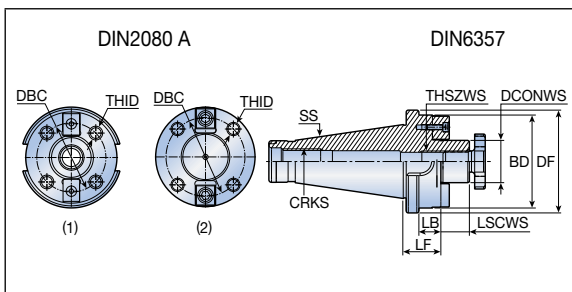
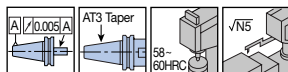
## Milling chucks

[illegible]

## End mill holders

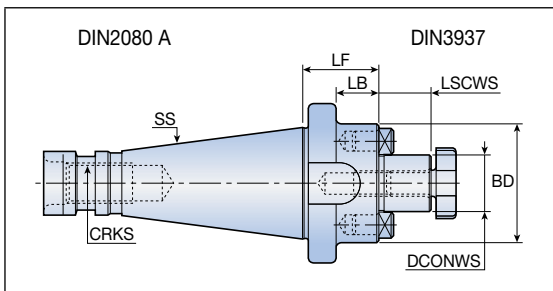
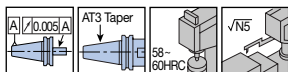
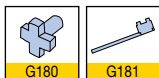
[illegible]

## Face mill arbors

[illegible]

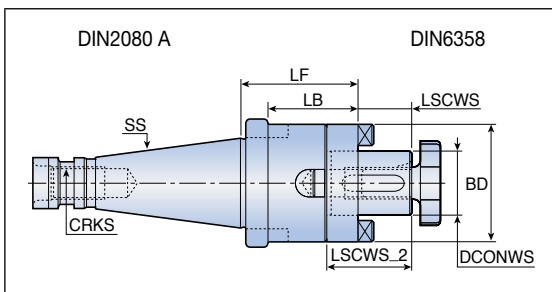
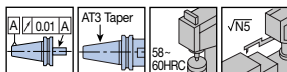
- ▶ Wrench not included
- ▶ (1) Form AD
- ▶ (2) Form A

## Shell end mill arbors

[illegible]

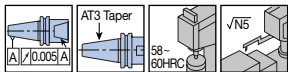
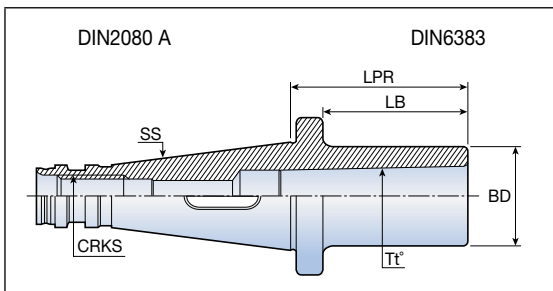
► Wrench not included

## Combi shell end mill arbors

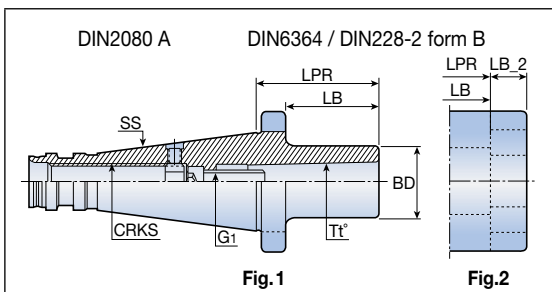
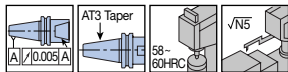
[illegible]

- ▶ Wrench not included

### Morse taper adapters



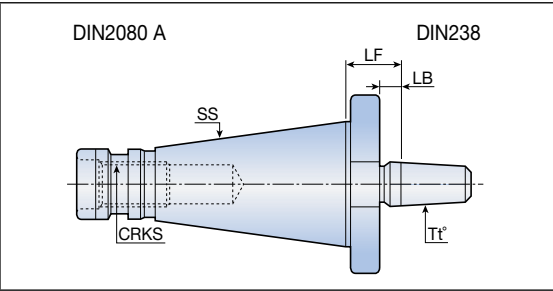
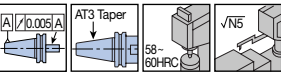
### Morse taper draw bar adapters

[illegible]

► MT4 & MT5: DIN2201

# DIN2080-DC

Drill chuck arbors - Jacobs taper arbors

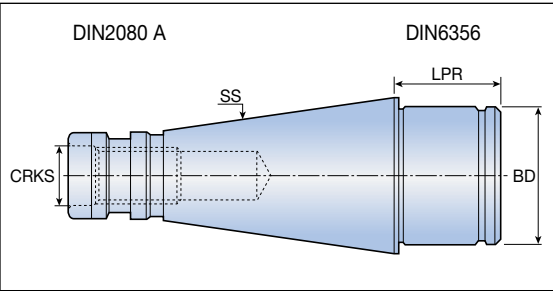
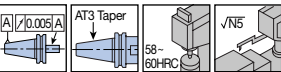


| Designation          | Dimension (mm) |     |    |      |      |
|----------------------|----------------|-----|----|------|------|
|                      | SS             | Tt° | LF | LB   | CRKS |
| DIN2080 40 DC B16x22 | 40             | B16 | 22 | 10.4 | M16  |
|                      |                |     |    |      |      |
|                      |                |     |    |      |      |
|                      |                |     |    |      |      |
|                      |                |     |    |      |      |
|                      |                |     |    |      |      |
|                      |                |     |    |      |      |

► Drill chuck not included

# DIN2080-CP

Centering plug



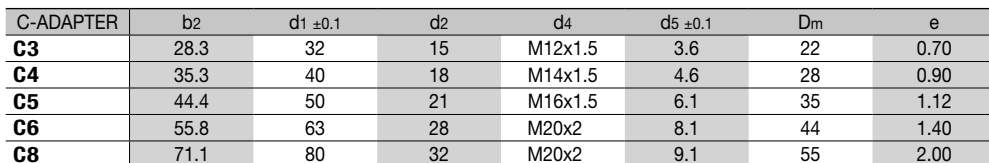
| Designation      | Dimension (mm) |    |     |      |
|------------------|----------------|----|-----|------|
|                  | SS             | BD | LPR | CRKS |
| DIN2080 50 CP 60 | 50             | 60 | 39  | M24  |
|                  |                |    |     |      |
|                  |                |    |     |      |
|                  |                |    |     |      |
|                  |                |    |     |      |
|                  |                |    |     |      |



# CADAPTER



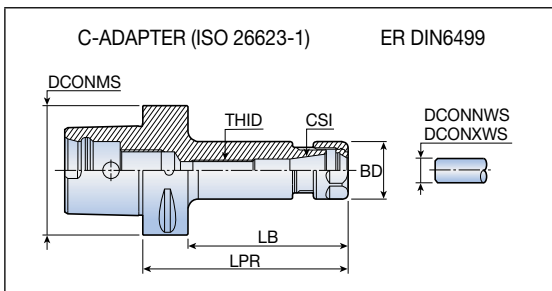
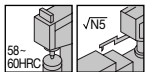
### Standard toolholder



► For non-stock items: Supply condition is subject to availability.  
If not available in stock then MOQ (Minimum order qty) will be applicable.

# C-ER

## ER collet chucks



| Designation                   | Dimension (mm) |      |         |         |    |     |     |         |
|-------------------------------|----------------|------|---------|---------|----|-----|-----|---------|
|                               | DCONMS         | CSI  | DCONNWS | DCONXWS | BD | LPR | LB  | THID    |
| <b>C4 ER 16x70</b>            | 40             | ER16 | 1.0     | 10.0    | 28 | 70  | 50  | M10     |
| <b>ER 20x35<sup>(1)</sup></b> | 40             | ER20 | 1.0     | 13.0    | 34 | 35  | 27  | -       |
| <b>ER 20x52</b>               | 40             | ER20 | 1.0     | 13.0    | 34 | 52  | 32  | -       |
| <b>ER 25x38<sup>(1)</sup></b> | 40             | ER25 | 1.0     | 16.0    | 42 | 38  | 30  | -       |
| <b>ER 25x52</b>               | 40             | ER25 | 1.0     | 16.0    | 42 | 52  | 32  | -       |
| <b>ER 32x54</b>               | 40             | ER32 | 2.0     | 20.0    | 50 | 54  | 34  | -       |
| <b>C5 ER 16x100</b>           | 50             | ER16 | 1.0     | 10.0    | 28 | 100 | 80  | M10     |
| <b>ER 16x130</b>              | 50             | ER16 | 1.0     | 10.0    | 28 | 130 | 110 | M10     |
| <b>ER 20x055</b>              | 50             | ER20 | 1.0     | 13.0    | 34 | 55  | 35  | -       |
| <b>ER 20x100</b>              | 50             | ER20 | 1.0     | 13.0    | 34 | 100 | 80  | M12     |
| <b>ER 20x130</b>              | 50             | ER20 | 1.0     | 13.0    | 34 | 130 | 110 | M12     |
| <b>ER 25x055</b>              | 50             | ER25 | 1.0     | 16.0    | 42 | 55  | 35  | -       |
| <b>ER 25x100</b>              | 50             | ER25 | 1.0     | 16.0    | 42 | 100 | 80  | M16     |
| <b>ER 32x057</b>              | 50             | ER32 | 2.0     | 20.0    | 50 | 57  | 36  | -       |
| <b>ER 32x100</b>              | 50             | ER32 | 2.0     | 20.0    | 50 | 100 | 80  | M22x1.5 |
| <b>C6 ER 16x100</b>           | 63             | ER16 | 1.0     | 10.0    | 28 | 100 | 78  | M10     |
| <b>ER 16x130</b>              | 63             | ER16 | 1.0     | 10.0    | 28 | 130 | 108 | M10     |
| <b>ER 16x160</b>              | 63             | ER16 | 1.0     | 10.0    | 28 | 160 | 138 | M10     |
| <b>ER 20x060</b>              | 63             | ER20 | 1.0     | 13.0    | 34 | 60  | 38  | -       |
| <b>ER 20x100</b>              | 63             | ER20 | 1.0     | 13.0    | 34 | 100 | 78  | M12     |
| <b>ER 20x130</b>              | 63             | ER20 | 1.0     | 13.0    | 34 | 130 | 108 | M12     |
| <b>ER 20x160</b>              | 63             | ER20 | 1.0     | 13.0    | 34 | 160 | 138 | M12     |
| <b>ER 25x060</b>              | 63             | ER25 | 1.0     | 16.0    | 42 | 60  | 38  | -       |
| <b>ER 25x100</b>              | 63             | ER25 | 1.0     | 16.0    | 42 | 100 | 78  | M16     |
| <b>ER 25x130</b>              | 63             | ER25 | 1.0     | 16.0    | 42 | 130 | 108 | M16     |
| <b>ER 25x160</b>              | 63             | ER25 | 1.0     | 16.0    | 42 | 160 | 138 | M16     |
| <b>ER 32x060</b>              | 63             | ER32 | 2.0     | 20.0    | 50 | 60  | 36  | -       |
| <b>ER 32x100</b>              | 63             | ER32 | 2.0     | 20.0    | 50 | 100 | 78  | M22x1.5 |
| <b>ER 32x130</b>              | 63             | ER32 | 2.0     | 20.0    | 50 | 130 | 108 | M22x1.5 |
| <b>ER 32x160</b>              | 63             | ER32 | 2.0     | 20.0    | 50 | 160 | 138 | M22x1.5 |
| <b>ER 40x065</b>              | 63             | ER40 | 3.0     | 26.0    | 63 | 65  | 37  | -       |
| <b>ER 40x100</b>              | 63             | ER40 | 3.0     | 26.0    | 63 | 100 | 78  | M28x1.5 |
| <b>ER 40x130</b>              | 63             | ER40 | 3.0     | 26.0    | 63 | 130 | 108 | M28x1.5 |

► <sup>(1)</sup> Without V grooves, for manual use only



G151-G159



G176-G177



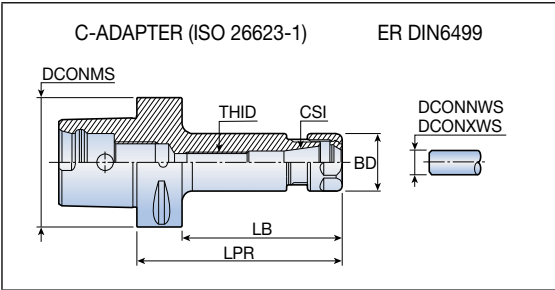
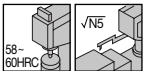
G180



G183

# C-ER

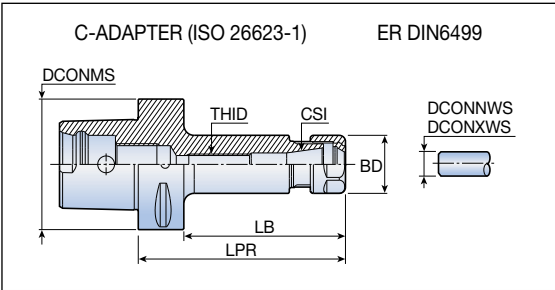
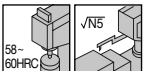
## ER collet chucks



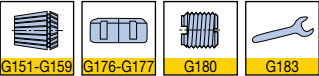
| Designation        | Dimension (mm) |      |         |         |    |     |     |         |
|--------------------|----------------|------|---------|---------|----|-----|-----|---------|
|                    | DCONMS         | CSI  | DCONNWS | DCONXWS | BD | LPR | LB  | THID    |
| <b>C8 ER 32x70</b> | 80             | ER32 | 2.0     | 20.0    | 50 | 70  | 40  | -       |
| <b>ER 32x100</b>   | 80             | ER32 | 2.0     | 20.0    | 50 | 100 | 70  | M22x1.5 |
| <b>ER 32x160</b>   | 80             | ER32 | 2.0     | 20.0    | 50 | 160 | 130 | M22x1.5 |
| <b>ER 40x70</b>    | 80             | ER40 | 3.0     | 26.0    | 63 | 70  | 40  | -       |
| <b>ER 40x100</b>   | 80             | ER40 | 3.0     | 26.0    | 63 | 100 | 70  | M28x1.5 |
| <b>ER 40x160</b>   | 80             | ER40 | 3.0     | 26.0    | 63 | 160 | 130 | M28x1.5 |

# C-ER-M

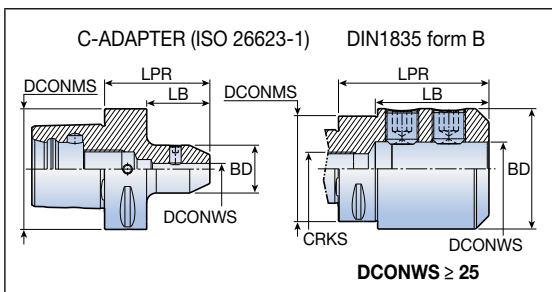
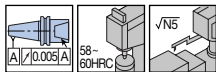
## ER mini collet chucks



| Designation           | Dimension (mm) |      |         |         |    |     |     |      |
|-----------------------|----------------|------|---------|---------|----|-----|-----|------|
|                       | DCONMS         | CSI  | DCONNWS | DCONXWS | BD | LPR | LB  | THID |
| <b>C4 ER 16x70 M</b>  | 40             | ER16 | 0.5     | 10.0    | 22 | 70  | 50  | M10  |
| <b>C5 ER 16x100 M</b> | 50             | ER16 | 0.5     | 10.0    | 22 | 100 | 80  | M10  |
| <b>ER 16x130 M</b>    | 50             | ER16 | 0.5     | 10.0    | 22 | 130 | 120 | M10  |
| <b>C6 ER 16x100 M</b> | 63             | ER16 | 0.5     | 10.0    | 22 | 100 | 78  | M10  |
| <b>ER 16x130 M</b>    | 63             | ER16 | 0.5     | 10.0    | 22 | 130 | 108 | M10  |
| <b>ER 16x160 M</b>    | 63             | ER16 | 0.5     | 10.0    | 22 | 160 | 138 | M10  |

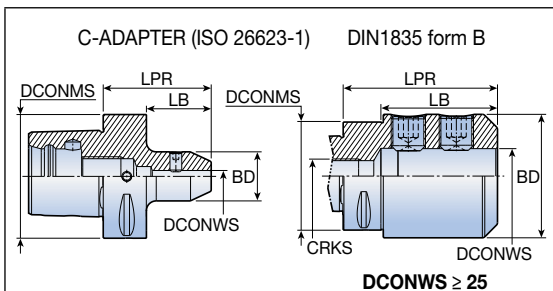
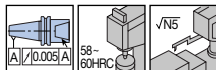


## End mill holders

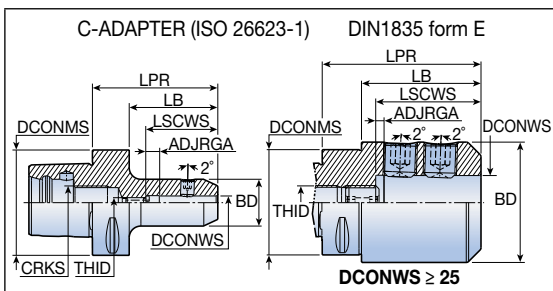
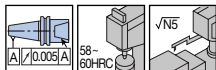


G180

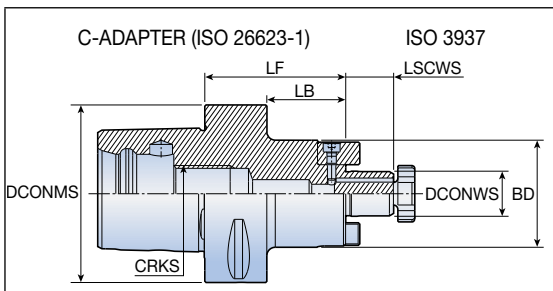
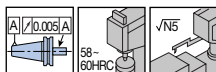
## End mill holders

[illegible]

### End mill holders - Whistle notch type

[illegible]

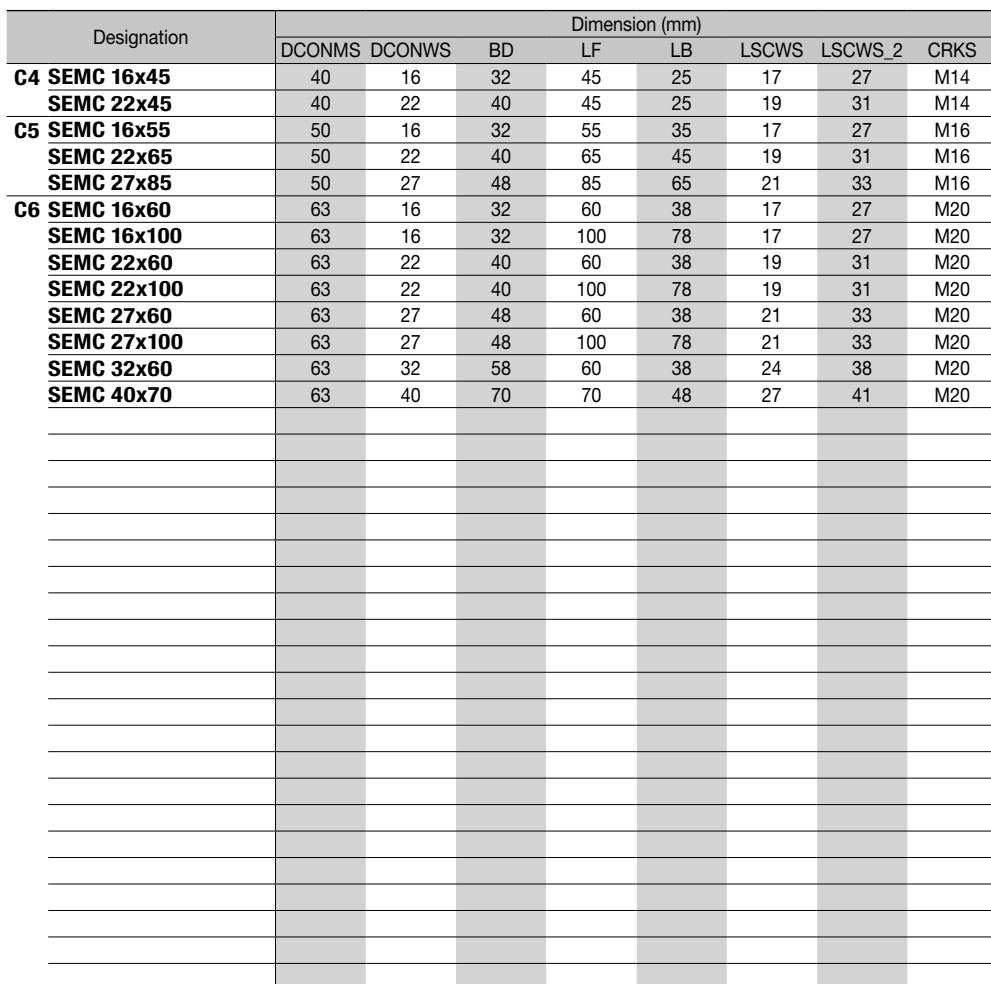
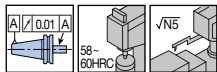
## Face mill arbors



|                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |
| G180                                                                              | G181                                                                              |

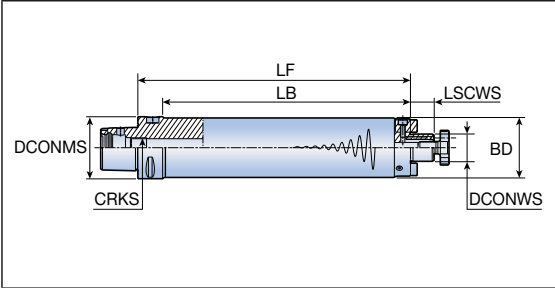
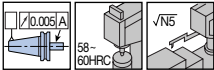


## Combi shell mill arbors



# AV C\*-SEM

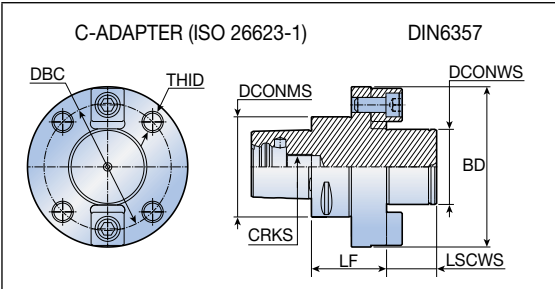
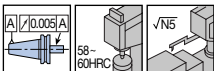
Anti-vibration face mill arbors with coolant holes and C-ADAPTER ISO 26623-1 taper shanks



| Designation        | Dimension (mm) |        |    |     |     |       |      |
|--------------------|----------------|--------|----|-----|-----|-------|------|
|                    | DCONMS         | DCONWS | BD | LF  | LB  | LSCWS | CRKS |
| AV C5 SEM22 48X220 | 50             | 22     | 48 | 220 | 200 | 19    | M16  |
| C5 SEM22 48X270    | 50             | 22     | 48 | 270 | 250 | 19    | M16  |
| C6 SEM22 48X270    | 63             | 22     | 48 | 270 | 248 | 19    | M20  |
| C6 SEM22 61X260    | 63             | 22     | 61 | 260 | 238 | 19    | M20  |
| C6 SEM22 61X310    | 63             | 22     | 61 | 310 | 288 | 19    | M20  |
| C6 SEM27 61X250    | 63             | 27     | 61 | 250 | 228 | 21    | M20  |
| C6 SEM27 61X300    | 63             | 27     | 61 | 300 | 278 | 21    | M20  |
|                    |                |        |    |     |     |       |      |
|                    |                |        |    |     |     |       |      |

# C-FM

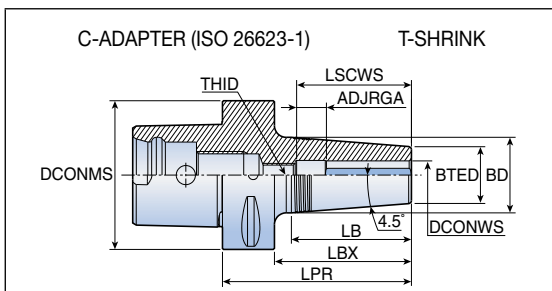
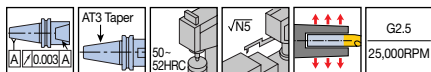
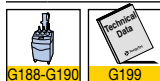
Face mill arbors



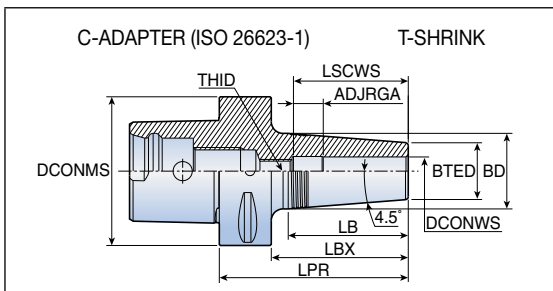
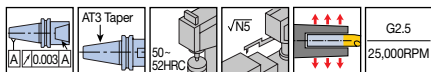
| Designation | Dimension (mm) |        |     |       |    |       |      |      |
|-------------|----------------|--------|-----|-------|----|-------|------|------|
|             | DCONMS         | DCONWS | BD  | DBC   | LF | LSCWS | CRKS | THID |
| C8 FM 60x60 | 80             | 60     | 128 | 101.6 | 20 | 40    | M20  | M16  |
|             |                |        |     |       |    |       |      |      |



**TSHRINK**

[illegible]

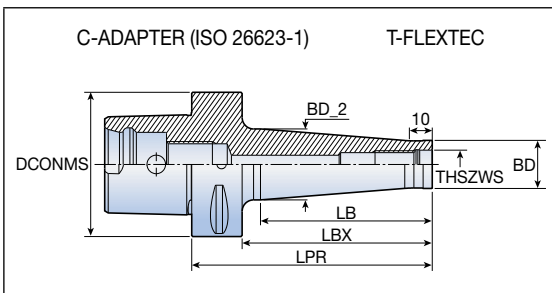
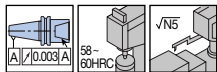
► Only use inductive heating device for T-SHRINK holders

[illegible]

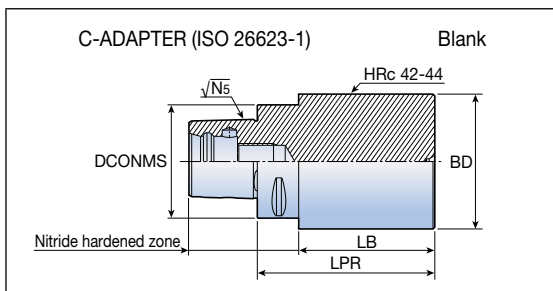
## C-ODP



### T-FLEXTEC holders

[illegible]

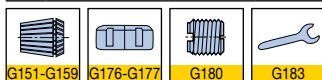
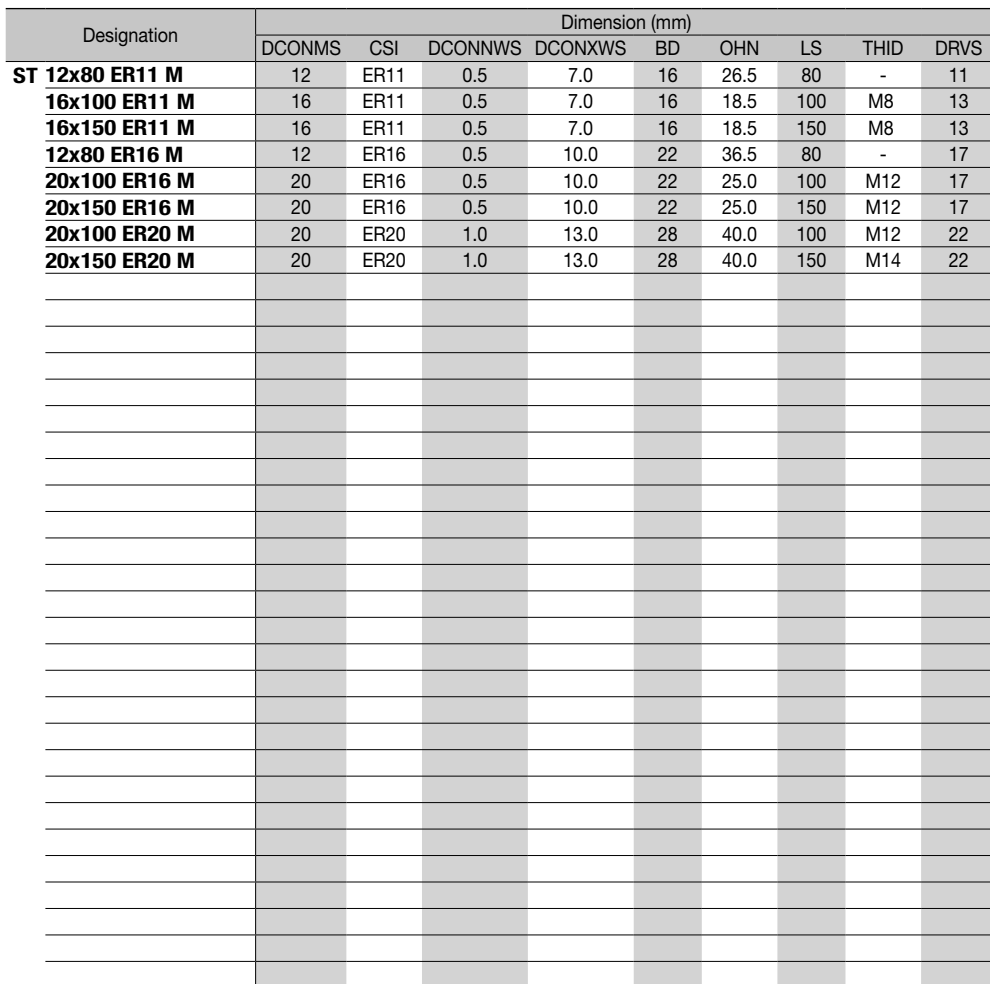
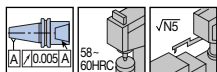
## Blank

[illegible]

# Straight & Morse Taper Shank



## ER mini collet chucks





# ST-ER(F)

## ER collet chucks

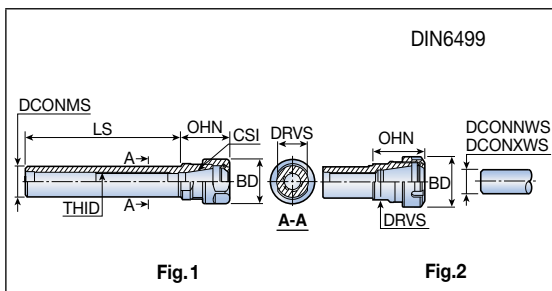
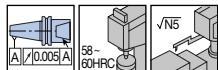
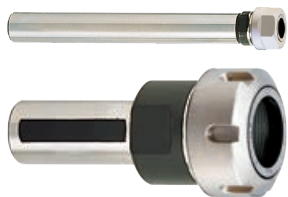
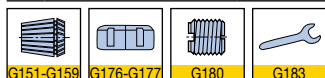


Fig. 1

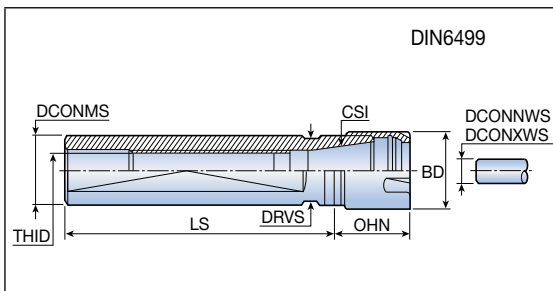
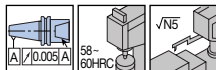
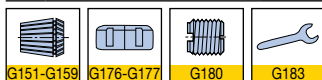
Fig. 2

| Designation            | Dimension (mm) |      |         |         |    |      |     |         |      | Fig. |
|------------------------|----------------|------|---------|---------|----|------|-----|---------|------|------|
|                        | DCONMS         | CSI  | DCONNWS | DCONXWS | BD | OHN  | LS  | THID    | DRVS |      |
| <b>ST 16x50 ER11 F</b> | 16             | ER11 | 0.5     | 7.0     | 19 | 18.5 | 50  | M8      | 13   | 1    |
| <b>20x50 ER11 F</b>    | 20             | ER11 | 0.5     | 7.0     | 19 | 18.5 | 50  | M10     | 17   | 1    |
| <b>20x100 ER11</b>     | 20             | ER11 | 0.5     | 7.0     | 19 | 18.5 | 100 | M10     | 17   | 1    |
| <b>20x150 ER11</b>     | 20             | ER11 | 0.5     | 7.0     | 19 | 18.5 | 150 | M10     | 17   | 1    |
| <b>20x50 ER16 F</b>    | 20             | ER16 | 0.5     | 10.0    | 28 | 32.3 | 50  | M12     | 19   | 1    |
| <b>20x100 ER16</b>     | 20             | ER16 | 0.5     | 10.0    | 28 | 30.0 | 100 | M12     | 19   | 1    |
| <b>20x100 ER16 F</b>   | 20             | ER16 | 0.5     | 10.0    | 28 | 30.0 | 100 | M12     | 19   | 1    |
| <b>20x150 ER16</b>     | 20             | ER16 | 0.5     | 10.0    | 28 | 30.0 | 150 | M12     | 19   | 1    |
| <b>20x50 ER20 F</b>    | 20             | ER20 | 1.0     | 13.0    | 34 | 42.5 | 50  | M12     | 22   | 1    |
| <b>25x100 ER20</b>     | 25             | ER20 | 1.0     | 13.0    | 34 | 36.0 | 100 | M16     | 22   | 1    |
| <b>25x150 ER20</b>     | 25             | ER20 | 1.0     | 13.0    | 34 | 36.0 | 150 | M16     | 22   | 1    |
| <b>20x50 ER25 F</b>    | 20             | ER25 | 1.0     | 16.0    | 42 | 46.0 | 50  | M12     | 27   | 2    |
| <b>20x100 ER25</b>     | 20             | ER25 | 1.0     | 16.0    | 42 | 46.0 | 100 | M12     | 27   | 2    |
| <b>20x100 ER25 F</b>   | 20             | ER25 | 1.0     | 16.0    | 42 | 46.0 | 100 | M12     | 27   | 2    |
| <b>25x50 ER25 F</b>    | 25             | ER25 | 1.0     | 16.0    | 42 | 46.0 | 50  | M16     | 27   | 2    |
| <b>25x100 ER25</b>     | 25             | ER25 | 1.0     | 16.0    | 42 | 46.0 | 100 | M16     | 27   | 2    |
| <b>20x50 ER32 F</b>    | 20             | ER32 | 2.0     | 20.0    | 50 | 54.0 | 50  | M12     | 36   | 2    |
| <b>20x100 ER32</b>     | 20             | ER32 | 2.0     | 20.0    | 50 | 54.0 | 100 | M12     | 36   | 2    |
| <b>25x50 ER32 F</b>    | 25             | ER32 | 2.0     | 20.0    | 50 | 52.0 | 50  | M16x2   | 36   | 2    |
| <b>30x50 ER32 F</b>    | 30             | ER32 | 2.0     | 20.0    | 50 | 52.0 | 50  | M18x1.5 | 36   | 2    |
| <b>32x50 ER32 F</b>    | 32             | ER32 | 2.0     | 20.0    | 50 | 52.0 | 50  | M18x1.5 | 36   | 2    |
| <b>32x150 ER32</b>     | 32             | ER32 | 2.0     | 20.0    | 50 | 52.0 | 150 | M18x1.5 | 36   | 2    |
| <b>40x75 ER32 F</b>    | 40             | ER32 | 2.0     | 20.0    | 50 | 46.0 | 75  | M22x1.5 | 44   | 2    |
| <b>25x50 ER40 F</b>    | 25             | ER40 | 3.0     | 26.0    | 63 | 60.0 | 50  | M16x2   | 46   | 2    |
| <b>30x50 ER40 F</b>    | 32             | ER40 | 3.0     | 26.0    | 63 | 60.0 | 50  | M22x1.5 | 46   | 2    |
| <b>32x50 ER40 F</b>    | 32             | ER40 | 3.0     | 26.0    | 63 | 60.0 | 50  | M22x1.5 | 46   | 2    |
| <b>40x75 ER40 F</b>    | 40             | ER40 | 3.0     | 26.0    | 63 | 55.0 | 75  | M28x1.5 | 46   | 2    |
| <b>50x80 ER40 F</b>    | 50             | ER40 | 3.0     | 26.0    | 63 | 60.0 | 80  | M28x1.5 | 55   | 2    |
| <b>50x80 ER50 F</b>    | 50             | ER50 | 10.0    | 34.0    | 78 | 77.0 | 80  | M36x1.5 | 58   | 2    |
|                        |                |      |         |         |    |      |     |         |      |      |
|                        |                |      |         |         |    |      |     |         |      |      |
|                        |                |      |         |         |    |      |     |         |      |      |
|                        |                |      |         |         |    |      |     |         |      |      |
|                        |                |      |         |         |    |      |     |         |      |      |
|                        |                |      |         |         |    |      |     |         |      |      |



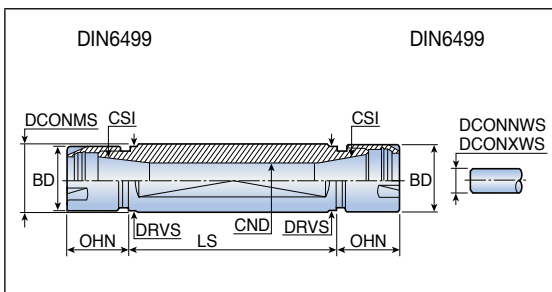
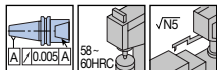
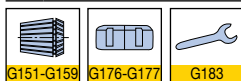
► F: Flat on the shank

### Straight shanks - Mini collet

[illegible]

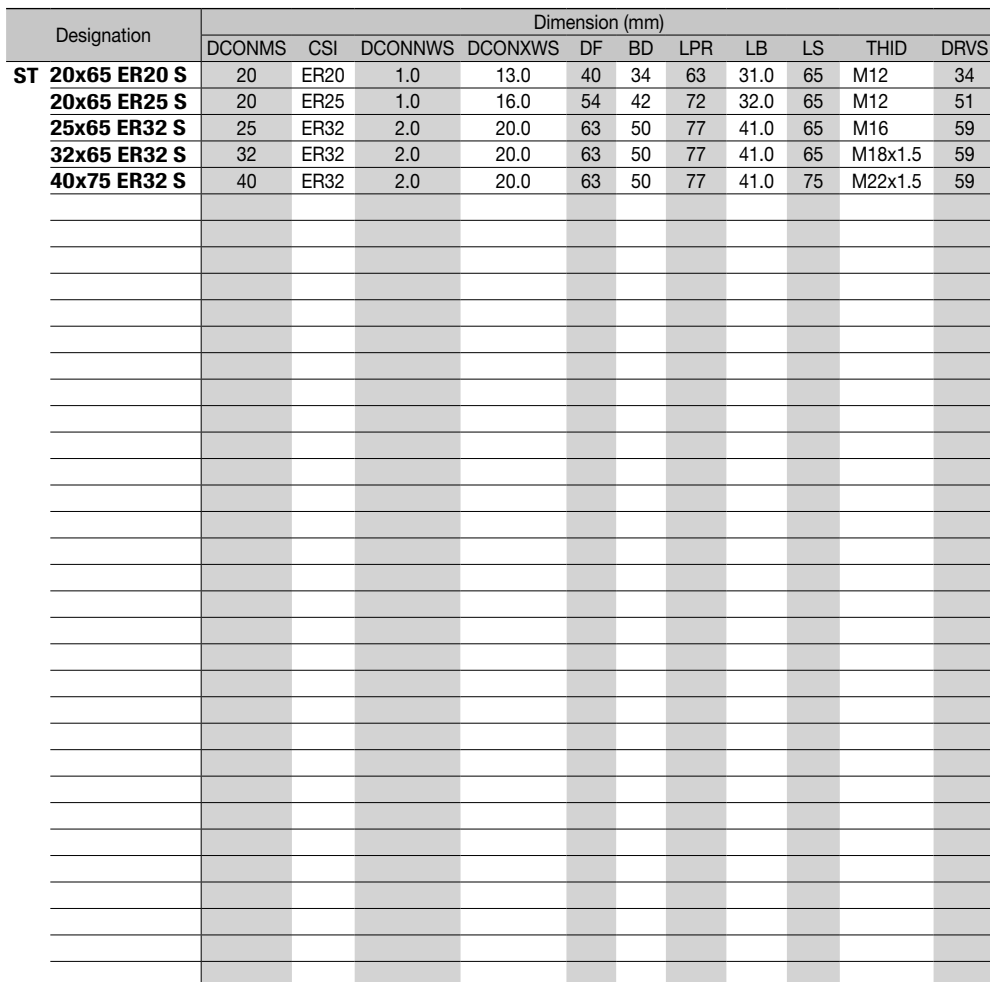
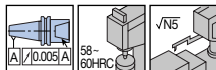
► MF: Mini flat shank

### Straight shanks - Double mini collet

[illegible]

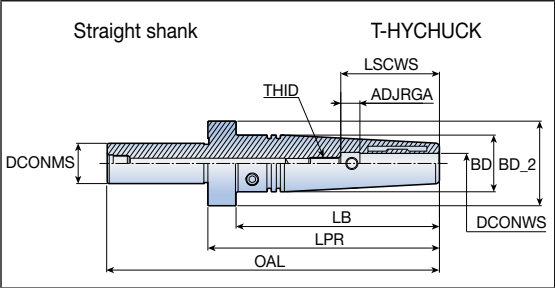
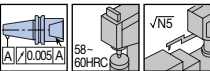
- ▶ MF D: Mini flat double

### Straight shanks - Internal coolant



# ST-THCR

## Adjustable hydraulic chucks

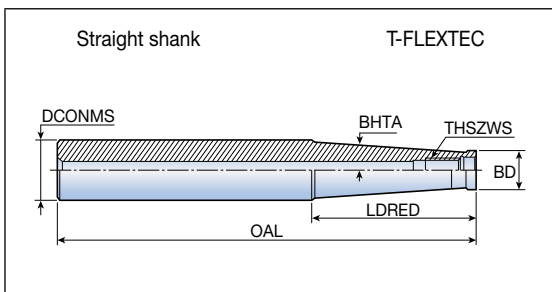
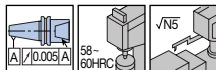
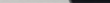


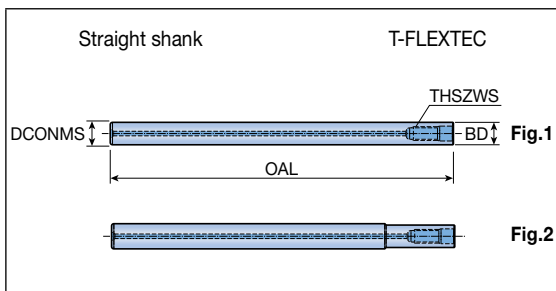
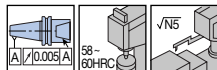
| Designation |             | Dimension (mm) |        |      |      |     |     |        |       |         |         |
|-------------|-------------|----------------|--------|------|------|-----|-----|--------|-------|---------|---------|
|             |             | DCONMS         | DCONWS | BD   | BD_2 | LPR | LB  | ADJRGA | LSCWS | THID    | Hex Key |
| ST20        | THCR 6-165  | 20             | 6      | 24   | 42   | 115 | 101 | 10     | 41.0  | M5X0.8  | 4.0     |
|             | THCR 8-165  | 20             | 8      | 26   | 42   | 115 | 101 | 10     | 41.0  | M6X1.0  | 4.0     |
|             | THCR 10-165 | 20             | 10     | 28   | 42   | 115 | 101 | 10     | 48.0  | M8X1.0  | 4.0     |
|             | THCR 12-165 | 20             | 12     | 30   | 42   | 115 | 101 | 10     | 53.0  | M10X1.0 | 4.0     |
|             | THCR 16-165 | 20             | 16     | 28   | 42   | 115 | 101 | 10     | 58.0  | M12X1.0 | 4.0     |
|             | THCR 20-165 | 20             | 20     | 31.5 | 42   | 115 | 101 | 10     | 58.0  | M16X1.0 | 5.0     |
|             | THCR 20-215 | 20             | 20     | 31.5 | 42   | 165 | 151 | 10     | 58.0  | M16X1.0 | 5.0     |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |
|             |             |                |        |      |      |     |     |        |       |         |         |



- ▶ Consult the user guide for relevant information including: insertion depth and proper use
- ▶ Clamping wrench should be ordered separately

G162-G163 G197-G198

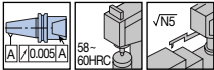
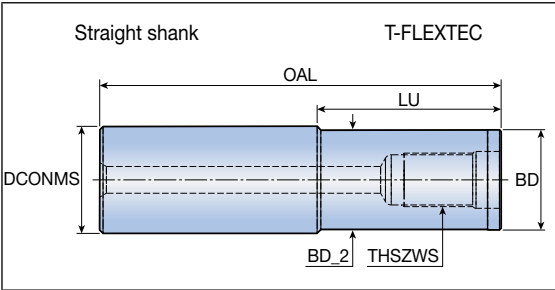


G

S M-CT-L (M08/10/12/16)



Carbide T-FLEXTEC shanks with internal coolant hole



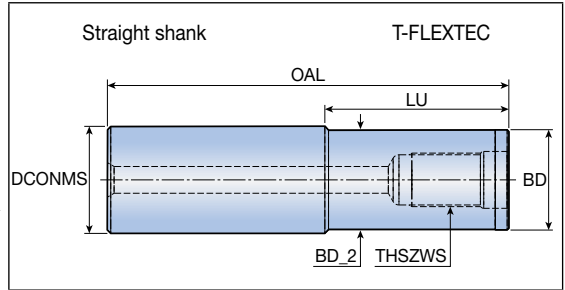
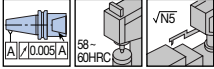
| Designation                 | Dimension (mm) |        |      |      |     |     |
|-----------------------------|----------------|--------|------|------|-----|-----|
|                             | THSZWS         | DCONMS | BD   | BD_2 | OAL | LU  |
| <b>S M08-CT16 - 20-L80</b>  | M08            | 16     | 15.3 | 15.3 | 80  | 20  |
|                             | 40-L100        | M08    | 16   | 15.3 | 100 | 40  |
|                             | 80-L150        | M08    | 16   | 15.3 | 150 | 80  |
|                             | 100-L200       | M08    | 16   | 13.0 | 200 | 100 |
|                             | 140-L200       | M08    | 16   | 15.3 | 200 | 140 |
|                             | 180-L250       | M08    | 16   | 15.3 | 250 | 180 |
| <b>S M10-CT20 - 20-L80</b>  | M10            | 20     | 18.5 | 18.5 | 80  | 20  |
|                             | 40-L100        | M10    | 20   | 18.5 | 100 | 40  |
|                             | 80-L150        | M10    | 20   | 18.5 | 150 | 80  |
|                             | 100-L200       | M10    | 20   | 18.5 | 200 | 100 |
|                             | 130-L250       | M10    | 20   | 18.0 | 250 | 130 |
|                             | 140-L200       | M10    | 20   | 18.0 | 200 | 140 |
|                             | 140-L200-N     | M10    | 20   | 18.5 | 200 | 140 |
|                             | 180-L250       | M10    | 20   | 18.0 | 250 | 180 |
|                             | 180-L250-N     | M10    | 20   | 18.5 | 250 | 180 |
|                             | 180-L300       | M10    | 20   | 18.0 | 300 | 180 |
|                             | 230-L300       | M10    | 20   | 18.0 | 300 | 230 |
|                             |                |        |      |      |     |     |
| <b>S M12-CT25 - 40-L100</b> | M12            | 25     | 24   | 24.0 | 100 | 40  |
|                             | 80-L150        | M12    | 25   | 21   | 150 | 80  |
|                             | 80-L150-N      | M12    | 25   | 24   | 150 | 80  |
|                             | 100-L200       | M12    | 25   | 21   | 200 | 100 |
|                             | 100-L200-N     | M12    | 25   | 24   | 200 | 100 |
|                             | 130-L250       | M12    | 25   | 21   | 250 | 130 |
|                             | 140-L200       | M12    | 25   | 21   | 200 | 140 |
|                             | 180-L250       | M12    | 25   | 24   | 250 | 180 |
|                             | 180-L250-B     | M12    | 25   | 21   | 250 | 180 |
|                             | 180-L300       | M12    | 25   | 21   | 300 | 180 |
|                             | 180-L300-N     | M12    | 25   | 24   | 300 | 180 |
|                             | 230-L300       | M12    | 25   | 21   | 300 | 230 |
|                             |                |        |      |      |     |     |
|                             |                |        |      |      |     |     |



# S M-CT-L (M08/10/12/16)



Carbide T-FLEXTEC shanks with internal coolant hole

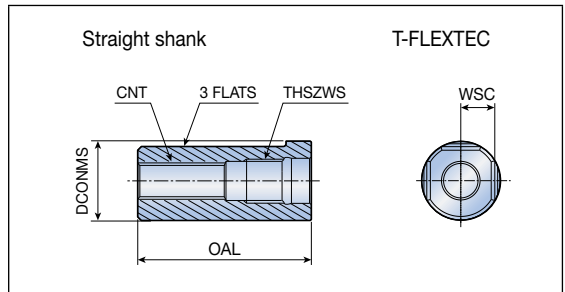


| Designation                 | Dimension (mm) |        |    |      |     |     |
|-----------------------------|----------------|--------|----|------|-----|-----|
|                             | THSZWS         | DCONMS | BD | BD_2 | OAL | LU  |
| <b>S M16-CT32 - 40-L100</b> | M16            | 32     | 29 | 29.0 | 100 | 40  |
| <b>80-L150</b>              | M16            | 32     | 29 | 29.0 | 150 | 80  |
| <b>100-L200</b>             | M16            | 32     | 29 | 29.0 | 200 | 100 |
| <b>130-L250</b>             | M16            | 32     | 29 | 29.0 | 250 | 130 |
| <b>140-L200</b>             | M16            | 32     | 29 | 29.0 | 200 | 140 |
| <b>180-L250</b>             | M16            | 32     | 29 | 29.0 | 250 | 180 |
| <b>180-L300</b>             | M16            | 32     | 29 | 29.0 | 300 | 180 |
| <b>230-L300</b>             | M16            | 32     | 29 | 29.0 | 300 | 230 |
| <b>230-L350</b>             | M16            | 32     | 29 | 29.0 | 350 | 230 |
| <b>280-L350</b>             | M16            | 32     | 29 | 29.0 | 350 | 280 |

## TFLEX-TCD-M12



T-FLEXTEC shank

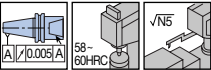
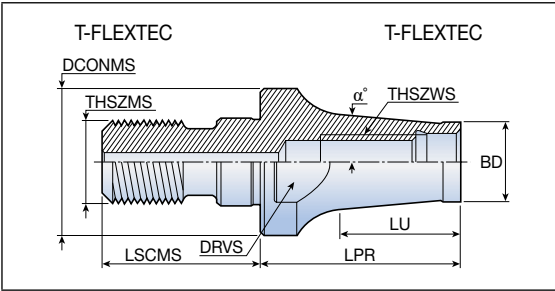


| Designation                 | Dimension (mm) |        |     |     | CNT      |
|-----------------------------|----------------|--------|-----|-----|----------|
|                             | THSZWS         | DCONMS | OAL | WSC |          |
| <b>TFLEX 160x36-TCD-M12</b> | M12            | 16     | 36  | 7.5 | UNF 5/16 |
| <b>190x36-TCD-M12</b>       | M12            | 19.05  | 36  | 8.5 | UNF 5/16 |
| <b>200x36-TCD-M12</b>       | M12            | 20     | 36  | 8.5 | G 1/8    |
| <b>220x48-TCD-M12</b>       | M12            | 22     | 48  | 9.5 | G 1/8    |
| <b>250x54-TCD-M12</b>       | M12            | 25     | 54  | 11  | G 1/8    |
| <b>254x54-TCD-M12</b>       | M12            | 25.4   | 54  | 11  | G 1/8    |

# CAB M-M



## Reducers



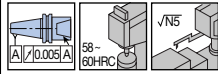
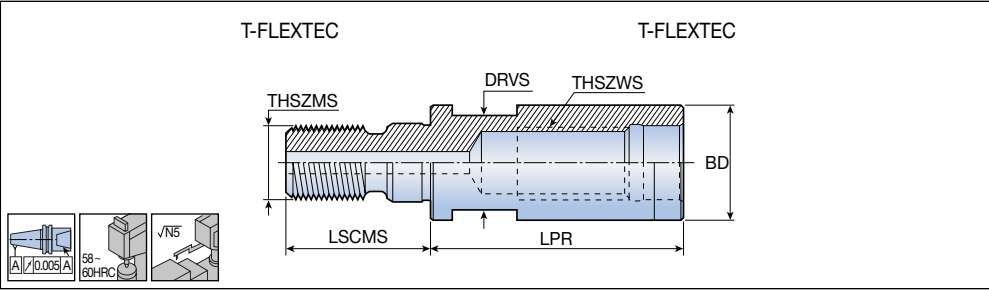
| Designation       | Dimension (mm) |        |      |        |     |       |      |      |                |
|-------------------|----------------|--------|------|--------|-----|-------|------|------|----------------|
|                   | THSZWS         | THSZMS | BD   | DCONMS | LPR | LSCMS | LU   | DRVS | $\alpha^\circ$ |
| <b>CAB M06M08</b> | M06            | M08    | 9.7  | 13     | 30  | 17.5  | 24.8 | 9.5  | 5.7            |
| <b>M08M10</b>     | M08            | M10    | 13.0 | 18     | 40  | 20.0  | 33.4 | 15.0 | 5.2            |
| <b>M10M12</b>     | M10            | M12    | 18.0 | 21     | 45  | 22.0  | 36.4 | 17.0 | 2.5            |
| <b>M12M16</b>     | M12            | M16    | 21.0 | 29     | 50  | 25.0  | 42.5 | 25.0 | 6.3            |
|                   |                |        |      |        |     |       |      |      |                |

► With coolant holes

# CAB M-M-C



## Extensions



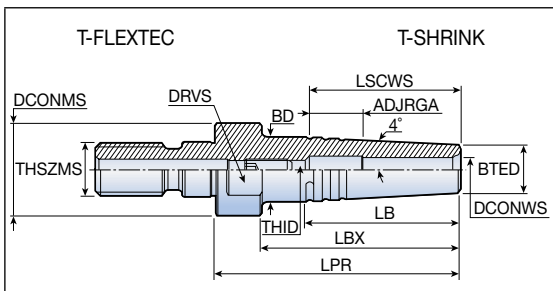
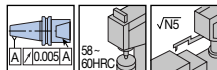
| Designation         | Dimension (mm) |        |    |     |       |      |
|---------------------|----------------|--------|----|-----|-------|------|
|                     | THSZWS         | THSZMS | BD | LPR | LSCMS | DRVS |
| <b>CAB M08M08-C</b> | M08            | M08    | 13 | 30  | 17.5  | 9.6  |
| <b>M10M10-C</b>     | M10            | M10    | 18 | 35  | 20.0  | 15.0 |
| <b>M12M12-C</b>     | M12            | M12    | 21 | 40  | 22.0  | 17.0 |
| <b>M16M16-C</b>     | M16            | M16    | 29 | 40  | 25.0  | 25.0 |
|                     |                |        |    |     |       |      |

► With coolant holes

# CDP M-SRK

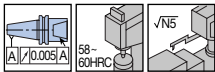
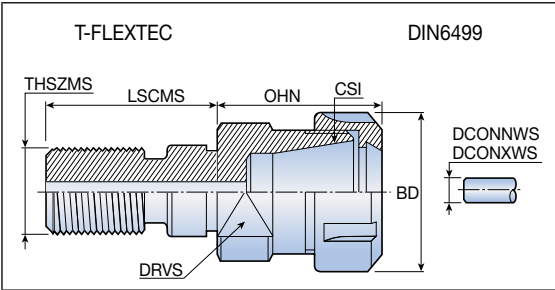


## Adapters with SRK T-SHRINK

[illegible]

- With coolant holes

Adapters with ER collet chuck

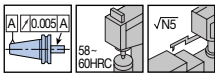
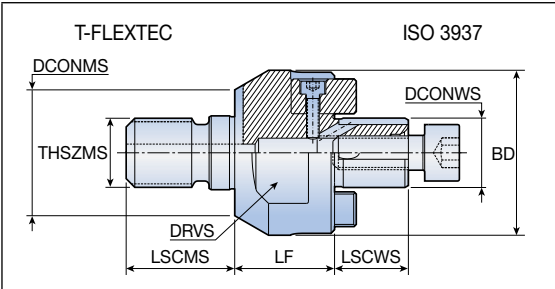


| Designation           | Dimension (mm) |        |         |         |    |      |       |      |
|-----------------------|----------------|--------|---------|---------|----|------|-------|------|
|                       | CSI            | THSZMS | DCONNWS | DCONXWS | BD | OHN  | LSCMS | DRVS |
| <b>CDP ER11 M10 M</b> | ER11           | M10    | 0.5     | 7.0     | 16 | 27.0 | 20    | 15   |
| <b>ER11 M12 M</b>     | ER11           | M12    | 0.5     | 7.0     | 16 | 27.0 | 22    | 17   |
| <b>ER16 M10 M</b>     | ER16           | M10    | 0.5     | 10.0    | 22 | 38.1 | 20    | 17   |
| <b>ER16 M12 M</b>     | ER16           | M12    | 0.5     | 10.0    | 22 | 37.1 | 22    | 17   |
| <b>ER16 M16</b>       | ER16           | M16    | 0.5     | 10.0    | 28 | 36.6 | 25    | 25   |
| <b>ER20 M16</b>       | ER20           | M16    | 1.0     | 13.0    | 34 | 45.5 | 25    | 25   |
| <b>ER25 M16</b>       | ER25           | M16    | 1.0     | 16.0    | 42 | 44.5 | 25    | 28   |

► With coolant holes

CAB M-SEM-C

Shell mill arbors

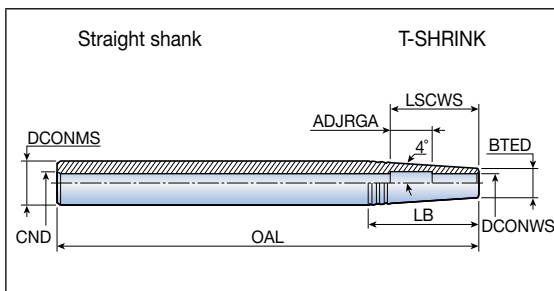
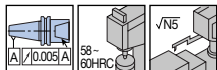


| Designation            | Dimension (mm) |        |        |    |    |       |       |      |
|------------------------|----------------|--------|--------|----|----|-------|-------|------|
|                        | THSZMS         | DCONWS | DCONMS | BD | LF | LSCWS | LSCMS | DRVS |
| <b>CAB M16 SEM 16C</b> | M16            | 16     | 29     | 38 | 23 | 17    | 25    | 32   |
|                        |                |        |        |    |    |       |       |      |

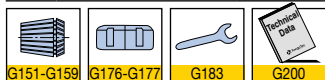
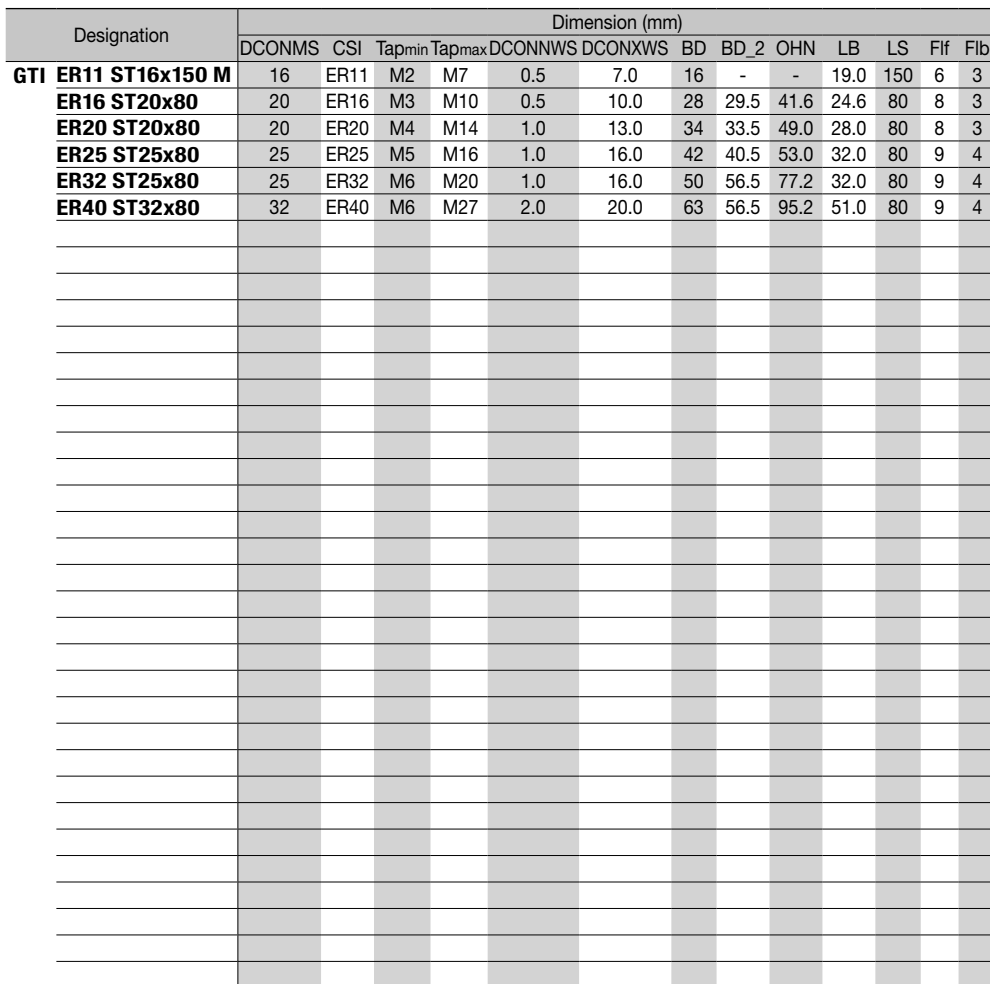
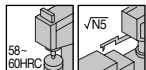


► With coolant holes

### Straight shanks with thermal chuck

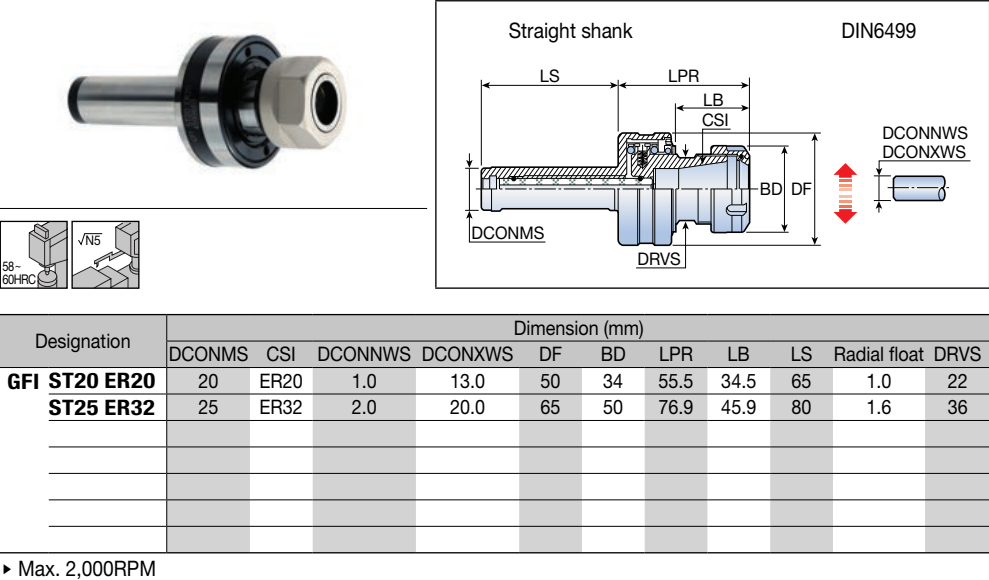
[illegible]

## GTI tap attachments



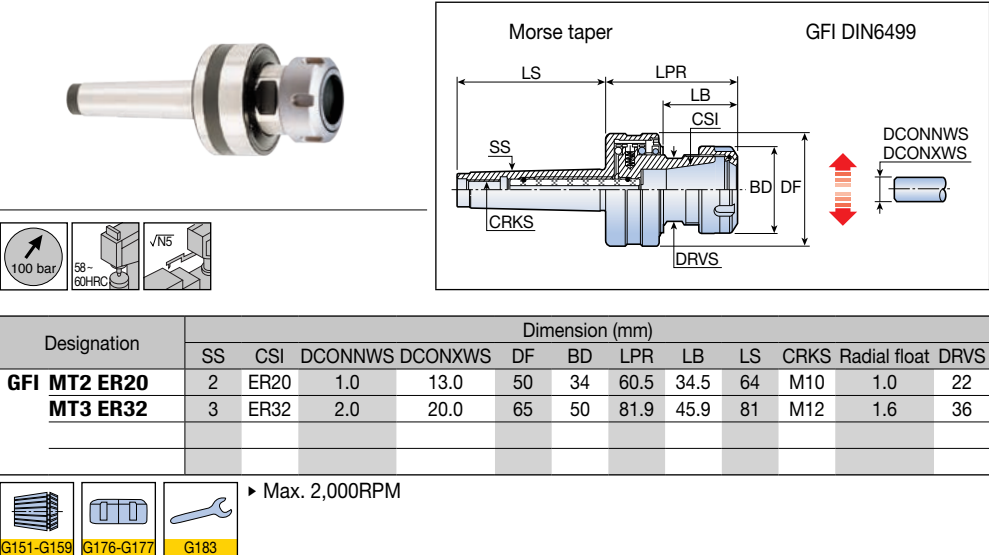
# GFI ST-ER

GFI floating reamer ER collet chucks

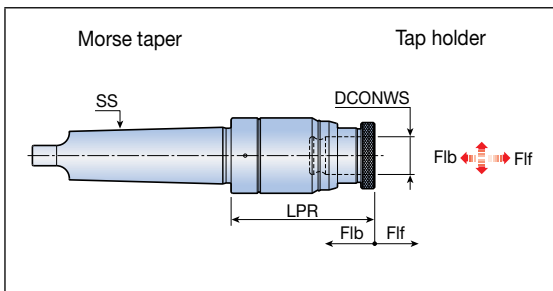


# GFI MT-ER

Morse taper GFI reamer holders



## Tap holders - MTA



|                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |
| <b>G174</b>                                                                       | <b>G200</b>                                                                       |



# TYPHOON



- ▶ Minimum coolant pressure 20 bar and flow rate 12 l/min
- ▶ The spindle provides only external strong coolant jet around the tool
- ▶ DCONXWS: Maximum tool shank diameter

| Designation          | Mini ER nut                                                                         | ER wrench                                                                           | Key                                                                                 | Locking pin                                                                         | Display*                                                                            |
|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                      |  |  |  |  |  |
| <b>TJS-GJET-ER32</b> | NUT ER11 GHS                                                                        | WRENCH ER11 SMS                                                                     | HW 2.0                                                                              | TJS SHAFT LOCK KEY                                                                  | TJS TSD DISPLAY                                                                     |
|                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



**TaeguTec**  
Member IMC Group



- ▶ Minimum coolant pressure 20 bar and flow rate 12 l/min
- ▶ The spindle provides only external strong coolant jet around the tool
- ▶ DCONXWS: Maximum tool shank diameter

| Designation        | Mini ER nut                                                                         | ER wrench                                                                           | Key                                                                                 | Locking pin                                                                         | Display*                                                                            |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                    |  |  |  |  |  |
| <b>TJS-GJET-BT</b> | NUT ER11 GHS                                                                        | WRENCH ER11 SMS                                                                     | HW 2.0                                                                              | TJS SHAFT LOCK KEY                                                                  | TJS TSD DISPLAY                                                                     |
|                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

142 G

- ▶ Minimum coolant pressure 20 bar and flow rate 12 l/min
- ▶ The spindle provides only external strong coolant jet around the tool
- ▶ DCONXWS: Maximum tool shank diameter

| Designation             | Mini ER nut                                                                         | ER wrench                                                                           | Key                                                                                 | Locking pin                                                                         | Display*                                                                            |
|-------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                         |  |  |  |  |  |
| <b>TJS-GJET-HSK A63</b> | NUT ER11 GHS                                                                        | WRENCH ER11 SMS                                                                     | HW 2.0                                                                              | TJS SHAFT LOCK KEY                                                                  | TJS TSD DISPLAY                                                                     |
|                         |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                         |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |



**TaeguTec**  
Member IMC Group

- ▶ Minimum coolant pressure 20 bar and flow rate 12 l/min
- ▶ The spindle provides only external strong coolant jet around the tool
- ▶ DCONXWS: Maximum tool shank diameter

► \*: Optional, sold separately



Technical drawing of the ER11 SPR EX..AA connector. The drawing shows a side view of the connector with the following dimensions and labels:

- LS**: Length of the main body.
- DCONMS<sub>Sh</sub>**: Diameter of the main body.
- Ø81**: Diameter of the main body.
- LPR**: Length of the protruding part.
- OAL**: Overall length.
- ER11 SPR EX..AA**: Label for the protruding part.
- BD**: Diameter of the protruding part.
- DCONXWS**: Diameter of the protruding part.

A small icon of a water tap is located in the bottom right corner.

- ▶ Minimum coolant pressure 20 bar and flow rate 12 l/min
- ▶ The spindle provides only external strong coolant jet around the tool
- ▶ DCONXWS: Maximum tool shank diameter

| Designation        | Mini ER nut                                                                         | ER wrench                                                                           | Key                                                                                 | Locking pin                                                                         | Display*                                                                            |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                    |  |  |  |  |  |
| <b>TJS-GJET-ST</b> | NUT ER11 GHS                                                                        | WRENCH ER11 SMS                                                                     | HW 2.0                                                                              | TJS SHAFT LOCK KEY                                                                  | TJS TSD DISPLAY                                                                     |
|                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |





- ▶ Coolant pressure: 40 - 70 bar and flow rate: 16 - 22 l/min
- ▶ Rotational spindle speed [rpm]: 25,000 - 45,000 (rev/min)
- ▶ The spindle provides only external strong coolant jet around the tool
- ▶ DCONXWS: Maximum diameter of tools

| Designation         | Mini ER nut                                                                         | ER wrench                                                                           | Key                                                                                 | Locking pin                                                                         | Display*                                                                            |
|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |  |  |  |  |  |
| <b>TJS HPC BT40</b> | NUT ER11 GHS                                                                        | WRENCH ER11 SMS                                                                     | HW 2.0                                                                              | TJS SHAFT LOCK KEY                                                                  | TJS TSD DISPLAY                                                                     |
|                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

146 G



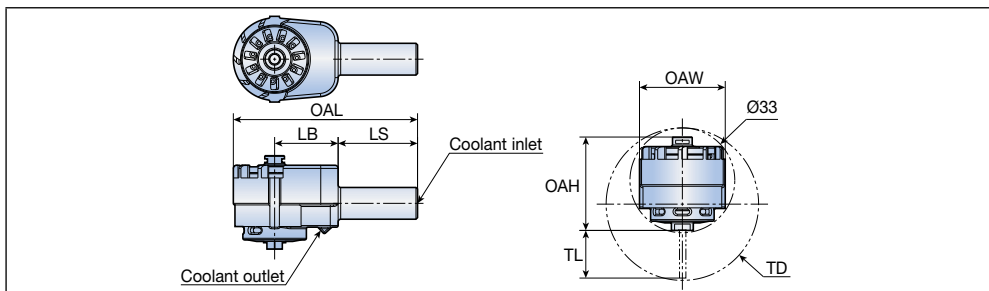
Technical drawing of a 1/2" ER11 collet. The main view shows the collet with dimensions: DCONMS (total length), Ø81 (inner diameter), LF (length of the first section), LPR (length of the second section), OAL (overall length), and BD (body diameter). A detail view on the right shows the DCONWS (collet nut) with its own dimension.

- ▶ Coolant pressure: 40 - 70 bar and flow rate: 16 - 22 l/min
- ▶ Rotational spindle speed [rpm]: 25,000 - 45,000 (rev/min)
- ▶ The spindle provides only external strong coolant jet around the tool
- ▶ DCONWS: Maximum diameter of tools

▶ \*: Optional, sold separately



## Coolant driven high-speed compact angular head spindle

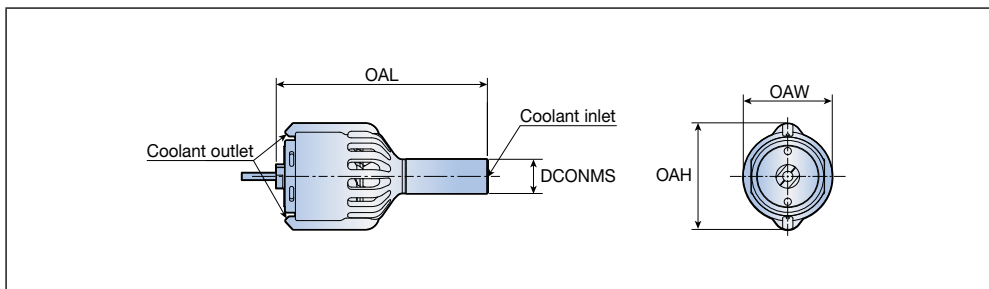


| Designation        | Dimension (mm) |    |    |     |     |     |
|--------------------|----------------|----|----|-----|-----|-----|
|                    | DCONMS         | LS | LB | OAL | OAH | OAW |
| <b>TJS M90-3.0</b> | 10             | 25 | 20 | 58  | 29  | 27  |

- Coolant pressure 20 – 40 bar and flow rate 10 - 20 ℓ/min
- Rotational spindle speed [rpm]: 35,000–53,000 (rev/min)
- The spindle provides only external strong coolant jet around the tool
- TD: TL (Tool Length)+33 mm

# TJS M00

## Coolant driven high-speed compact spindle



| Designation        | Dimension (mm) |      |      |     |     |
|--------------------|----------------|------|------|-----|-----|
|                    | DCONMS         | LS   | OAL  | OAH | OAW |
| <b>TJS M00-3.0</b> | 10             | 23.8 | 61.8 | 26  | 31  |

- Coolant pressure: 15 - 40 bar and flow rate: 10 - 20 ℓ/min
- Rotational spindle speed [rpm]: 18,000 - 40,000 (rev/min)
- The spindle provides only external strong coolant jet around the tool

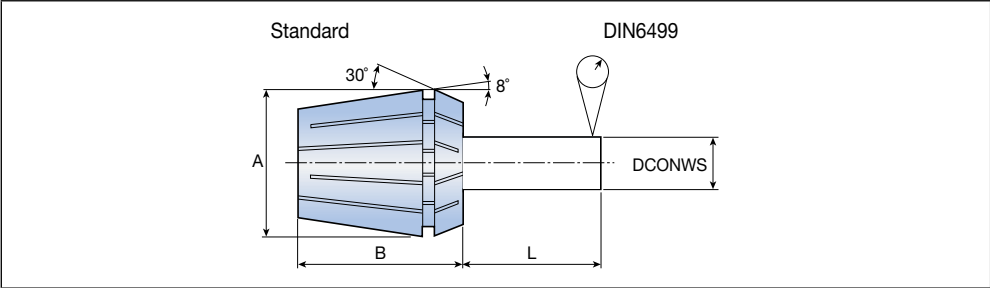
## Spare parts

| Designation        | Ø3 collet      | Lock key            | Wrench                  | Nozzle                 | Collet*                                                    |
|--------------------|----------------|---------------------|-------------------------|------------------------|------------------------------------------------------------|
|                    |                |                     | (1)<br>(2)              |                        |                                                            |
| <b>TJS M90-3.0</b> | TJS-COLLET 3.0 |                     | TJS MJ90<br>WRENCH-2430 |                        | * TJS-COLLET 1.6<br>* TJS-COLLET 2.0<br>* TJS-COLLET 3.175 |
| <b>TJS M00-3.0</b> | TJS-COLLET 3.0 | TJS<br>MJ-SHAFTLOCK | TJS MJ-WRENCH<br>COLLET | TJS MJ-PLUG<br>COOLANT | * TJS-COLLET 1.6<br>* TJS-COLLET 2.0                       |

- \*: Optional, sold separately
- (1): For TJS M90, (2): For TJS M00

# Collet



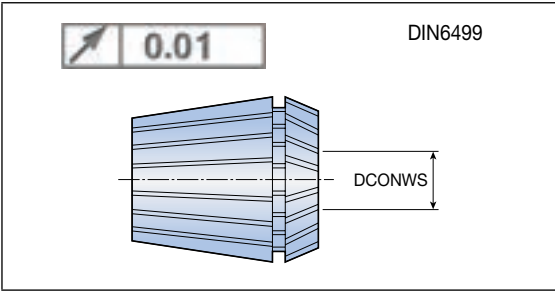


| Precision   |    | (mm)               |                 |         |
|-------------|----|--------------------|-----------------|---------|
| DCONWSrange | L  | Run-out            |                 |         |
|             |    | Standard precision | Ultra precision | DIN6499 |
| 1.0-1.6     | 6  | 0.01               | 0.005           | -       |
| 1.6-3.0     | 10 | 0.01               | 0.005           | 0.015   |
| 3.0-6.0     | 16 | 0.01               | 0.005           | 0.015   |
| 6.0-10.0    | 25 | 0.01               | 0.005           | 0.015   |
| 10.0-18.0   | 40 | 0.01               | 0.005           | 0.020   |
| 18.0-26.0   | 50 | 0.01               | 0.005           | 0.020   |
| 26.0-34     | 60 | -                  | -               | 0.025   |
|             |    |                    |                 |         |
|             |    |                    |                 |         |
|             |    |                    |                 |         |
|             |    |                    |                 |         |
|             |    |                    |                 |         |
|             |    |                    |                 |         |

| Dimension |      | (mm) |  |
|-----------|------|------|--|
| Type      | A    | B    |  |
| ER11      | 11.5 | 18   |  |
| ER16      | 17.0 | 27   |  |
| ER20      | 21.0 | 31   |  |
| ER25      | 26.0 | 35   |  |
| ER32      | 33.0 | 40   |  |
| ER40      | 41.0 | 46   |  |
| ER50      | 52.0 | 60   |  |
|           |      |      |  |
|           |      |      |  |
|           |      |      |  |
|           |      |      |  |
|           |      |      |  |
|           |      |      |  |
|           |      |      |  |
|           |      |      |  |

# ER-SPR

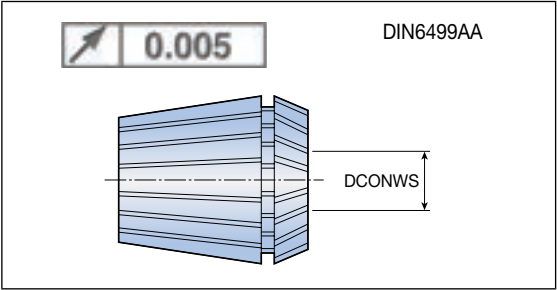
## ER spring collets - Precision



| DCONWS <sub>range</sub> | ER11             | ER16             | ER20    | ER25            | ER32            | ER40         | ER50           |
|-------------------------|------------------|------------------|---------|-----------------|-----------------|--------------|----------------|
| <b>0.5-1</b>            | ER11 SPR 0.5-1.0 | ER16 SPR 0.5-1.0 |         |                 |                 |              |                |
| <b>1-2</b>              | <b>1-1.5</b>     | 1.0-1.5          | 1.0-1.5 | ER20 SPR1.0-1.5 | ER25 SPR1.0-1.5 |              |                |
|                         | <b>1.5-2</b>     | 1.5-2.0          | 1.5-2.0 | 1.5-2.0         | 1.5-2.0         |              |                |
| <b>2-3</b>              | <b>2-2.5</b>     | 2.0-2.5          | 2-3     | 2-3             | 2-3             | ER32 SPR 2-3 |                |
|                         | <b>2.5-3</b>     | 2.5-3.0          |         |                 |                 |              |                |
| <b>3-4</b>              | <b>3-3.5</b>     | 3.0-3.5          | 3-4     | 3-4             | 3-4             | 3-4          | ER40 SPR 3-4   |
|                         | <b>3.5-4</b>     | 3.5-4.0          |         |                 |                 |              |                |
| <b>4-5</b>              | <b>4-4.5</b>     | 4.0-4.5          | 4-5     | 4-5             | 4-5             | 4-5          |                |
|                         | <b>4.5-5</b>     | 4.5-5.0          |         |                 |                 |              |                |
| <b>5-6</b>              | <b>5-5.5</b>     | 5.0-5.5          | 5-6     | 5-6             | 5-6             | 5-6          |                |
|                         | <b>5.5-6</b>     | 5.5-6.0          |         |                 |                 |              |                |
| <b>6-7</b>              | <b>6-6.5</b>     | 6.0-6.5          | 6-7     | 6-7             | 6-7             | 6-7          |                |
|                         | <b>6.5-7</b>     | 6.5-7.0          |         |                 |                 |              |                |
| <b>7-8</b>              |                  | 7-8              | 7-8     | 7-8             | 7-8             | 7-8          |                |
| <b>8-9</b>              |                  | 8-9              | 8-9     | 8-9             | 8-9             | 8-9          |                |
| <b>9-10</b>             |                  | 9-10             | 9-10    | 9-10            | 9-10            | 9-10         |                |
| <b>10-11</b>            |                  |                  | 10-11   | 10-11           | 10-11           | 10-11        | ER50 SPR 10-12 |
| <b>11-12</b>            |                  |                  | 11-12   | 11-12           | 11-12           | 11-12        | ER50 SPR 10-12 |
| <b>12-13</b>            |                  |                  | 12-13   | 12-13           | 12-13           | 12-13        | 12-14          |
| <b>13-14</b>            |                  |                  |         | 13-14           | 13-14           | 13-14        | 12-14          |
| <b>14-15</b>            |                  |                  |         | 14-15           | 14-15           | 14-15        | 14-16          |
| <b>15-16</b>            |                  |                  |         | 15-16           | 15-16           | 15-16        | 14-16          |
| <b>16-17</b>            |                  |                  |         |                 | 16-17           | 16-17        | 16-18          |
| <b>17-18</b>            |                  |                  |         |                 | 17-18           | 17-18        | 16-18          |
| <b>18-19</b>            |                  |                  |         |                 | 18-19           | 18-19        | 18-20          |
| <b>19-20</b>            |                  |                  |         |                 | 19-20           | 19-20        | 18-20          |
| <b>20-21</b>            |                  |                  |         |                 |                 | 20-21        | 20-22          |
| <b>21-22</b>            |                  |                  |         |                 |                 | 21-22        | 20-22          |
| <b>22-23</b>            |                  |                  |         |                 |                 | 22-23        | 22-24          |
| <b>23-24</b>            |                  |                  |         |                 |                 | 23-24        | 22-24          |
| <b>24-25</b>            |                  |                  |         |                 |                 | 24-25        | 24-26          |
| <b>25-26</b>            |                  |                  |         |                 |                 | 25-26        | 24-26          |
| <b>26-28</b>            |                  |                  |         |                 |                 |              | 26-28          |
| <b>28-30</b>            |                  |                  |         |                 |                 |              | 28-30          |
| <b>30-32</b>            |                  |                  |         |                 |                 |              | 30-32          |
| <b>32-34</b>            |                  |                  |         |                 |                 |              | 32-34          |

# ER-SPR-AA

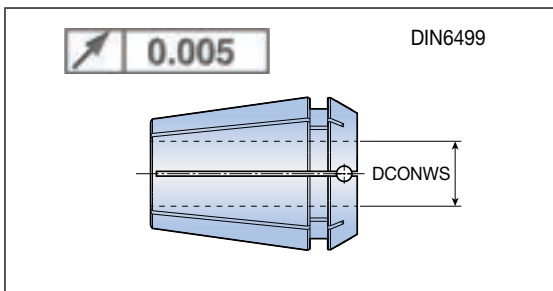
ER spring collets - Ultra precision “AA”



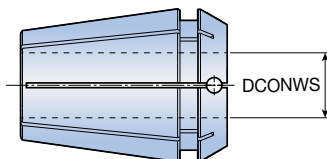
| DCONWSRange  |              | ER11               | ER16             | ER20                | ER25                | ER32           | ER40           |
|--------------|--------------|--------------------|------------------|---------------------|---------------------|----------------|----------------|
| <b>0.5-1</b> |              | ER11 SPR 0.5-1.0AA | ER16 SPR 0.5-1AA |                     |                     |                |                |
| <b>1-2</b>   | <b>1-1.5</b> | 1.0-1.5AA          |                  |                     |                     |                |                |
|              | <b>1.5-2</b> | 1.5-2.0AA          | 1.5-2.0 AA       | ER20 SPR 1.5-2.0 AA | ER25 SPR 1.5-2.0 AA |                |                |
| <b>2-3</b>   | <b>2-2.5</b> | 2.0-2.5AA          |                  |                     |                     |                |                |
|              | <b>2.5-3</b> | 2.5-3.0AA          | 2-3AA            | 2-3AA               | 2-3AA               | ER32 SPR 2-3AA |                |
| <b>3-4</b>   | <b>3-3.5</b> | 3.0-3.5AA          |                  |                     |                     |                |                |
|              | <b>3.5-4</b> | 3.5-4.0AA          | 3-4AA            | 3-4AA               | 3-4AA               | 3-4AA          | ER40 SPR 3-4AA |
| <b>4-5</b>   | <b>4-4.5</b> | 4.0-4.5AA          |                  |                     |                     |                |                |
|              | <b>4.5-5</b> | 4.5-5.0AA          | 4-5AA            | 4-5AA               | 4-5AA               | 4-5AA          | 4-5AA          |
| <b>5-6</b>   | <b>5-5.5</b> | 5.0-5.5AA          |                  |                     |                     |                |                |
|              | <b>5.5-6</b> | 5.5-6.0AA          | 5-6AA            | 5-6AA               | 5-6AA               | 5-6AA          | 5-6AA          |
| <b>6-7</b>   | <b>6-6.5</b> | 6.0-6.5AA          |                  |                     |                     |                |                |
|              | <b>6.5-7</b> | 6.5-7.0AA          | 6-7AA            | 6-7AA               | 6-7AA               | 6-7AA          | 6-7AA          |
| <b>7-8</b>   |              |                    | 7-8AA            | 7-8AA               | 7-8AA               | 7-8AA          | 7-8AA          |
| <b>8-9</b>   |              |                    | 8-9AA            | 8-9AA               | 8-9AA               | 8-9AA          | 8-9AA          |
| <b>9-10</b>  |              |                    | 9-10AA           | 9-10AA              | 9-10AA              | 9-10AA         | 9-10AA         |
| <b>10-11</b> |              |                    |                  | 10-11AA             | 10-11AA             | 10-11AA        | 10-11AA        |
| <b>11-12</b> |              |                    |                  | 11-12AA             | 11-12AA             | 11-12AA        | 11-12AA        |
| <b>12-13</b> |              |                    |                  | 12-13AA             | 12-13AA             | 12-13AA        | 12-13AA        |
| <b>13-14</b> |              |                    |                  |                     | 13-14AA             | 13-14AA        | 13-14AA        |
| <b>14-15</b> |              |                    |                  |                     | 14-15AA             | 14-15AA        | 14-15AA        |
| <b>15-16</b> |              |                    |                  |                     | 15-16AA             | 15-16AA        | 15-16AA        |
| <b>16-17</b> |              |                    |                  |                     |                     | 16-17AA        | 16-17AA        |
| <b>17-18</b> |              |                    |                  |                     |                     | 17-18AA        | 17-18AA        |
| <b>18-19</b> |              |                    |                  |                     |                     | 18-19AA        | 18-19AA        |
| <b>19-20</b> |              |                    |                  |                     |                     | 19-20AA        | 19-20AA        |
| <b>20-21</b> |              |                    |                  |                     |                     |                | 20-21AA        |
| <b>21-22</b> |              |                    |                  |                     |                     |                | 21-22AA        |
| <b>22-23</b> |              |                    |                  |                     |                     |                | 22-23AA        |
| <b>23-24</b> |              |                    |                  |                     |                     |                | 23-24AA        |
| <b>24-25</b> |              |                    |                  |                     |                     |                | 24-25AA        |
| <b>25-26</b> |              |                    |                  |                     |                     |                | 25-26AA        |
|              |              |                    |                  |                     |                     |                |                |
|              |              |                    |                  |                     |                     |                |                |
|              |              |                    |                  |                     |                     |                |                |
|              |              |                    |                  |                     |                     |                |                |

# ER-SEAL-AA

## ER sealed collets - Ultra precision

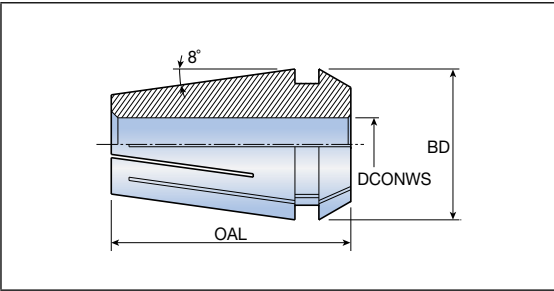
[illegible]

### ER sealed jet collets – Ultra precision

G

# EROH

## ER collets for internal coolant

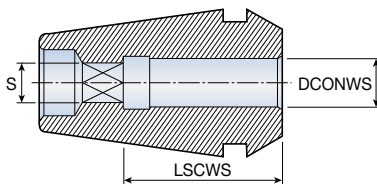
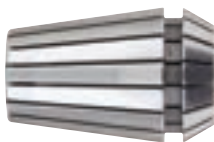


| Designation    | Dimension (mm)          |    |      |
|----------------|-------------------------|----|------|
|                | DCONWS <sub>range</sub> | BD | OAL  |
| <b>EROH 16</b> | 4.0-10.0                | 17 | 27.5 |
| <b>EROH 20</b> | 6.0-13.0                | 21 | 31.5 |
| <b>EROH 25</b> | 6.0-16.0                | 26 | 34.0 |
| <b>EROH 32</b> | 8.0-20.0                | 33 | 40.0 |
| <b>EROH 40</b> | 10.0-26.0               | 41 | 46.0 |

| DCONWS    | ER16       | ER20       | ER25       | ER32       | ER40       |
|-----------|------------|------------|------------|------------|------------|
| <b>4</b>  | EROH 16-4  |            |            |            |            |
| <b>5</b>  | EROH 16-5  |            |            |            |            |
| <b>6</b>  | EROH 16-6  | EROH 20-6  | EROH 25-6  |            |            |
| <b>7</b>  | EROH 16-7  | EROH 20-7  | EROH 25-7  |            |            |
| <b>8</b>  | EROH 16-8  | EROH 20-8  | EROH 25-8  | EROH 32-8  |            |
| <b>9</b>  | EROH 16-9  | EROH 20-9  | EROH 25-9  | EROH 32-9  |            |
| <b>10</b> | EROH 16-10 | EROH 20-10 | EROH 25-10 | EROH 32-10 | EROH 40-10 |
| <b>11</b> |            | EROH 20-11 | EROH 25-11 | EROH 32-11 |            |
| <b>12</b> |            | EROH 20-12 | EROH 25-12 | EROH 32-12 | EROH 40-12 |
| <b>13</b> |            | EROH 20-13 | EROH 25-13 | EROH 32-13 |            |
| <b>14</b> |            |            | EROH 25-14 | EROH 32-14 | EROH 40-14 |
| <b>15</b> |            |            | EROH 25-15 | EROH 32-15 |            |
| <b>16</b> |            |            | EROH 25-16 | EROH 32-16 | EROH 40-16 |
| <b>17</b> |            |            |            | EROH 32-17 |            |
| <b>18</b> |            |            |            | EROH 32-18 | EROH 40-18 |
| <b>19</b> |            |            |            | EROH 32-19 |            |
| <b>20</b> |            |            |            | EROH 32-20 | EROH 40-20 |
| <b>21</b> |            |            |            |            |            |
| <b>22</b> |            |            |            |            | EROH 40-22 |
| <b>23</b> |            |            |            |            |            |
| <b>24</b> |            |            |            |            | EROH 40-24 |
| <b>25</b> |            |            |            |            | EROH 40-25 |
| <b>26</b> |            |            |            |            |            |
|           |            |            |            |            |            |
|           |            |            |            |            |            |
|           |            |            |            |            |            |
|           |            |            |            |            |            |
|           |            |            |            |            |            |



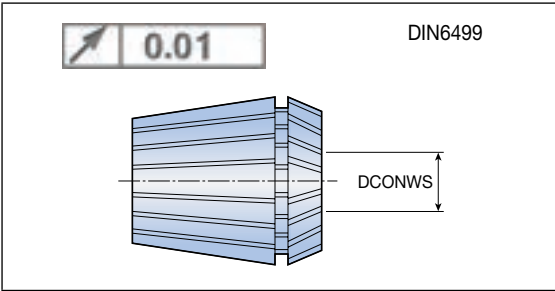
### ER type tap collets

[illegible]

▶ Tap specification is based on JIS (DIN or ISO standard prepared by special quotation)

# SET ER-SPR

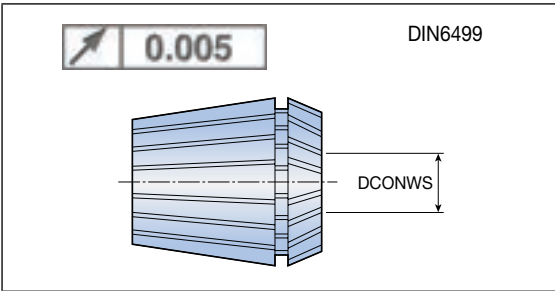
ER spring collet sets



| Designation            | Pieces / set | DCONWSrange |
|------------------------|--------------|-------------|
| <b>SET ER11 SPR 13</b> | 13           | 0.5-7       |
| <b>ER16 SPR 10</b>     | 10           | 0.5-10      |
| <b>ER20 SPR 12</b>     | 12           | 1-13        |
| <b>ER25 SPR 15</b>     | 15           | 1-16        |
| <b>ER32 SPR 18</b>     | 18           | 2-20        |
| <b>ER40 SPR 23</b>     | 23           | 3-26        |
| <b>ER50 SPR 12</b>     | 12           | 10-34       |
|                        |              |             |
|                        |              |             |

# SET ER-SPR-AA

ER spring collet sets – Ultra precision “AA”



| Designation              | Pieces / set | DCONWSrange |
|--------------------------|--------------|-------------|
| <b>SET ER11 SPR 13AA</b> | 13           | 0.5-7       |
| <b>ER16 SPR 10AA</b>     | 10           | 0.5-10      |
| <b>ER20 SPR 12AA</b>     | 12           | 1-13        |
| <b>ER25 SPR 15AA</b>     | 15           | 1-16        |
| <b>ER32 SPR 18AA</b>     | 18           | 2-20        |
| <b>ER40 SPR 23AA</b>     | 23           | 3-26        |
|                          |              |             |
|                          |              |             |

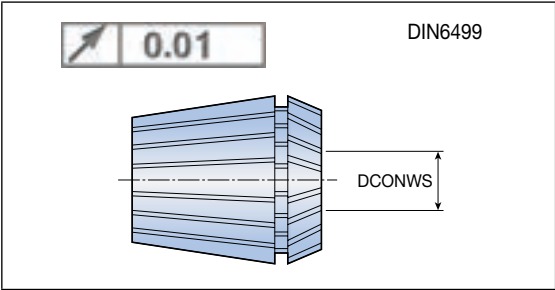
## ER sealed collet sets - Ultra precision



**ADVANCECUTTING**  
TaequTec

# SET ER-SPR-EM

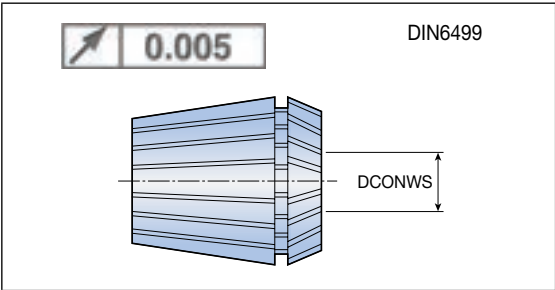
ER spring collet sets



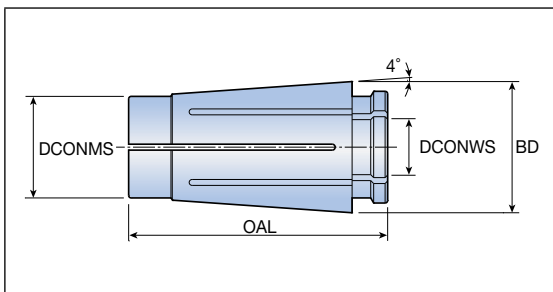
| Designation       | Pieces / set | DCONWSrange              |
|-------------------|--------------|--------------------------|
| SET ER11 SPR 7 EM | 7            | 1,2,3,4,5,6,7            |
| ER16 SPR 8 EM     | 8            | 3, 4, 5, 6, 7, 8, 9, 10  |
| ER20 SPR 5 EM     | 5            | 4, 6, 8, 10, 12          |
| ER25 SPR 6 EM     | 6            | 4, 6, 8, 10, 12, 16      |
| ER32 SPR 6 EM     | 6            | 6, 8, 10, 12, 16, 20     |
| ER40 SPR 7 EM     | 7            | 6, 8, 10, 12, 16, 20, 25 |
|                   |              |                          |
|                   |              |                          |
|                   |              |                          |

# SET ER-SPR-EM AA

ER spring collet sets – Ultra precision “AA”



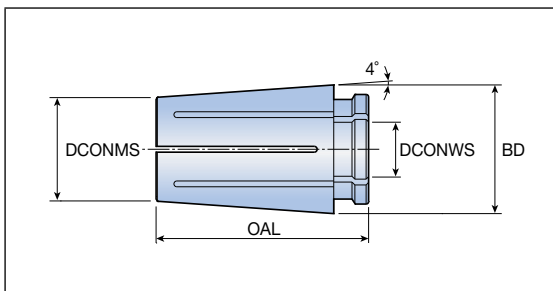
| Designation          | Pieces / set | DCONWSrange   |
|----------------------|--------------|---------------|
| SET ER11 SPR 7 EM AA | 7            | 1,2,3,4,5,6,7 |
|                      |              |               |
|                      |              |               |
|                      |              |               |
|                      |              |               |
|                      |              |               |
|                      |              |               |



| Designation   | Dimension (mm) |      |        |      |
|---------------|----------------|------|--------|------|
|               | DCONWSrange    | BD   | DCONMS | OAL  |
| <b>TSK 06</b> | 2.0-6.0        | 10.4 | 7.5    | 25.0 |
| <b>TSK 10</b> | 2.0-10.0       | 15.5 | 12.0   | 30.6 |
| <b>TSK 16</b> | 3.0-16.0       | 24.6 | 18.8   | 45.0 |
| <b>TSK 25</b> | 8.0-25.0       | 35.7 | 28.8   | 57.0 |

| DCONWSrange      | TSK 06     | TSK 10      | TSK 16      | TSK 25      |
|------------------|------------|-------------|-------------|-------------|
| <b>1.5-2.0</b>   | TSK 06-2.0 | TSK 10-2.0  |             |             |
| <b>2.5-3.0</b>   | TSK 06-3.0 | TSK 10-3.0  | TSK 16-3.0  |             |
| <b>3.5-4.0</b>   | TSK 06-4.0 | TSK 10-4.0  | TSK 16-4.0  |             |
| <b>4.5-5.0</b>   | TSK 06-5.0 | TSK 10-5.0  | TSK 16-5.0  |             |
| <b>5.5-6.0</b>   | TSK 06-6.0 | TSK 10-6.0  | TSK 16-6.0  |             |
| <b>6.5-7.0</b>   |            | TSK 10-7.0  | TSK 16-7.0  |             |
| <b>7.5-8.0</b>   |            | TSK 10-8.0  | TSK 16-8.0  | TSK 25-8.0  |
| <b>8.5-9.0</b>   |            | TSK 10-9.0  | TSK 16-9.0  |             |
| <b>9.5-10.0</b>  |            | TSK 10-10.0 | TSK 16-10.0 | TSK 25-10.0 |
| <b>10.5-11.0</b> |            |             | TSK 16-11.0 |             |
| <b>11.5-12.0</b> |            |             | TSK 16-12.0 | TSK 25-12.0 |
| <b>12.5-13.0</b> |            |             | TSK 16-13.0 |             |
| <b>13.5-14.0</b> |            |             | TSK 16-14.0 | TSK 25-14.0 |
| <b>14.5-15.0</b> |            |             | TSK 16-15.0 |             |
| <b>15.5-16.0</b> |            |             | TSK 16-16.0 | TSK 25-16.0 |
| <b>16.5-17.0</b> |            |             |             | TSK 25-17.0 |
| <b>17.5-18.0</b> |            |             |             | TSK 25-18.0 |
| <b>18.5-19.0</b> |            |             |             | TSK 25-19.0 |
| <b>19.5-20.0</b> |            |             |             | TSK 25-20.0 |
| <b>20.5-21.0</b> |            |             |             | TSK 25-21.0 |
| <b>21.5-22.0</b> |            |             |             | TSK 25-22.0 |
| <b>22.5-23.0</b> |            |             |             | TSK 25-23.0 |
| <b>23.5-24.0</b> |            |             |             | TSK 25-24.0 |
| <b>24.5-25.0</b> |            |             |             | TSK 25-25.0 |
|                  |            |             |             |             |
|                  |            |             |             |             |
|                  |            |             |             |             |
|                  |            |             |             |             |
|                  |            |             |             |             |

### Internal coolant type collets for TSK chucks

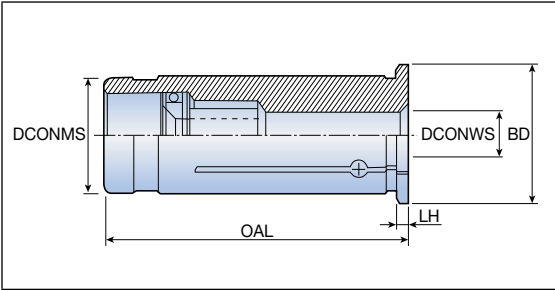


| Designation    | Dimension (mm) |      |        |      |
|----------------|----------------|------|--------|------|
|                | DCONWSrange    | BD   | DCONMS | OAL  |
| <b>TSKC 06</b> | 4.0-6.0        | 10.4 | 8.00   | 21.0 |
| <b>TSKC 10</b> | 6.0-10.0       | 15.5 | 12.50  | 25.6 |
| <b>TSKC 16</b> | 8.0-16.0       | 24.6 | 20.12  | 37.0 |
| <b>TSKC 25</b> | 16.0-25.0      | 35.7 | 29.70  | 48.5 |

[illegible]

# THC

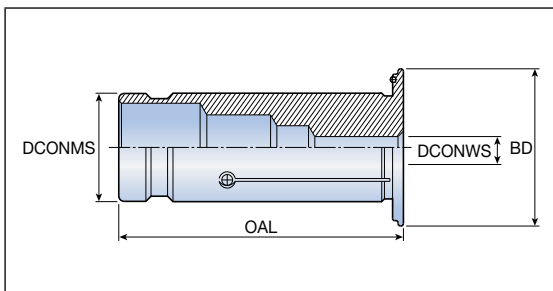
## Straight collets for hydraulic chucks



| Designation | Dimension (mm) |        |    |      |    |
|-------------|----------------|--------|----|------|----|
|             | DCONMS         | DCONWS | BD | OAL  | LH |
| THC 12-3    | 12             | 3      | 16 | 46.5 | 2  |
| 12-4        | 12             | 4      | 16 | 46.5 | 2  |
| 12-5        | 12             | 5      | 16 | 46.5 | 2  |
| 12-6        | 12             | 6      | 16 | 46.5 | 2  |
| 12-7        | 12             | 7      | 16 | 46.5 | 2  |
| 12-8        | 12             | 8      | 16 | 46.5 | 2  |
| 12-9        | 12             | 9      | 16 | 46.5 | 2  |
| 20-3        | 20             | 3      | 24 | 50.5 | 2  |
| 20-4        | 20             | 4      | 24 | 50.5 | 2  |
| 20-5        | 20             | 5      | 24 | 50.5 | 2  |
| 20-6        | 20             | 6      | 24 | 50.5 | 2  |
| 20-7        | 20             | 7      | 24 | 50.5 | 2  |
| 20-8        | 20             | 8      | 24 | 50.5 | 2  |
| 20-9        | 20             | 9      | 24 | 50.5 | 2  |
| 20-10       | 20             | 10     | 24 | 50.5 | 2  |
| 20-11       | 20             | 11     | 24 | 50.5 | 2  |
| 20-12       | 20             | 12     | 24 | 50.5 | 2  |
| 20-13       | 20             | 13     | 24 | 50.5 | 2  |
| 20-14       | 20             | 14     | 24 | 50.5 | 2  |
| 20-15       | 20             | 15     | 24 | 50.5 | 2  |
| 20-16       | 20             | 16     | 24 | 50.5 | 2  |
| 32-6        | 32             | 6      | 36 | 60.5 | 3  |
| 32-8        | 32             | 8      | 36 | 60.5 | 3  |
| 32-10       | 32             | 10     | 36 | 60.5 | 3  |
| 32-12       | 32             | 12     | 36 | 60.5 | 3  |
| 32-14       | 32             | 14     | 36 | 60.5 | 3  |
| 32-16       | 32             | 16     | 36 | 60.5 | 3  |
| 32-18       | 32             | 18     | 36 | 60.5 | 3  |
| 32-20       | 32             | 20     | 36 | 60.5 | 3  |
| 32-25       | 32             | 25     | 36 | 60.5 | 3  |
|             |                |        |    |      |    |
|             |                |        |    |      |    |
|             |                |        |    |      |    |
|             |                |        |    |      |    |
|             |                |        |    |      |    |

# THC C

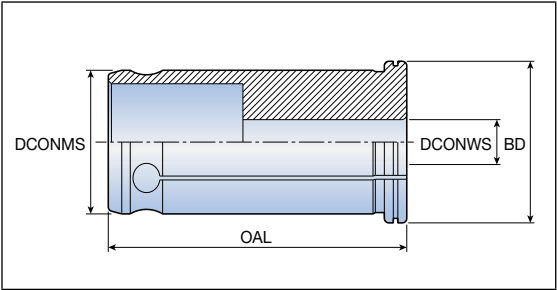
## Straight collets of internal coolant type for hydraulic chucks



| Designation      | Dimension (mm) |        |    |      |
|------------------|----------------|--------|----|------|
|                  | DCONMS         | DCONWS | BD | OAL  |
| <b>THC C12-3</b> | 12             | 3      | 19 | 47.0 |
| <b>C12-4</b>     | 12             | 4      | 19 | 47.0 |
| <b>C12-5</b>     | 12             | 5      | 19 | 47.0 |
| <b>C12-6</b>     | 12             | 6      | 19 | 47.0 |
| <b>C12-7</b>     | 12             | 7      | 19 | 47.0 |
| <b>C12-8</b>     | 12             | 8      | 19 | 47.0 |
| <b>C20-3</b>     | 20             | 3      | 29 | 52.5 |
| <b>C20-4</b>     | 20             | 4      | 29 | 52.5 |
| <b>C20-5</b>     | 20             | 5      | 29 | 52.5 |
| <b>C20-6</b>     | 20             | 6      | 29 | 52.5 |
| <b>C20-7</b>     | 20             | 7      | 29 | 52.5 |
| <b>C20-8</b>     | 20             | 8      | 29 | 52.5 |
| <b>C20-9</b>     | 20             | 9      | 29 | 52.5 |
| <b>C20-10</b>    | 20             | 10     | 29 | 52.5 |
| <b>C20-11</b>    | 20             | 11     | 29 | 52.5 |
| <b>C20-12</b>    | 20             | 12     | 29 | 52.5 |
| <b>C20-13</b>    | 20             | 13     | 29 | 52.5 |
| <b>C20-14</b>    | 20             | 14     | 29 | 52.5 |
| <b>C20-15</b>    | 20             | 15     | 29 | 52.5 |
| <b>C20-16</b>    | 20             | 16     | 29 | 52.5 |
| <b>C20-17</b>    | 20             | 17     | 29 | 52.5 |
| <b>C32-6</b>     | 32             | 6      | 39 | 63.5 |
| <b>C32-8</b>     | 32             | 8      | 39 | 63.5 |
| <b>C32-10</b>    | 32             | 10     | 39 | 63.5 |
| <b>C32-12</b>    | 32             | 12     | 39 | 63.5 |
| <b>C32-14</b>    | 32             | 14     | 39 | 63.5 |
| <b>C32-16</b>    | 32             | 16     | 39 | 63.5 |
| <b>C32-18</b>    | 32             | 18     | 39 | 63.5 |
| <b>C32-20</b>    | 32             | 20     | 39 | 63.5 |
| <b>C32-25</b>    | 32             | 25     | 39 | 63.5 |
|                  |                |        |    |      |
|                  |                |        |    |      |
|                  |                |        |    |      |
|                  |                |        |    |      |

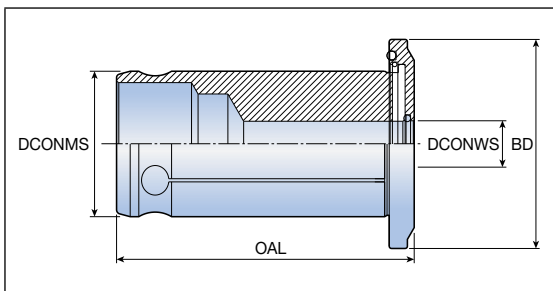


Straight collets for milling chucks: general type



| Designation | Dimension (mm) |        |    |     |
|-------------|----------------|--------|----|-----|
|             | DCONMS         | DCONWS | BD | OAL |
| NCSR 20-6   | 20             | 6      | 25 | 55  |
| 20-8        | 20             | 8      | 25 | 55  |
| 20-10       | 20             | 10     | 25 | 55  |
| 20-12       | 20             | 12     | 25 | 55  |
| 20-16       | 20             | 16     | 25 | 55  |
| 25-6        | 25             | 6      | 29 | 59  |
| 25-8        | 25             | 8      | 29 | 59  |
| 25-10       | 25             | 10     | 29 | 59  |
| 25-12       | 25             | 12     | 29 | 59  |
| 25-16       | 25             | 16     | 29 | 59  |
| 25-20       | 25             | 20     | 29 | 59  |
| 32-6        | 32             | 6      | 36 | 65  |
| 32-8        | 32             | 8      | 36 | 65  |
| 32-10       | 32             | 10     | 36 | 65  |
| 32-12       | 32             | 12     | 36 | 65  |
| 32-16       | 32             | 16     | 36 | 65  |
| 32-20       | 32             | 20     | 36 | 65  |
| 32-25       | 32             | 25     | 36 | 65  |
| 42-6        | 42             | 6      | 45 | 70  |
| 42-8        | 42             | 8      | 45 | 70  |
| 42-10       | 42             | 10     | 45 | 70  |
| 42-12       | 42             | 12     | 45 | 70  |
| 42-16       | 42             | 16     | 45 | 70  |
| 42-20       | 42             | 20     | 45 | 70  |
| 42-25       | 42             | 25     | 45 | 70  |
| 42-32       | 42             | 32     | 45 | 70  |
|             |                |        |    |     |
|             |                |        |    |     |
|             |                |        |    |     |
|             |                |        |    |     |
|             |                |        |    |     |
|             |                |        |    |     |
|             |                |        |    |     |
|             |                |        |    |     |
|             |                |        |    |     |

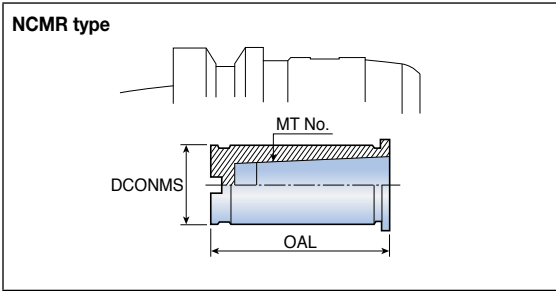
### Straight collets for milling chucks: internal coolant type



**TaeguTec**  
Member IMC Group

# NCMR

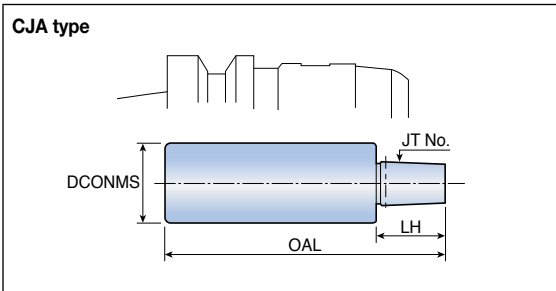
## Collet for milling chucks - Morse taper adapter for milling chuck



| Designation | MT No. | Dimension (mm) |     | Application chuck |
|-------------|--------|----------------|-----|-------------------|
|             |        | DCONMS         | OAL |                   |
| NCMR 32-1   | 1      | 32             | 60  | NTMC 32           |
| 32-2        | 2      | 32             | 72  | NTMC 32           |
| 32-3        | 3      | 32             | 90  | NTMC 32           |
| 42-1        | 1      | 42             | 60  | NTMC 42           |
| 42-2        | 2      | 42             | 72  | NTMC 42           |
| 42-3        | 3      | 42             | 90  | NTMC 42           |
| 42-4        | 4      | 42             | 113 | NTMC 42           |

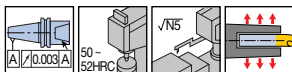
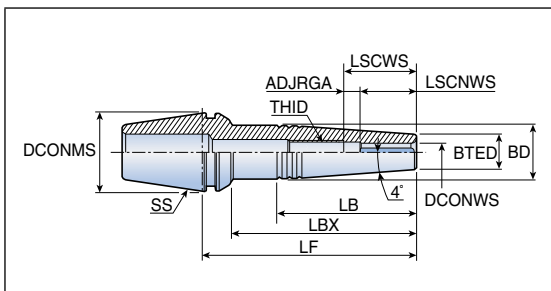
# CJA

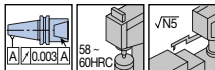
## Collet for milling chucks - Jacobs taper adapter for milling chuck



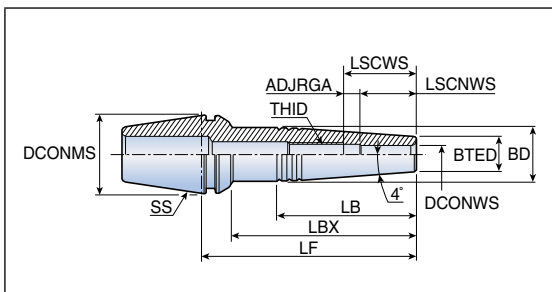
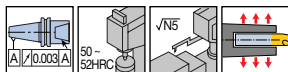
| Designation | JT No. | Dimension (mm) |     |    | Application chuck |
|-------------|--------|----------------|-----|----|-------------------|
|             |        | DCONMS         | OAL | LH |                   |
| CJA 32-6    | 6      | 32             | 118 | 28 | NTMC 32           |
|             |        |                |     |    |                   |
|             |        |                |     |    |                   |

**TSHRINK**

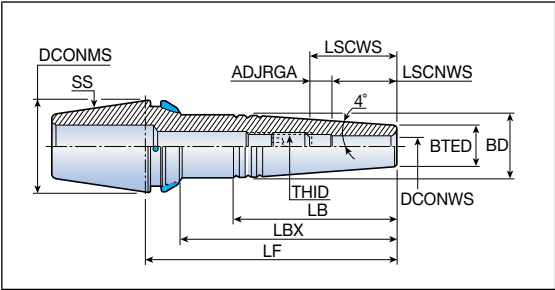




► <sup>(1)</sup> To be used only for TYPHOON spindles

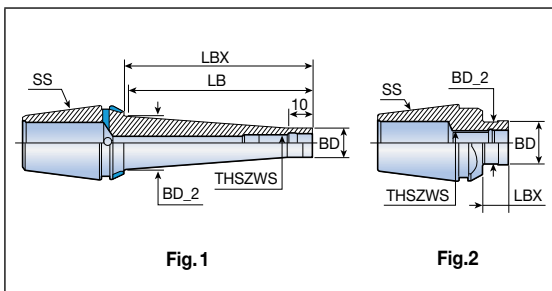
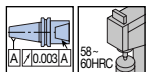


► Only use inductive heating device for T-SHRINK holders



| Designation        | Dimension (mm) |        |        |      |      |      |     |      |       |        |       |      |         |
|--------------------|----------------|--------|--------|------|------|------|-----|------|-------|--------|-------|------|---------|
|                    | SS             | DCONWS | DCONMS | BTED | BD   | LB   | LBX | LF   | ADJRG | LSCNWS | LSCWS | THID | Hex key |
| ER20 SRK 3x35 JET2 | ER20           | 3      | 20     | 10   | 13.5 | 24.5 | 35  | 43.5 | 6     | 10     | 16    | M6   | 3.0     |
| SRK 4x35 JET2      | ER20           | 4      | 20     | 10   | 13.5 | 24.5 | 35  | 43.5 | 6     | 12     | 18    | M6   | 3.0     |
| SRK 5x35 JET2      | ER20           | 5      | 20     | 10   | 13.5 | 24.5 | 35  | 43.5 | 6     | 15     | 21    | M6   | 3.0     |
| SRK 6x35 JET2      | ER20           | 6      | 20     | 11   | 13.5 | 25.5 | 35  | 43.5 | 6     | 18     | 24    | M8   | 4.0     |
| ER25 SRK 3x35 JET2 | ER25           | 3      | 25     | 10   | 13.5 | 24.5 | 35  | 44   | 6     | 10     | 16    | M6   | 3.0     |
| SRK 3x60 JET2      | ER25           | 3      | 25     | 10   | 16.3 | 44.5 | 60  | 69   | 6     | 10     | 16    | M6   | 3.0     |
| SRK 4x35 JET2      | ER25           | 4      | 25     | 10   | 13.5 | 24.5 | 35  | 44   | 6     | 12     | 18    | M6   | 3.0     |
| SRK 4x60 JET2      | ER25           | 4      | 25     | 10   | 16.3 | 44.5 | 60  | 69   | 6     | 12     | 18    | M6   | 3.0     |
| SRK 5x35 JET2      | ER25           | 5      | 25     | 10   | 13.5 | 24.5 | 35  | 44   | 6     | 15     | 21    | M6   | 3.0     |
| SRK 5x60 JET2      | ER25           | 5      | 25     | 10   | 16.3 | 44.5 | 60  | 69   | 6     | 15     | 21    | M6   | 3.0     |
| SRK 6x35 JET2      | ER25           | 6      | 25     | 11   | 14.7 | 26.0 | 35  | 44   | 6     | 18     | 24    | M8   | 4.0     |
| SRK 6x60 JET2      | ER25           | 6      | 25     | 11   | 17.3 | 44.5 | 60  | 69   | 6     | 18     | 24    | M8   | 4.0     |
| SRK 8x35 JET2      | ER25           | 8      | 25     | 14   | 17.8 | 26.5 | 35  | 44   | 5     | 25     | 30    | M10  | 5.0     |
| SRK 8x60 JET2      | ER25           | 8      | 25     | 14   | 17.9 | 39.5 | 60  | 69   | 6     | 25     | 31    | M10  | 5.0     |
| ER32 SRK 3x35 JET2 | ER32           | 3      | 32     | 10   | 13.5 | 22.5 | 35  | 45   | 6     | 10     | 16    | M6   | 3.0     |
| SRK 3x60 JET2      | ER32           | 3      | 32     | 10   | 16.3 | 44.5 | 60  | 70   | 6     | 10     | 16    | M6   | 3.0     |
| SRK 3x85 JET2      | ER32           | 3      | 32     | 10   | 19.8 | 70.0 | 85  | 95   | 6     | 10     | 16    | M6   | 3.0     |
| SRK 4x35 JET2      | ER32           | 4      | 32     | 10   | 13.5 | 23.5 | 35  | 45   | 6     | 12     | 18    | M6   | 3.0     |
| SRK 4x60 JET2      | ER32           | 4      | 32     | 10   | 16.3 | 44.5 | 60  | 70   | 6     | 12     | 18    | M6   | 3.0     |
| SRK 4x85 JET2      | ER32           | 4      | 32     | 10   | 19.8 | 70.0 | 85  | 95   | 6     | 12     | 18    | M6   | 3.0     |
| SRK 5x35 JET2      | ER32           | 5      | 32     | 10   | 13.5 | 24.5 | 35  | 45   | 6     | 15     | 21    | M6   | 3.0     |
| SRK 5x60 JET2      | ER32           | 5      | 32     | 10   | 16.3 | 44.5 | 60  | 70   | 6     | 15     | 21    | M6   | 3.0     |
| SRK 5x85 JET2      | ER32           | 5      | 32     | 10   | 19.8 | 70.0 | 85  | 95   | 6     | 15     | 21    | M6   | 3.0     |
| SRK 6x35 JET2      | ER32           | 6      | 32     | 11   | 14.7 | 25.5 | 35  | 45   | 6     | 18     | 24    | M8   | 4.0     |
| SRK 6x60 JET2      | ER32           | 6      | 32     | 11   | 17.3 | 45.0 | 60  | 70   | 6     | 18     | 24    | M8   | 4.0     |
| SRK 6x85 JET2      | ER32           | 6      | 32     | 11   | 20.8 | 69.5 | 85  | 95   | 8     | 18     | 26    | M8   | 4.0     |
| SRK 8x35 JET2      | ER32           | 8      | 32     | 14   | 18.8 | 33.0 | 35  | 45   | 6     | 25     | 31    | M10  | 5.0     |
| SRK 8x60 JET2      | ER32           | 8      | 32     | 14   | 20.4 | 45.0 | 60  | 70   | 6     | 25     | 31    | M10  | 5.0     |
| SRK 8x85 JET2      | ER32           | 8      | 32     | 14   | 23.2 | 65.0 | 85  | 95   | 6     | 25     | 31    | M10  | 5.0     |
| SRK 10x35 JET2     | ER32           | 10     | 32     | 16   | 20.8 | 34.0 | 35  | 45   | 5     | 30     | 35    | M12  | 6.0     |
| SRK 10x60 JET2     | ER32           | 10     | 32     | 16   | 22.4 | 44.5 | 60  | 70   | 6     | 30     | 36    | M12  | 6.0     |
| SRK 10x85 JET2     | ER32           | 10     | 32     | 16   | 23.0 | 49.5 | 85  | 95   | 6     | 30     | 36    | M12  | 6.0     |
| SRK 12x35 JET2     | ER32           | 12     | 32     | 20   | 24.0 | 28.0 | 35  | 45   | -     | 32     | -     | -    | -       |
| SRK 12x60 JET2     | ER32           | 12     | 32     | 20   | 24.0 | 28.0 | 60  | 70   | 6     | 32     | 38    | M14  | 6.0     |
| SRK 12x85 JET2     | ER32           | 12     | 32     | 20   | 24.0 | 28.0 | 85  | 95   | 6     | 32     | 38    | M14  | 6.0     |

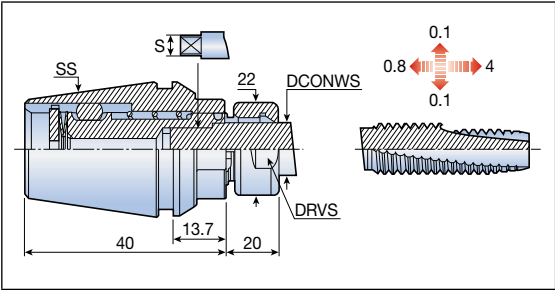
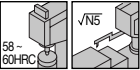
**TSHRINK**

[illegible]



# GTIN ER

## GTIN ER collets



### GTIN ER 32 - DIN 371 / 352

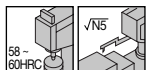
| Designation                    | Dimension (mm) |        |        |        |     |      |
|--------------------------------|----------------|--------|--------|--------|-----|------|
|                                | SS             | DCONWS | Tapmin | Tapmax | S   | DRVS |
| <b>GTIN ER32 DIN 2.50x2.10</b> | ER32           | 2.5    | M1     | M1.8   | 2.1 | 20   |
| <b>DIN 2.80x2.10</b>           | ER32           | 2.8    | M2     | M4     | 2.1 | 20   |
| <b>DIN 3.50x2.70</b>           | ER32           | 3.5    | M3     | M5     | 2.7 | 20   |
| <b>DIN 4.00x3.00</b>           | ER32           | 4.0    | M3.5   | M3.5   | 3.0 | 20   |
| <b>DIN 4.50x3.40</b>           | ER32           | 4.5    | M4     | M6     | 3.4 | 20   |
| <b>DIN 6.00x4.90</b>           | ER32           | 6.0    | M5     | M8     | 4.9 | 20   |
| <b>DIN 7.00x5.50</b>           | ER32           | 7.0    | M7     | M10    | 5.5 | 20   |
| <b>DIN 8.00x6.20</b>           | ER32           | 8.0    | M8     | M8     | 6.2 | 20   |
| <b>DIN 9.00x7.00</b>           | ER32           | 9.0    | M12    | M12    | 7.0 | 20   |
| <b>DIN 10.00x8.00</b>          | ER32           | 10.0   | M10    | M10    | 8.0 | 20   |
| <b>DIN 11.00x9.00</b>          | ER32           | 11.0   | M14    | M14    | 9.0 | 20   |
| <b>DIN 12.00x9.00</b>          | ER32           | 12.0   | M16    | M16    | 9.0 | 20   |
|                                |                |        |        |        |     |      |
|                                |                |        |        |        |     |      |
|                                |                |        |        |        |     |      |

### GTIN ER 32 - JIS

| Designation                    | Dimension (mm) |        |        |        |      |      |
|--------------------------------|----------------|--------|--------|--------|------|------|
|                                | SS             | DCONWS | Tapmin | Tapmax | S    | DRVS |
| <b>GTIN ER32 JIS 3.00x2.50</b> | ER32           | 3.0    | M1     | M2.6   | 2.5  | 20   |
| <b>JIS 4.00x3.20</b>           | ER32           | 4.0    | M3     | M3.5   | 3.2  | 20   |
| <b>JIS 5.00x4.00</b>           | ER32           | 5.0    | M4     | M4     | 4.0  | 20   |
| <b>JIS 6.00x4.50</b>           | ER32           | 6.0    | M6     | M6     | 4.5  | 20   |
| <b>JIS 6.20x5.00</b>           | ER32           | 6.2    | M8     | M8     | 5.0  | 20   |
| <b>JIS 7.00x5.50</b>           | ER32           | 7.0    | M10    | M10    | 5.5  | 20   |
| <b>JIS 8.50x6.50</b>           | ER32           | 8.5    | M12    | M12    | 6.5  | 20   |
| <b>JIS 10.50x8.00</b>          | ER32           | 10.5   | M14    | M14    | 8.0  | 20   |
| <b>JIS 12.50x10.00</b>         | ER32           | 12.5   | M16    | M16    | 10.0 | 20   |
|                                |                |        |        |        |      |      |
|                                |                |        |        |        |      |      |
|                                |                |        |        |        |      |      |
|                                |                |        |        |        |      |      |
|                                |                |        |        |        |      |      |

► No coolant should be induced through the tap collet, as it will cause malfunctioning of the mechanism

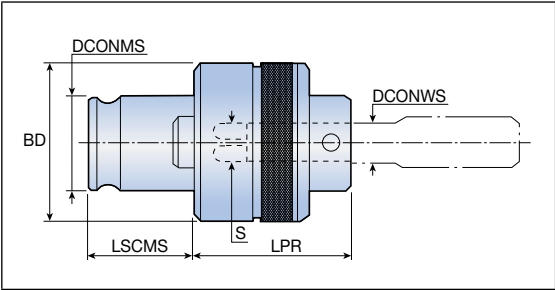
## GTIN ER collets



- ▶ No coolant should be induced through the tap collet, as it will cause malfunctioning of the mechanism

# TA (For JIS)

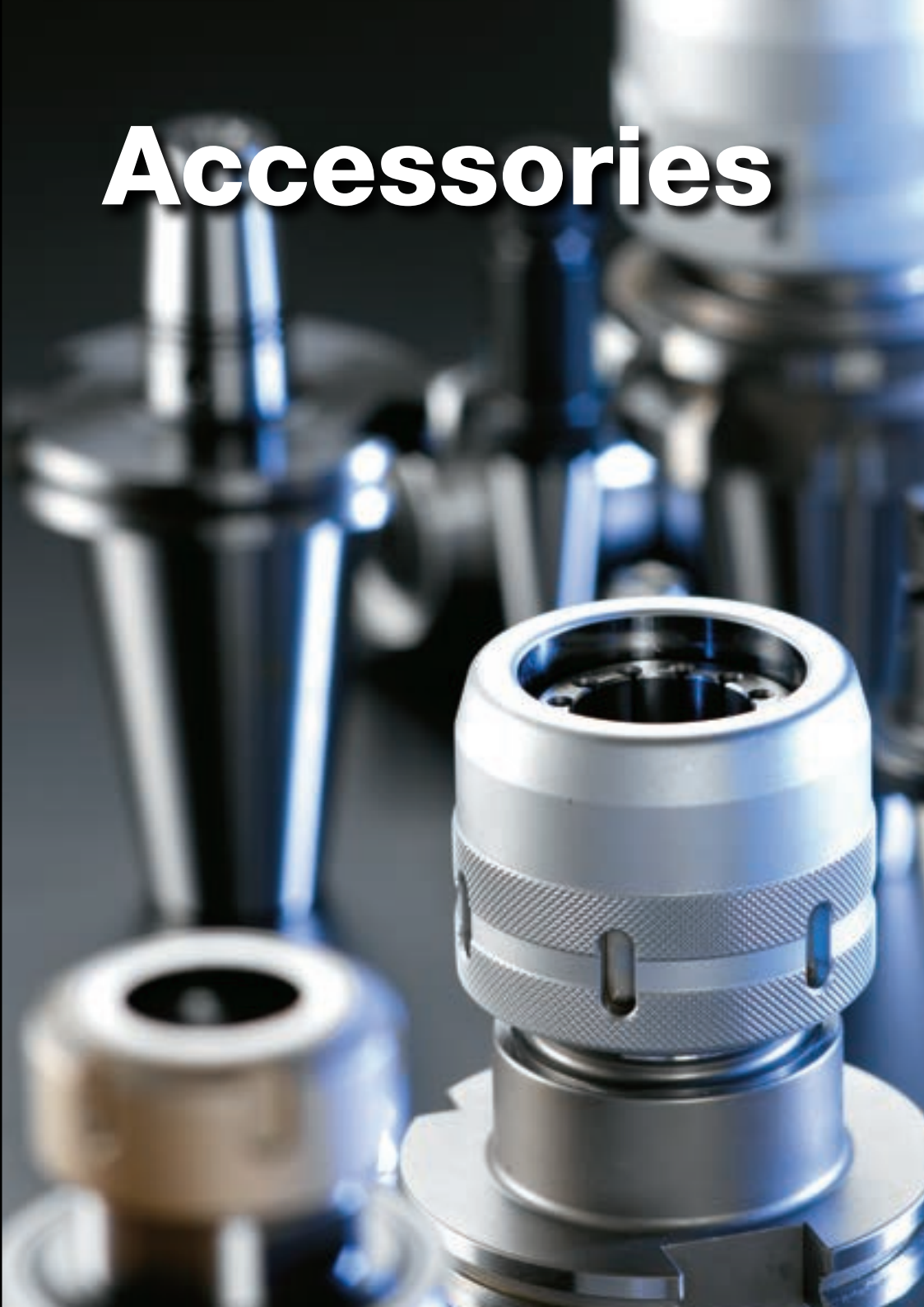
## Tap adapters



| Designation | Dimension (mm) |        |    |     |       |      |
|-------------|----------------|--------|----|-----|-------|------|
|             | DCONMS         | DCONWS | BD | LPR | LSCMS | S    |
| TA 1-M3     | 19             | 4.0    | 32 | 25  | 21.5  | 3.2  |
| 1-M4        | 19             | 5.0    | 32 | 25  | 21.5  | 4.0  |
| 1-M5        | 19             | 5.5    | 32 | 25  | 21.5  | 4.5  |
| 1-M6        | 19             | 6.0    | 32 | 25  | 21.5  | 4.5  |
| 1-M8        | 19             | 6.2    | 32 | 25  | 21.5  | 5.0  |
| 1-M10       | 19             | 7.0    | 32 | 25  | 21.5  | 5.5  |
| 1-M12       | 19             | 8.5    | 32 | 25  | 21.5  | 6.5  |
| 2-M6        | 31             | 6.0    | 50 | 33  | 35.5  | 4.5  |
| 2-M8        | 31             | 6.2    | 50 | 33  | 35.5  | 5.0  |
| 2-M10       | 31             | 7.0    | 50 | 33  | 35.5  | 5.5  |
| 2-M12       | 31             | 8.5    | 50 | 33  | 35.5  | 6.5  |
| 2-M14       | 31             | 10.5   | 50 | 33  | 35.5  | 8.0  |
| 2-M16       | 31             | 12.5   | 50 | 33  | 35.5  | 10.0 |
| 2-M18       | 31             | 14.0   | 50 | 33  | 35.5  | 11.0 |
| 2-M20       | 31             | 15.0   | 50 | 33  | 35.5  | 12.0 |
| 2-M22       | 31             | 17.0   | 50 | 33  | 35.5  | 13.0 |
| 2-M24       | 31             | 19.0   | 50 | 33  | 35.5  | 15.0 |
| 3-M18       | 48             | 14.0   | 72 | 45  | 55.5  | 11.0 |
| 3-M20       | 48             | 15.0   | 72 | 45  | 55.5  | 12.0 |
| 3-M22       | 48             | 17.0   | 72 | 45  | 55.5  | 13.0 |
| 3-M24       | 48             | 19.0   | 72 | 45  | 55.5  | 15.0 |
| 3-M27       | 48             | 20.0   | 72 | 45  | 55.5  | 15.0 |
| 3-M30       | 48             | 23.0   | 72 | 45  | 55.5  | 17.0 |
| 3-M33       | 48             | 25.0   | 72 | 45  | 55.5  | 19.0 |
| 3-M36       | 48             | 28.0   | 72 | 45  | 55.5  | 19.0 |
| 3-M38       | 48             | 28.0   | 72 | 45  | 55.5  | 21.0 |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |
|             |                |        |    |     |       |      |

► Based on JIS standard tap

# Accessories



# NUT ER TOP

## ER - Top™ clamping nuts

|  | Designation         | Dimension (mm) |     |         |
|--|---------------------|----------------|-----|---------|
|  |                     | DLN            | HLN | THSZMS  |
|  | <b>NUT ER16 TOP</b> | 28             | 17  | M22x1.5 |
|  | <b>ER20 TOP</b>     | 34             | 19  | M25x1.5 |
|  | <b>ER25 TOP</b>     | 42             | 20  | M32x1.5 |
|  | <b>ER32 TOP</b>     | 50             | 22  | M40x1.5 |
|  | <b>ER40 TOP</b>     | 63             | 25  | M50x1.5 |

# NUT ER MINI/UM

## ER clamping nuts

|  | Designation          | Dimension (mm) |      |          |
|--|----------------------|----------------|------|----------|
|  |                      | DLN            | HLN  | THSZMS   |
|  | <b>NUT ER11 MINI</b> | 16             | 10.8 | M13x0.75 |
|  | <b>ER11 UM</b>       | 19             | 11.3 | M14x0.75 |
|  | <b>ER16 MINI</b>     | 22             | 18.0 | M19x1.0  |
|  | <b>ER16 UM</b>       | 28             | 17.0 | M22x1.5  |
|  | <b>ER20 MINI</b>     | 28             | 19.0 | M24x1.0  |
|  | <b>ER20 UM</b>       | 34             | 19.0 | M25x1.5  |
|  | <b>ER25 MINI</b>     | 35             | 20.0 | M30x1.5  |
|  | <b>ER25 UM</b>       | 42             | 20.0 | M32x1.5  |
|  | <b>ER32 UM</b>       | 50             | 22.0 | M40x1.5  |
|  | <b>ER40 UM</b>       | 63             | 25.0 | M50x1.5  |
|  | <b>ER50 UM</b>       | 78             | 55.0 | M64x2.0  |
|  |                      |                |      |          |
|  |                      |                |      |          |

# NUT ER11 GHS

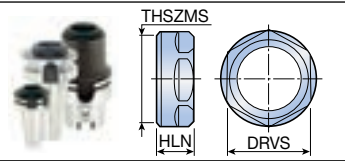


## Tightening nuts

|  | Designation         | Dimension (mm) |      |          |
|--|---------------------|----------------|------|----------|
|  |                     | DLN            | HLN  | THSZMS   |
|  | <b>NUT ER11 GHS</b> | 16             | 11.5 | M13x0.75 |
|  |                     |                |      |          |
|  |                     |                |      |          |
|  |                     |                |      |          |
|  |                     |                |      |          |

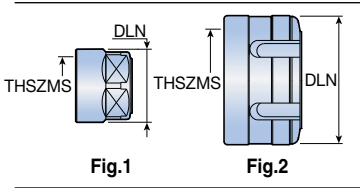
# NUT ER SHORT

## T-SHORT nuts

|  | Designation           | Dimension (mm) |      |         |
|----------------------------------------------------------------------------------|-----------------------|----------------|------|---------|
|                                                                                  |                       | DRVS           | HLN  | THSZMS  |
|                                                                                  | <b>NUT ER20 SHORT</b> | 22             | 10.7 | M25x1.5 |
|                                                                                  | <b>ER32 SHORT</b>     | 36             | 15.0 | M40x1.5 |
|                                                                                  | <b>ER40 SHORT</b>     | 46             | 16.0 | M50x1.5 |

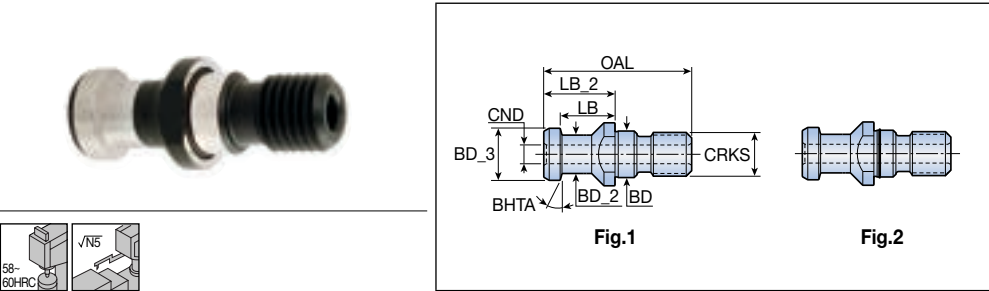
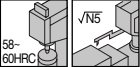
# TSKN

## TSK clamping nuts

|  | Designation   | Dimension (mm) |           | Fig. |
|----------------------------------------------------------------------------------|---------------|----------------|-----------|------|
|                                                                                  |               | DLN            | THSZMS    |      |
|                                                                                  | <b>TSKN 6</b> | 20             | M15x1.0   | 1    |
|                                                                                  | <b>10</b>     | 28             | M21.5x1.0 | 1    |
|                                                                                  | <b>16</b>     | 40             | M32x1.5   | 2    |
|                                                                                  | <b>25</b>     | 55             | M45x1.5   | 2    |

# PS SK-DIN

## Pull studs DIN69872 with JIS63398 retention knob

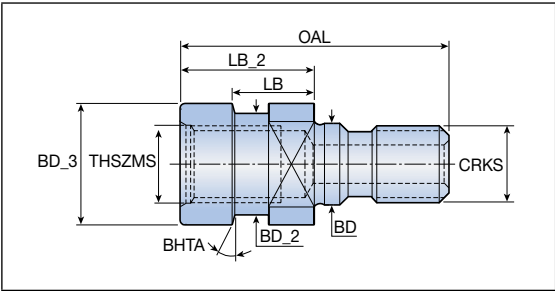
|                                                                                    |                                                                                   |       |       |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-------|
|  |  | Fig.1 | Fig.2 |
|                                                                                    |                                                                                   |       |       |

| Designation               | Dimension (mm) |    |      |       |       |       |       |      |      | Fig. |
|---------------------------|----------------|----|------|-------|-------|-------|-------|------|------|------|
|                           | CRKS           | BD | BD_2 | BD_3  | CND   | LB    | LB_2  | OAL  | BHTA |      |
| <b>PS SK30 15 M12 DIN</b> | M12            | 13 | 9.0  | 13.00 | -     | 19.00 | 24.00 | 44.0 | 15   | 1    |
| <b>PS SK40 15 M16 DIN</b> | M16            | 17 | 14.0 | 19.00 | -     | 20.00 | 26.00 | 54.0 | 15   | 1    |
| <b>15 M16 DIN O</b>       | M16            | 17 | 14.0 | 19.00 | -     | 20.00 | 26.00 | 54.0 | 15   | 2    |
| <b>15 M16 DIN B</b>       | M16            | 17 | 14.0 | 19.00 | 7.00  | 20.00 | 26.00 | 54.0 | 15   | 1    |
| <b>15 M16 DIN OB</b>      | M16            | 17 | 14.0 | 19.00 | 7.00  | 20.00 | 26.00 | 54.0 | 15   | 2    |
| <b>PS SK50 15 M24 DIN</b> | M24            | 25 | 21.0 | 28.00 | -     | 25.00 | 34.00 | 74.0 | 15   | 1    |
| <b>15 M24 DIN O</b>       | M24            | 25 | 21.0 | 28.00 | -     | 25.00 | 34.00 | 74.0 | 15   | 2    |
| <b>15 M24 DIN B</b>       | M24            | 25 | 21.0 | 28.00 | 11.50 | 25.00 | 34.00 | 74.0 | 15   | 1    |
|                           |                |    |      |       |       |       |       |      |      |      |
|                           |                |    |      |       |       |       |       |      |      |      |

- Coolant holes only in items with a "B" suffix
- Fig. 2: With external O-ring

# PS OTT BT/SK

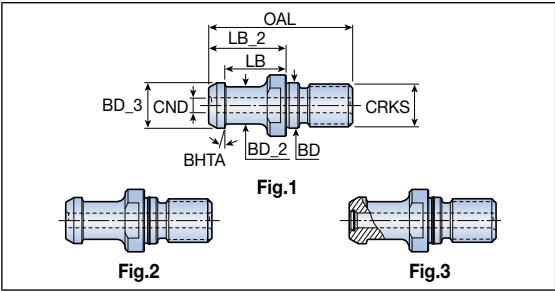
Pull studs OTT system



| Designation     | Dimension (mm) |        |    |      |      |       |      |     |      |
|-----------------|----------------|--------|----|------|------|-------|------|-----|------|
|                 | CRKS           | THSZMS | BD | BD_2 | BD_3 | LB    | LB_2 | OAL | BHTA |
| PS OTT BT40 M16 | M16            | M16    | 17 | 21.1 | 25.0 | 16.60 | 28   | 56  | 15   |
| BT50 M24        | M24            | M24    | 24 | 32.0 | 39.3 | 13.35 | 25   | 65  | 15   |
| SK40 M16        | M16            | M16    | 17 | 21.1 | 25.0 | 13.60 | 25   | 53  | 15   |

# PS BT-JIS/MAZAK

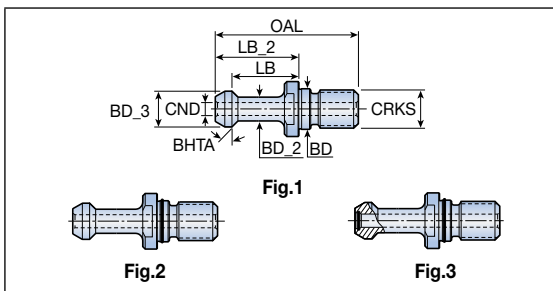
Pull studs BT-JIS 63398 / ANSI-metric for MAZAK machine



| Designation           | Dimension (mm) |    |       |       |     |       |      |      |      | Fig. |
|-----------------------|----------------|----|-------|-------|-----|-------|------|------|------|------|
|                       | CRKS           | BD | BD_2  | BD_3  | CND | LB    | LB_2 | OAL  | BHTA |      |
| PS BT30 15 M12 JIS B  | M12            | 13 | 8.00  | 12.00 | 4.0 | 18.40 | 23.4 | 43.0 | 15   | 1    |
| BT40 15 M16 JIS B     | M16            | 17 | 14.00 | 19.00 | 5.5 | 23.00 | 29.0 | 54.0 | 15   | 1    |
| BT40 15 M16 JIS O B O | M16            | 17 | 14.00 | 19.00 | 5.5 | 23.00 | 29.0 | 54.0 | 15   | 2    |
| BT40 15 M16 JIS O B O | M16            | 17 | 14.00 | 19.00 | 5.5 | 23.00 | 29.0 | 54.0 | 15   | 3    |
| BT50 15 M24 JIS B     | M24            | 25 | 21.00 | 28.00 | 8.0 | 25.00 | 34.0 | 74.0 | 15   | 1    |
| BT40 45 M16 MAZAK B   | M16            | 17 | 12.45 | 18.79 | 7.0 | 14.02 | 19.1 | 44.1 | 45   | 1    |
| BT50 45 M24 MAZAK B   | M24            | 25 | 20.83 | 28.95 | 8.0 | 17.58 | 25.2 | 65.2 | 45   | 1    |
|                       |                |    |       |       |     |       |      |      |      |      |
|                       |                |    |       |       |     |       |      |      |      |      |
|                       |                |    |       |       |     |       |      |      |      |      |

- Fig. 1: Coolant holes only in items with a "B" suffix
- Fig. 2: With external O-ring and coolant hole
- Fig. 3: With external and internal O-rings and coolant hole

### Pull studs BT-MAS-metric

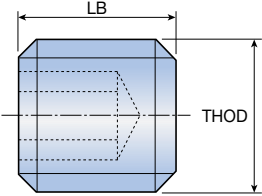


- ▶ Fig. 1: Coolant holes only in items with a "B" suffix
- ▶ Fig. 2: With external O-ring and coolant hole
- ▶ Fig. 3: With external and internal O-rings and coolant hole



# SR-DIN

Lock screw DIN1835 B/E for end mill holders

|  | Designation                | Dimension (mm) |    |                 |
|-----------------------------------------------------------------------------------|----------------------------|----------------|----|-----------------|
|                                                                                   |                            | THOD           | LB | Used for shanks |
|                                                                                   | <b>SR M6x10 DIN 1835-B</b> | M6             | 10 | 6               |
|                                                                                   | <b>M8x10 DIN 1835-B</b>    | M8             | 10 | 8               |
|                                                                                   | <b>M10x12 DIN 1835-B</b>   | M10            | 12 | 10              |
|                                                                                   | <b>M12x16 DIN 1835-B</b>   | M12            | 16 | 12, 14          |
|                                                                                   | <b>M14x16 DIN 1835-B</b>   | M14            | 16 | 16              |
|                                                                                   | <b>M16x16 DIN 1835-B</b>   | M16            | 16 | 20              |
|                                                                                   | <b>M18x2x20 DIN 1835-B</b> | M18x2          | 20 | 25              |
|                                                                                   | <b>M20x2x20 DIN 1835-B</b> | M20x2          | 20 | 32, 40          |
|                                                                                   | <b>M24x2x25 DIN 1835-B</b> | M24x2          | 25 | 50              |

# PRESET ER-JET

Preset screw with oil hole for ER collets

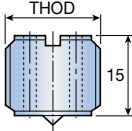


Fig.1

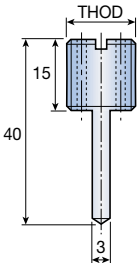
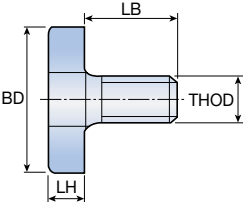


Fig.2

| Designation                 | Dimension (mm) | Fig. |
|-----------------------------|----------------|------|
|                             | THOD           |      |
| <b>PRESET ER-JET 8x1.25</b> | M8x1.25        | 1    |
| <b>10x1.5</b>               | M10x1.5        | 1    |
| <b>12x1.75</b>              | M12x1.75       | 1    |
| <b>12x1.75L</b>             | M12x1.75       | 2    |
| <b>16x2</b>                 | M16x2          | 1    |
| <b>16x2L</b>                | M16x2          | 2    |
| <b>18x1.5</b>               | M18x1.5        | 1    |
| <b>18x1.5L</b>              | M18x1.5        | 2    |
| <b>22x1.5</b>               | M22x1.5        | 1    |
| <b>22x1.5L</b>              | M22x1.5        | 2    |
| <b>28x1.5</b>               | M28x1.5        | 1    |

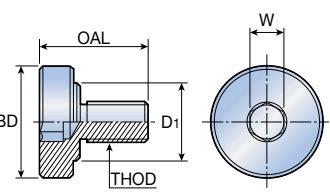
# M-CLAMP SCREW SEM

Lock screw DIN6367 for face mill arbors

|  | Designation                   | Dimension (mm) |      |    |    |    |
|-------------------------------------------------------------------------------------|-------------------------------|----------------|------|----|----|----|
|                                                                                     |                               | S.M.C          | THOD | BD | LH | LB |
|                                                                                     | <b>M8 CLAMP SCREW SEM 16</b>  | 16             | M8   | 20 | 6  | 16 |
|                                                                                     | <b>M10 CLAMP SCREW SEM 22</b> | 22             | M10  | 28 | 7  | 18 |
|                                                                                     | <b>M12 CLAMP SCREW SEM 27</b> | 27             | M12  | 35 | 8  | 22 |
|                                                                                     | <b>M16 CLAMP SCREW SEM 32</b> | 32             | M16  | 42 | 9  | 26 |
|                                                                                     | <b>M20 CLAMP SCREW SEM 40</b> | 40             | M20  | 52 | 10 | 30 |
|                                                                                     | <b>M24 CLAMP SCREW SEM 50</b> | 50             | M24  | 63 | 12 | 36 |
|                                                                                     |                               |                |      |    |    |    |

# MBA M

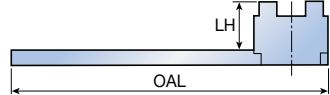
## Lock screw for FMA

|  | Designation   | Dimension (mm) |    |    |     |    |
|----------------------------------------------------------------------------------|---------------|----------------|----|----|-----|----|
|                                                                                  |               | THOD           | BD | D1 | OAL | W  |
|                                                                                  | <b>MBA M8</b> | M8x1.25        | 20 | 15 | 24  | 6  |
|                                                                                  | <b>M10</b>    | M10x1.5        | 28 | 18 | 28  | 8  |
|                                                                                  | <b>M12</b>    | M12x1.75       | 33 | 23 | 32  | 10 |
|                                                                                  | <b>M16</b>    | M16x2.0        | 40 | 23 | 40  | 14 |
|                                                                                  | <b>M20</b>    | M20x2.5        | 50 | 27 | 50  | 17 |
|                                                                                  |               |                |    |    |     |    |
|                                                                                  |               |                |    |    |     |    |
|                                                                                  |               |                |    |    |     |    |
|                                                                                  |               |                |    |    |     |    |

► Wrench for MBA screw: L-W □□

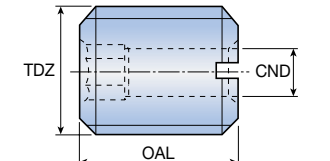
# WRENCH M-SEMC

## Wrench DIN6368 for face mill and combi shell mill arbors

|  | Designation              | Dimension (mm) |      |    |     |
|----------------------------------------------------------------------------------|--------------------------|----------------|------|----|-----|
|                                                                                  |                          | DRVS           | FTDZ | LH | OAL |
|                                                                                  | <b>WRENCH M8 SEMC 16</b> | 16             | M8   | 20 | 180 |
|                                                                                  | <b>M10 SEMC 22</b>       | 22             | M10  | 25 | 200 |
|                                                                                  | <b>M12 SEMC 27</b>       | 27             | M12  | 32 | 225 |
|                                                                                  | <b>M16 SEMC 32</b>       | 32             | M16  | 36 | 250 |
|                                                                                  | <b>M20 SEMC 40</b>       | 40             | M20  | 40 | 280 |
|                                                                                  | <b>M24 SEMC 50</b>       | 50             | M24  | 50 | 315 |
|                                                                                  |                          |                |      |    |     |
|                                                                                  |                          |                |      |    |     |
|                                                                                  |                          |                |      |    |     |

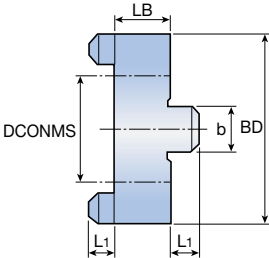
# PRESET SCREW

## SRKIN thermal shrink collets

|  | Designation                 | Dimension (mm) |     |     |                 |         |
|------------------------------------------------------------------------------------|-----------------------------|----------------|-----|-----|-----------------|---------|
|                                                                                    |                             | TDZ            | OAL | CND | Used for shanks | Hex key |
|                                                                                    | <b>PRESET SCREW M5x18 B</b> | M5             | 18  | 2.5 | EM E / SRKIN    | 2.5     |
|                                                                                    | <b>M6x20 B</b>              | M6             | 20  | 3.0 | EM E / SRKIN    | 3.0     |
|                                                                                    | <b>M8x20 B</b>              | M8             | 20  | 4.0 | EM E / SRKIN    | 4.0     |
|                                                                                    | <b>M10x18 B</b>             | M10            | 18  | 5.0 | EM E / SRKIN    | 5.0     |
|                                                                                    | <b>M12x18 B</b>             | M12            | 18  | 6.0 | EM E / SRKIN    | 6.0     |
|                                                                                    | <b>M16x20 B</b>             | M16            | 20  | 6.0 | EM E / SRKIN    | 6.0     |
|                                                                                    | <b>M16x25 B</b>             | M16            | 25  | 6.0 | SRKIN           | 6.0     |
|                                                                                    |                             |                |     |     |                 |         |

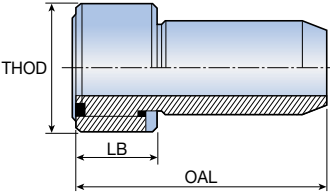
# D-RING SEMC

Driving ring DIN6366/1 for combi shell end mill holders

|  | Designation             | Dimension (mm) |    |    |    |     |
|----------------------------------------------------------------------------------|-------------------------|----------------|----|----|----|-----|
|                                                                                  |                         | DCONMS         | BD | LB | b  | L1  |
|                                                                                  | <b>16 D - RING SEMC</b> | 16             | 32 | 10 | 8  | 5.0 |
|                                                                                  | <b>22 D - RING SEMC</b> | 22             | 40 | 12 | 10 | 5.6 |
|                                                                                  | <b>27 D - RING SEMC</b> | 27             | 48 | 12 | 12 | 6.3 |
|                                                                                  | <b>32 D - RING SEMC</b> | 32             | 58 | 14 | 14 | 7.0 |
|                                                                                  | <b>40 D - RING SEMC</b> | 40             | 70 | 14 | 16 | 8.0 |
|                                                                                  | <b>50 D - RING SEMC</b> | 50             | 90 | 16 | 18 | 9.0 |
|                                                                                  |                         |                |    |    |    |     |
|                                                                                  |                         |                |    |    |    |     |
|                                                                                  |                         |                |    |    |    |     |

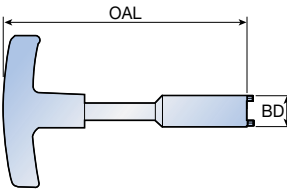
# COOLING TUBE HSK A

HSK A cooling tube

|  | Designation                  | Dimension (mm) |      |         |
|----------------------------------------------------------------------------------|------------------------------|----------------|------|---------|
|                                                                                  |                              | OAL            | LB   | THOD    |
|                                                                                  | <b>COOLING TUBE HSK A 50</b> | 33.0           | 9.5  | M16x1   |
|                                                                                  | <b>HSK A 63</b>              | 36.5           | 11.5 | M18x1   |
|                                                                                  | <b>HSK A 80</b>              | 40.0           | 13.5 | M20x1.5 |
|                                                                                  | <b>HSK A 100</b>             | 44.0           | 15.5 | M24x1.5 |
|                                                                                  |                              |                |      |         |
|                                                                                  |                              |                |      |         |
|                                                                                  |                              |                |      |         |
|                                                                                  |                              |                |      |         |

# WRENCH COOL TUBE HSK A

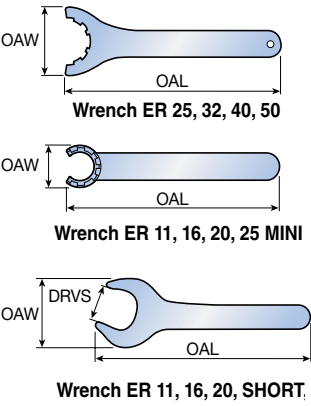
HSK A cooling tube wrench

|  | Designation                      | Dimension (mm) |     |
|-------------------------------------------------------------------------------------|----------------------------------|----------------|-----|
|                                                                                     |                                  | BD             | OAL |
|                                                                                     | <b>WRENCH COOL TUBE HSK A 50</b> | 15.0           | 120 |
|                                                                                     | <b>HSK A 63</b>                  | 17.0           | 122 |
|                                                                                     | <b>HSK A 80</b>                  | 18.5           | 136 |
|                                                                                     | <b>HSK A 100</b>                 | 22.0           | 141 |
|                                                                                     |                                  |                |     |
|                                                                                     |                                  |                |     |
|                                                                                     |                                  |                |     |

# WRENCH ER-MINI/SHORT

## ER wrench

DIN6499



| Designation             | Dimension (mm) |      |     |
|-------------------------|----------------|------|-----|
|                         | OAW            | DRVS | OAL |
| <b>WRENCH ER11 MINI</b> | 16.8           | -    | 95  |
| <b>ER11</b>             | 32.0           | 17   | 95  |
| <b>ER16 MINI</b>        | 22.5           | -    | 117 |
| <b>ER16</b>             | 42.8           | 25   | 143 |
| <b>ER20 MINI</b>        | 28.0           | -    | 128 |
| <b>ER20</b>             | 53.5           | 30   | 172 |
| <b>ER25 MINI</b>        | 29.0           | -    | 120 |
| <b>ER25</b>             | 70.0           | -    | 207 |
| <b>ER32</b>             | 78.0           | -    | 255 |
| <b>ER40</b>             | 95.0           | -    | 285 |
| <b>ER50</b>             | 110.0          | -    | 350 |
| <b>ER32 SHORT</b>       | 75.0           | 36   | 303 |
| <b>ER40 SHORT</b>       | 94.0           | 46   | 378 |
|                         |                |      |     |

# WRENCH ER11 SMS



## ER11 Tightening wrench

| Designation            | Dimension (mm) |     |
|------------------------|----------------|-----|
|                        | OAW            | OAL |
| <b>WRENCH ER11 SMS</b> | 25             | 100 |
|                        |                |     |
|                        |                |     |
|                        |                |     |
|                        |                |     |

# SPANNER TMC

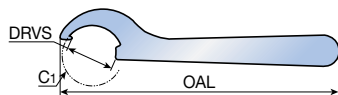
## NTMC milling chuck wrench

| Designation           | Dimension (mm) |       |
|-----------------------|----------------|-------|
|                       | OAW            | OAL   |
| <b>SPANNER TMC 20</b> | 15.8           | 84.1  |
| <b>TMC 25</b>         | 18.1           | 94.3  |
| <b>TMC 32</b>         | 21.7           | 109.1 |
| <b>TMC 42</b>         | 23.2           | 108.0 |
|                       |                |       |
|                       |                |       |

**TSK slim chuck wrench**



**Fig.1**



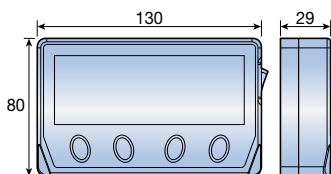
**Fig.2**

[illegible]

## TJS TSD DISPLAY

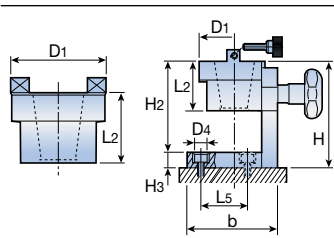


## RPM speed display for TYPHOON high-speed spindles

[illegible]

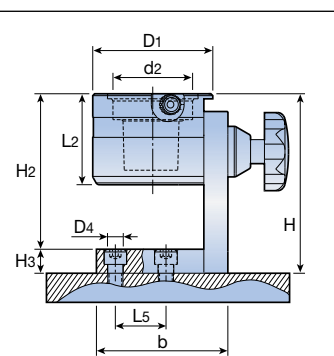
# TOOL CLAMP-ROTARY/FIX

Tool clamp fixture - ISO, DIN69871, BT MAS-403

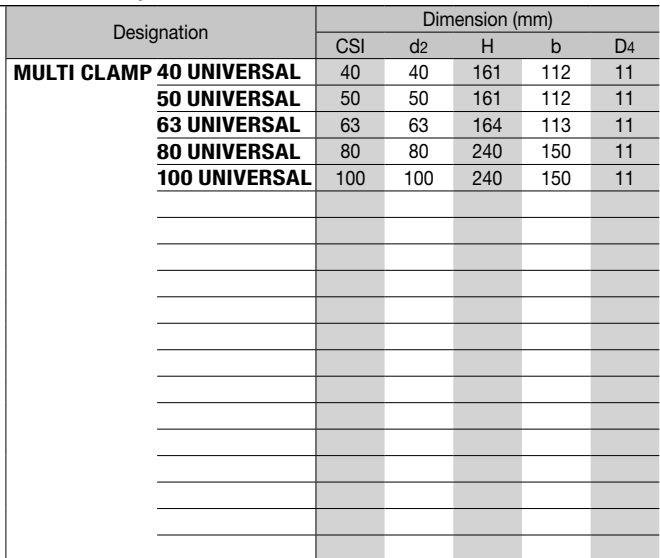
|  | Designation                 | Dimension (mm) |     |     |      |    |     |     |    |    |  |
|----------------------------------------------------------------------------------|-----------------------------|----------------|-----|-----|------|----|-----|-----|----|----|--|
|                                                                                  |                             | CSI            | b   | D1  | D4   | L2 | H   | H2  | H3 | L5 |  |
| <b>FIX</b>                                                                       | <b>TOOL CLAMP 30 ROTARY</b> | ROTARY         | 104 | 70  | 12.5 | 56 | 128 | 109 | 19 | 40 |  |
|                                                                                  | <b>40 ROTARY</b>            | ROTARY         | 104 | 82  | 12.5 | 56 | 128 | 109 | 19 | 40 |  |
|                                                                                  | <b>50 ROTARY</b>            | ROTARY         | 144 | 103 | 12.5 | 71 | 170 | 151 | 19 | 85 |  |
|                                                                                  | <b>30 FIX</b>               | FIX            | -   | 82  | -    | 58 | -   | -   | -  | -  |  |
|                                                                                  | <b>40 FIX</b>               | FIX            | -   | 82  | -    | 58 | -   | -   | -  | -  |  |
| <b>ROTARY</b>                                                                    | <b>50 FIX</b>               | FIX            | -   | 103 | -    | 71 | -   | -   | -  | -  |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |
|                                                                                  |                             |                |     |     |      |    |     |     |    |    |  |

# MULTI CLAMP C

C-ADAPTER rotary clamp

|  | Designation | Dimension (mm) |     |    |     |      |    |    |     |     |    |
|-----------------------------------------------------------------------------------|-------------|----------------|-----|----|-----|------|----|----|-----|-----|----|
|                                                                                   |             | SS             | b   | d2 | D1  | D4   | L2 | L5 | H   | H2  | H3 |
| <b>MULTI CLAMP C</b>                                                              | <b>C5</b>   | 50             | 104 | 50 | 82  | 12.5 | 72 | 40 | 142 | 123 | 19 |
|                                                                                   | <b>C6</b>   | 63             | 104 | 63 | 95  | 12.5 | 72 | 40 | 142 | 123 | 19 |
|                                                                                   | <b>C8</b>   | 80             | 104 | 80 | 130 | 12.5 | 90 | 85 | 178 | 159 | 19 |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |
|                                                                                   |             |                |     |    |     |      |    |    |     |     |    |

## Universal rotary tool clamping fixtures - for tapered shanks

[illegible]

# EASYLOCK T.C EU

Choose the correct wrench size.  
Mount it on the wrench holder.

Place the wrench on the collet chuck nut

Mount the Collet chuck into the unit spindle

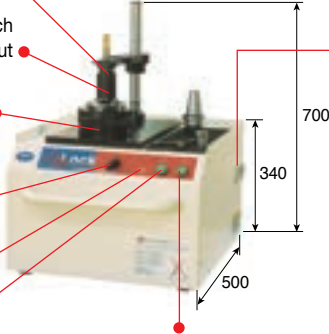
Torque selector

Power lamp

To unclamp - Push and hold in the "unclmap" button until the collet chuck is totally open

To clamp - Push and hold in the "clmap" button until the collet chuck is totally open

Ensure that main poser switch is on and that the power supply cable is connected



700  
340  
500

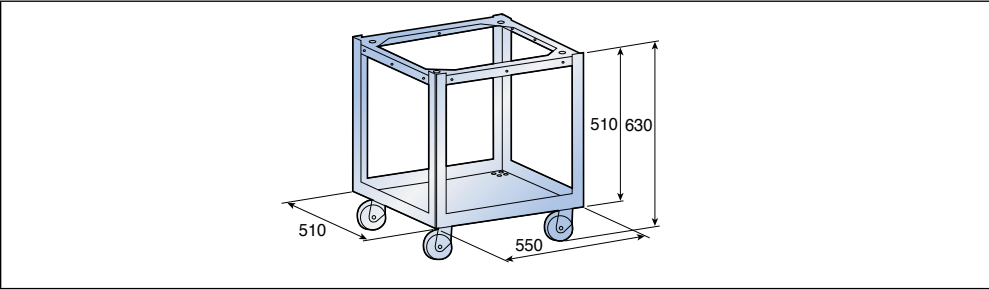
■ **Specifications**

- Motor : Phase 200/240V, 50/60HZ(1HP)
- Spindle : Taper #40, 50 HSK 63, 100
- Weight : Table model - 85kg  
Trolley (Optional) - 15kg

**Note:** Assemble the collet and cutting tools. By hand, place the nut onto the collet chuck.

| Designation            | TaeguTec No. | Accssories            |                        |
|------------------------|--------------|-----------------------|------------------------|
|                        |              | Standard              | Optional               |
| <b>EASYLOCK T.C EU</b> | 4651108      | TP50 AD 40 EASY       | EASY LOCK TROLLEY      |
|                        |              | WRENCH ER16 EASY LOCK | TP40 AD 30 EASY        |
|                        |              | WRENCH ER20 EASY LOCK | TP50 AD HSK 63 EASY    |
|                        |              | WRENCH ER25 EASY LOCK | TP50 AD HSK 100 EASY   |
|                        |              | WRENCH ER32 EASY LOCK | WRENCH ER50 EASY LOCK  |
|                        |              | WRENCH ER40 EASY LOCK | WRENCH TG100 OPEN EASY |

# EASYLOCK TROLLEY



| Designation             | TaeguTec No. |
|-------------------------|--------------|
| <b>EASYLOCK TROLLEY</b> | 4651109      |

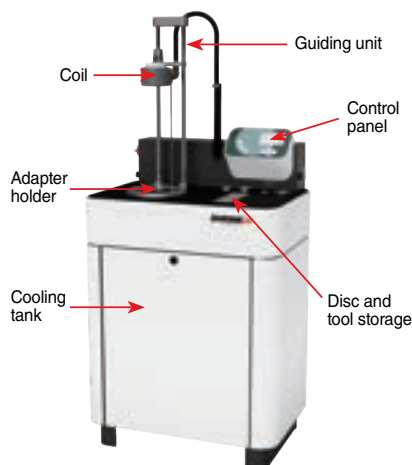


# AP Induction Unit

6266950 INDN AP UNIT EU / 6266951 INDN AP UNIT US

## Specifications

| Model                  | INDN AP UNIT                           |
|------------------------|----------------------------------------|
| Clamping range         | Carbide: Ø3-32 mm / HSS: Ø6-32 mm      |
| Max. tool length       | 400 mm                                 |
| Max. machine interface | HSK 100 / Taper #50                    |
| Cooling type           | Liquid, Capacity: 50 L                 |
| Max. cooling length    | 200 mm                                 |
| Cooling time           | 30 sec                                 |
| Dimensions             | 800x560x1720 mm                        |
| Weight                 | 120 kg                                 |
| Power supply           | EU: 400V 50Hz 16A<br>US: 480V 60Hz 15A |
| Power                  | 11 kW                                  |



## B.O.M

| Item                | Item No.  | Designation            | Q'ty |
|---------------------|-----------|------------------------|------|
| Clamping ring       | 6266972   | INDN CLAMP RING        | 1    |
| Cooling concentrate | 6266978   | COOLANT SYNERGY 905 1L | 1    |
| Stop disc           | See table | INDN AP DISC...        | 7    |
| Protective gloves   | -         | -                      | 1    |

► AP unit adapters and setting discs should be ordered separately

## AP unit multi-adapters:

- For the correct positioning of the chuck

| Item No. | Designation    | Used for                  |
|----------|----------------|---------------------------|
| 6266966  | INDN AP AD 32  | HSK 32                    |
| 6266967  | INDN AP AD 40  | HSK 40 / C4               |
| 6266968  | INDN AP AD 50  | HSK 50 / C5 / Taper #30   |
| 6266969  | INDN AP AD 63  | HSK 63 / C6 / Taper #40   |
| 6266970  | INDN AP AD 80  | HSK 80 / C8 / Taper #45   |
| 6266965  | INDN AP AD 100 | HSK 100 / C10 / Taper #50 |

► Should be ordered separately



AP unit adapter



AP unit stop discs

## AP unit stop discs:

- To avoid coil-tool shank contact

| Item No. | Designation            | Clamping Dia. (mm)  | Item No. | Designation              | Clamping Dia. (mm) |
|----------|------------------------|---------------------|----------|--------------------------|--------------------|
| 6266963  | INDN AP DISC 3-5 #0    | SRKIN Ø3-5 / SRK Ø6 | 6266953  | INDN AP SPLIT #0         | T shape Ø3-5       |
| 6266964  | INDN AP DISC 6-12 #1   | SRKIN Ø6-12         | 6266954  | INDN AP SPLIT #1         | T shape Ø6-12      |
| 6266962  | INDN AP DISC 14-20 #2  | SRKIN Ø14-22        | 6266955  | INDN AP SPLIT #2         | T shape Ø14-22     |
| 6266952  | INDN AP DISC 25-32 #3  | SRKIN Ø25-32        | 6266956  | INDN AP SPLIT #3         | T shape Ø25-32     |
| 6266960  | INDN AP DISC SRK3-5 #5 | SRK Ø3-5            | 6266957  | INDN AP DISC SHORT 12-22 | Short Ø12-22       |
| 6266961  | INDN AP DISC SRK8 #8   | SRK Ø8              |          |                          |                    |
| 6266959  | INDN AP DISC SRK12 #12 | SRK Ø10-12          |          |                          |                    |

► Should be ordered separately

► Unit box included

# BS Induction Unit

6266979 INDN BS UNIT EU / 6266980 INDN BS UNIT US

## Specifications

| Model                  | INDN BS UNIT                           |
|------------------------|----------------------------------------|
| Clamping range         | Carbide: Ø3-32 mm                      |
| Max. tool length       | 400 mm                                 |
| Max. machine interface | HSK 100 / Taper #50                    |
| Cooling type           | Air                                    |
| Dimensions             | 320x400x840 mm                         |
| Weight                 | 20 kg                                  |
| Power supply           | EU: 400V 50Hz 16A<br>US: 480V 60Hz 15A |
| Power                  | 8 kW                                   |



## B.O.M

| Item              | Item No.  | Designation           | Q'ty |
|-------------------|-----------|-----------------------|------|
| Clamping ring     | 6267011   | INDN BS CLAMP RING    | 1    |
| Parameter sticker | 6267014   | INDN BS STICKER SRKIN | 1    |
| Stop disc         | See table | INDN BS DISC...       | 5    |
| Blank magnets     | -         | MAGNET BLANK          | 12   |
| Barcode scanner   | -         | -                     | 1    |
| Protective gloves | -         | -                     | 1    |

► BS unit adapters, SRK parameter sticker and setting discs should be ordered separately.

## BS unit adapters:

- For the correct positioning of the chuck

| Item No. | Designation          | Used for  |
|----------|----------------------|-----------|
| 6267001  | INDN BS AD HSK 32    | HSK 32    |
| 6267002  | INDN BS AD HSK 40    | HSK 40    |
| 6267003  | INDN BS AD HSK 50    | HSK 50    |
| 6267004  | INDN BS AD HSK 63    | HSK 63    |
| 6267005  | INDN BS AD HSK 80    | HSK 80    |
| 6266999  | INDN BS AD HSK 100   | HSK 100   |
| 6266994  | INDN BS AD C3        | C3        |
| 6266995  | INDN BS AD C4        | C4        |
| 6266996  | INDN BS AD C5        | C5        |
| 6266997  | INDN BS AD C6        | C6        |
| 6266998  | INDN BS AD C8        | C8        |
| 6267006  | INDN BS AD TAPER #30 | Taper #30 |
| 6267008  | INDN BS AD TAPER #40 | Taper #40 |
| 6267010  | INDN BS AD TAPER #50 | Taper #50 |

► Should be ordered separately

## SRK parameter sticker:

| Item No. | Designation         |
|----------|---------------------|
| 6267013  | INDN BS STICKER SRK |

► Should be ordered separately

## BS unit stop discs:

- To avoid coil-tool shank contact

| Item No. | Designation           | Clamping Dia. (mm) |
|----------|-----------------------|--------------------|
| 6266993  | INDN BS DISC 6-8 #1   | SRKIN Ø6-8         |
| 6266988  | INDN BS DISC 10-14 #2 | SRKIN Ø10-14       |
| 6266990  | INDN BS DISC 16-18 #3 | SRKIN Ø16-18       |
| 6266991  | INDN BS DISC 20 #4    | SRKIN Ø20          |
| 6266992  | INDN BS DISC 25-32 #5 | SRKIN Ø25-32       |

► Unit box included

| Item No. | Designation            | Clamping Dia. (mm) |
|----------|------------------------|--------------------|
| 6266983  | INDN BS DISC SRK3 #6   | SRK Ø3             |
| 6266984  | INDN BS DISC SRK4 #7   | SRK Ø4             |
| 6266985  | INDN BS DISC SRK5 #8   | SRK Ø5             |
| 6266986  | INDN BS DISC SRK6 #9   | SRK Ø6             |
| 6266987  | INDN BS DISC SRK8 #10  | SRK Ø8             |
| 6266981  | INDN BS DISC SRK10 #11 | SRK Ø10            |
| 6266982  | INDN BS DISC SRK12 #12 | SRK Ø12            |

► Should be ordered separately

# Induction unit setting discs

| Item No. | Designation          | Tool Dia. (mm) | Item No. | Designation          | Tool Dia. (mm) |
|----------|----------------------|----------------|----------|----------------------|----------------|
| 6267028  | INDN SETTING DISC 3  | 3              | 6267023  | INDN SETTING DISC 14 | 14             |
| 6267033  | INDN SETTING DISC 4  | 4              | 6267024  | INDN SETTING DISC 16 | 16             |
| 6267034  | INDN SETTING DISC 5  | 5              | 6267025  | INDN SETTING DISC 18 | 18             |
| 6267037  | INDN SETTING DISC 6  | 6              | 6267026  | INDN SETTING DISC 20 | 20             |
| 6267038  | INDN SETTING DISC 8  | 8              | 6267027  | INDN SETTING DISC 25 | 25             |
| 6267021  | INDN SETTING DISC 10 | 10             | 6267032  | INDN SETTING DISC 32 | 32             |
| 6267022  | INDN SETTING DISC 12 | 12             |          |                      |                |

► Should be ordered separately

## Requirements

- 16A 5-pin industrial socket for AP and BS units



- G3/8 fittings only for AP unit to connect 4 bar air

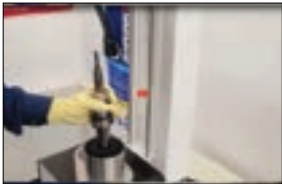


## Installation & Operation video

- AP induction unit



- BS induction unit



# Technical Data

## ► ER-SEAL collet

### ■ Application

ER collets are used for applications requiring through coolant, as well as for standard cutting tools such as drills, boring bars, end mills, reamers, taps and special tools.

They provide an effective solution for accurate controlled coolant flow.

Front sealing collets are available for advanced high speed machines with through coolant spindles/turrets.

They provide maximum performance, high cutting speeds, extended tool life and high quality surface finish.

### ■ Features

- A revolutionary high precision front sealing collet with 1.00mm collapsibility that has through coolant capability
- Increased machining efficiency
- Extended tool life
- Has powerful gripping and parallel clamping
- Front sealing provides protection from contamination
- Fast chip removal from work piece

### ■ Advantages

- High-pressure coolant supply up to 100 bar
- Eliminates coolant flow interference

### ■ Notes

- For maximum security and clamping power, the cutting tool shank must be inserted into the collet to a minimum depth of 2 x shank diameter
- Suitable for all shank standards

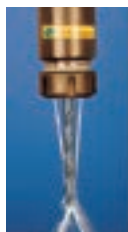
## ► TaeguTec ER coolant sealed collet

### ■ Two types:



Oil hole collet: ER-SEAL

For straight shank cutting tools with internal coolant supply



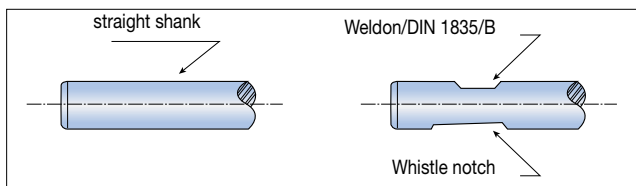
JET2 collet: ER-SEAL-JET

With angular double nozzle.

Coolant flow is direct to the cutting edge

- For use with standard straight shank cutting tools (Without coolant hole)

## ► Shank standards



# Technical Data

## ► ER - Top clamping nut DIN6499

### ■ Description

The friction ER Nut has a unique two piece exclusive friction mechanism combining radial and angular self-centering movements.

### ■ Features

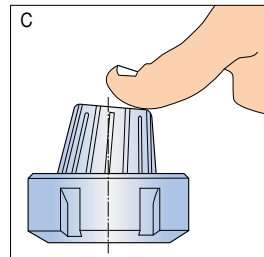
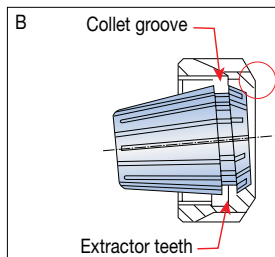
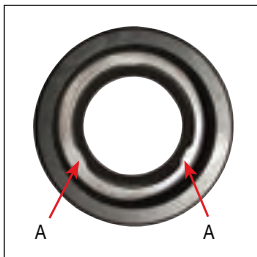
- Unique two piece friction bearing
- Radial and angular float for better concentricity
- Powerful gripping force, 50-100% higher than standard ER nut due to the friction bearing mechanism
- Balanced for higher spindle speed due to unique extractor teeth design
- Compact design: General dimensions and size range are the same as the standard nut sealed design for use with sealed collets.

### ■ Operation

To insert collet: Always assemble the collet into the nut before mounting onto the collet chuck.

### ■ Inserting procedure

Insert the collet slantwise, fitting the two protruding extractor teeth (A) into the collet groove (B).  
Place the two parts onto a clean and horizontal surface.  
Press down with your thumb on the back end of the collet until it clicks into place (C).



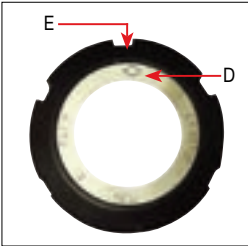
### ■ Important

Never insert the collet parallel to the extractor ring. This will chip or break the teeth of the extractor.  
When unclamping the nut, the collet will self release from the chuck by means of the extractor teeth.

# Technical Data

## ► ER - Top clamping nut DIN6499

- Extracting procedure
  - ➊ Align the diamond-shaped engraved logo which is on the silver ring (D) to any of the key slots (E) of the nut.
  - ➋ Place the nut with the collet facing down on a clean and horizontal work surface.
  - ➌ Insert a screwdriver vertically between the nut slots and the collet - on the reverse side of the diamond shaped engraved logo (D).
  - ➍ Tilt the screwdriver outwards while helping the extraction by pushing the back of the collet in the opposite direction (F).



### Note:

For maximum performance the clamping nut thread and collet taper must be cleaned and oiled before use.

**Recommended clamping torque for standard ER & ER-Top clamping nut.**

| Nut type | Kg × m |
|----------|--------|
| ER-11    | 5      |
| ER-11M   | 3      |
| ER-16    | 7      |
| ER-16M   | 4      |
| ER-20    | 12     |
| ER-20M   | 8      |
| ER-25    | 20     |
| ER-32    | 22     |
| ER-40    | 25     |
| ER-50    | 35     |

### Important:

The torque is calculated to suit the maximum diameter capacity of each collet. The torque should be gradually reduced when used with a smaller shank size.

# Technical Data

## ► TSK slim collet chuck

- Features & advantages
  - Excellent accuracy & good gripping power by gentle taper angle (ER collet : 8°, TSK collet : 4°)
  - Slim design for deep and cavity machining
  - Suitable on high speed machining
  - Variety of TSK collets (Normal & coolant type)
  - General machining using drill & end mill
- Application
  - General machining using drill & end mill
  - High speed machining for mold & die industry
  - Accurate machining using reamer & end mill
- How to assemble the collet with a nut



a. Assembly device  
(Optional, sold separately)



b. Nut



c. Collet

- 1 Insert the back end of the collet (c) into the assembly device (a)
- 2 Insert the combined part (a+c) in the nut (b)
- 3 Pluck out the assembly device (a) from the remaining part (b+c)



| a. Assembly device | Designation                    |
|--------------------|--------------------------------|
|                    | TSK 06, TSK 10, TSK 16, TSK 25 |

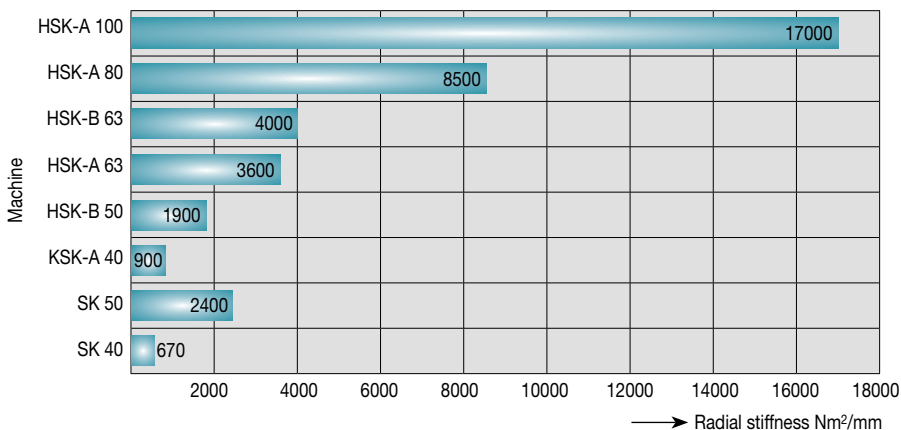
# Technical Data

## ► HSK (DIN69893) system

### ■ Features

- DIN standard
- For high speed machining
- Size: #32, 40, 50, 63, 100
- For A.T.C. & manual machine
- Double face contact
- High stiffness

## ► Radial stiffness of different machine tool interface

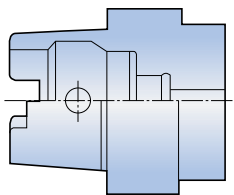
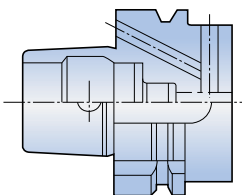
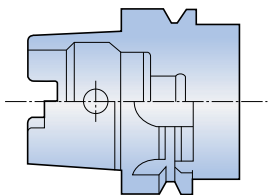


## ► Type

■ A type: Automatic tool change

■ B type: With coolant through face

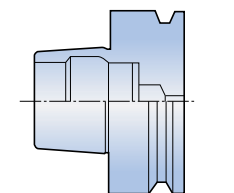
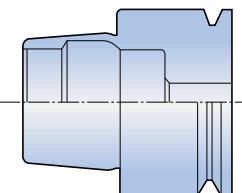
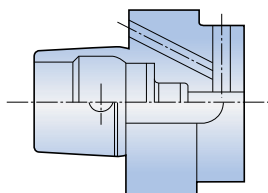
■ C type: Manual clamp



■ D type: With coolant through face

■ E type: Super high speed

■ F type: Ultra high speed





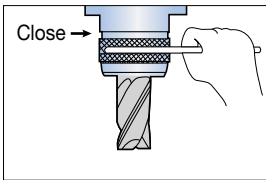
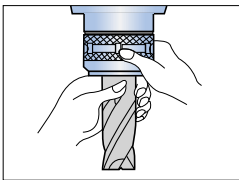
# Technical Data

## ► Milling chuck

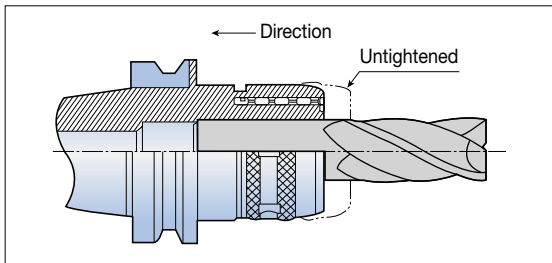
- Exceptional gripping power and simple operation

- Torque

| Type    | Torque (kgf•m) |
|---------|----------------|
| NTMC 25 | 180            |
| NTMC 32 | 360            |
| NTMC 42 | 520            |

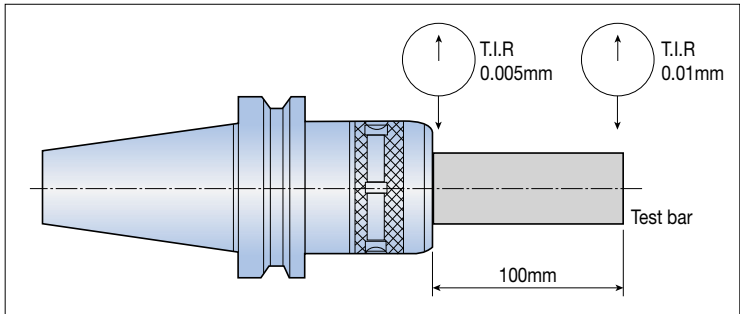


Tighten slightly when collar is close to body (Avoid hammering)



- Improved accuracy prolongs tool life

The accuracy and low runout has been achieved by utilizing precise grinding and spiral laser slitting to avoid damage and tool distortion.



## ► Hydraulic chuck

### ■ Tool Fastening

- As shown in Figure 1, after inserting the tool while observing the Lmax and Lmin of the hydraulic chuck, tighten the clamping screw by rotating it clockwise by the specified torque value.

### ■ Tool Releasing

- Remove the tool by rotating the clamping screw counter clockwise approximately 3-4 times.

### ■ Notice

1. Before tightening the tool, remove dust from the inside of the hydraulic chuck and the tool shank, and ensure they are dry and clean. This will improve tool runout and clamping force after fastening.
2. The minimum insertion depth of the tool, Lmin, must be observed when in use.  
This prevents changes in the hydraulic chuck's internal diameter or loss of hydraulic oil.
3. Clamping screws must be fully locked to the recommended torque value.  
This prevents tool breakage, loss of hydraulic oil, and ensures optimal machining performance.
4. A cylindrical shank tool with h6 tolerance is recommended to ensure clamping force.
5. Weldon shank tools must be tightened using collets to prevent changes in the hydraulic chuck's internal diameter and damage.
6. If not used for long periods of time, tools should be removed and stored in a clean condition to minimize loss of hydraulic oil.
7. The clamping screw must not be tightened without the tool inserted to prevent changes in the hydraulic chuck's internal diameter and damage.
8. The vent bolt must not be disassembled by the customer.

Figure 1. Tool structure

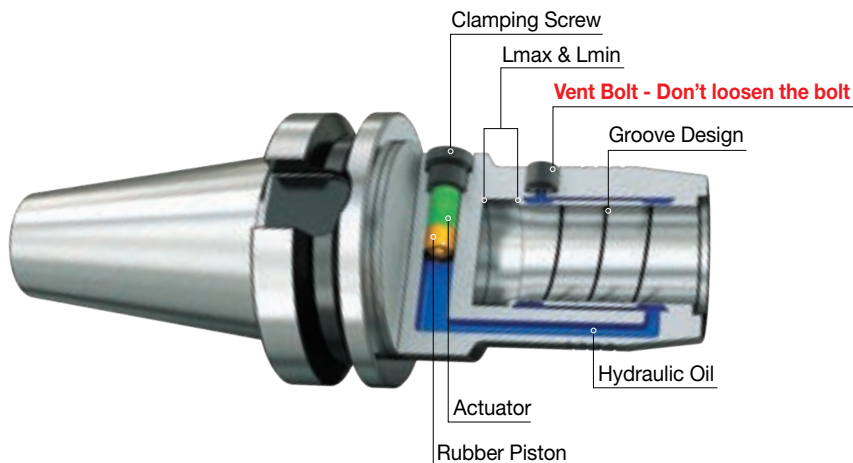


Table 1. Tool insertion minimum and maximum depth

| Inner diameter Ø(mm)                                                                     | Lmin (mm) | Lmax (mm) |
|------------------------------------------------------------------------------------------|-----------|-----------|
| 6                                                                                        | 27.5      | 37.5      |
| 8                                                                                        | 27.5      | 37.5      |
| 10                                                                                       | 32.5      | 42.5      |
| 12                                                                                       | 37.5      | 47.5      |
| 14                                                                                       | 37.5      | 47.5      |
| 16                                                                                       | 42.5      | 52.5      |
| 18                                                                                       | 42.5      | 52.5      |
| 20                                                                                       | 42.5      | 52.5      |
| 25                                                                                       | 51        | 61        |
| 32                                                                                       | 55        | 65        |
| Only for THCG & THCS product lines.<br>Must check the specification<br>for each product. |           |           |

Table 2. Clamping screw recommended tightening torque

| Inner diameter Ø(mm) | Tightening torque (N·m) |
|----------------------|-------------------------|
| All diameter         | 5.5                     |

Table 3. Clamping screw wrench size

| Inner diameter Ø(mm) | Wrench size (mm) |
|----------------------|------------------|
| 6-18                 | 4                |
| 20-32                | 5                |



Table 4. Tool clamping force

| Inner diameter Ø(mm) | Tightening torque (N·m) |
|----------------------|-------------------------|
| 6                    | 16                      |
| 8                    | 23                      |
| 10                   | 45                      |
| 12                   | 90                      |
| 14                   | 110                     |
| 16                   | 185                     |
| 18                   | 280                     |
| 20                   | 430                     |
| 25                   | 650                     |
| 32                   | 900                     |

► Thermal T-SHRINK chucking system



► T-SHRINK chucking system

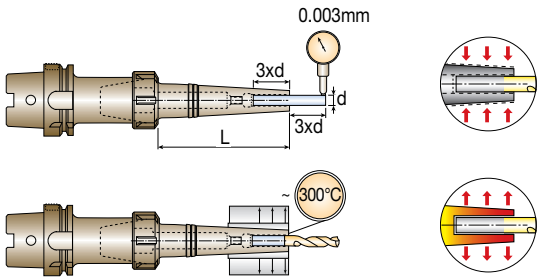
The thermal T-SHRINK ER collet chucking system is an enhancement to the existing popular ER system. The T-SHRINK collets utilize the thermal shrink phenomena for rigid clamping of solid carbide cutters. This new system provides higher torque, precision runout and better repeatability. The T-SHRINK collets with their slim design and different projection length allows the user to reach into deeper cavities and perform narrow milling applications. TaeguTec offers a complete system for T-SHRINK ER collets, including a uniquely designed heating unit with a portable heating handle. The unit is equipped with a high-tech temperature control for easy and practical use at the machining center or in the tool room.



■ For carbide tools only



| L(mm) | Max. T.I.R |
|-------|------------|
| 35    | 7 $\mu$ m  |
| 60    | 9 $\mu$ m  |
| 85    | 10 $\mu$ m |



## ► GTI-Tap attachment

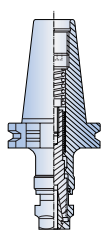
### ■ Description

Short tap chucks for ER collets

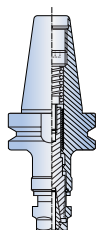


### ■ Application

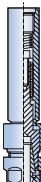
Axial-float/tension/compression type for CNC milling machines and lathes with reversing motors and rigid tapping



DIN 69871



BT MAS-403



Straight shank

### ■ Features

- Compensates for machine feed and tap pitch variance
- Floating mechanism compensates for misalignment between tap and workpiece
- Right and left-hands tapping

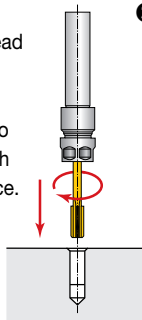
### ■ Advantages

- Practical and efficient tap holding by the ER spring collet without using drive jaw
- Compact design for minimal clearance applications
- Heavy-duty design for high torque drive ensures the same accuracy as the tap itself

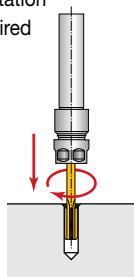
### ■ Operation

For through and blind hole tapping

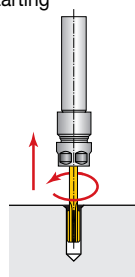
- ①** Enter feed rate according to thread pitch (or 1-2% lower), and set spindle to starting point with 0.08mm clearance.



- ②** Start spindle forward with right hand rotation until reaching desired depth.

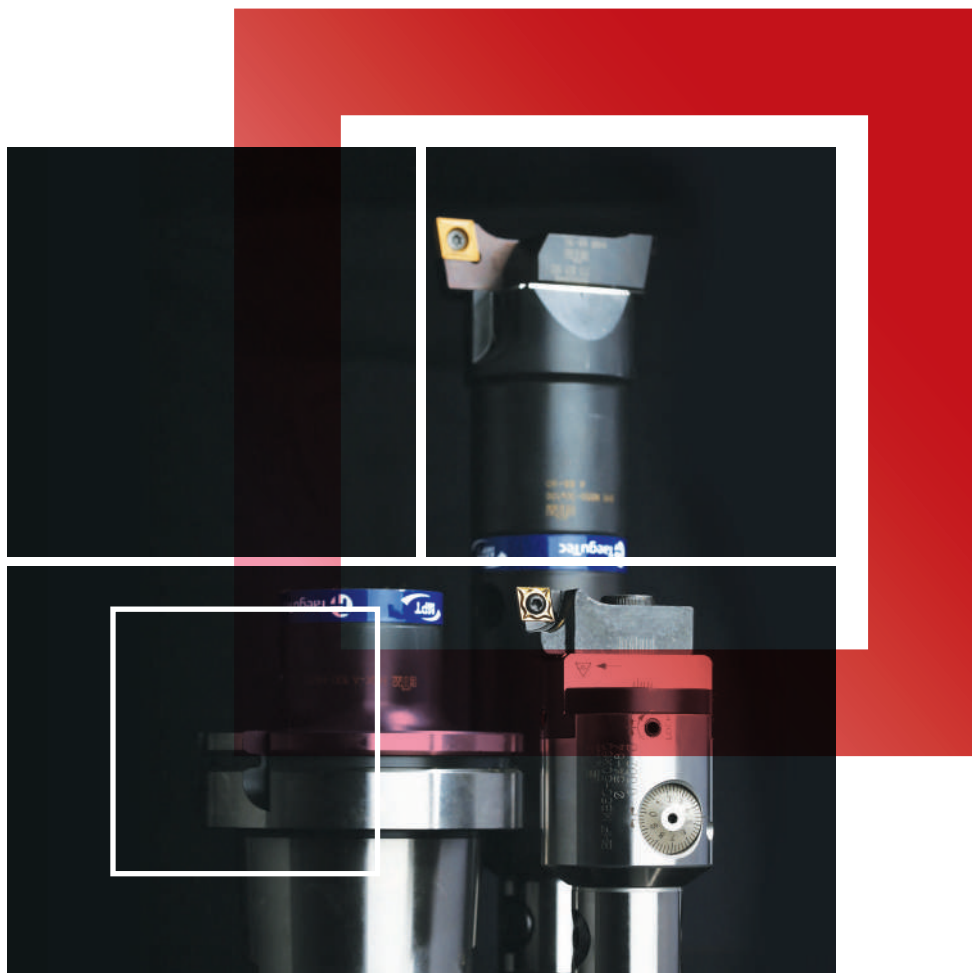


- ③** Stop feed and rotation and reverse to starting point.



# MPT

MODULAR **P**RECISION **T**OOLING



## Modular Precision Tooling

The Taegutec logo is located in the bottom right corner. It consists of the word "TAEGUTEC" in a white, sans-serif font, arched over a stylized white graphic that resembles a large, bold letter "H" or a series of parallel lines forming a circular shape.This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## Guide to Icons



➤ Insert Page



➤ Spare Parts Page



➤ Toolholders Page



➤ Slide Page



➤ Cutting Condition Page

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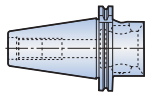


# Tool Selection Guide

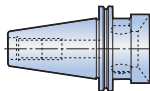
MPT system

## Shanks

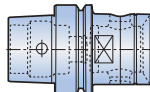
SKA



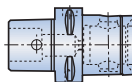
CATM



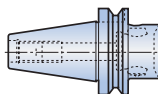
HSK



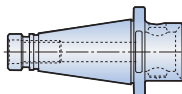
C MB



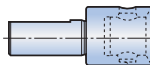
BT/BT-FC



ISOM/ISO



ST

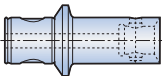


## Extensions and reducers

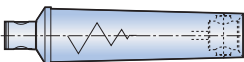
EX  H16



RE  H17



RE AVI  H8

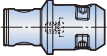


# Tool Selection Guide

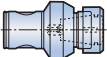
MPT system

## Toolholders

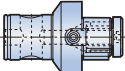
EMH  H19



CC  H20



SMH  H21



DC  H22



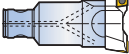
BLANK  H22



## Boring heads

**Rough boring heads**

BHR  H23

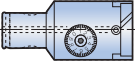


**Fine boring heads**

BHE  H27

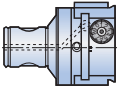


BHF  H31



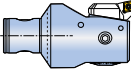
 H37

BHF 50,63,80

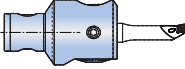


 H45

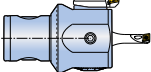
BSFD MB A-G



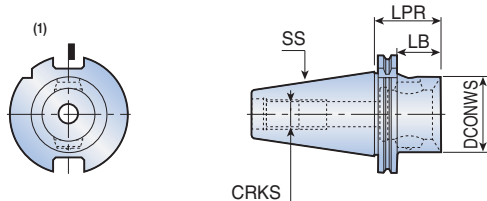
BSFD MB-H



BSFD-V MB-I



### SK shank with MB connection



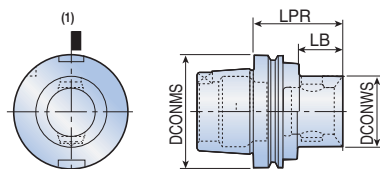
DIN 69871- AD / ISO 7388/1 MB

[illegible]

► <sup>(1)</sup> Cutting edge position

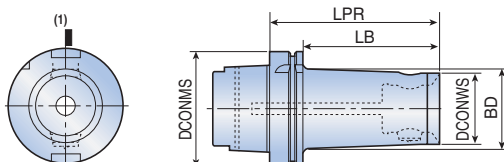
► <sup>(1)</sup> Cutting edge position

### HSK shank with MB connection



HSK DIN 69893 MB

**Fig.1**



HSK DIN 69893-A MB

**Fig.2**

[illegible]

► <sup>(1)</sup> Cutting edge position

Technical drawing of a double-ported hydraulic cylinder. The drawing shows a side view of the cylinder with two ports. Key dimensions are labeled: LPR (Total Length), LB (Bore Length), DCONMS (Maximum Diameter), and DCONWS (Minimum Diameter).

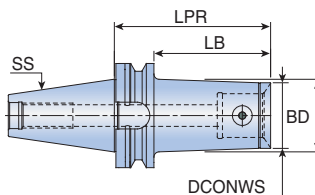
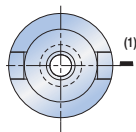


**TaeguTec**  
Member IMC Group

► <sup>(1)</sup> Cutting edge position

### BT-FC shanks with MB connection

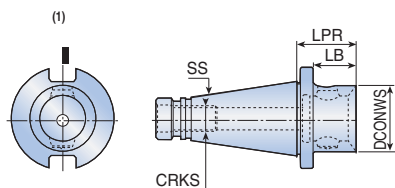
DIN6357

[illegible]

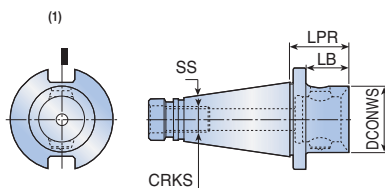
► <sup>(1)</sup> Cutting edge position



### ISO Taper shank with MB connection



**Fig.1**



**Fig.2**

[illegible]

► <sup>(1)</sup> Cutting edge position

[illegible]

**TaeguTec**  
Member IMC Group

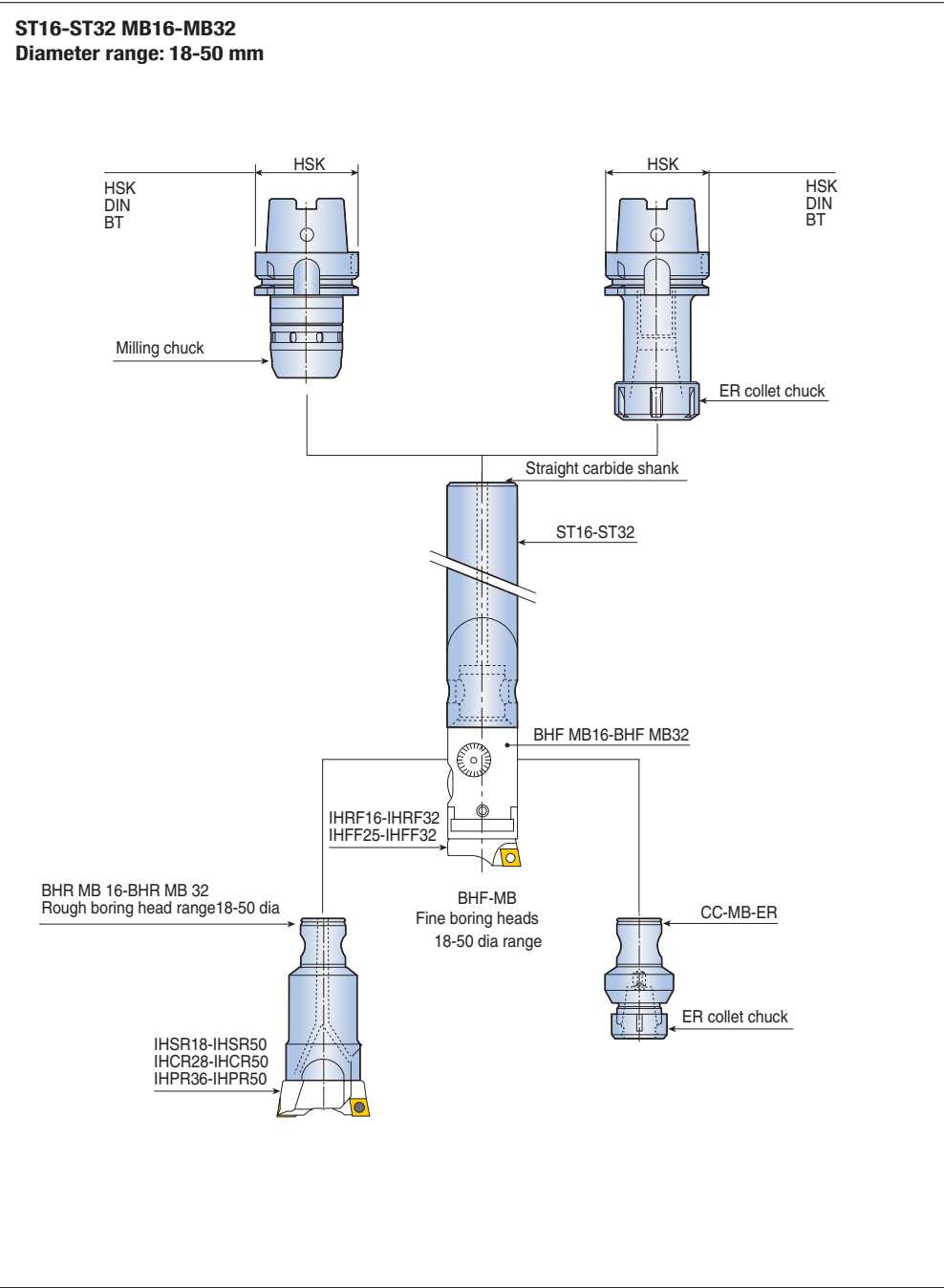
Technical drawing of a shaft assembly. The drawing shows a shaft with a blue finish, a central hole, and a keyway. The dimensions are labeled as follows:

- LF(assembly)**: Total length of the assembly.
- Lmax**: Maximum length of the shaft.
- OAL**: Overall length of the shaft.
- DCONWS**: Diameter of the shaft.

**ADVANCECUTTING**  
TaeguTec

ST-MB straight carbide shank with MB connection assembly options

ST16-ST32 MB16-MB32  
Diameter range: 18-50 mm



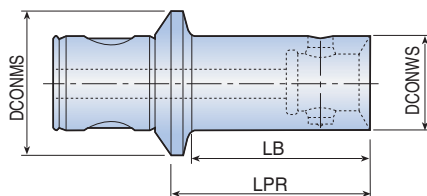
Technical drawing of a cylindrical component. The drawing shows a side view of the cylinder with a flange on the left. Dimensions are indicated: DCONMS is the diameter of the flange, LPR is the length of the main cylinder body, and DCONWS is the diameter of the main cylinder body. The drawing includes a centerline and a dashed line indicating the internal structure of the cylinder.

**ADVANCECUTTING**  
TaequTec

## RE MB-MB

## Extensions and Reducers

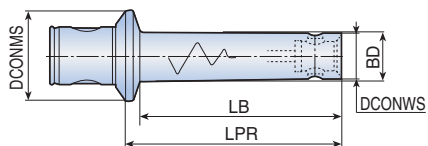
### Reducers with MB connection

[illegible]

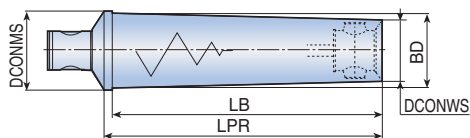
## RE MB-AVI

## Extensions and Reducers

### Carbide core reducers with MB connection



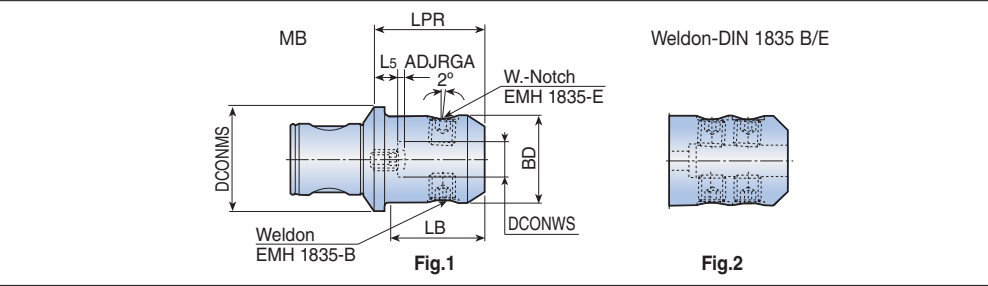
**Fig.1**



**Fig.2**

[illegible]

Weldon holder with MB connection



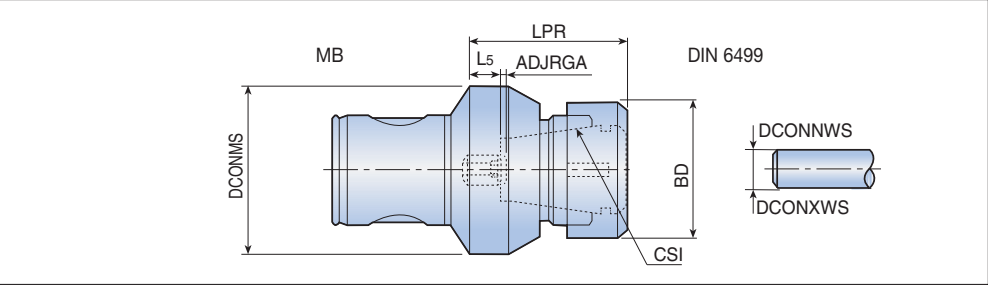
| Designation | Dimension (mm) |        |    |     |      |    |        |  Kg | Fig. |
|-------------|----------------|--------|----|-----|------|----|--------|--------------------------------------------------------------------------------------|------|
|             | DCONMS         | DCONWS | BD | LPR | LB   | L5 | ADJRGA |                                                                                      |      |
| EMH MB50-6  | MB50           | 6      | 25 | 44  | 32.5 | 7  | 2      | 0.5                                                                                  | 1    |
| MB50-8      | MB50           | 8      | 28 | 44  | 33   | 7  | 2      | 0.5                                                                                  | 1    |
| MB50-10     | MB50           | 10     | 35 | 52  | 42   | 11 | 3      | 0.7                                                                                  | 1    |
| MB50-12     | MB50           | 12     | 42 | 57  | 48   | 11 | 3      | 0.8                                                                                  | 1    |
| MB50-14     | MB50           | 14     | 42 | 57  | 48   | 11 | 3      | 0.8                                                                                  | 1    |
| MB50-16     | MB50           | 16     | 48 | 67  | 61   | 17 | 4      | 1.1                                                                                  | 1    |
| MB50-20     | MB50           | 20     | 51 | 67  | -    | 16 | 4      | 1.1                                                                                  | 1    |
| MB50-25     | MB50           | 25     | 63 | 80  | -    | 22 | 4      | 1.2                                                                                  | 2    |
| MB63-16     | MB63           | 16     | 48 | 64  | 53   | 14 | 4      | 1.4                                                                                  | 1    |
| MB63-20     | MB63           | 20     | 52 | 66  | 56   | 14 | 4      | 1.5                                                                                  | 1    |
| MB63-25     | MB63           | 25     | 64 | 74  | -    | 16 | 4      | 2.1                                                                                  | 2    |
| MB63-32     | MB63           | 32     | 72 | 76  | -    | 14 | 4      | 2.5                                                                                  | 2    |
| MB80-40     | MB80           | 40     | 80 | 83  | -    | 12 | 4      | 3.2                                                                                  | 2    |

Spare Parts

| Designation  | Preset Screw                                                                        | Lock Screw                                                                          |
|--------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|              |  |  |
| EMH MB50-6   | BH EMH PRST M8X8B                                                                   | SR M6X10 DIN1835B                                                                   |
| MB50-8       | BH EMH PRST M8X8B                                                                   | BH EMH M8X9.5                                                                       |
| MB50-10      | BH EMH PRST M8X10B                                                                  | BH EMH M10X11.5                                                                     |
| MB50-12      | BH EMH PRST M8X10B                                                                  | BH EMH M12X15.5                                                                     |
| MB50-14      | BH EMH PRST M8X10B                                                                  | BH EMH M12X15.5                                                                     |
| MB50/MB63-16 | BH EMH PRST M12X16B                                                                 | BH EMH M14X15.5                                                                     |
| MB50/MB63-20 | BH EMH PRST M12X16B                                                                 | BH EMH M16X15.5                                                                     |
| MB50/MB63-25 | BH EMH PRST M16X16B                                                                 | BH EMH M18X19.5                                                                     |
| MB63-32      | BH EMH PRST M16X16B                                                                 | BH EMH M20X19.5                                                                     |
| MB80-40      | -                                                                                   | BH EMH M20X19.5                                                                     |



ER Collet chucks with MB connection

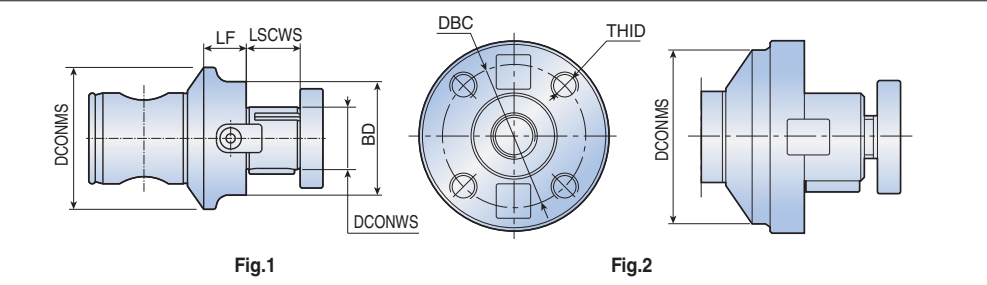


| Designation   | Dimension (mm) |      |         |         |    |     |        |  Kg |
|---------------|----------------|------|---------|---------|----|-----|--------|----------------------------------------------------------------------------------------|
|               | DCONMS         | CSI  | DCONNWS | DCONXWS | BD | LPR | ADJRGA |                                                                                        |
| CC MB16 ER11M | MB16           | ER11 | 0.5     | 7.0     | 16 | 25  | 2.5    | 0.03                                                                                   |
| MB20 ER16M    | MB20           | ER16 | 0.5     | 10.0    | 22 | 32  | 1.0    | 0.06                                                                                   |
| MB32 ER25M    | MB32           | ER25 | 1.0     | 16.0    | 35 | 42  | 1.5    | 0.25                                                                                   |
| MB40 ER25     | MB40           | ER25 | 1.0     | 16.0    | 42 | 45  | 5.0    | 0.25                                                                                   |
| MB50 ER25     | MB50           | ER25 | 1.0     | 16.0    | 42 | 48  | 7.0    | 0.70                                                                                   |
| MB50 ER32     | MB50           | ER32 | 2.0     | 20.0    | 50 | 59  | 7.0    | 1.00                                                                                   |
| MB63 ER32     | MB63           | ER32 | 2.0     | 20.0    | 50 | 59  | 12     | 1.30                                                                                   |
|               |                |      |         |         |    |     |        |                                                                                        |
|               |                |      |         |         |    |     |        |                                                                                        |
|               |                |      |         |         |    |     |        |                                                                                        |
|               |                |      |         |         |    |     |        |                                                                                        |
|               |                |      |         |         |    |     |        |                                                                                        |

Spare Parts

| Designation   | Press Screw                                                                         | ER Nut                                                                              | ER Wrench                                                                           |
|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|               |  |  |  |
| CC MB16-ER11M | CC MB16 SCREW                                                                       | NUT ER11 MINI                                                                       | WRENCH ER11 MINI                                                                    |
| MB20-ER16M    | CC MB20 SCREW                                                                       | NUT ER16 MINI                                                                       | WRENCH ER16 MINI                                                                    |
| MB32-ER25M    | CC MB32 SCREW                                                                       | NUT ER25 MINI                                                                       | WRENCH ER25 MINI                                                                    |
| MB40-ER25     | CC MB40 SCREW                                                                       | NUT ER25 TOP                                                                        | WRENCH ER25                                                                         |
| MB50-ER25     | CC MB50 SCREW                                                                       | NUT ER25 TOP                                                                        | WRENCH ER25                                                                         |
| MB50-ER32     | CC MB50 SCREW                                                                       | NUT ER32 TOP                                                                        | WRENCH ER32                                                                         |
| MB63-ER32     | CC MB63 SCREW                                                                       | NUT ER32 TOP                                                                        | WRENCH ER32                                                                         |
|               |                                                                                     |                                                                                     |                                                                                     |
|               |                                                                                     |                                                                                     |                                                                                     |
|               |                                                                                     |                                                                                     |                                                                                     |

Shell mill holders with MB connection



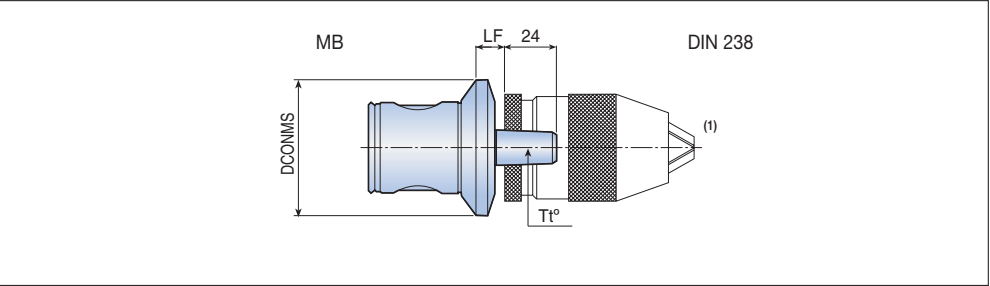
| Designation                  | Dimension (mm) |        |       |       |      |      |       | Fig. | Kg   |
|------------------------------|----------------|--------|-------|-------|------|------|-------|------|------|
|                              | DCONMS         | DCONWS | BD    | DBC   | THID | LF   | LSCWS |      |      |
| <b>SMH MB40-16</b>           | 40             | 16     | 32    | -     | -    | 15   | 17    | 1    | 0.32 |
| <b>MB40-22</b>               | 40             | 22     | 40    | -     | -    | 13   | 19    | 1    | 0.38 |
| <b>MB50-16</b>               | 50             | 16     | 32    | -     | -    | 15   | 17    | 1    | 0.48 |
| <b>MB50-22</b>               | 50             | 22     | 40    | -     | -    | 15   | 19    | 1    | 0.55 |
| <b>MB50-27</b>               | 50             | 27     | 50    | -     | -    | 15   | 21    | 1    | 0.66 |
| <b>MB50-32</b>               | 50             | 32     | 60    | -     | -    | 15   | 24    | 1    | 0.79 |
| <b>MB63-22</b>               | 63             | 22     | 60    | -     | -    | 15   | 19    | 1    | 1.01 |
| <b>MB63-27</b>               | 63             | 27     | 60    | -     | -    | 15   | 21    | 1    | 1.09 |
| <b>MB63-32</b>               | 63             | 32     | 70    | -     | -    | 15   | 24    | 1    | 1.24 |
| <b>MB80-32</b>               | 80             | 32     | 88    | -     | -    | 24   | 24    | 1    | 2.09 |
| <b>MB80-40</b>               | 80             | 40     | 88    | 66.7  | M12  | 24   | 27    | 2    | 2.25 |
| <b>MB80-50</b>               | 80             | 50     | 90    | -     | -    | 24   | 30    | 2    | 2.58 |
| <b>MB80-60<sup>(1)</sup></b> | 80             | 60     | 128.5 | 101.6 | M16  | 31.5 | 40    | 2    | 4.19 |

► <sup>(1)</sup>Shell locking screw not supplied

Spare Parts

| Designation        | Clamp Screw                                                                         | Dog Drive                                                                           | Key                                                                                 | Key Screw                                                                           |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                    |  |  |  |  |
| <b>SMH MB40-22</b> | M10 CLAMP SCREW SEM 22                                                              | BH DOG DRIVE SMH 22                                                                 | KEY SMH 22                                                                          | M4x10 SMH KEY SCREW                                                                 |
| <b>MB50-16</b>     | M 8 CLAMP SCREW SEM 16                                                              | BH DOG DRIVE SMH 16                                                                 | KEY SMH 16                                                                          | M3x 8 SMH KEY SCREW                                                                 |
| <b>MB50-22</b>     | M10 CLAMP SCREW SEM 22                                                              | BH DOG DRIVE SMH 22                                                                 | KEY SMH 22                                                                          | M4x10 SMH KEY SCREW                                                                 |
| <b>MB50-27</b>     | M12 CLAMP SCREW SEM 27                                                              | BH DOG DRIVE SMH 27                                                                 | KEY SMH 27                                                                          | M5x12 SMH KEY SCREW                                                                 |
| <b>MB50-32</b>     | M16 CLAMP SCREW SEM 32                                                              | BH DOG DRIVE SMH 32                                                                 | KEY SMH 32                                                                          | M6x16 SMH KEY SCREW                                                                 |
| <b>MB63-27</b>     | M12 CLAMP SCREW SEM 27                                                              | BH DOG DRIVE SMH 27                                                                 | KEY SMH 27                                                                          | M5x12 SMH KEY SCREW                                                                 |
| <b>MB63-32</b>     | M16 CLAMP SCREW SEM 32                                                              | BH DOG DRIVE SMH 32                                                                 | KEY SMH 32                                                                          | M6x16 SMH KEY SCREW                                                                 |
| <b>MB80-32</b>     | M16 CLAMP SCREW SEM 32                                                              | BH DOG DRIVE SMH 32                                                                 | KEY SMH 32                                                                          | M6x16 SMH KEY SCREW                                                                 |
| <b>MB80-40</b>     | M20 CLAMP SCREW SEM 40                                                              | BH D OG DRIVE SMH 40                                                                | KEY SMH 40                                                                          | M6x18 SMH KEY SCREW                                                                 |
|                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Drill chucks with MB connection

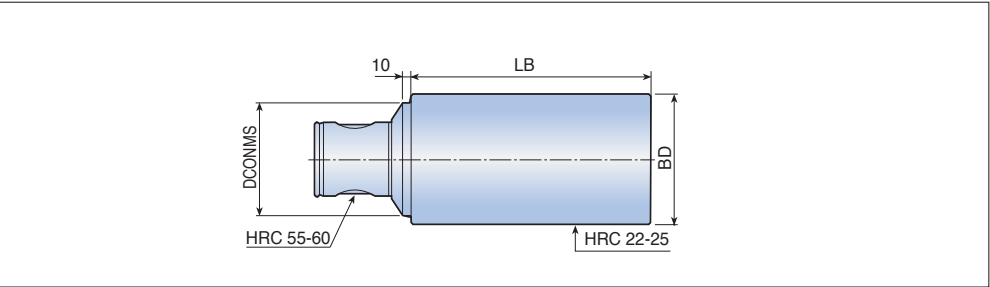


| Designation        | Dimension (mm) |     |      |  Kg |
|--------------------|----------------|-----|------|--------------------------------------------------------------------------------------|
|                    | DCONMS         | Tt° | LF   |                                                                                      |
| <b>DC MB50 B16</b> | MB50           | B16 | 10.0 | 0.4                                                                                  |
| <b>MB63 B16</b>    | MB63           | B16 | 13.5 | 0.8                                                                                  |
|                    |                |     |      |                                                                                      |
|                    |                |     |      |                                                                                      |
|                    |                |     |      |                                                                                      |

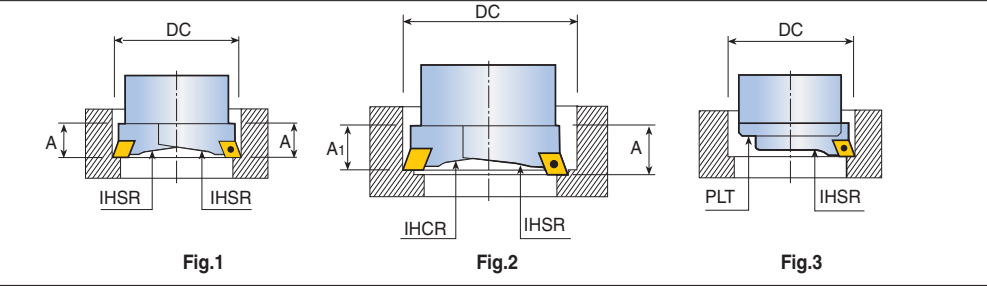
► <sup>(1)</sup>Without drill chuck

BLANK MB

Blanks with MB connection



| Designation              | Dimension (mm) |     |     |  Kg |
|--------------------------|----------------|-----|-----|----------------------------------------------------------------------------------------|
|                          | DCONMS         | BD  | LB  |                                                                                        |
| <b>BLANK MB50-63x160</b> | MB50           | 63  | 160 | 4.4                                                                                    |
| <b>MB63-80x200</b>       | MB63           | 80  | 200 | 8.8                                                                                    |
| <b>MB80-100x250</b>      | MB80           | 100 | 250 | 16.6                                                                                   |
| <b>MB110-130x250</b>     | MB110          | 130 | 250 | 18.0                                                                                   |
|                          |                |     |     |                                                                                        |
|                          |                |     |     |                                                                                        |

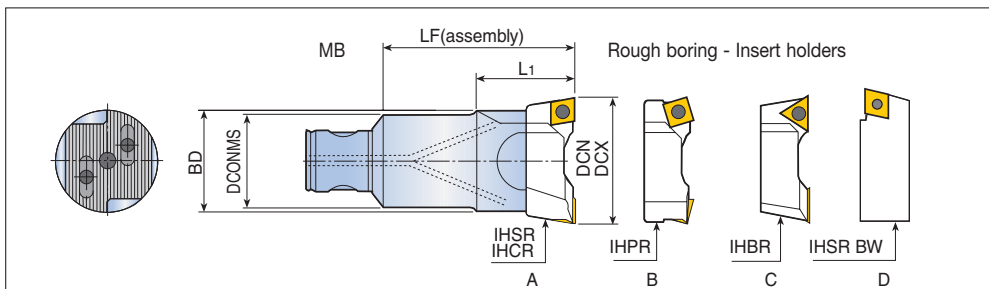


- ▶ When using the MPT system, it is strongly recommended that the user utilizes the tool pre-setting equipment provided to set the radial cutting edges. The boring bars that are equipped with two inserts holders are for rough machining and heavy stock removal.
- ▶ The bars are applicable to three types of machining scenarios:
  - When two IHSR insert holders are on the same plane, the two cutting edges are placed at identical radial distances for high feed rough machining(Fig. 1).
  - When each IHCR and IHSR insert is not set on the same plane, each of the two cutting edges is placed at a different radial distance for deep rough machining(Fig. 2).
  - If boring bars are set with a single insert holder it allows rough and finish machining with normal chip removal. In this situation, it is strongly recommended that a serrated surface protection plate (PLT) is used(Fig. 3).

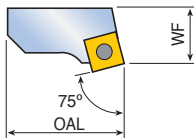
Rough boring head diameter range

|                 | 0 | 10 | 20 | 30    | 40    | 50      | 60    | 70    | 80 | 90     | 100    | 110 | 120 | 130 | 150 | 200     | 300 | 400 | 600 | 700 | 800 |
|-----------------|---|----|----|-------|-------|---------|-------|-------|----|--------|--------|-----|-----|-----|-----|---------|-----|-----|-----|-----|-----|
| BHR MB 16-16x34 |   |    |    | 18-22 |       |         |       |       |    |        |        |     |     |     |     |         |     |     |     |     |     |
| 20-20x40        |   |    |    | 22-28 |       |         |       |       |    |        |        |     |     |     |     |         |     |     |     |     |     |
| 25-25x50        |   |    |    |       | 28-38 |         |       |       |    |        |        |     |     |     |     |         |     |     |     |     |     |
| 32-32x63        |   |    |    |       |       | 35.5-50 |       |       |    |        |        |     |     |     |     |         |     |     |     |     |     |
| 40-40x75        |   |    |    |       |       |         | 50-68 |       |    |        |        |     |     |     |     |         |     |     |     |     |     |
| 50-50x90        |   |    |    |       |       |         |       | 68-90 |    |        |        |     |     |     |     |         |     |     |     |     |     |
| 50-63x105       |   |    |    |       |       |         |       |       |    | 90-120 |        |     |     |     |     |         |     |     |     |     |     |
| 63-63x105       |   |    |    |       |       |         |       |       |    |        | 90-120 |     |     |     |     |         |     |     |     |     |     |
| 80-80x115       |   |    |    |       |       |         |       |       |    |        |        |     |     |     |     | 120-200 |     |     |     |     |     |

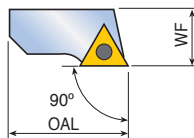
### Rough boring heads 18-200mm range with MB connection

[illegible]

**Fig.1**



**Fig.2**

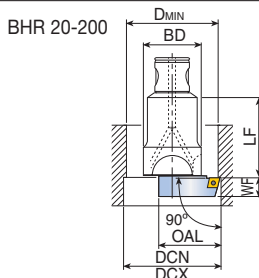


**Fig.3**



H54-H57

### Back face for BHR and rough boring heads

[illegible]

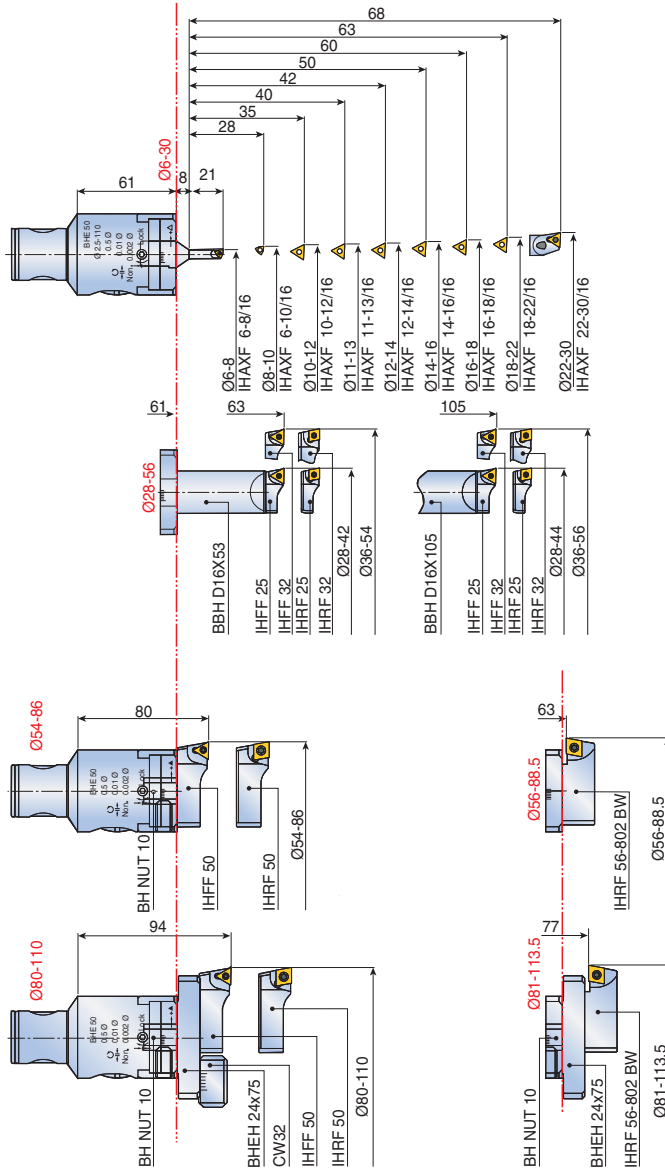
- ▶ DCX= Size of the boring head being used
- ▶  $D_{MIN}$ = (min bore diameter)=  $(DCN+BD+1)/2$

**Fine boring head range: 10µm direct diametric adjustment and 2µm with the vernier scale**

## BHE MB50-50x80

**Ø6-113.5**

10μm  
2μm

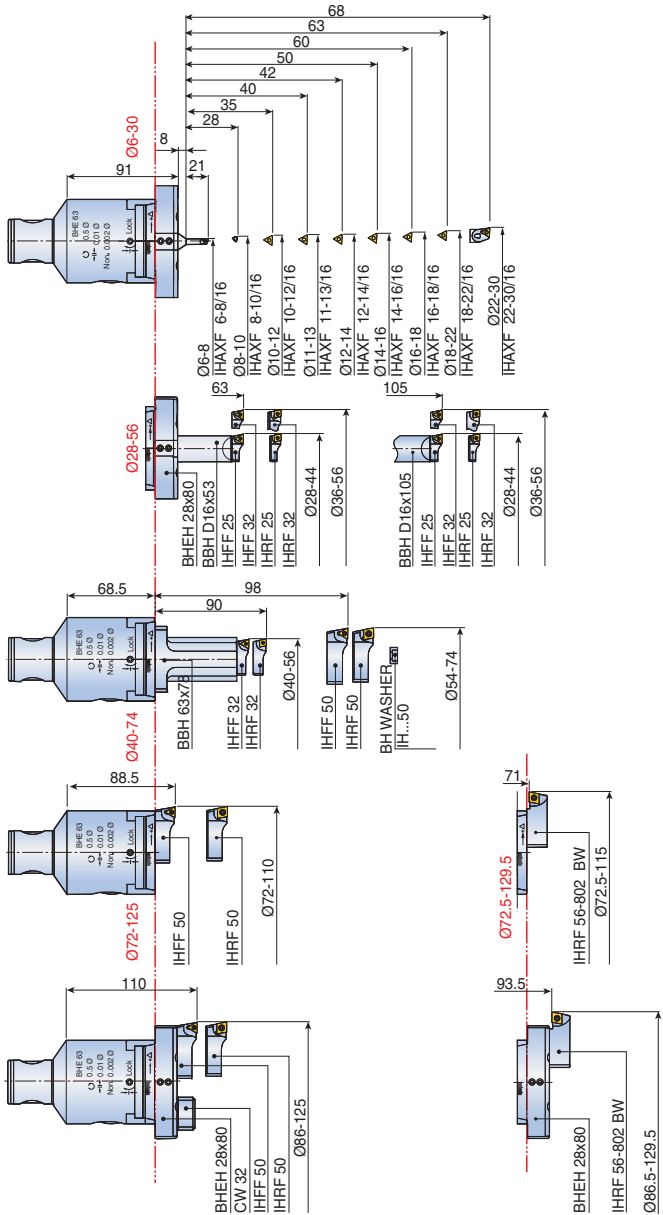




Fine boring head range: 10µm direct diametric adjustment and 2µm with the vernier scale

BHE MB63-63x89  
Ø6-129.5

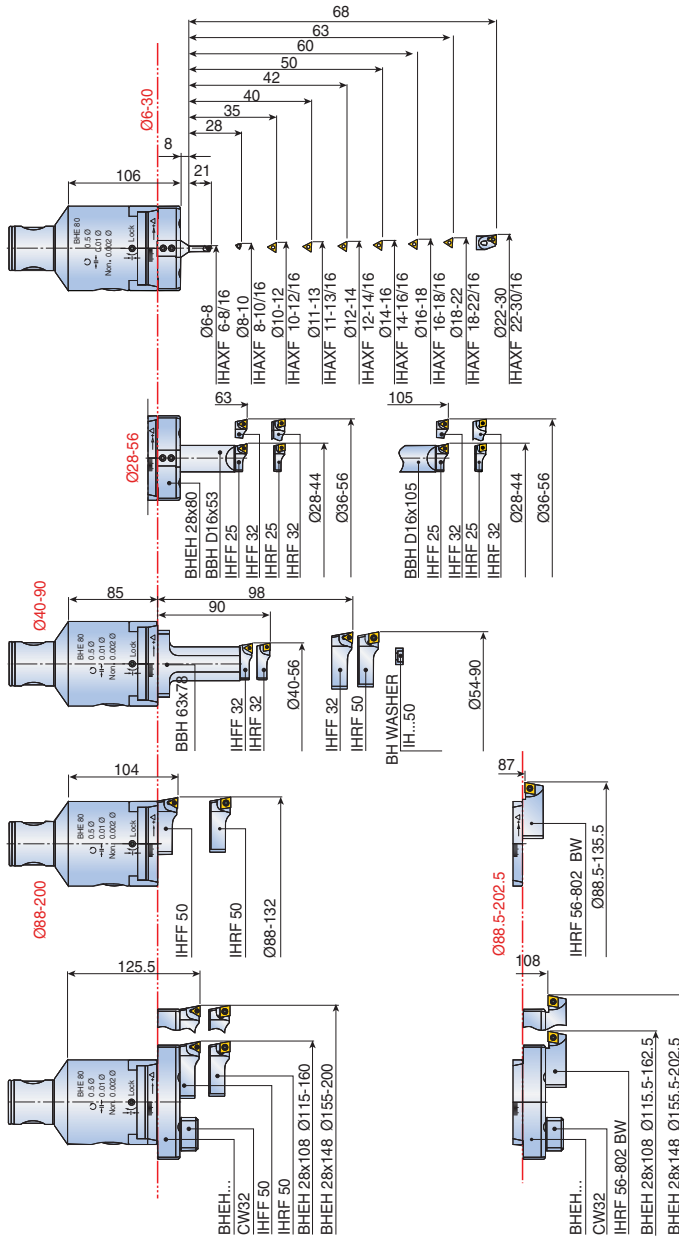
10µm  
2µm



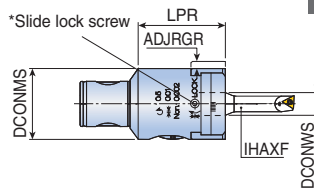
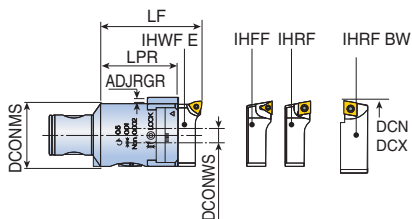
**Fine boring head range: 10µm direct diametric adjustment and 2µm with the vernier scale**

**BHE MB80-80x104**  
**ø6-202.5**

10μm  
2μm



**10 $\mu$ m direct diametric adjustment and 2 $\mu$ m with the vernier scale**



BHE MB50-50x80

[illegible]

BHF fine boring heads

These intricate boring heads enable fine radial adjustments as small as 0.002mm whilst accomplishing high precision machining to the strictest of tolerances with a superb surface finish.

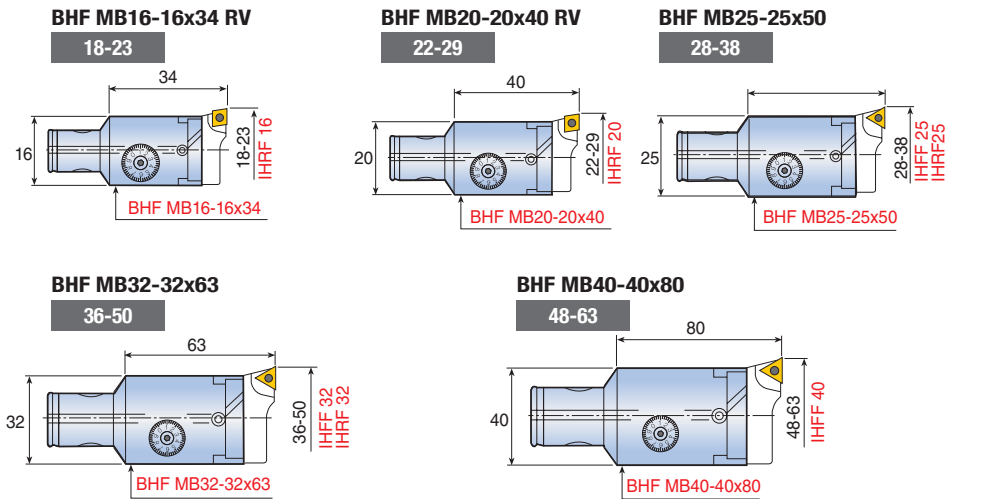


2µm

Fine boring head diameter range

|                    | 0 | 10 | 20 | 30    | 40    | 50    | 60    | 70 | 80 | 90 | 100 | 110 | 120     | 130     | 150     | 180     | 280 | 400 | 600     | 700 | 800 |
|--------------------|---|----|----|-------|-------|-------|-------|----|----|----|-----|-----|---------|---------|---------|---------|-----|-----|---------|-----|-----|
| BHF MB 16-16x34 RV |   |    |    | 18-23 |       |       |       |    |    |    |     |     |         |         |         |         |     |     |         |     |     |
| 20-20x40 RV        |   |    |    | 22-29 |       |       |       |    |    |    |     |     |         |         |         |         |     |     |         |     |     |
| 25-25x50           |   |    |    |       | 28-38 |       |       |    |    |    |     |     |         |         |         |         |     |     |         |     |     |
| 32-32x63           |   |    |    |       |       | 36-50 |       |    |    |    |     |     |         |         |         |         |     |     |         |     |     |
| 40-40x80           |   |    |    |       |       |       | 48-63 |    |    |    |     |     |         |         |         |         |     |     |         |     |     |
| 50-50x60           |   |    |    |       |       |       |       |    |    |    |     |     | 2.5-108 |         |         |         |     |     |         |     |     |
| 50-63x87           |   |    |    |       |       |       |       |    |    |    |     |     |         | 2.5-125 |         |         |     |     |         |     |     |
| 50-80x94           |   |    |    |       |       |       |       |    |    |    |     |     |         |         | 2.5-160 |         |     |     |         |     |     |
| 63-63x87           |   |    |    |       |       |       |       |    |    |    |     |     |         | 2.5-125 |         |         |     |     |         |     |     |
| 80-80x94           |   |    |    |       |       |       |       |    |    |    |     |     |         |         |         | 2.5-220 |     |     |         |     |     |
| 80-125x114         |   |    |    |       |       |       |       |    |    |    |     |     |         |         |         |         |     |     | 135-500 |     |     |

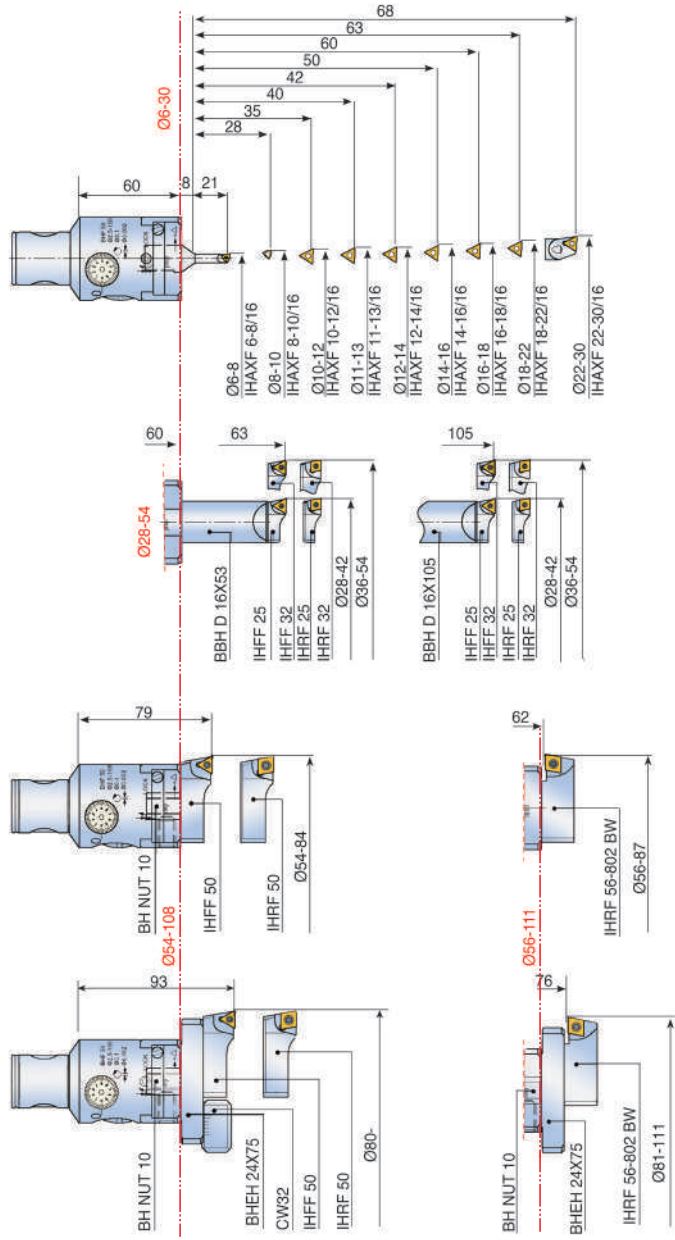
BHF MB16-MB40  
Diameter range: 18-63



Fine boring head range: 2µm direct diametric adjustment

BHF MB50-50x60  
Diamete

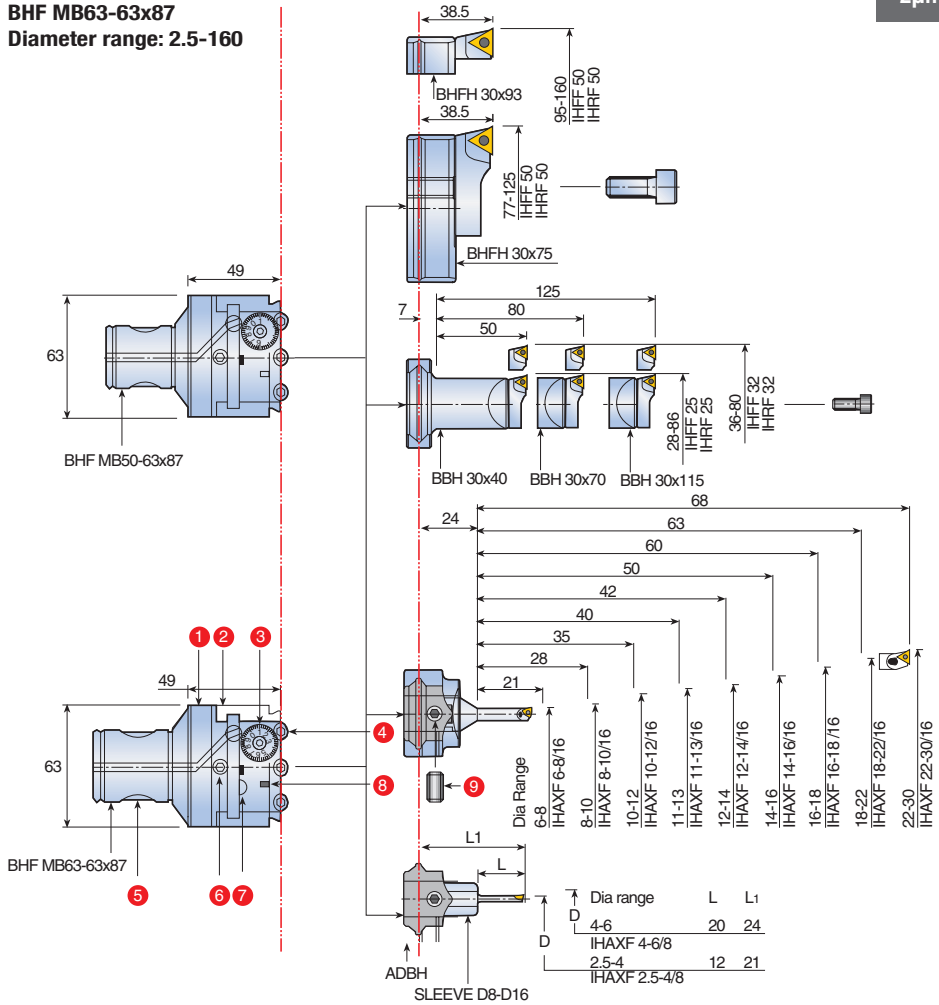
2µm



## Fine boring head range: 2µm direct diametric adjustment

**BHF MB50-63x87**  
**BHF MB63-63x87**  
**Diameter range: 2.5-160**

2µm

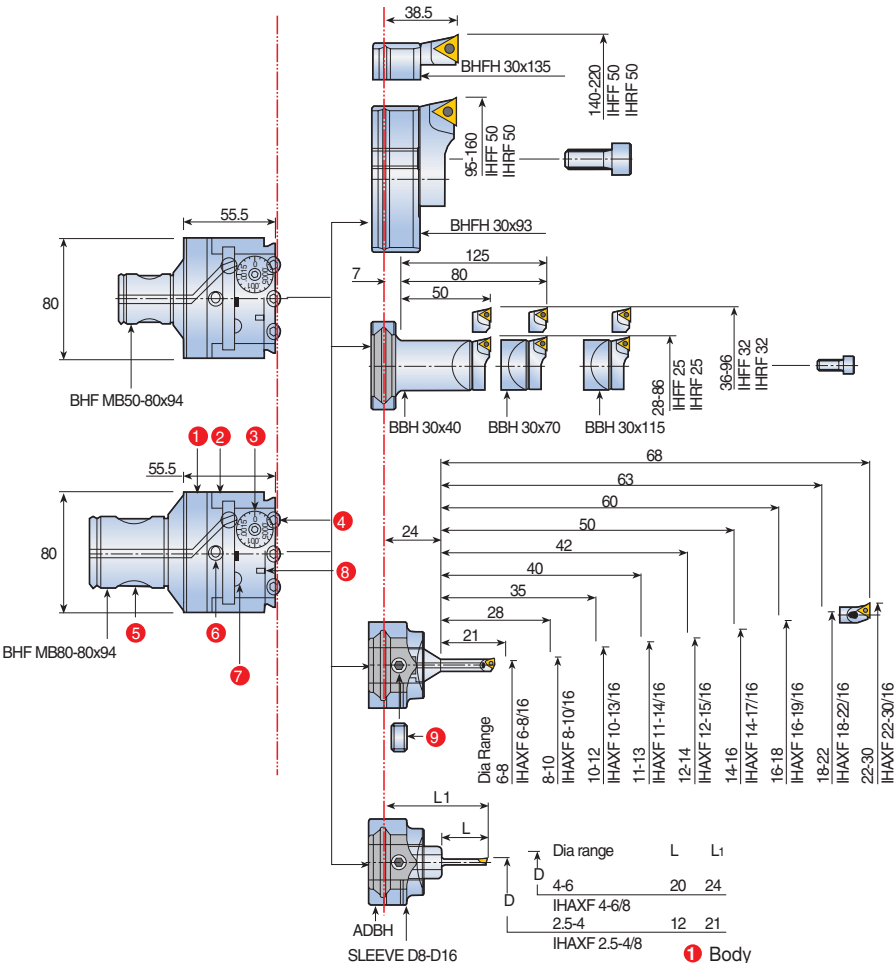


- 1 Body
- 2 Tool slide
- 3 Graduated dial
- 4 Toolholder locking screw
- 5 Expanding pin
- 6 Slide locking screw
- 7 Coolant nozzle
- 8 Oiling nipple
- 9 Toolholder locking screw

Fine boring head range: 2µm direct diametric adjustment

2µm

BHF MB50-80x94  
BHF MB80-80x94  
Diameter range: 2.5-220

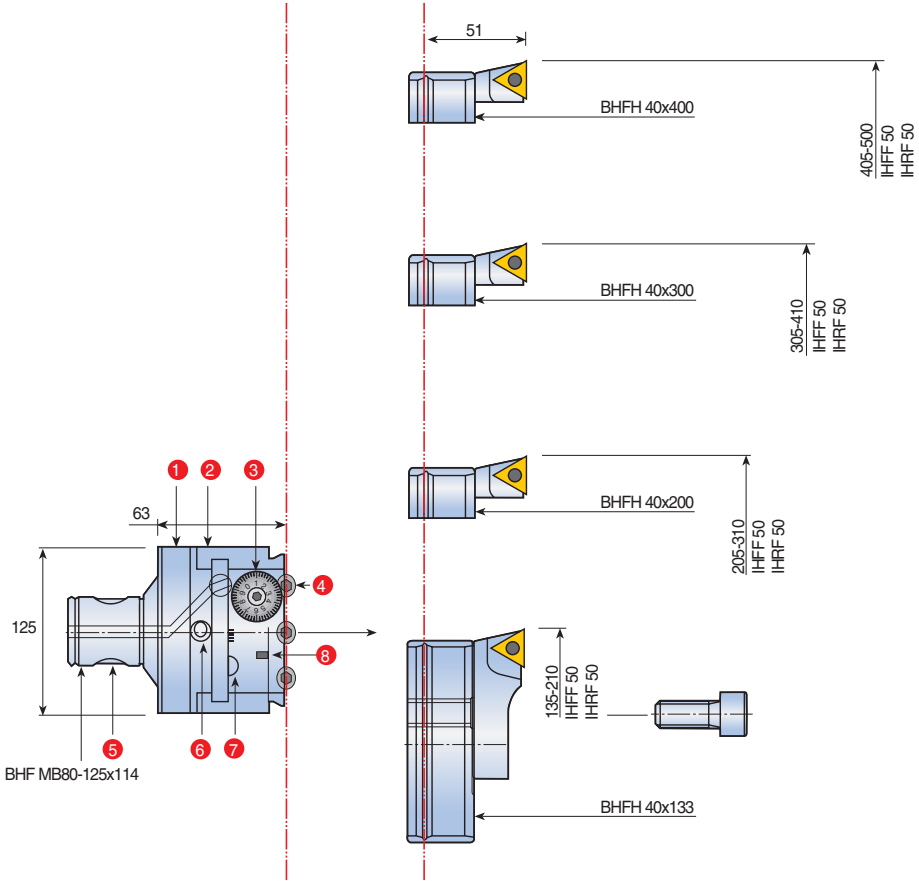


- 1 Body
- 2 Tool slide
- 3 Graduated dial
- 4 Toolholder locking screw
- 5 Expanding pin
- 6 Slide locking screw
- 7 Coolant nozzle
- 8 Oiling nipple
- 9 Toolholder locking screw

## Fine boring head range: 2µm direct diametric adjustment

**BHF MB80-125x114**  
Diameter range:135-500

2µm

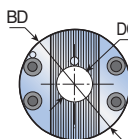


- ❶ Body
- ❷ Tool slide
- ❸ Graduated dial
- ❹ Toolholder locking screw
- ❺ Expanding pin
- ❻ Slide locking screw
- ❼ Coolant nozzle
- ❽ Oiling nipple



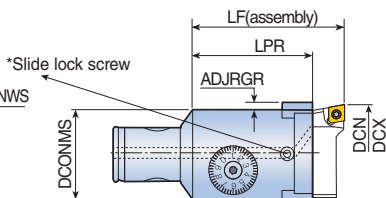
## Fine Boring Heads

2μm



**Fig.1**

**Fig.2**

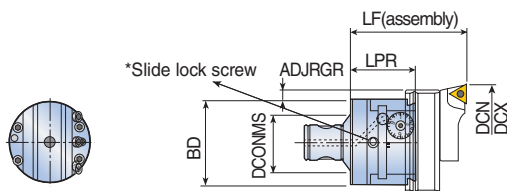


|                                                                                                                       |                                                                                                                             |                                                                                                                 |                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <p>Spare Parts</p>  <p>H60-H67</p> | <p>Cutting Condition</p>  <p>H68-H74</p> | <p>Slide</p>  <p>H42-H44</p> |  <p>H38-H41</p> |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|

► Important: Loosen the \*slide lock screw before making any slide adjustment.

## Fine Boring Heads

2μm



**Spare Parts** **Cutting Condition** **Slide**  ▶ Important: Loosen the \*slide lock screw before making any slide adjustment



8-16mm boring bar for 2.5-30mm fine boring heads

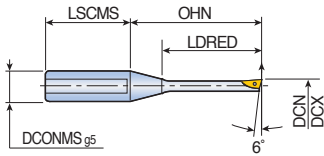


Fig.1

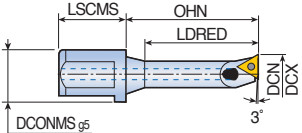


Fig.2

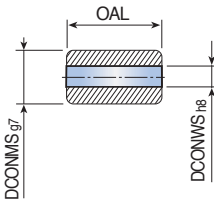
| Designation                  | Dimension (mm) |     |       |     |       |        | Coolant hole | Spare parts |           |     | Fig. |
|------------------------------|----------------|-----|-------|-----|-------|--------|--------------|-------------|-----------|-----|------|
|                              | DCN            | DCX | LDRED | OHN | LSCMS | DCONMS |              | Insert      | Screw     | Key |      |
| IHAXF 2.5-4/8 <sup>(1)</sup> | 2.5            | 4   | 12.5  | 21  | 22    | 8      | x            | Solid       | -         | -   | 1    |
| 4-6/8 <sup>(1)</sup>         | 4              | 6   | 20.0  | 24  | 24    | 8      | x            | Solid       | -         | -   | 1    |
| 6-8/16                       | 6              | 8   | 21.0  | 29  | 22    | 16     | ●            | WCGT 0201   | SR 14-299 | T 6 | 2    |
| 8-10/16                      | 8              | 10  | 28.0  | 36  | 22    | 16     | ●            | WCGT 0201   | SR 14-299 | T 6 | 2    |
| 10-12/16                     | 10             | 12  | 35.0  | 43  | 22    | 16     | ●            | TPGX 0902   | SR 14-298 | T 8 | 2    |
| 11-13/16                     | 11             | 13  | 40.0  | 48  | 22    | 16     | ●            | TPGX 0902   | SR 14-298 | T 8 | 2    |
| 12-14/16                     | 12             | 14  | 42.0  | 48  | 22    | 16     | ●            | TPGX 0902   | SR 14-298 | T 8 | 2    |
| 14-16/16                     | 14             | 16  | 50.0  | 52  | 22    | 16     | ●            | TPGX 0902   | SR 14-298 | T 8 | 2    |
| 16-18/16                     | 16             | 18  | 50.0  | 58  | 22    | 16     | ●            | TPGX 0902   | SR 14-298 | T 8 | 2    |
| 18-22/16                     | 18             | 22  | 60.0  | 63  | 22    | 16     | ●            | TPGX 0902   | SR 14-298 | T 8 | 2    |
| 22-30/16                     | 22             | 30  | 60.0  | 68  | 22    | 16     | ●            | TPGX 0902   | SR 14-298 | T 8 | 2    |



►<sup>(1)</sup> Brazed tool

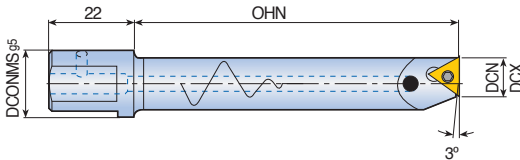
SLEEVE

Reducers for fine boring heads



| Designation   | Dimension (mm) |        |     |
|---------------|----------------|--------|-----|
|               | DCONMS         | DCONWS | OAL |
| SLEEVE D8-D16 | 16             | 8      | 23  |

Vibration damping for fine boring bars – Heavy metal shank

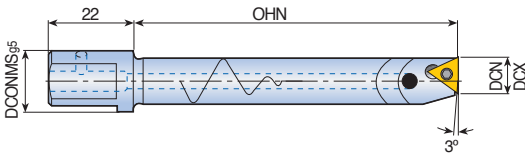


| Designation   | Dimension (mm) |     |     |        | Spare parts |           |     |
|---------------|----------------|-----|-----|--------|-------------|-----------|-----|
|               | DCN            | DCX | OHN | DCONMS | Insert      | Screw     | Key |
| IHAXF 6-8-AVI | 6              | 8   | 36  | 16     | WCGT 0201.. | SR 14-299 | T 6 |
| 8-10-AVI      | 8              | 10  | 48  | 16     | WCGT 0201.. | SR 14-299 | T 6 |
| 10-12-AVI     | 10             | 12  | 60  | 16     | TPGX 0902.. | SR 14-298 | T 8 |
| 12-14-AVI     | 12             | 14  | 72  | 16     | TPGX 0902.. | SR 14-298 | T 8 |
| 14-16-AVI     | 14             | 16  | 84  | 16     | TPGX 0902.. | SR 14-298 | T 8 |
| 16-18-AVI     | 16             | 18  | 96  | 16     | TPGX 0902.. | SR 14-298 | T 8 |
|               |                |     |     |        |             |           |     |

IHAXF-E

Fine Boring Bar

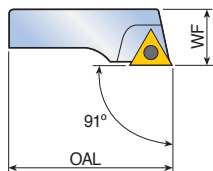
Vibration damping for fine boring bars – Carbide shank



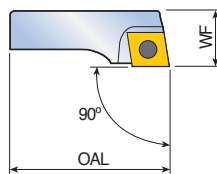
| Designation | Dimension (mm) |     |     |        | Spare parts |           |     |
|-------------|----------------|-----|-----|--------|-------------|-----------|-----|
|             | DCN            | DCX | OHN | DCONMS | Insert      | Screw     | Key |
| IHAXF 6-8-E | 6              | 8   | 45  | 16     | WCGT 0201.. | SR 14-299 | T 6 |
| 8-10-E      | 8              | 10  | 60  | 16     | WCGT 0201.. | SR 14-299 | T 6 |
| 10-12-E     | 10             | 12  | 75  | 16     | TPGX 0902.. | SR 14-298 | T 8 |
| 12-14-E     | 12             | 14  | 90  | 16     | TPGX 0902.. | SR 14-298 | T 8 |
| 14-16-E     | 14             | 16  | 105 | 16     | TPGX 0902.. | SR 14-298 | T 8 |
| 16-18-E     | 16             | 18  | 120 | 16     | TPGX 0902.. | SR 14-298 | T 8 |
|             |                |     |     |        |             |           |     |



### Insert holders for mounting on the MB fine boring heads



**Fig.1**

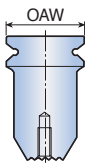
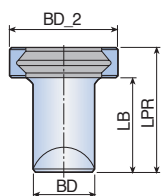


**Fig.2**

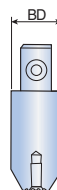
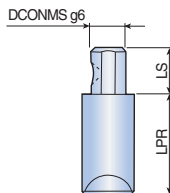
[illegible]

- ▶ BD= Size of the boring head being used.
- ▶ D<sub>MIN</sub>= (min bore diameter)= (DCN+BD+1)/2

### Slide extensions for fine boring holders



**Fig.1**



**Fig.2**

[illegible]

## Fine Boring Insert Holders & Slides

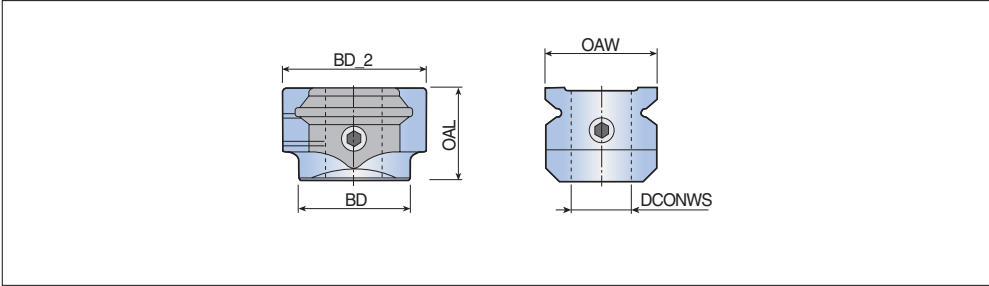
Technical drawing of a bolt and nut. The bolt is shown in profile with dimensions OAL (Overall Length) and OAH (Overall Height). The nut is shown in profile with dimension OAW (Overall Width).

**Fig.2**





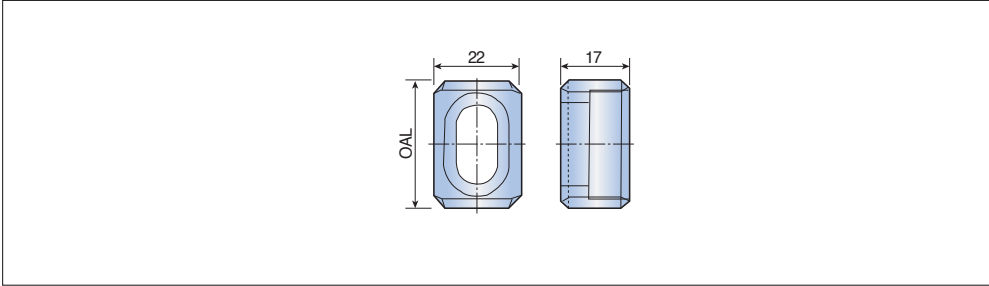
Sleeve for fine boring holders



| Designation | Dimension (mm) |      |     |      |        | Lock Screw      |  Kg |
|-------------|----------------|------|-----|------|--------|-----------------|----------------------------------------------------------------------------------------|
|             | BD             | BD_2 | OAL | OAW  | DCONWS |                 |                                                                                        |
| ADBH 30xD16 | 30             | 39   | 25  | 30.5 | 16     | SR M8x8 DIN 915 | 0.2                                                                                    |
|             |                |      |     |      |        |                 |                                                                                        |
|             |                |      |     |      |        |                 |                                                                                        |
|             |                |      |     |      |        |                 |                                                                                        |
|             |                |      |     |      |        |                 |                                                                                        |
|             |                |      |     |      |        |                 |                                                                                        |

CW32

Counter balancing weight



| Designation | Dimension (mm) |  Kg |
|-------------|----------------|----------------------------------------------------------------------------------------|
|             | OAL            |                                                                                        |
| CW 32       | 31.5           | 0.5                                                                                    |
|             |                |                                                                                        |
|             |                |                                                                                        |
|             |                |                                                                                        |
|             |                |                                                                                        |
|             |                |                                                                                        |

BSFD fine boring heads

The Boring Heads Feature an MB20 to MB80 Connection. Boring Super Fine Digital Heads from Ø3mm – Ø203.1mm



1µm

Fine boring head diameter range

|                      | 0 | 10 | 20 | 30 | 40 | 50        | 60        | 70        | 80        | 90                    | 100         | 110 | 120 | 130 | 140 | 150 | 160                    | 170 | 180 | 190 | 200 |
|----------------------|---|----|----|----|----|-----------|-----------|-----------|-----------|-----------------------|-------------|-----|-----|-----|-----|-----|------------------------|-----|-----|-----|-----|
| BSFD MB 20-24-37-A   |   |    |    |    |    | 23.9-37.1 |           |           |           |                       |             |     |     |     |     |     |                        |     |     |     |     |
| MB 25-31-47-B        |   |    |    |    |    |           | 30.9-47.1 |           |           |                       |             |     |     |     |     |     |                        |     |     |     |     |
| MB 32-40-59-C        |   |    |    |    |    |           |           | 39.9-59.1 |           |                       |             |     |     |     |     |     |                        |     |     |     |     |
| MB 40-51-81-D        |   |    |    |    |    |           |           |           | 50.9-81.1 |                       |             |     |     |     |     |     |                        |     |     |     |     |
| MB 50-67-105-E       |   |    |    |    |    |           |           |           |           | 66.9-105.1            |             |     |     |     |     |     |                        |     |     |     |     |
| MB 63-87-134-F       |   |    |    |    |    |           |           |           |           |                       | 86.9-134.1  |     |     |     |     |     |                        |     |     |     |     |
| MB 80-115-203-G      |   |    |    |    |    |           |           |           |           |                       | 115.9-203.1 |     |     |     |     |     |                        |     |     |     |     |
| BSFD MB 50-03-88-H   |   |    |    |    |    |           |           |           |           | 9.75-88.1             |             |     |     |     |     |     |                        |     |     |     |     |
| BSFD-V MB63-03-152-I |   |    |    |    |    |           |           |           |           | 9.75-88.1(BORING BAR) |             |     |     |     |     |     |                        |     |     |     |     |
|                      |   |    |    |    |    |           |           |           |           |                       |             |     |     |     |     |     | 87.75-152(BORING HEAD) |     |     |     |     |

BSFD

|             | Boring Type | Adapter & Extension | Insert Holder |
|-------------|-------------|---------------------|---------------|
| BSFD MB     |             | -                   | CAR-CC...     |
|             |             | ADP-V...            | CAR-V-CC...   |
|             |             |                     |               |
| BSFD MB-H   |             | -                   | BAR-CC...HI   |
|             |             | SH-DX...            | BAR-DX-CC...  |
|             |             |                     |               |
| BSFD-V MB-I |             | -                   | BAR-CC...HI   |
|             |             | SH-DX...            | BAR-DX-CC...  |
|             |             | ADP-V...            | CAR-V-CC...   |

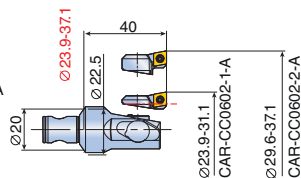
Digital fine boring head range : 1µm direct diametric adjustment.

1µm

## BSFD MB A-F

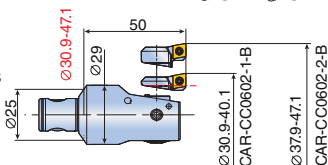
**A**

BSFD MB20-24-37-A



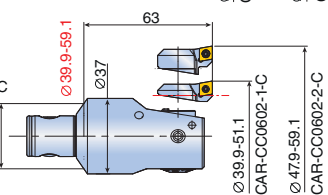
**B**

BSFD MB25-31-47-B



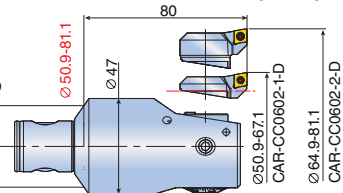
**C**

BSFD MB32-40-59-C



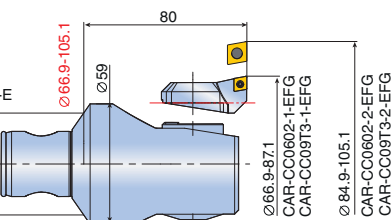
**D**

BSFD MB40-51-81-D



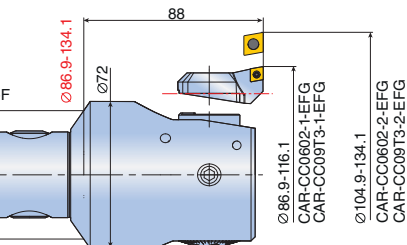
**E**

BSFD MB50-67-105-E



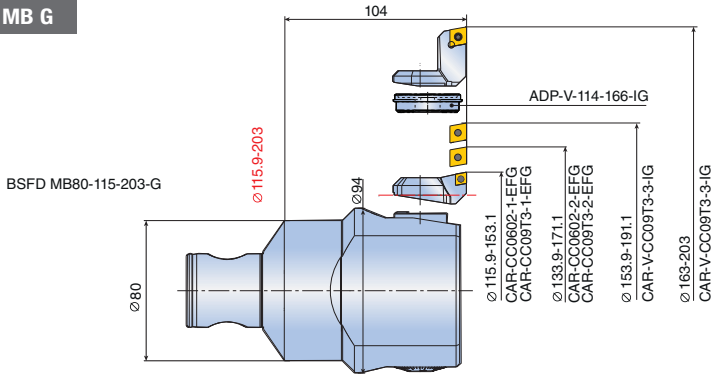
**F**

BSFD MB63-87-134-F



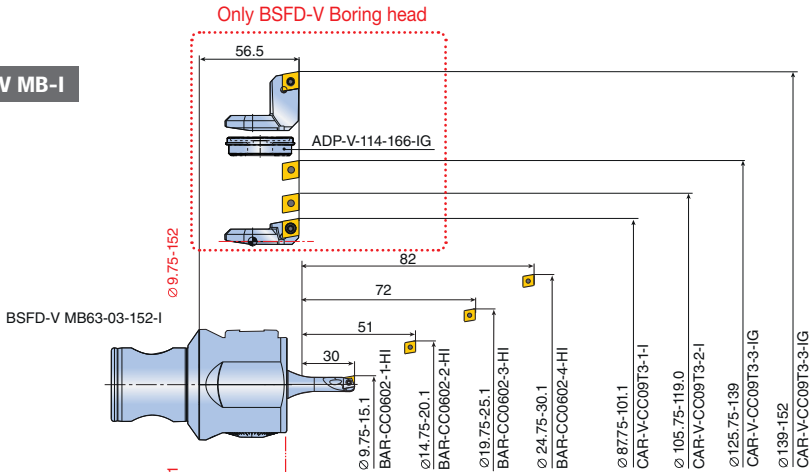
Digital fine boring head range : 1µm direct diametric adjustment.

## BSFD MB G

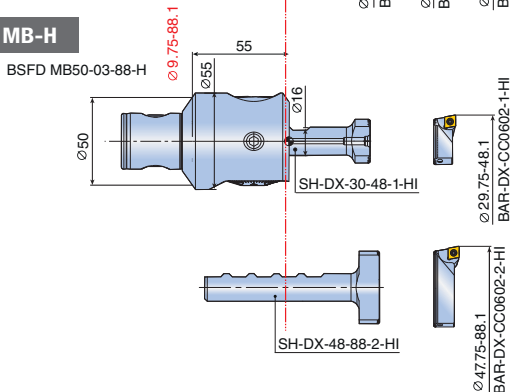


1µm

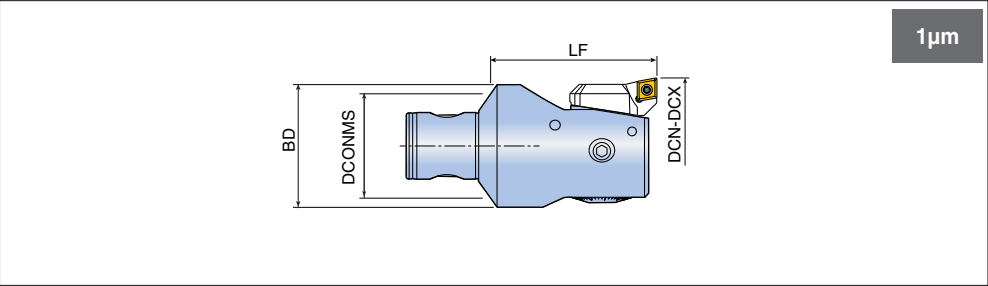
## BSFD-V MB-I



## BSFD MB-H



Digital fine boring heads with 1 µm accurate adjustment and detachable display

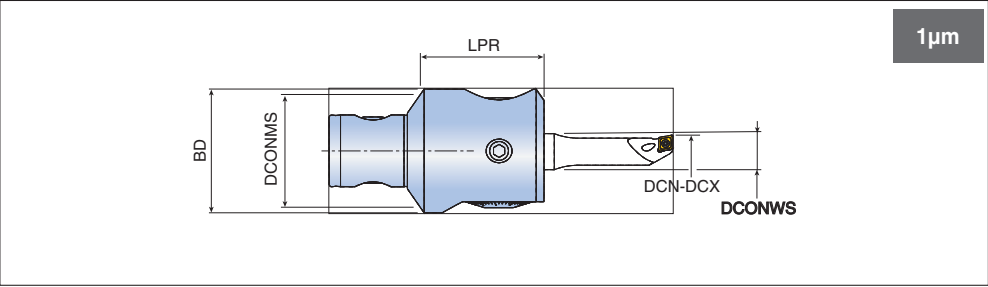


| Designation              | Dimension (mm) |       |       |     |      | Insert Holder | Kg  |
|--------------------------|----------------|-------|-------|-----|------|---------------|-----|
|                          | DCONMS         | DCN   | DCX   | LF  | BD   |               |     |
| <b>BSFD MB20-24-37-A</b> | 20             | 23.9  | 37.1  | 40  | 22.5 | CAR-CC...A    | 0.1 |
| <b>MB25-31-47-B</b>      | 25             | 30.9  | 47.1  | 50  | 29   | CAR-CC...B    | 0.2 |
| <b>MB32-40-59-C</b>      | 32             | 39.9  | 59.1  | 63  | 37   | CAR-CC...C    | 0.5 |
| <b>MB40-51-81-D</b>      | 40             | 50.9  | 81.1  | 80  | 47   | CAR-CC...D    | 1.0 |
| <b>MB50-67-105-E</b>     | 50             | 66.9  | 105.1 | 80  | 59   | CAR-CC...EFG  | 1.6 |
| <b>MB63-87-134-F</b>     | 63             | 86.9  | 134.1 | 88  | 72   | CAR-CC...EFG  | 3.1 |
| <b>MB80-115-203-G</b>    | 80             | 115.9 | 203.1 | 104 | 94   | CAR-CC...EFG  | 5.0 |

BSFD MB-H

Fine Boring Heads

Digital fine boring head with 1 µm accurate adjustment and detachable display



| Designation              | Dimension (mm) |     |      |     |       |        | Insert Holder | Kg  |
|--------------------------|----------------|-----|------|-----|-------|--------|---------------|-----|
|                          | DCONMS         | DCN | DCX  | LPR | BD    | DCONWS |               |     |
| <b>BSFD MB50-03-88-H</b> | 50             | 3   | 88.1 | 55  | 50.15 | 16     | BAR-CC...HI   | 1.1 |
|                          |                |     |      |     |       |        |               |     |
|                          |                |     |      |     |       |        |               |     |
|                          |                |     |      |     |       |        |               |     |
|                          |                |     |      |     |       |        |               |     |
|                          |                |     |      |     |       |        |               |     |
|                          |                |     |      |     |       |        |               |     |

Spare Parts

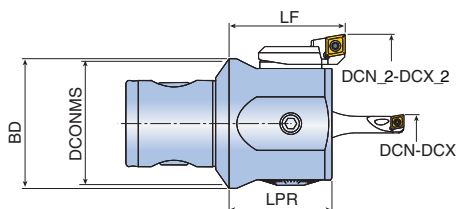
H60-H67

Cutting Condition

H68-H74

H50-H52

**Digital fine boring vario head with 1 µm accurate adjustment and detachable display**

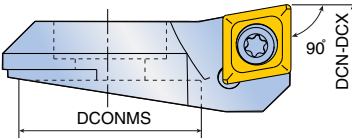


1  $\mu\text{m}$

[illegible]

► Note: When using ADP-V-114-116-IG on BSFD-V MB63-03-152-I & CAR-V-CC09T3-3-IG, Maximum diameter is 203mm.

Side lock insert holders for BSFD MB boring heads



| Designation    | Dimension (mm) |       |       |       |       |       |        |            |
|----------------|----------------|-------|-------|-------|-------|-------|--------|------------|
|                | DCN            | DCX   | DCN_2 | DCX_2 | DCN_3 | DCX_3 | DCONMS | Insert     |
| CAR-CC0602-1-A | 23.9           | 31.1  | -     | -     | -     | -     | 11     | CC..0602.. |
| CC0602-2-A     | 29.6           | 37.1  | -     | -     | -     | -     | 11     | CC..0602.. |
| CC0602-1-B     | 30.9           | 40.1  | -     | -     | -     | -     | 13     | CC..0602.. |
| CC0602-2-B     | 37.9           | 47.1  | -     | -     | -     | -     | 13     | CC..0602.. |
| CC0602-1-C     | 39.9           | 51.1  | -     | -     | -     | -     | 17     | CC..0602.. |
| CC0602-2-C     | 47.9           | 59.1  | -     | -     | -     | -     | 17     | CC..0602.. |
| CC0602-1-D     | 51.1           | 67.1  | -     | -     | -     | -     | 22     | CC..0602.. |
| CC0602-2-D     | 64.9           | 81.1  | -     | -     | -     | -     | 22     | CC..0602.. |
| CC0602-1-EFG   | 66.9           | 87.1  | 86.9  | 116.1 | 115.9 | 153.1 | 30     | CC..0602.. |
| CC09T3-1-EFG   | 66.9           | 87.1  | 86.9  | 116.1 | 115.9 | 153.1 | 30     | CC..09T3.. |
| CC0602-2-EFG   | 84.9           | 105.1 | 104.9 | 134.1 | 133.9 | 171.1 | 30     | CC..0602.. |
| CC09T3-2-EFG   | 84.9           | 105.1 | 104.9 | 134.1 | 133.9 | 171.1 | 30     | CC..09T3.. |

- ▶ DCN\_2-DCX\_2: for BSFD MB63-87-134-F boring head
- ▶ DCN\_3-DCX\_3: for BSFD MB80-115-203-G boring head

BAR-CC0602-HI

Fine Boring Bar

Indexable boring bars for the BSFD-H/I boring heads

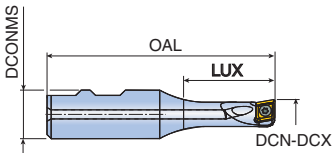


Fig.1

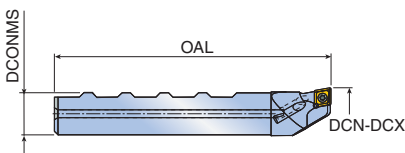
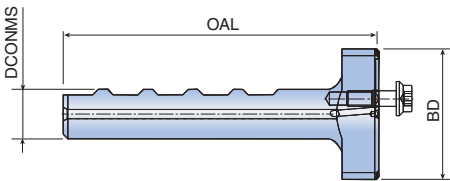


Fig.2

| Designation      | Dimension (mm) |      |     |        |     |      |            |              |
|------------------|----------------|------|-----|--------|-----|------|------------|--------------|
|                  | DCN            | DCX  | LUX | DCONMS | OAL | Fig. | Insert     | Coolant hole |
| BAR- CC0602-1-HI | 9.75           | 15.1 | 30  | 16     | 75  | 1    | CC..0602.. | ●            |
| CC0602-2-HI      | 14.75          | 20.1 | 51  | 16     | 90  | 1    | CC..0602.. | ●            |
| CC0602-3-HI      | 19.75          | 25.1 | 72  | 16     | 105 | 2    | CC..0602.. | ●            |
| CC0602-4-HI      | 24.75          | 30.1 | 82  | 16     | 115 | 2    | CC..0602.. | ●            |

# SH-DX-HI

Extension shanks for sliding insert holders for BSFD-H/I boring heads

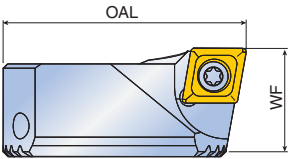


| Designation      | Dimension (mm) |     |        | Insert Holder |  Kg |
|------------------|----------------|-----|--------|---------------|--------------------------------------------------------------------------------------|
|                  | BD             | OAL | DCONMS |               |                                                                                      |
| SH-DX-30-48-1-HI | 25             | 103 | 16     | BAR-DX...1-HI | 0.18                                                                                 |
| DX-48-88-2-HI    | 42             | 101 | 16     | BAR-DX...2-HI | 0.22                                                                                 |
|                  |                |     |        |               |                                                                                      |
|                  |                |     |        |               |                                                                                      |
|                  |                |     |        |               |                                                                                      |
|                  |                |     |        |               |                                                                                      |
|                  |                |     |        |               |                                                                                      |
|                  |                |     |        |               |                                                                                      |
|                  |                |     |        |               |                                                                                      |

# BAR-DX-CC...-HI

Fine Boring Insert Holders

Sliding insert holders for BSFD-H/I boring heads

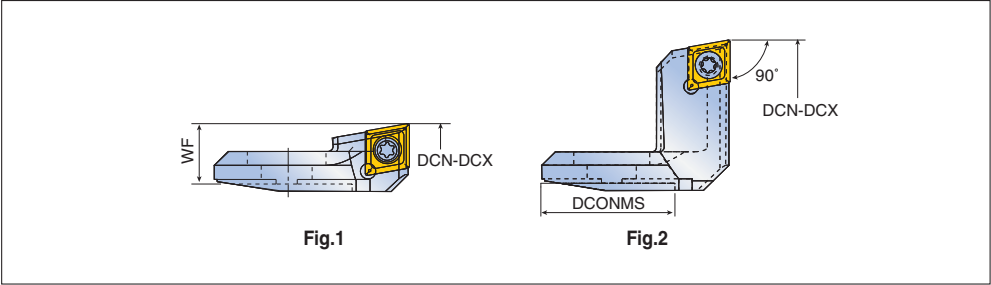


| Designation        | Dimension (mm) |      |       |      | Insert     | Extension Shanks |
|--------------------|----------------|------|-------|------|------------|------------------|
|                    | WF             | OAL  | DCN   | DCX  |            |                  |
| BAR-DX-CC0602-1-HI | 12             | 28.2 | 29.75 | 48.1 | CC..0602.. | SH-DX...1-HI     |
| DX-CC0602-2-HI     | 14             | 46.0 | 47.75 | 88.1 | CC..0602.. | SH-DX...2-HI     |
|                    |                |      |       |      |            |                  |





Side lock insert holders for BSFD-V-I boring heads



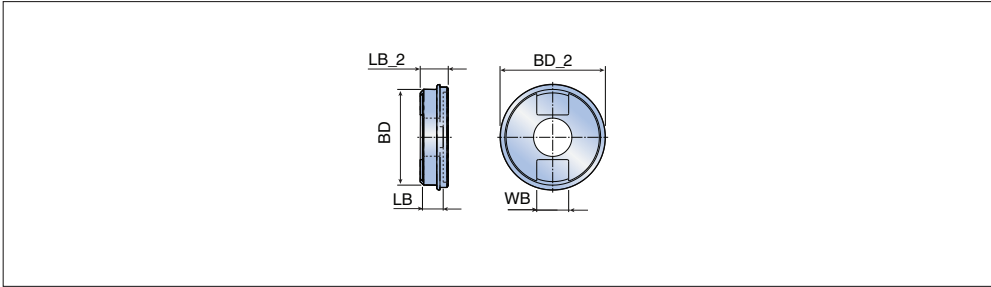
| Designation       | Dimension (mm) |        |        |        | Insert     | Fig. |
|-------------------|----------------|--------|--------|--------|------------|------|
|                   | WF             | DCN    | DCX    | DCONMS |            |      |
| CAR- V-CC09T3-1-I | 13.05          | 87.75  | 101.10 | 30     | CC..09T3.. | 1    |
| V-CC09T3-2-I      | 22.05          | 105.75 | 119.00 | 30     | CC..09T3.. | 1    |
| V-CC09T3-3-IG     | 32.05          | 153.90 | 191.10 | 30     | CC..09T3.. | 2    |
|                   |                |        |        |        |            |      |
|                   |                |        |        |        |            |      |
|                   |                |        |        |        |            |      |
|                   |                |        |        |        |            |      |
|                   |                |        |        |        |            |      |



► Note: When using ADP-V-114-116-IG on BSFD-V MB63-03-152-I & CAR-V-CC09T3-3-IG, Maximum diameter is 203mm.

ADP-V-IG

Adapter plate for diameter range extension of the CAR-V-I/IG insert holders

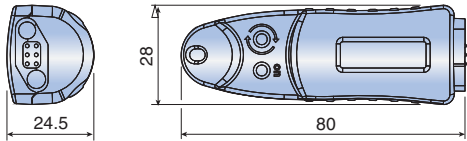


| Designation       | Dimension (mm) |      |     |      |    | Insert Holder |
|-------------------|----------------|------|-----|------|----|---------------|
|                   | BD             | BD 2 | LB  | LB 2 | WB |               |
| ADP- V-114-166-IG | 30             | 33   | 6.5 | 8.8  | 10 | CAR-V...IG    |
|                   |                |      |     |      |    |               |
|                   |                |      |     |      |    |               |
|                   |                |      |     |      |    |               |

# BSFD DISPLAY UNIT

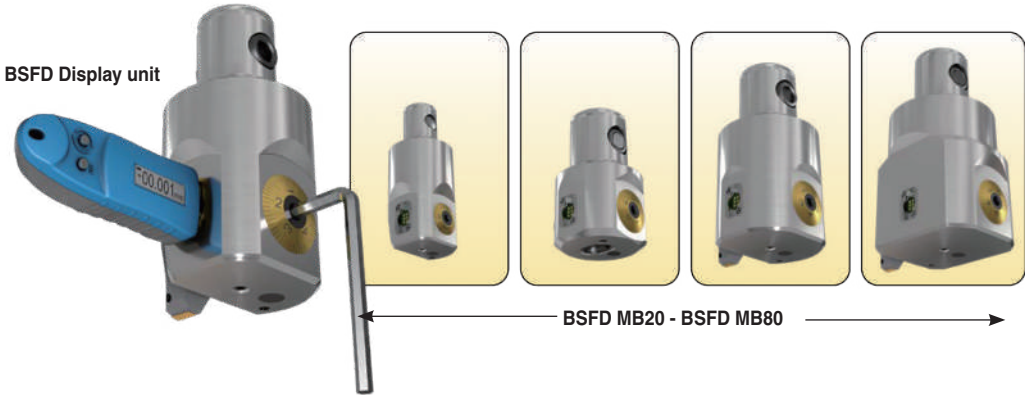
Fine Boring Unit

Digital display unit for BSFD boring heads with 1 µm accurate adjustment



| Designation       | Dimension (mm) |
|-------------------|----------------|
|                   | Accuracy       |
| BSFD DISPLAY UNIT | 0.001          |

## BSFD - Super fine digital boring heads



## BSFD - Operating instructions

**Battery status**

**Measurements unit**

**On + Reset**

Press 1 sec. to flip display view

Press 3 sec. change metric/imperial

**3X Torx T6**

**+ Type AAA -**

**Function and maintenance**

**1**

1. Connect  
2. Switch on

**2**

Unlock

Set

2.1

2.2

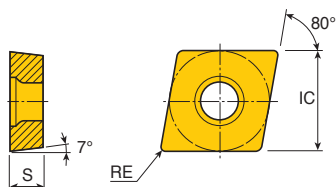
Lock

2.3

**3**

1. Disconnect  
2. Auto power off 15 sec.

### Positive 7° clearance 80° rhombic inserts

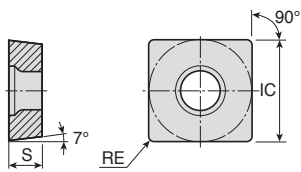


| Size      | Dimension (mm) |      |         |
|-----------|----------------|------|---------|
|           | IC             | S    | RE      |
| <b>06</b> | 6.35           | 2.38 | 0.1-0.8 |
| <b>09</b> | 9.52           | 3.97 | 0.1-0.8 |
| <b>12</b> | 12.7           | 4.76 | 0.2-1.2 |
|           |                |      |         |
|           |                |      |         |
|           |                |      |         |

[illegible]

● : Standard items

Positive 7° clearance inserts for aluminum machining

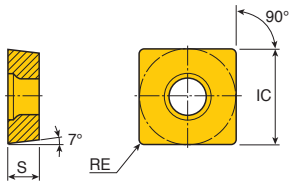


| Size | Dimension (mm) |      |         |  |
|------|----------------|------|---------|--|
|      | IC             | S    | RE      |  |
| 09   | 9.52           | 3.97 | 0.8     |  |
| 12   | 12.7           | 4.76 | 0.2-0.8 |  |
|      |                |      |         |  |
|      |                |      |         |  |
|      |                |      |         |  |
|      |                |      |         |  |

| Insert                                                                           | Designation    | Cermet |        | CVD coated |        |         |         |         |         |        |        | PVD coated |        |        |        | Uncoated |        |        |     |     |     |
|----------------------------------------------------------------------------------|----------------|--------|--------|------------|--------|---------|---------|---------|---------|--------|--------|------------|--------|--------|--------|----------|--------|--------|-----|-----|-----|
|                                                                                  |                | PV3010 | CT3000 | TT7005     | TT7015 | TT8105B | TT8115B | TT8125B | TT8135B | TT9215 | TT9225 | TT9235     | TT5100 | TT7100 | TT5080 | TT8020   | TT9020 | TT9080 | P20 | K10 | K20 |
|  | SCGT 09T308 FL |        |        |            |        |         |         |         |         |        |        |            |        |        |        |          |        |        |     | ●   |     |
|                                                                                  | 120402 FL      |        |        |            |        |         |         |         |         |        |        |            |        |        |        |          |        |        |     | ●   |     |
|                                                                                  | 120404 FL      |        |        |            |        |         |         |         |         |        |        |            |        |        |        |          |        |        |     | ●   |     |
|                                                                                  | 120408 FL      |        |        |            |        |         |         |         |         |        |        |            |        |        |        |          |        |        |     | ●   |     |
|                                                                                  |                |        |        |            |        |         |         |         |         |        |        |            |        |        |        |          |        |        |     |     |     |

● : Standard items

Positive 7° clearance square inserts

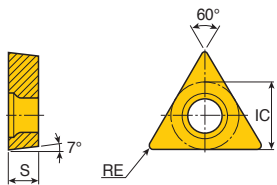


| Size | Dimension (mm) |      |         |
|------|----------------|------|---------|
|      | IC             | S    | RE      |
| 09   | 9.52           | 3.97 | 0.4-0.8 |
| 12   | 12.7           | 4.76 | 0.4-1.2 |
|      |                |      |         |
|      |                |      |         |
|      |                |      |         |
|      |                |      |         |

| Insert                                                                             | Designation    | Cermet |        | CVD coated |        |        |         |         |         |        |        | PVD coated |        |        |        |        | Uncoated |        |     |     |     |
|------------------------------------------------------------------------------------|----------------|--------|--------|------------|--------|--------|---------|---------|---------|--------|--------|------------|--------|--------|--------|--------|----------|--------|-----|-----|-----|
|                                                                                    |                | PV3010 | CT3000 | TT7005     | TT7015 | TT7025 | TT8105B | TT8115B | TT8125B | TT9225 | TT9235 | TT5100     | TT7100 | TT5080 | TT6080 | TT8020 | TT8080   | TT9020 | P20 | K10 | K20 |
|  | SCMT 09T304 FG |        |        |            |        |        |         | ●       |         | ●      |        |            |        |        |        |        | ●        |        |     |     |     |
|                                                                                    | 09T308 FG      | ●      |        |            |        |        |         | ●       | ●       | ●      |        | ●          |        | ●      |        | ●      | ●        |        |     |     |     |
|  | SCMT 09T304 MT | ●      | ●      | ●          | ●      |        |         | ●       | ●       | ●      |        | ●          |        |        |        | ●      |          |        |     |     |     |
|                                                                                    | 09T308 MT      |        | ●      | ●          | ●      | ●      |         | ●       | ●       | ●      | ●      | ●          | ●      | ●      | ●      | ●      |          |        |     |     |     |
|                                                                                    | 120404 MT      |        | ●      | ●          | ●      |        |         |         | ●       |        |        | ●          |        |        |        |        |          |        |     |     |     |
|                                                                                    | 120408 MT      |        | ●      | ●          | ●      | ●      |         |         | ●       | ●      | ●      | ●          |        | ●      |        | ●      |          |        |     |     |     |
|                                                                                    | 120412 MT      |        |        | ●          | ●      |        | ●       |         | ●       |        |        |            |        |        |        | ●      |          |        |     |     |     |

● : Standard items

## Positive 7° clearance triangular inserts

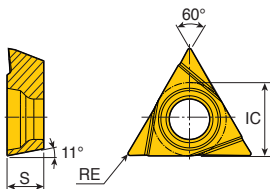


| Size      | Dimension (mm) |      |     |
|-----------|----------------|------|-----|
|           | IC             | S    | RE  |
| <b>22</b> | 12.7           | 4.76 | 0.8 |
|           |                |      |     |
|           |                |      |     |
|           |                |      |     |
|           |                |      |     |
|           |                |      |     |

| Insert                                                                           | Designation           | Cermet |        | CVD coated |        |         |         |         |         |        |        |        |        | PVD coated |        |        |        | Uncoated |     |     |     |
|----------------------------------------------------------------------------------|-----------------------|--------|--------|------------|--------|---------|---------|---------|---------|--------|--------|--------|--------|------------|--------|--------|--------|----------|-----|-----|-----|
|                                                                                  |                       | PV3010 | CT3000 | TT7005     | TT7015 | TT8105B | TT8115B | TT8125B | TT8135B | TT9215 | TT9225 | TT9235 | TT5100 | TT7100     | TT5080 | TT8020 | TT9020 | TT9080   | P30 | K10 | K20 |
|  | <b>TCMT 220508-19</b> |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |        |          | ●   |     |     |
|                                                                                  |                       |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |        |          |     |     |     |
|                                                                                  |                       |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |        |          |     |     |     |
|                                                                                  |                       |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |        |          |     |     |     |

● : Standard items

## Positive 11° clearance triangular inserts

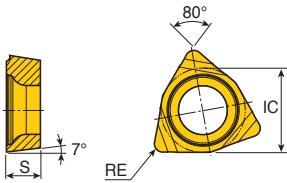


| Size      | Dimension (mm) |      |         |
|-----------|----------------|------|---------|
|           | IC             | S    | RE      |
| <b>09</b> | 5.56           | 2.38 | 0.2-0.4 |
| <b>11</b> | 6.35           | 3.18 | 0.2-0.4 |
|           |                |      |         |
|           |                |      |         |
|           |                |      |         |
|           |                |      |         |

| Insert                                                                                          | Designation   | Cermet |        | CVD coated |        |         |         |         |         |        |        |        |        | PVD coated |        |        | Uncoated |     |     |     |     |
|-------------------------------------------------------------------------------------------------|---------------|--------|--------|------------|--------|---------|---------|---------|---------|--------|--------|--------|--------|------------|--------|--------|----------|-----|-----|-----|-----|
|                                                                                                 |               | PV3010 | CT3000 | TT7005     | TT7015 | TT8105B | TT8115B | TT8125B | TT8135B | TT9215 | TT9225 | TT9235 | TT5100 | TT7100     | TT5080 | TT8020 | TT9020   | P20 | P30 | K10 | K20 |
| <br>Left-hand | TPGX 090202 L |        | ●      |            |        |         |         |         |         |        |        |        |        |            |        |        |          |     |     | ●   |     |
|                                                                                                 | 090204 L      |        | ●      |            |        |         |         |         |         |        |        |        |        |            |        |        |          |     |     | ●   |     |
|                                                                                                 | 110302 L      |        | ●      |            |        |         |         |         |         |        |        |        |        |            |        |        |          |     |     | ●   |     |
|                                                                                                 | 110304 L      |        | ●      |            |        |         |         |         |         |        |        |        |        |            |        |        |          |     |     | ●   |     |
|                                                                                                 |               |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |     |     |     |     |
|                                                                                                 |               |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |     |     |     |     |

● : Standard items

Positive 7° clearance 80° trigon inserts



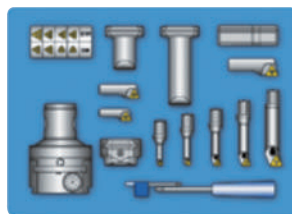
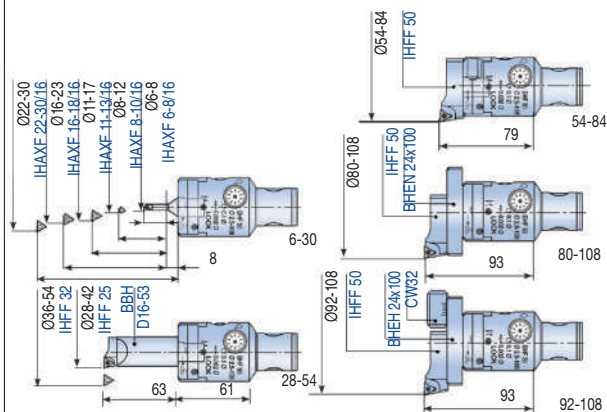
| Size | Dimension (mm) |      |         |
|------|----------------|------|---------|
|      | IC             | S    | RE      |
| 02   | 3.97           | 1.59 | 0.2-0.4 |
|      |                |      |         |
|      |                |      |         |
|      |                |      |         |
|      |                |      |         |
|      |                |      |         |

| Insert                                                                                        | Designation  | Cermet |        | CVD coated |        |         |         |         |         |        |        |        |        | PVD coated |        |        | Uncoated |        |     |     |
|-----------------------------------------------------------------------------------------------|--------------|--------|--------|------------|--------|---------|---------|---------|---------|--------|--------|--------|--------|------------|--------|--------|----------|--------|-----|-----|
|                                                                                               |              | PV3010 | CT3000 | TT7005     | TT7015 | TT8105B | TT8115B | TT8125B | TT8135B | TT9215 | TT9225 | TT9235 | TT5100 | TT7100     | TT5080 | TT8020 | TT9030   | TT9080 | P20 | K10 |
| <br>Left-hand | WCGT 020102L |        |        |            |        |         |         |         |         |        |        |        |        |            |        | ●      |          |        |     |     |
|                                                                                               | 020104L      |        |        |            |        |         |         |         |         |        |        |        |        |            |        | ●      |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |
|                                                                                               |              |        |        |            |        |         |         |         |         |        |        |        |        |            |        |        |          |        |     |     |

● : Standard items

### 6-140mm diameter range

2μm

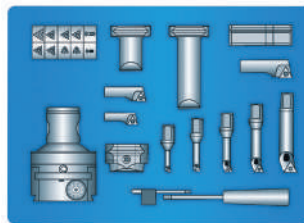
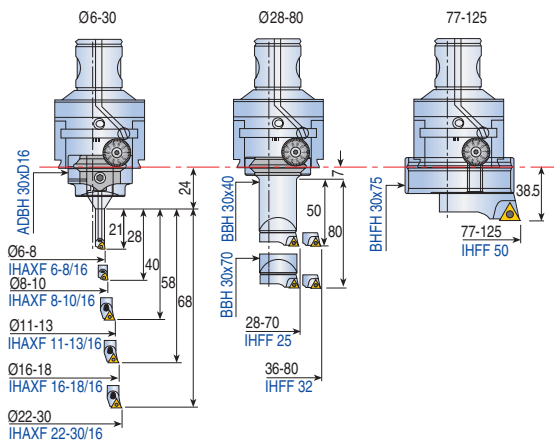


- |                  |                |
|------------------|----------------|
| 1 BHF MB50-50x60 | 1 BBH D16-53   |
| 1 IHFF 25        | 1 BHEH 24x100  |
| 1 IHFF 32        | 1 CW 32        |
| 1 IHFF 50        | 5 TPGX 090202L |
| 1 IHAXF 6-8/16   | 1 TPGX 110302L |
| 1 IHAXF 8-10/16  | 2 WCGT 020102L |
| 1 IHAXF 11-13/16 |                |
| 1 IHAXF 16-18/16 |                |
| 1 IHAXF 22-30/16 |                |

## Kits

### 6-155mm diameter range

2μm



- |                   |                |
|-------------------|----------------|
| 1 BHF MB...-63x87 | 1 BHFH 30x75   |
| 1 IHAXF 6-8/16    | 1 IHFF 25      |
| 1 IHAXF 8-10/16   | 1 IHFF 32      |
| 1 IHAXF 11-13/16  | 1 IHFF 50      |
| 1 IHAXF 16-18/16  | 5 TPGX 090202L |
| 1 IHAXF 22-30/16  | 1 TPGX 110302L |
| 1 ADBH 30xD16     | 2 WCGT 020102L |
| 1 BBH 30x40       | T-8/5          |
| 1 BBH 30x70       | T-6/5          |

| Designation                  | Dimension (mm) |              |
|------------------------------|----------------|--------------|
|                              | SS             | Boring range |
| <b>KIT BHF MB50-63 6-155</b> | MB50           | 6-155        |
| <b>MB63-63 6-155</b>         | MB63           | 6-155        |

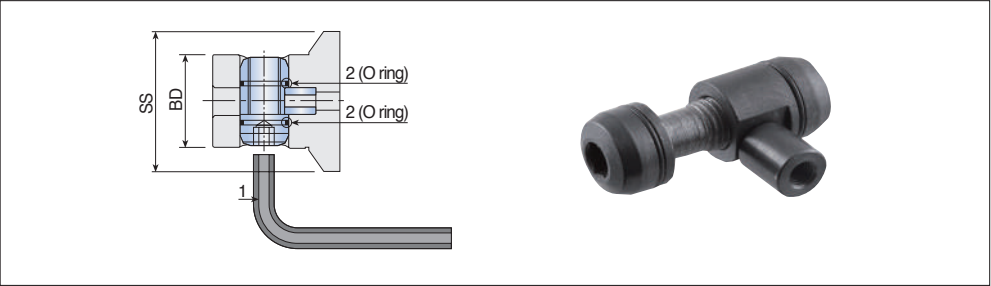




# MB CLAMP

# Spare Parts

## MB system clamp set

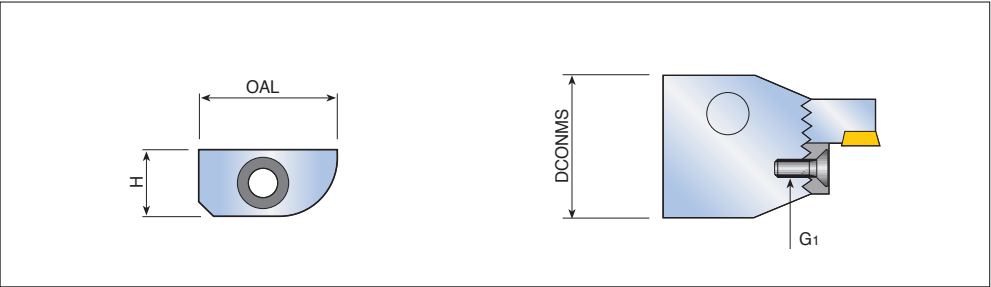


| Designation                     | Dimension (mm) |    |
|---------------------------------|----------------|----|
|                                 | SS             | BD |
| <b>BH MB 14/16 COUPLING SET</b> | MB14/MB16      | 10 |
| <b>MB 20 COUPLING SET</b>       | MB20           | 13 |
| <b>MB 25 COUPLING SET</b>       | MB25           | 16 |
| <b>MB 32 COUPLING SET</b>       | MB32           | 20 |
| <b>MB 40 COUPLING SET</b>       | MB40           | 25 |
| <b>MB 50 COUPLING SET</b>       | MB50           | 32 |
| <b>MB 63/80 COUPLING SET</b>    | MB63/MB80      | 42 |
| <b>MB 110/140 COUPLING SET</b>  | MB110/MB140    | 76 |

# PLT

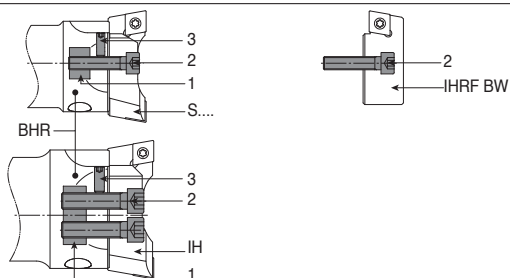
# Spare Parts

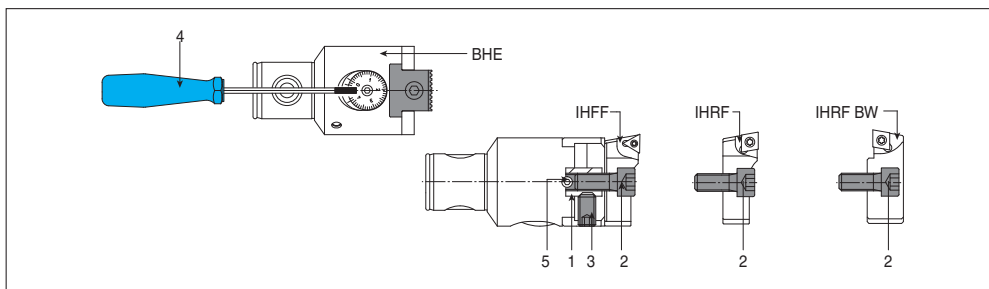
## Cover plate

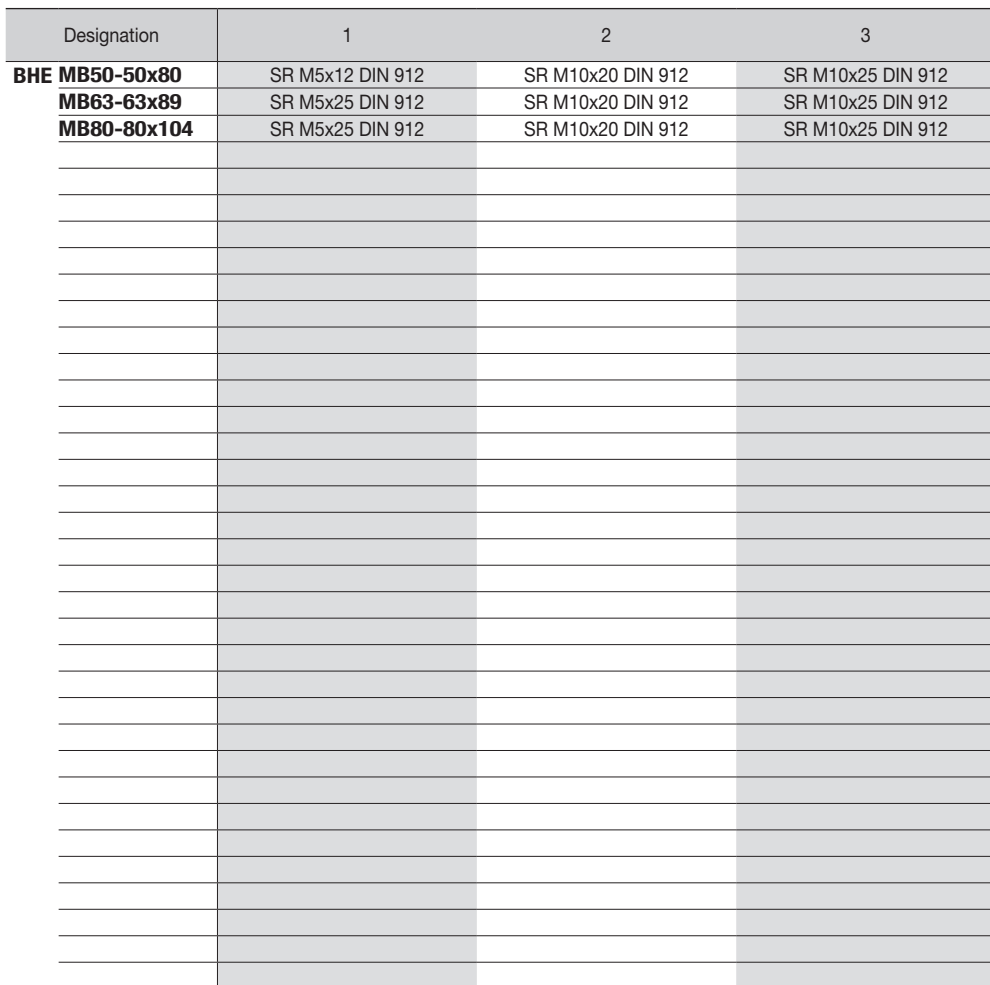


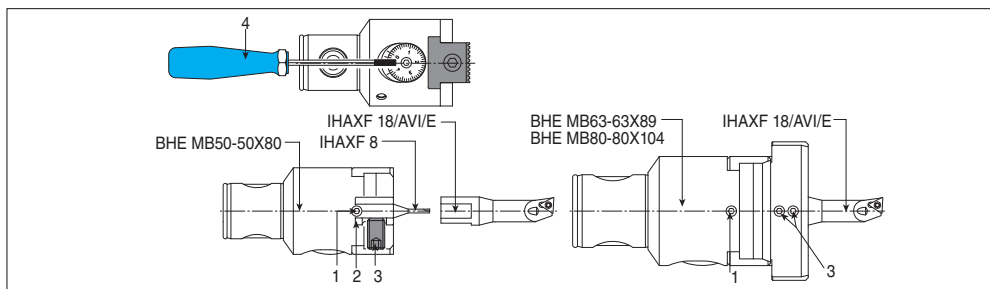
| Designation   | Dimension (mm) |      |     |                   |
|---------------|----------------|------|-----|-------------------|
|               | DCONMS         | H    | OAL | G1                |
| <b>PLT 16</b> | 16             | 7    | 14  | SR M3x12 DIN912   |
| <b>20</b>     | 20             | 8.5  | 17  | SR M4x14 DIN912   |
| <b>32</b>     | 32             | 13.9 | 28  | SR M5x20 DIN7991  |
| <b>40</b>     | 40             | 17.4 | 35  | SR M6x25 DIN7991  |
| <b>63</b>     | 63             | 26.4 | 62  | SR M10x30 DIN7991 |
|               |                |      |     |                   |
|               |                |      |     |                   |

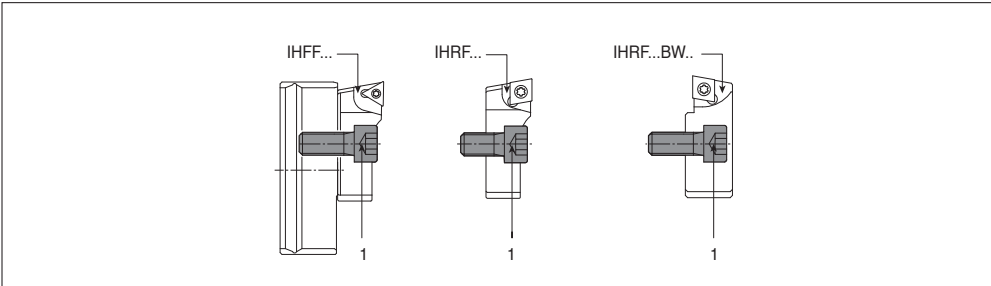
► Protects the serrated faces when a single toolholder is being used.

[illegible]

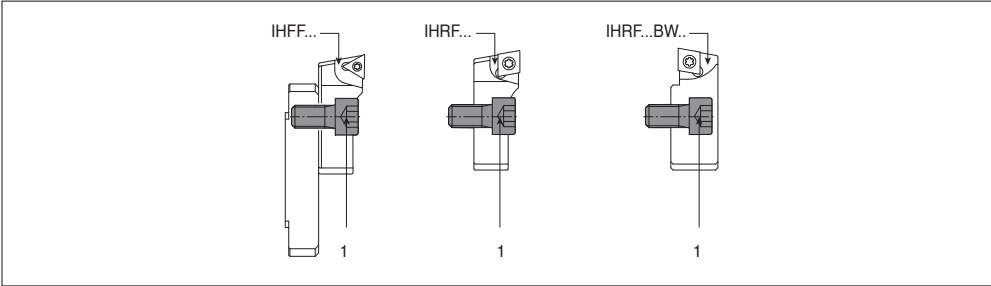
[illegible]



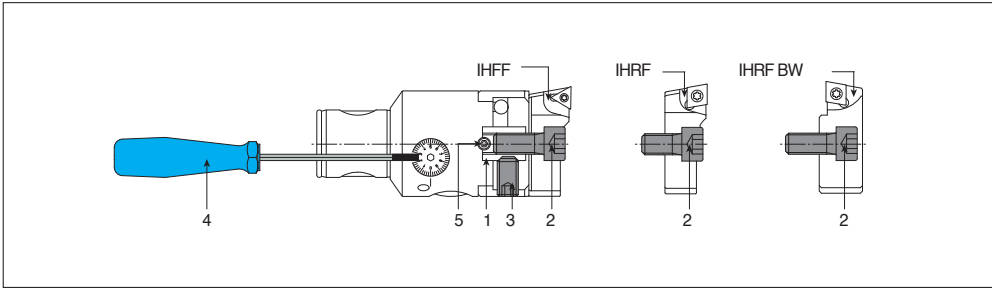
[illegible]



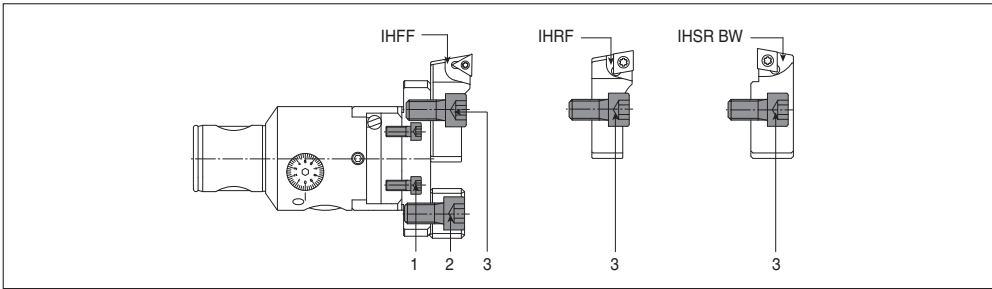
| Designation       | 1                 |
|-------------------|-------------------|
| <b>BHFH 30x75</b> | SR M10x18 DIN 912 |
| <b>30x93</b>      | SR M10x18 DIN 912 |
| <b>30x135</b>     | SR M10x25 DIN 912 |
| <b>40x133</b>     | SR M10x18 DIN 912 |
| <b>40x200</b>     | SR M10x25 DIN 912 |
| <b>40x300</b>     | SR M10x25 DIN 912 |
| <b>40x400</b>     | SR M10x25 DIN 912 |
|                   |                   |
|                   |                   |
|                   |                   |



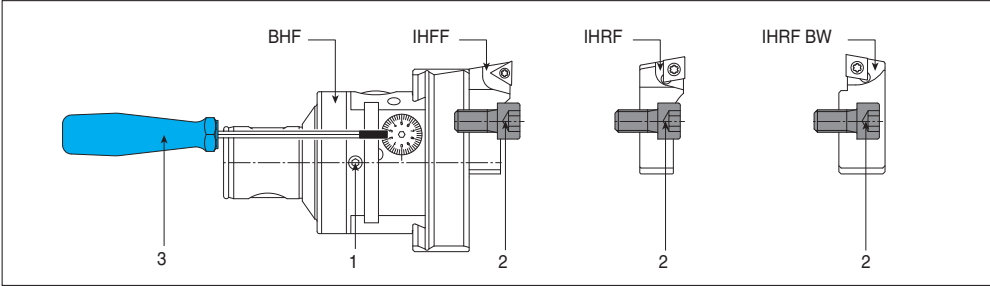
| Designation       | 1                 |
|-------------------|-------------------|
| <b>BHEH 24x75</b> | SR M10x20 DIN 912 |
| <b>24x100</b>     | SR M10x20 DIN 912 |
| <b>28x80</b>      | SR M10x25 DIN 912 |
| <b>28x108</b>     | SR M10x25 DIN 912 |
| <b>28x148</b>     | SR M10x25 DIN 912 |



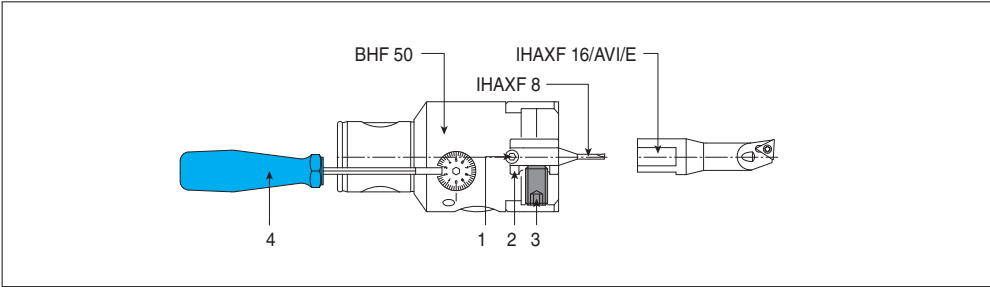
| Designation          | 1         | 2                 | 3                 | 4                | 5                  |
|----------------------|-----------|-------------------|-------------------|------------------|--------------------|
| <b>BHF...- 16...</b> | -         | SR M3x6 DIN 912   | -                 | BH HW 1.5 HANDLE | SR M3x4.5 DIN 913  |
| <b>20...</b>         | -         | SR M4x8 DIN 912   | -                 | BH HW 1.5 HANDLE | SR M3x4.5 DIN 913  |
| <b>25...</b>         | -         | SR M5x10 DIN 912  | -                 | BH HW 2.0 HANDLE | SR M4x4 DIN 913    |
| <b>32...</b>         | -         | SR M6x12 DIN 912  | -                 | BH HW 2.0 HANDLE | SR M4x5 DIN 913    |
| <b>40...</b>         | -         | SR M8x14 DIN 912  | -                 | BH HW 2.5 HANDLE | SR M5x6 DIN 913 SR |
| <b>50-60</b>         | BH NUT 10 | SR M10x25 DIN 912 | SR M10x16 DIN 913 | BH HW 2.5 HANDLE | SR M5x8 DIN 913    |



| Designation          | 1                | 2                 | 3                 |
|----------------------|------------------|-------------------|-------------------|
| <b>BHF...- 50...</b> | SR M5x12 DIN 912 | SR M10x20 DIN 912 | SR M10x25 DIN 912 |
|                      |                  |                   |                   |
|                      |                  |                   |                   |
|                      |                  |                   |                   |
|                      |                  |                   |                   |
|                      |                  |                   |                   |



| Designation   | 1                | 2                 | 3                |
|---------------|------------------|-------------------|------------------|
| BHF...- 63... | SR M6x10 DIN 915 | SR M10x25 DIN 912 | BH HW 3.0 HANDLE |
| 80...         | SR M6x14 DIN 915 | SR M10x25 DIN 912 | BH HW 3.0 HANDLE |
| 125...        | SR M6x22 DIN 915 | SR M10x25 DIN 912 | BH HW 3.0 HANDLE |
|               |                  |                   |                  |
|               |                  |                   |                  |
|               |                  |                   |                  |
|               |                  |                   |                  |

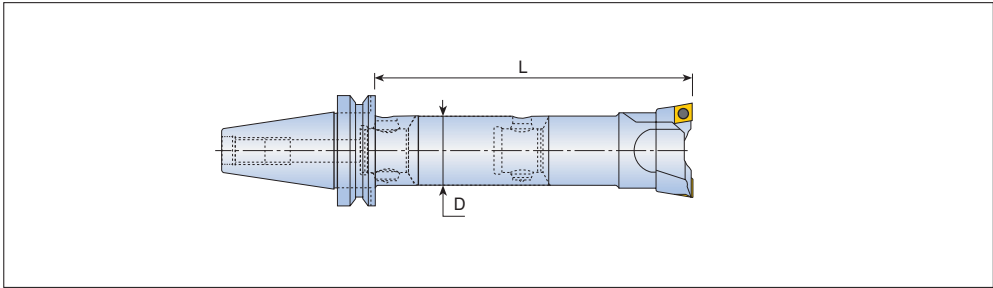


| Designation   | 1               | 2             | 3                 | 4                |
|---------------|-----------------|---------------|-------------------|------------------|
| BHF...- 50... | SR M5x8 DIN 913 | SLEEVE D8-D16 | SR M10x10 DIN 913 | BH HW 2.5 HANDLE |
|               |                 |               |                   |                  |
|               |                 |               |                   |                  |
|               |                 |               |                   |                  |
|               |                 |               |                   |                  |
|               |                 |               |                   |                  |
|               |                 |               |                   |                  |

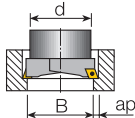


# Recommended Cutting Conditions

## BHR rough boring heads



## Cutting depth



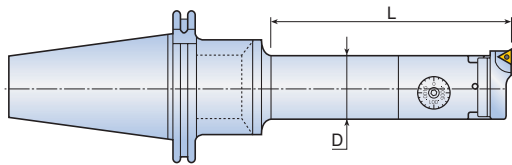
It's advisable to start with  
 $B \text{ hole} \geq \text{boring bar diameter } d$

| B<br>Working range | ap (mm)<br>Steel | ap (mm)<br>Cast iron, Aluminum |
|--------------------|------------------|--------------------------------|
| 18-20              | 1.5-2            | 2-2.5                          |
| 28-50              | 2-3              | 2.5-3.5                        |
| 50-68              | 3-4              | 3.5-5                          |
| 68-200             | 4-5              | 5-7                            |
| 200-500            | 5-6              | 6-8                            |

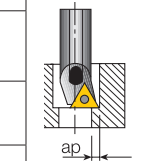
► In case of a single or a stepped boring cutter configuration, only half the feed should be applied

# Recommended Cutting Conditions

## Fine boring heads



Stability ●●● – Good  
●● – Normal  
● – Poor

| Material                    | L/D     | Stability | Cutting speed<br>(Vc=m/min) | Feed f=mm/rev |           | Cutting depth<br>(ap)                                                              |
|-----------------------------|---------|-----------|-----------------------------|---------------|-----------|------------------------------------------------------------------------------------|
|                             |         |           |                             | Insert radius |           |                                                                                    |
|                             |         |           |                             | R=0.2         | R=0.4     |                                                                                    |
| Carbon steel<br>HB≤200      | L/D=2.5 | ●●●       | 200-300                     | 0.05-0.08     | 0.08-0.10 |  |
|                             | L/D=4   | ●●        | 160-250                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=6.3 | ●         | 70-100                      | 0.05-0.08     | -         |                                                                                    |
| Carbon steel<br>HB>200      | L/D=2.5 | ●●●       | 160-250                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=4   | ●●        | 150-200                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=6.3 | ●         | 70-100                      | 0.05-0.08     | -         |                                                                                    |
| Stainless steel             | L/D=2.5 | ●●●       | 150-200                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=4   | ●●        | 120-180                     | 0.08-0.10     | 0.08-0.10 |                                                                                    |
|                             | L/D=6.3 | ●         | 70-80                       | 0.05-0.08     | 0.08-0.10 |                                                                                    |
| Alloyed steel<br>HB 480-550 | L/D=2.5 | ●●●       | 120-160                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=4   | ●●        | 100-140                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=6.3 | ●         | 70-100                      | 0.05-0.08     | -         |                                                                                    |
| Cast iron                   | L/D=2.5 | ●●●       | 120-160                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=4   | ●●        | 100-140                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=6.3 | ●         | 70-100                      | 0.05-0.08     | -         |                                                                                    |
| Aluminum                    | L/D=2.5 | ●●●       | 300-400                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=4   | ●●        | 250-350                     | 0.05-0.08     | 0.08-0.10 |                                                                                    |
|                             | L/D=6.3 | ●         | 100-150                     | 0.05-0.08     | -         |                                                                                    |

# Recommended Cutting Conditions

Stability ●●● – Good  
 ●● – Normal  
 ● – Poor

## BHR rough boring cutting data

ap(mm), R(radius), Vc(m/min), f(mm/rev)

| ISO | Workpiece material | Hardness HB | Overhang L/D | Boring range D18-28 |           |           | Boring range D28-50 |           | Boring range D50-68 |           |
|-----|--------------------|-------------|--------------|---------------------|-----------|-----------|---------------------|-----------|---------------------|-----------|
|     |                    |             |              | ap (mm)             | 0.5-1.2   | 1.2-2.5   | 0.8-1.5             | 1.5-2.5   | 0.8-1.5             | 1.5-3.0   |
|     |                    |             |              | R (Radius)          | 0.2       | 0.4       | 0.2-0.4             | 0.4       | 0.2-0.4             | 0.4-0.8   |
| P   | Carbon steel       | HB<200      | 2.5<br>●●●   | Vc                  | 150-180   | 120-150   | 160-200             | 140-170   | 160-200             | 140-180   |
|     |                    |             |              | f                   | 0.1-0.2   | 0.08-0.2  | 0.15-0.2            | 0.1-0.175 | 0.15-0.25           | 0.08-0.2  |
|     |                    |             | 4<br>●●●     | Vc                  | 140-160   | 100-140   | 160-180             | 120-150   | 160-180             | 120-150   |
|     |                    |             |              | f                   | 0.1-0.18  | 0.08-0.15 | 0.1-0.12            | 0.08-0.1  | 0.1-0.12            | 0.08-0.1  |
|     |                    |             | 6.3<br>●●●   | Vc                  | 60-80     | 40-60     | 60-90               | 50-60     | 70-90               | 50-70     |
|     |                    |             |              | f                   | 0.06-0.12 | 0.06-0.1  | 0.06-0.12           | 0.06-0.1  | 0.06-0.1            | 0.06-0.1  |
|     | Carbon steel       | HB>200      | 2.5<br>●●●   | Vc                  | 130-160   | 100-130   | 140-180             | 120-160   | 140-180             | 120-160   |
|     |                    |             |              | f                   | 0.08-0.15 | 0.08-0.12 | 0.08-0.2            | 0.06-0.12 | 0.08-0.25           | 0.08-0.18 |
|     |                    |             | 4<br>●●●     | Vc                  | 110-140   | 80-110    | 100-140             | 80-120    | 100-140             | 80-120    |
|     |                    |             |              | f                   | 0.08-0.12 | 0.08-0.1  | 0.08-0.15           | 0.06-0.15 | 0.08-0.2            | 0.06-0.15 |
|     |                    |             | 6.3<br>●●●   | Vc                  | 70-90     | 60-70     | 80-100              | 60-80     | 80-100              | 60-80     |
|     |                    |             |              | f                   | 0.08-0.1  | 0.06-0.08 | 0.06-0.1            | 0.06-0.08 | 0.08-0.15           | 0.06-0.1  |

| ISO | Workpiece material | Hardness HB | Overhang L/D | Boring range D68-120 |           |           | Boring range D120-200 |           | Boring range D200-500 |          |
|-----|--------------------|-------------|--------------|----------------------|-----------|-----------|-----------------------|-----------|-----------------------|----------|
|     |                    |             |              | ap (mm)              | 0.8-1.5   | 1.5-3.5   | 0.8-2.0               | 2.0-3.5   | 0.8-1.5               | 2.0-4.0  |
|     |                    |             |              | R (Radius)           | 0.2-0.4   | 0.4-0.8   | 0.2-0.4               | 0.4-0.8   | 0.2-0.4               | 0.4-0.8  |
| P   | Carbon steel       | HB<200      | 2.5<br>●●●   | Vc                   | 160-220   | 150-180   | 180-250               | 160-200   | 220-280               | 200-220  |
|     |                    |             |              | f                    | 0.15-0.25 | 0.08-0.2  | 0.15-0.3              | 0.1-0.2   | 0.15-0.3              | 0.1-0.15 |
|     |                    |             | 4<br>●●●     | Vc                   | 140-180   | 120-150   | 160-200               | 140-180   | N.R.                  | N.R.     |
|     |                    |             |              | f                    | 0.08-0.2  | 0.08-0.15 | 0.1-0.2               | 0.08-0.15 |                       |          |
|     |                    |             | 6.3<br>●●●   | Vc                   | 70-100    | 50-70     | N.R.                  | N.R.      | N.R.                  | N.R.     |
|     |                    |             |              | f                    | 0.06-0.1  | 0.06-0.1  |                       |           |                       |          |
|     | Carbon steel       | HB>200      | 2.5<br>●●●   | Vc                   | 140-180   | 120-160   | 150-170               | 100-140   | 100-140               | 80-120   |
|     |                    |             |              | f                    | 0.15-0.3  | 0.12-0.2  | 0.15-0.25             | 0.1-0.2   | 0.15-0.3              | 0.1-0.2  |
|     |                    |             | 4<br>●●●     | Vc                   | 120-150   | 100-140   | 100-130               | 80-110    | N.R.                  | N.R.     |
|     |                    |             |              | f                    | 0.1-0.2   | 0.1-0.18  | 0.08-0.2              | 0.08-0.12 |                       |          |
|     |                    |             | 6.3<br>●●●   | Vc                   | 80-100    | 60-80     | N.R.                  | N.R.      | N.R.                  | N.R.     |
|     |                    |             |              | f                    | 0.08-0.12 | 0.08-0.12 |                       |           |                       |          |

► N.R. = Not recommended

► In case of a single or a stepped boring cutter configuration, only half the feed should be applied

# Recommended Cutting Conditions

Stability ●●● – Good  
 ●● – Normal  
 ● – Poor

## BHR rough boring cutting data

ap(mm), R(radius), Vc(m/min), f(mm/rev)

| ISO | Workpiece material | Hardness HB | Overhang L/D | Boring range D18-28  |           | Boring range D28-50   |           | Boring range D50-68   |           |
|-----|--------------------|-------------|--------------|----------------------|-----------|-----------------------|-----------|-----------------------|-----------|
|     |                    |             |              | ap (mm)              |           |                       |           |                       |           |
|     |                    |             |              | R (Radius)           | 0.2       | 0.4                   | 0.2-0.4   | 0.4                   | 0.2-0.4   |
| P   | Alloyed steel      | HB<200      | 2.5<br>●●●   | Vc                   | 140-160   | 90-120                | 150-180   | 100-130               | 160-200   |
|     |                    |             |              | f                    | 0.08-0.18 | 0.08-0.15             | 0.08-0.2  | 0.08-0.18             | 0.1-0.25  |
|     |                    |             | 4<br>●●      | Vc                   | 100-130   | 70-100                | 110-150   | 90-120                | 140-180   |
|     |                    |             |              | f                    | 0.08-0.15 | 0.06-0.12             | 0.08-0.18 | 0.08-0.15             | 0.8-0.18  |
|     |                    |             | 6.3<br>●     | Vc                   | 80-100    | 60-90                 | 80-100    | 70-90                 | 100-140   |
|     |                    |             |              | f                    | 0.08-0.15 | 0.06-0.1              | 0.06-0.12 | 0.06-0.15             | 0.08-0.1  |
|     | Alloyed steel      | HB>200      | 2.5<br>●●●   | Vc                   | 130-150   | 120-140               | 130-150   | 120-140               | 140-170   |
|     |                    |             |              | f                    | 0.08-0.18 | 0.06-0.15             | 0.08-0.18 | 0.06-0.15             | 0.08-0.2  |
|     |                    |             | 4<br>●●      | Vc                   | 100-130   | 100-120               | 100-130   | 100-120               | 120-150   |
|     |                    |             |              | f                    | 0.08-0.15 | 0.06-0.13             | 0.08-0.15 | 0.06-0.13             | 0.08-0.18 |
|     |                    |             | 6.3<br>●     | Vc                   | 80-100    | 70-90                 | 80-100    | 70-90                 | 100-120   |
|     |                    |             |              | f                    | 0.08-0.12 | 0.06-0.11             | 0.08-0.12 | 0.06-0.11             | 0.08-0.12 |
| ISO | Workpiece material | Hardness HB | Overhang L/D | Boring range D68-120 |           | Boring range D120-200 |           | Boring range D200-500 |           |
|     |                    |             |              | ap (mm)              |           |                       |           |                       |           |
|     |                    |             |              | R (Radius)           | 0.2-0.4   | 0.4-0.8               | 0.2-0.4   | 0.4-0.8               | 0.2-0.4   |
| P   | Alloyed steel      | HB<200      | 2.5<br>●●●   | Vc                   | 160-220   | 140-180               | 160-220   | 140-180               | 160-220   |
|     |                    |             |              | f                    | 0.1-0.3   | 0.1-0.25              | 0.1-0.3   | 0.1-0.25              | 0.1-0.35  |
|     |                    |             | 4<br>●●      | Vc                   | 150-200   | 120-160               | 120-160   | 120-160               | N.R.      |
|     |                    |             |              | f                    | 0.1-0.2   | 0.08-0.18             | 0.1-0.2   | 0.08-0.18             | N.R.      |
|     |                    |             | 6.3<br>●     | Vc                   | 100-140   | 100-140               | N.R.      | N.R.                  | N.R.      |
|     |                    |             |              | f                    | 0.08-0.18 | 0.08-0.15             |           |                       |           |
|     | Alloyed steel      | HB>200      | 2.5<br>●●●   | Vc                   | 160-200   | 140-180               | 140-200   | 140-180               | 140-200   |
|     |                    |             |              | f                    | 0.1-0.3   | 0.01-0.25             | 0.01-0.35 | 0.01-0.3              | 0.01-0.35 |
|     |                    |             | 4<br>●●      | Vc                   | 140-160   | 120-140               | 150-180   | 120-140               | N.R.      |
|     |                    |             |              | f                    | 0.08-0.2  | 0.08-0.15             | 0.08-0.12 | 0.08-0.12             | N.R.      |
|     |                    |             | 6.3<br>●     | Vc                   | 100-120   | 70-90                 | N.R.      | N.R.                  | N.R.      |
|     |                    |             |              | f                    | 0.08-0.16 | 0.08-0.12             |           |                       |           |

► N.R. = Not recommended

► In case of a single or a stepped boring cutter configuration, only half the feed should be applied

# Recommended Cutting Conditions

Stability ●●● – Good  
●● – Normal  
● – Poor

## BHR rough boring cutting data

ap(mm), R(radius), Vc(m/min), f(mm/rev)

| ISO | Workpiece material   | Hardness HB            | Overhang L/D |            |  | Boring range D18-28 |           | Boring range D28-50 |           | Boring range D50-68 |           |
|-----|----------------------|------------------------|--------------|------------|--|---------------------|-----------|---------------------|-----------|---------------------|-----------|
|     |                      |                        |              | ap (mm)    |  | 0.5-1.0             | 1.0-1.8   | 0.5-1.0             | 1.0-1.8   | 0.5-1.2             | 1.2-2.0   |
|     |                      |                        |              | R (Radius) |  | 0.2                 | 0.4       | 0.2-0.4             | 0.4       | 0.2-0.4             | 0.4-0.8   |
| M   | Stainless steel      | Ferritic & martensitic | 2.5<br>●●●   | Vc         |  | 100-150             | 110-130   | 120-160             | 100-150   | 120-160             | 110-160   |
|     |                      |                        |              | f          |  | 0.08-0.15           | 0.06-0.12 | 0.08-0.18           | 0.06-0.12 | 0.08-0.25           | 0.08-0.18 |
|     |                      |                        | 4<br>●●      | Vc         |  | 90-130              | 90-120    | 100-140             | 90-140    | 100-150             | 80-120    |
|     |                      |                        |              | f          |  | 0.08-0.12           | 0.06-0.1  | 0.08-0.12           | 0.06-0.1  | 0.08-0.18           | 0.08-0.12 |
|     |                      |                        | 6.3<br>●     | Vc         |  | 60-90               | 50-70     | 60-90               | 50-70     | 70-100              | 50-70     |
|     |                      |                        |              | f          |  | 0.06-0.1            | 0.06-0.1  | 0.06-0.12           | 0.06-0.1  | 0.06-0.15           | 0.08-0.1  |
|     | Stainless steel      | Austenitic             | 2.5<br>●●●   | Vc         |  | 110-130             | 100-130   | 120-150             | 110-140   | 110-160             | 100-150   |
|     |                      |                        |              | f          |  | 0.08-0.15           | 0.06-0.12 | 0.08-0.18           | 0.06-0.12 | 0.08-0.25           | 0.06-0.12 |
|     |                      |                        | 4<br>●●      | Vc         |  | 80-110              | 80-110    | 90-130              | 90-120    | 100-150             | 90-130    |
|     |                      |                        |              | f          |  | 0.08-0.12           | 0.06-0.1  | 0.08-0.12           | 0.06-0.1  | 0.08-0.18           | 0.06-0.1  |
|     |                      |                        | 6.3<br>●     | Vc         |  | 60-90               | 50-70     | 60-90               | 50-70     | 70-100              | 50-70     |
|     |                      |                        |              | f          |  | 0.06-0.1            | 0.06-0.1  | 0.06-0.12           | 0.06-0.1  | 0.06-0.15           | 0.06-0.1  |
|     | Stainless steel cast | Ferritic & martensitic | 2.5<br>●●●   | Vc         |  | 90-130              | 100-130   | 120-150             | 110-140   | 120-160             | 100-150   |
|     |                      |                        |              | f          |  | 0.08-0.15           | 0.06-0.12 | 0.08-0.18           | 0.06-0.12 | 0.08-0.25           | 0.06-0.12 |
|     |                      |                        | 4<br>●●      | Vc         |  | 70-110              | 80-110    | 90-130              | 90-120    | 100-150             | 90-130    |
|     |                      |                        |              | f          |  | 0.08-0.12           | 0.06-0.1  | 0.08-0.12           | 0.06-0.1  | 0.08-0.18           | 0.06-0.1  |
|     |                      |                        | 6.3<br>●     | Vc         |  | 60-90               | 50-70     | 60-90               | 50-70     | 70-100              | 50-70     |
|     |                      |                        |              | f          |  | 0.06-0.1            | 0.06-0.1  | 0.06-0.12           | 0.06-0.1  | 0.06-0.15           | 0.06-0.1  |
|     | Stainless steel cast | Austenitic             | 2.5<br>●●●   | Vc         |  | 80-120              | 70-110    | 100-150             | 90-140    | 110-150             | 100-150   |
|     |                      |                        |              | f          |  | 0.08-0.15           | 0.06-0.12 | 0.08-0.18           | 0.06-0.12 | 0.08-0.25           | 0.06-0.12 |
|     |                      |                        | 4<br>●●      | Vc         |  | 70-100              | 70-100    | 80-130              | 70-120    | 90-140              | 90-130    |
|     |                      |                        |              | f          |  | 0.08-0.12           | 0.06-0.1  | 0.08-0.12           | 0.06-0.1  | 0.08-0.18           | 0.06-0.1  |
|     |                      |                        | 6.3<br>●     | Vc         |  | 60-90               | 50-70     | 60-90               | 50-70     | 70-100              | 50-70     |
|     |                      |                        |              | f          |  | 0.06-0.1            | 0.06-0.1  | 0.06-0.12           | 0.06-0.1  | 0.06-0.15           | 0.06-0.1  |
| M   | Stainless steel      | Ferritic & martensitic | 2.5<br>●●●   | Vc         |  | 130-220             | 120-200   | 140-220             | 120-180   | 150-220             | 120-200   |
|     |                      |                        |              | f          |  | 0.08-0.3            | 0.08-0.25 | 0.08-0.3            | 0.08-0.25 | 0.08-0.3            | 0.08-0.25 |
|     |                      |                        | 4<br>●●      | Vc         |  | 100-160             | 90-140    | 120-180             | 90-140    | N.R.                | N.R.      |
|     |                      |                        |              | f          |  | 0.08-0.25           | 0.08-0.18 | 0.08-0.25           | 0.08-0.18 |                     |           |
|     |                      |                        | 6.3<br>●     | Vc         |  | 70-100              | 50-70     | N.R.                | N.R.      | N.R.                | N.R.      |
|     |                      |                        |              | f          |  | 0.08-0.2            | 0.08-0.15 |                     |           |                     |           |
|     | Stainless steel      | Austenitic             | 2.5<br>●●●   | Vc         |  | 120-200             | 100-160   | 120-200             | 100-160   | 120-200             | 100-180   |
|     |                      |                        |              | f          |  | 0.08-0.3            | 0.08-0.25 | 0.08-0.3            | 0.08-0.25 | 0.08-0.3            | 0.08-0.25 |
|     |                      |                        | 4<br>●●      | Vc         |  | 100-150             | 90-140    | 100-160             | 90-140    | N.R.                | N.R.      |
|     |                      |                        |              | f          |  | 0.08-0.25           | 0.08-0.18 | 0.08-0.25           | 0.08-0.18 | 0.08-0.18           | 0.06-0.1  |
|     |                      |                        | 6.3<br>●     | Vc         |  | 70-100              | 50-70     | N.R.                | N.R.      | N.R.                | N.R.      |
|     |                      |                        |              | f          |  | 0.08-0.2            | 0.08-0.15 |                     |           |                     |           |
|     | Stainless steel cast | Ferritic & martensitic | 2.5<br>●●●   | Vc         |  | 130-200             | 120-180   | 140-200             | 120-160   | 140-200             | 120-180   |
|     |                      |                        |              | f          |  | 0.08-0.3            | 0.08-0.25 | 0.08-0.3            | 0.08-0.25 | 0.08-0.3            | 0.08-0.25 |
|     |                      |                        | 4<br>●●      | Vc         |  | 110-150             | 90-150    | 100-160             | 90-140    | N.R.                | N.R.      |
|     |                      |                        |              | f          |  | 0.08-0.25           | 0.08-0.18 | 0.08-0.25           | 0.08-0.18 |                     |           |
|     |                      |                        | 6.3<br>●     | Vc         |  | 70-100              | 50-70     | N.R.                | N.R.      | N.R.                | N.R.      |
|     |                      |                        |              | f          |  | 0.08-0.2            | 0.08-0.15 |                     |           |                     |           |
|     | Stainless steel cast | Austenitic             | 2.5<br>●●●   | Vc         |  | 130-180             | 120-180   | 120-200             | 100-160   | 120-200             | 100-180   |
|     |                      |                        |              | f          |  | 0.08-0.3            | 0.08-0.25 | 0.08-0.3            | 0.08-0.25 | 0.08-0.3            | 0.08-0.25 |
|     |                      |                        | 4<br>●●      | Vc         |  | 100-140             | 90-140    | 100-160             | 90-140    | N.R.                | N.R.      |
|     |                      |                        |              | f          |  | 0.08-0.25           | 0.08-0.18 | 0.08-0.25           | 0.08-0.18 |                     |           |
|     |                      |                        | 6.3<br>●     | Vc         |  | 70-190              | 50-70     | N.R.                | N.R.      | N.R.                | N.R.      |
|     |                      |                        |              | f          |  | 0.08-0.2            | 0.08-0.15 |                     |           |                     |           |

► N.R. = Not recommended

► In case of a single or a stepped boring cutter configuration, only half the feed should be applied

# Recommended Cutting Conditions

Stability ●●● – Good  
●● – Normal  
● – Poor

## BHR rough boring cutting data

ap(mm), R(radius), Vc(m/min), f(mm/rev)

| ISO | Workpiece material      | Hardness HB           | Overhang L/D | Boring range D18-28 |           |           | Boring range D28-50 |           | Boring range D50-68 |           |
|-----|-------------------------|-----------------------|--------------|---------------------|-----------|-----------|---------------------|-----------|---------------------|-----------|
|     |                         |                       |              | ap (mm)             | 0.5-1.0   | 1.0-1.8   | 0.5-1.0             | 1.0-1.8   | 0.5-1.2             | 1.2-2.0   |
|     |                         |                       |              | R (Radius)          | 0.2-0.4   | 0.4       | 0.2-0.4             | 0.4       | 0.2-0.4             | 0.4-0.8   |
| K   | Gray cast iron GG 10-25 | HB<200                | 2.5<br>●●●   | Vc                  | 120-160   | 100-140   | 120-180             | 110-150   | 120-180             | 110-150   |
|     |                         |                       |              | f                   | 0.06-0.15 | 0.06-0.18 | 0.06-0.15           | 0.06-0.12 | 0.08-0.2            | 0.08-0.12 |
|     |                         |                       | 4<br>●●      | Vc                  | 100-140   | 80-120    | 100-150             | 80-120    | 100-150             | 80-120    |
|     |                         |                       |              | f                   | 0.06-0.12 | 0.06-0.1  | 0.06-0.12           | 0.06-0.1  | 0.08-0.12           | 0.08-0.1  |
|     |                         |                       | 6.3<br>●     | Vc                  | 70-100    | 60-90     | 70-100              | 60-90     | 70-100              | 60-90     |
|     |                         |                       |              | f                   | 0.06-0.1  | 0.06-0.1  | 0.06-0.1            | 0.06-0.1  | 0.08-0.1            | 0.08-0.1  |
|     | Gray cast iron GG 25-40 |                       | 2.5<br>●●●   | Vc                  | 140-200   | 140-200   | 140-220             | 160-250   | 180-220             | 200-280   |
|     |                         |                       |              | f                   | 0.06-0.15 | 0.06-0.18 | 0.06-0.15           | 0.06-0.18 | 0.08-0.2            | 0.1-0.25  |
|     |                         |                       | 4<br>●●      | Vc                  | 120-160   | 120-160   | 120-180             | 140-200   | 140-180             | 180-220   |
|     |                         |                       |              | f                   | 0.06-0.12 | 0.06-0.14 | 0.06-0.12           | 0.06-0.14 | 0.08-0.12           | 0.08-0.2  |
|     |                         |                       | 6.3<br>●     | Vc                  | 70-100    | 60-90     | 70-100              | 60-90     | 60-100              | 60-120    |
|     |                         |                       |              | f                   | 0.06-0.1  | 0.06-0.1  | 0.06-0.1            | 0.06-0.1  | 0.08-0.1            | 0.08-0.1  |
|     | Cast iron GGG           | Spheroidal & graphite | 2.5<br>●●●   | Vc                  | 120-180   | 120-180   | 120-200             | 140-220   | 180-220             | 180-240   |
|     |                         |                       |              | f                   | 0.06-0.15 | 0.06-0.18 | 0.06-0.15           | 0.06-0.18 | 0.08-0.18           | 0.1-0.2   |
|     |                         |                       | 4<br>●●      | Vc                  | 120-160   | 120-160   | 120-180             | 140-200   | 140-200             | 160-220   |
|     |                         |                       |              | f                   | 0.06-0.12 | 0.06-0.14 | 0.06-0.12           | 0.06-0.14 | 0.08-0.12           | 0.08-0.18 |
|     |                         |                       | 6.3<br>●     | Vc                  | 60-100    | 60-90     | 60-100              | 60-90     | 60-90               | 60-100    |
|     |                         |                       |              | f                   | 0.06-0.1  | 0.06-0.1  | 0.06-0.1            | 0.06-0.1  | 0.08-0.1            | 0.08-0.1  |

| ISO           | Workpiece material      | Hardness HB | Overhang L/D | Boring range D18-28 |           |           | Boring range D28-50 |           | Boring range D50-68 |           |
|---------------|-------------------------|-------------|--------------|---------------------|-----------|-----------|---------------------|-----------|---------------------|-----------|
|               |                         |             |              | ap (mm)             | 0.8-1.8   | 1.8-2.5   | 0.8-2.0             | 2.0-3.0   | 0.8-2.0             | 2.0-3.5   |
|               |                         |             |              | R (Radius)          | 0.2-0.4   | 0.4-0.8   | 0.2-0.4             | 0.4-0.8   | 0.2-0.4             | 0.4-0.8   |
| K             | Gray cast iron GG 10-25 | HB<200      | 2.5<br>●●●   | Vc                  | 120-200   | 110-150   | 150-250             | 180-280   | 150-250             | 180-280   |
|               |                         |             |              | f                   | 0.08-0.25 | 0.08-0.3  | 0.08-0.25           | 0.08-0.35 | 0.08-0.25           | 0.08-0.35 |
|               |                         |             | 4<br>●●      | Vc                  | 100-150   | 80-120    | 120-170             | 120-170   | N.R.                | N.R.      |
|               |                         |             |              | f                   | 0.08-0.18 | 0.08-0.2  | 0.08-0.18           | 0.08-0.25 |                     |           |
|               |                         |             | 6.3<br>●     | Vc                  | 70-100    | 60-90     | N.R.                | N.R.      | N.R.                | N.R.      |
|               |                         |             |              | f                   | 0.08-0.15 | 0.08-0.12 |                     |           |                     |           |
|               | Gray cast iron GG 25-40 |             | 2.5<br>●●●   | Vc                  | 50-300    | 250-350   | 250-350             | 250-350   | 250-350             | 250-350   |
|               |                         |             |              | f                   | 0.12-0.35 | 0.12-0.35 | 0.15-0.3            | 0.15-0.4  | 0.15-0.3            | 0.15-0.4  |
|               |                         |             | 4<br>●●      | Vc                  | 200-270   | 230-300   | 200-300             | 200-270   | N.R.                | N.R.      |
|               |                         |             |              | f                   | 0.1-0.25  | 0.12-0.3  | 0.15-0.3            | 0.15-0.35 |                     |           |
|               |                         |             | 6.3<br>●     | Vc                  | 70-150    | 60-120    | N.R.                | N.R.      | N.R.                | N.R.      |
|               |                         |             |              | f                   | 0.1-0.15  | 0.12-0.25 |                     |           |                     |           |
| Cast iron GGG | Spheroidal & graphite   | 2.5<br>●●●  | Vc           | 200-240             | 200-280   | 200-280   | 220-300             | 220-300   | 220-300             |           |
|               |                         |             | f            | 0.12-0.3            | 0.12-0.3  | 0.15-0.3  | 0.15-0.35           | 0.15-0.3  | 0.15-0.35           |           |
|               |                         | 4<br>●●     | Vc           | 160-220             | 180-240   | 180-250   | 200-270             | N.R.      | N.R.                |           |
|               |                         |             | f            | 0.1-0.2             | 0.12-0.25 | 0.15-0.25 | 0.15-0.35           |           |                     |           |
|               |                         | 6.3<br>●    | Vc           | 60-100              | 60-100    | N.R.      | N.R.                | N.R.      | N.R.                |           |
|               |                         |             | f            | 0.1-0.15            | 0.12-0.2  |           |                     |           |                     |           |

- ▶ N.R. = Not recommended
- ▶ In case of a single or a stepped boring cutter configuration, only half the feed should be applied

# Recommended Cutting Conditions

Stability ●●● – Good  
 ●● – Normal  
 ● – Poor

## BHR rough boring cutting data

ap(mm), R(radius), Vc(m/min), f(mm/rev)

| ISO | Workpiece material | Hardness HB | Overhang L/D |            | Boring range D18-28 |           | Boring range D28-50 |           | Boring range D50-68 |           |
|-----|--------------------|-------------|--------------|------------|---------------------|-----------|---------------------|-----------|---------------------|-----------|
|     |                    |             |              | ap (mm)    | 0.5-1.5             | 1.5-2.5   | 0.5-1.5             | 1.5-2.5   | 0.5-2.0             | 1.2-3.0   |
|     |                    |             |              | R (Radius) | 0.2-0.4             | 0.4       | 0.2-0.4             | 0.4       | 0.2-0.4             | 0.4-0.8   |
| N   | Aluminum/<br>Cast  | >12si       | 2.5<br>●●●   | Vc         | 200-300             | 240-350   | 200-300             | 240-350   | 200-300             | 240-350   |
|     |                    |             |              | f          | 0.06-0.2            | 0.06-0.25 | 0.06-0.2            | 0.06-0.25 | 0.06-0.25           | 0.06-0.3  |
|     |                    |             | 4<br>●●      | Vc         | 150-220             | 150-220   | 150-220             | 150-220   | 150-220             | 150-220   |
|     |                    |             |              | f          | 0.06-0.2            | 0.06-0.2  | 0.06-0.2            | 0.06-0.2  | 0.06-0.2            | 0.06-0.2  |
|     |                    |             | 6.3<br>●     | Vc         | 60-100              | 60-100    | 60-100              | 60-100    | 60-100              | 60-100    |
|     |                    |             |              | f          | 0.06-0.1            | 0.06-0.1  | 0.06-0.1            | 0.06-0.1  | 0.06-0.1            | 0.06-0.1  |
|     | Aluminum/<br>Cast  | <12si       | 2.5<br>●●●   | Vc         | 180-250             | 220-280   | 180-250             | 220-280   | 180-250             | 220-280   |
|     |                    |             |              | f          | 0.06-0.2            | 0.06-0.25 | 0.06-0.25           | 0.06-0.25 | 0.06-0.25           | 0.06-0.3  |
|     |                    |             | 4<br>●●      | Vc         | 120-220             | 120-220   | 120-220             | 120-220   | 120-220             | 120-220   |
|     |                    |             |              | f          | 0.06-0.2            | 0.06-0.2  | 0.06-0.2            | 0.06-0.2  | 0.06-0.2            | 0.06-0.25 |
|     |                    |             | 6.3<br>●     | Vc         | 60-100              | 60-100    | 60-100              | 60-100    | 60-100              | 60-100    |
|     |                    |             |              | f          | 0.06-0.1            | 0.06-0.1  | 0.06-0.1            | 0.06-0.1  | 0.06-0.1            | 0.06-0.1  |

| ISO | Workpiece material | Hardness HB | Overhang L/D |            | Boring range D68-120 |           | Boring range D120-200 |           | Boring range D200-500 |          |
|-----|--------------------|-------------|--------------|------------|----------------------|-----------|-----------------------|-----------|-----------------------|----------|
|     |                    |             |              | ap (mm)    | 0.8-3.0              | 1.8-4.0   | 0.8-3.0               | 2.0-4.0   | 0.8-3.0               | 2.0-4.5  |
|     |                    |             |              | R (Radius) | 0.2-0.4              | 0.4-0.8   | 0.2-0.4               | 0.4-0.8   | 0.2-0.4               | 0.4-0.8  |
| N   | Aluminum/<br>Cast  | >12si       | 2.5<br>●●●   | Vc         | 200-300              | 240-350   | 200-300               | 240-350   | 200-300               | 240-350  |
|     |                    |             |              | f          | 0.06-0.25            | 0.06-0.3  | 0.06-0.25             | 0.06-0.4  | 0.06-0.25             | 0.06-0.4 |
|     |                    |             | 4<br>●●      | Vc         | 150-220              | 150-220   | 150-220               | 150-220   | N.R.                  | N.R.     |
|     |                    |             |              | f          | 0.06-0.2             | 0.06-0.2  | 0.06-0.2              | 0.06-0.2  |                       |          |
|     |                    |             | 6.3<br>●     | Vc         | 60-100               | 60-100    | N.R.                  | N.R.      | N.R.                  | N.R.     |
|     |                    |             |              | f          | 0.06-0.1             | 0.06-0.1  |                       |           |                       |          |
|     | Aluminum/<br>Cast  | <12si       | 2.5<br>●●●   | Vc         | 180-250              | 220-280   | 180-250               | 220-280   | 180-250               | 220-280  |
|     |                    |             |              | f          | 0.06-0.25            | 0.06-0.3  | 0.06-0.3              | 0.06-0.4  | 0.06-0.3              | 0.06-0.4 |
|     |                    |             | 4<br>●●      | Vc         | 120-220              | 120-220   | 120-220               | 120-220   | N.R.                  | N.R.     |
|     |                    |             |              | f          | 0.06-0.2             | 0.06-0.25 | 0.06-0.2              | 0.06-0.25 |                       |          |
|     |                    |             | 6.3<br>●     | Vc         | 60-100               | 60-100    | N.R.                  | N.R.      | N.R.                  | N.R.     |
|     |                    |             |              | f          | 0.06-0.1             | 0.06-0.1  |                       |           |                       |          |

► N.R. = Not recommended

► In case of a single or a stepped boring cutter configuration, only half the feed should be applied

# Technical Data

## ► Fine boring head BHF 16-50 and BHE operating instructions

### ■ Assembly

- When mounting the BHF boring head, the expanding pin should be kept tightly inside the cylindrical body
- Insert the BHF into the shank
- Tighten the pin ❷ by turning clockwise

The recommended tightening torque guidelines are as follows:

| Recommended Torque | (N·m)       |
|--------------------|-------------|
| BHF MB16 - 16 x 34 | 2.0 - 2.5   |
| BHF MB20 - 20 x 40 | 4.0 - 4.5   |
| BHF MB25 - 25 x 50 | 6.5 - 7.5   |
| BHF MB32 - 32 x 63 | 7.0 - 8.0   |
| BHF MB40 - 40 x 80 | 16.0 - 18.0 |
| BHF MB50 - 50 x 60 | 30.0 - 35.0 |

- Insert screw ❸ until it completely enters the recess in the sleeve nut or boring bar

### ■ Disassembly

- Loosen the pin ❷ by turning counter-clockwise

### ■ Positioning

- Loosen the screw ❹ before making any slide adjustment
- By turning the graduated dial ❸ counterclockwise, set the tool slide ❷ allowance for a 4mm adjustment
- Lock the tool slide by means of screw ❹, to the desired position
- Lock the screw ❹
- When making any slide adjustment, firstly loosen the screw ❹

### ■ Maintenance

Weekly:

- Lubricate through the oiling nipple ❸ with ISO UN G220 oil

Periodically:

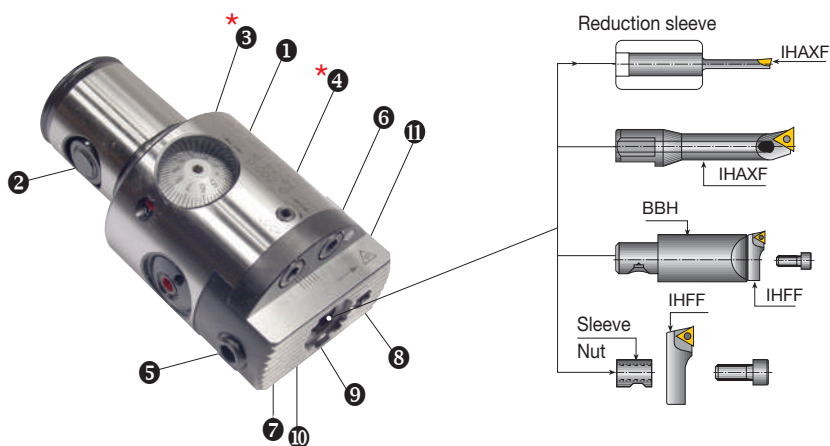
- Clean the conical cylindrical surface and then lubricate
- Grease the expanding pin ❷ with an anti-friction lubricant
- Clean and lubricate the tool slide guideway

### ■ Important note:

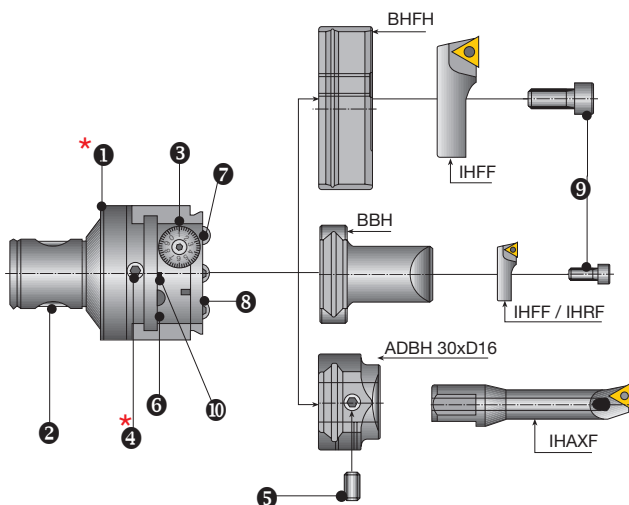
- Toolholder should be firmly affixed to the slide at all times

\* Due to back-lash phenomenon, if you pass the required value, turn the dial ❸ in the reverse direction at least one rotation and then re-adjust in the original direction



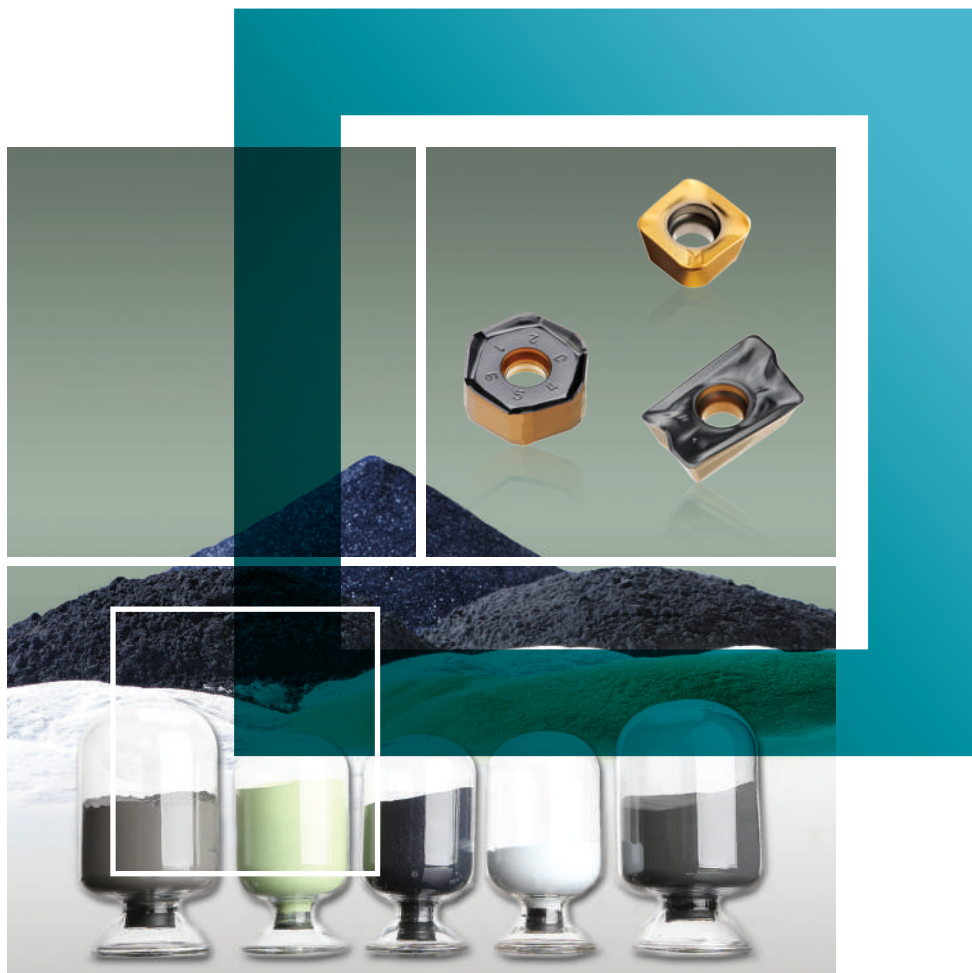


- |                    |                            |                   |                                                            |
|--------------------|----------------------------|-------------------|------------------------------------------------------------|
| ① Body             | * ④ Slide locking screw    | ⑦ Slide holder    | ⑩ Slide adjusting range<br>Do not exceed the range marks!! |
| ② Expanding pin    | ⑤ Toolholder locking screw | ⑧ Oiling nipple   |                                                            |
| * ③ Graduated dial | ⑥ Coolant nozzle           | ⑨ Tool bore .63H7 | ⑪ Cutting edge position mark                               |



- |                  |                            |                 |                                                            |
|------------------|----------------------------|-----------------|------------------------------------------------------------|
| * ① Body         | * ④ Slide locking screw    | ⑦ Slide holder  | ⑨ Toolholder locking screws                                |
| ② Expanding pin  | ⑤ Toolholder locking screw | ⑧ Oiling nipple | ⑩ Slide adjusting range<br>Do not exceed the range marks!! |
| ③ Graduated dial | ⑥ Coolant nozzle           |                 |                                                            |

# MATERIALS & GRADES



# Grade Comparison Table

## ► Milling grades

| ISO class | TaeguTec                                                 | Sandvik                                                | Walter                                                                                                 | Seco                                                          | Kennametal                                                        | MMC                                                                | Sumitomo                                                              | Tungaloy                                                                 | Kyocera                                                | Korloy                                                             | Iscar                                                                 |
|-----------|----------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------|
| P         | TT5505<br>TT5515<br>TT2510<br>TT7080                     | GC4330<br>GC1010<br>GC4220<br>GC4230                   | WKP25S<br>WAM10<br>WAM20<br>WHH15X<br>WXM15                                                            | MP1501<br>MP1500<br>MP2501<br>MP2500<br>T250M                 | KC510M<br>KCPM15                                                  | MV1020<br>MP6120<br>UP20M                                          | ACP100                                                                | T3130<br>AH3035<br>AH710                                                 |                                                        | PC2005<br>PC3700<br>PC3600<br>PC3525<br>PC3530<br>NC5330<br>NC5340 | IC5600<br>IC5400<br>IC903                                             |
|           | TT5513<br>TT5520<br>TT9080<br>TT5523<br>TT5525           | GC4340<br>GC1230<br>GC1130<br>GC1030<br>GC4240         | WKP25<br>WKP25S<br>WAM30<br>GC1030<br>WJ30TF                                                           | F25M<br>F30M<br>F32M<br>MK2050<br>MP3000                      | KC522M<br>KC635M<br>KC633M<br>KC643M                              | MV1030<br>MP9120<br>MP9130<br>VP15TF<br>MP6130<br>VP20RT           | XCU2500<br>ACP3000<br>ACU2500<br>ACP200                               | AH110<br>AH3225<br>AH725<br>AH730<br>GH330<br>AH120                      | PR830<br>PR1225<br>PR1230<br>PR9925<br>PR1825          | PC3500<br>PC5300<br>PC5535<br>PC3535<br>PC210F                     | IC608<br>IC808<br>IC908<br>IC810                                      |
|           | TT8080<br>TT5543<br>TT8625                               | GC4240<br>GC1040                                       | WKP35G<br>WKP35S<br>WKP45S<br>WSM45X<br>WSP45S<br>WSP45G<br>WSP46                                      | F40M<br>MP3501<br>T350M<br>T60M<br>MS2050<br>MP2051<br>MP2050 | KC725M<br>KC735M<br>KC935M<br>KCPM20<br>KCPM40                    | VP30RT<br>FH7020<br>F7030                                          | ACP300<br>ACZ350                                                      | AH140<br>T3130<br>AH130<br>AH3135<br>AH9030                              | PR1525                                                 | UPC830<br>PC5400<br>NC5350<br>NCM535                               | IC5500<br>IC830<br>IC928<br>IC330<br>IC328<br>IC845                   |
|           | TT5515<br>TT5520<br>TT9080<br>GC2030<br>TT9030<br>TT5523 | GC1010<br>GC1130<br>GC1030<br>GC2030<br>S30T<br>GC1025 | WXM15<br>WAM30<br>WXM35                                                                                | MS2050<br>MP3000<br>MP2501<br>MP2500<br>F25M<br>F30M<br>F32M  | KC635M<br>KCSM15A<br>KCPM15<br>KC643M<br>KCSM15<br>KC633M         | MP9120<br>MP9130<br>VP15TF<br>VP20RT                               | XCU2500<br>ACU2500<br>ACK300<br>ACP300<br>ACM100<br>ACM200<br>ACS1000 | AH110<br>AH3225<br>T3130<br>AH8015<br>AH725<br>AH9130<br>AH120<br>AH4035 | PR830<br>PR1210<br>PR1025<br>PR1225<br>PR905<br>PR1835 | PC210F<br>PC5300<br>PC5535<br>PC9530<br>UPC845                     | IC903<br>IC608<br>IC808<br>IC908<br>IC380                             |
|           | TT8080<br>TT5543<br>TT8020<br>TT3535<br>TT3520           | GC2040<br>GC1040<br>S40T                               | WJ30RA<br>WSM30<br>WSM35<br>WSM35G<br>WSM36<br>WSP45G<br>WSP45S<br>WSM45X<br>WMP45G<br>WSP45G<br>WSP46 | MP3501<br>F40M<br>MS2500<br>MM4500<br>MP2051<br>MP2050        | KC725M<br>KCPM40<br>KCSM40                                        | MP9140<br>MP7030<br>MP7130<br>MP7140<br>VP30RT<br>MV1030<br>MC7020 | ACM200<br>ACM300<br>ACZ2500<br>ACS3000                                | AH130<br>AH140<br>SH730<br>AH3135                                        | PR1225<br>PR905<br>PR1525<br>PR1535                    | PC5400<br>NC5350<br>PC9540                                         | IC840<br>IC5820<br>IC716<br>IC882<br>IC830<br>IC928<br>IC330<br>IC328 |
|           | TT7505<br>TT7515                                         | GC1010<br>GC3220<br>GC3330<br>GC4220                   | WAK15<br>WHH15X<br>WXM15                                                                               | F15M<br>MK1500<br>MP1500<br>MH1000                            | KC915M<br>KCK15<br>KC643M<br>KCPM15                               | MC5020<br>MV1020                                                   | ACK3000<br>ACU2500<br>ACK200                                          | T1115<br>AH9130                                                          |                                                        | PC2005<br>PC8110                                                   | IC4100<br>IC5100<br>IC903                                             |
|           | TT5515<br>TT5520<br>TT6080<br>TT5525                     | GC1020<br>GC1220<br>GC4230<br>GC3040<br>GC4240<br>K20D | WKP25S<br>WKP35G<br>WKP35S<br>WKK25G<br>WKK25S                                                         | MP3501<br>F25M<br>MK2000<br>MK3000<br>MK2050<br>F32M          | KCKP10<br>KCK20B<br>KCK15<br>KC520M<br>KC633M<br>KC643M<br>KCPM15 | MV1030<br>MP8010<br>VP15TF<br>VP20RT<br>F5010                      | XCU2500<br>XCK2000<br>ACK300<br>ACZ310                                | AH110<br>AH725<br>AH120<br>AH8015                                        | PR1810<br>PR905<br>PR1210<br>PR1510                    | PC6100<br>PC210F<br>PC6510<br>NC5330<br>PC5535<br>NC5340<br>NCM535 | IC608<br>IC810<br>IC808<br>IC908                                      |
|           | TT5505<br>TT5515<br>TT2510<br>TT6080<br>TT9080           | GC1010<br>GC1130<br>GC1030                             | WHH15<br>WHH15X                                                                                        | F15M<br>MH1000<br>MP1500<br>MP2051<br>MP3000<br>F30M<br>F32M  | KC510M<br>KC522M<br>KC635M<br>KC639M<br>KCPM15                    | MP8010<br>VP15TF<br>VP20RT<br>F5010                                |                                                                       | AH710<br>AH750<br>AH8005<br>AH8015<br>AH9030                             | PR015S                                                 | PC2005<br>PC2010<br>PC2015<br>PC2510<br>PC2505<br>PC210F<br>PC5535 | IC903<br>IC608<br>IC808<br>IC908                                      |
| N         | K10<br>UF10<br>TTA101                                    | H13A<br>H10<br>GC1030                                  | WNN15<br>WXN15                                                                                         | F15M<br>F32M<br>F40M                                          | K600<br>KC410M<br>KC422M                                          |                                                                    | DL1000<br>DL2000                                                      | DS1100<br>DS1200<br>GH110                                                | PDL025                                                 | PD1005<br>PD1010                                                   | IC1058                                                                |

# Grade Comparison Table

## ► Cermet grades

| ISO class | TaeguTec | Sandvik | Kennametal      | Sumitomo       | Kyocera                           | Tungaloy | Mitsubishi              | Korloy       | Seco           | NTK                      | Ceramtec       |
|-----------|----------|---------|-----------------|----------------|-----------------------------------|----------|-------------------------|--------------|----------------|--------------------------|----------------|
| P         | CT7000   | CT530   | KT1120<br>KT175 | T250A<br>T130A | TN100M<br>TN620M<br>TC60M<br>PV90 | NS740    | VP45N<br>NX99<br>NX3035 | CN20<br>CN30 | TP1020<br>C15M | N20<br>Z15<br>C50<br>C7X | SC7015<br>SC60 |

## ► Ceramic grades

| ISO class | Composition                                                                                                           | TaeguTec         | Sandvik                    | Kennametal                                   | Ceramtec                                                 | NTK                      | Kyocera          | Sumitomo                    | Tungaloy       |
|-----------|-----------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|----------------------------------------------|----------------------------------------------------------|--------------------------|------------------|-----------------------------|----------------|
| K         | Al <sub>2</sub> O <sub>3</sub> , ZrO <sub>2</sub>                                                                     | AW120            | CC620                      |                                              | SN60<br>SN80                                             | HC1<br>HW2               | KA30             |                             | TZ120          |
|           | Al <sub>2</sub> O <sub>3</sub> , TiC                                                                                  | AB30             | CC650                      | KY1615                                       | SH2<br>SH4                                               | HC2<br>HC5<br>HC6        | A65              | NB90S<br>NB90M              | LX21           |
|           | Si <sub>3</sub> N <sub>4</sub> , Al <sub>2</sub> O <sub>3</sub> ,<br>Y <sub>2</sub> O <sub>3</sub> , AlN              | AS500            |                            | KY1310<br>KY3000                             | SL506<br>SL508<br>SL606<br>SL608                         | SX9                      |                  |                             |                |
|           | Si <sub>3</sub> N <sub>4</sub> , ZrO <sub>2</sub> ,<br>Al <sub>2</sub> O <sub>3</sub> , Y <sub>2</sub> O <sub>3</sub> | AS10             | CC6090<br>CC6190           | KY1320<br>KY3500<br>KYK10                    | SL500<br>SL808                                           | SX1<br>SX6<br>SX8        | KS6000<br>KS6050 | SN2000K<br>SN2100K<br>NS260 | FX105<br>CX710 |
|           | CVD coated                                                                                                            | SC10             | CC1690                     | KY3400<br>KYK25                              | SL550C<br>SL554C<br>SL654C<br>SL658C<br>SL854C<br>SL858C | SP2<br>SP9               | CS7050           | NS260C                      | CXC73          |
| H         | Al <sub>2</sub> O <sub>3</sub> , TiCN                                                                                 | AB20<br>AB30     | CC6050                     |                                              | SH2<br>SH4                                               | HC2<br>HC5<br>HC7        |                  |                             | LX10           |
|           | PVD coated                                                                                                            | AB2010           | CC670                      | KY4400                                       |                                                          | ZC4<br>ZC7               | A66N<br>PT600M   | NB100C                      | LX11           |
| S         | Al <sub>2</sub> O <sub>3</sub> ,<br>SiC whisker                                                                       | TC430            | CC6060<br>CC6065<br>CC6160 | KY4300                                       |                                                          | WA1<br>WA5               |                  | WX2000                      |                |
|           | Si <sub>3</sub> N <sub>4</sub> , TiN                                                                                  | TC3020<br>TC3030 | CC6220<br>CC6230           | KY2100<br>KY1540<br>KYS30<br>KYS25<br>KYS30P |                                                          | SX3<br>SX5<br>SX7<br>SX9 | KS6030<br>KS6040 | SN1000S<br>SN2000S          | TS200<br>TS300 |

# Grade Comparison Table

## ► CBN grades

| ISO class | TaeguTec        | Iscar          | Tungaloy                         | Sumitomo                   | Sandvik                                      | Kennametal       | Mitsubishi                          | Kyocera                    | Seco                                             |
|-----------|-----------------|----------------|----------------------------------|----------------------------|----------------------------------------------|------------------|-------------------------------------|----------------------------|--------------------------------------------------|
| H         | TB610           | IB10H<br>IB50  | BX310                            | BN1000<br>BNX10            | CB7105<br>CB7015                             | KB1610           | MBC010                              | KBN510                     | CBN010                                           |
|           |                 | IB10HC         | BXC30<br>BXA30                   | BNC80<br>BNC100<br>BNC2010 |                                              | KB5610<br>KB9610 | MB8025<br>BC8105<br>BC8210          | KBN10M<br>KBN10C<br>KBN25C | CBN050C<br>CH0550                                |
|           | TB2015<br>TB650 | IB20H<br>IB55  | BX330<br>BX530                   | BN250<br>BN2000<br>BNX20   | CB7115<br>CB7025                             | KB1625           | MB810                               | KBN525                     | CBN100                                           |
|           |                 | IB25HA         | BXM10<br>BXC30<br>BXA40          | BNC160<br>BNC2020          |                                              | KB5625           | MB820<br>BC8110<br>BC8220           | KBN05M<br>KBN25M           | CBN160C<br>CH2540                                |
|           | TB670           | IB25HC         | BX360<br>BX380                   | BNX25<br>BN350             | CB7125<br>CB7135<br>CB50<br>CB7525<br>CB7925 |                  | MB825<br>MB8025<br>BC8120<br>BC8220 |                            | CBN150<br>CBN170                                 |
|           |                 |                | BXM20<br>BXA20<br>BXA40<br>BXC50 | BNC200<br>BNC300           |                                              |                  | MB835<br>BC8020<br>BC8130           | KBN30M                     | CBN060K<br>CBN100P                               |
| K         | TB7015<br>TB730 | IB90           | BX930<br>BX850<br>BX950          | BN500<br>BN7500<br>BN7000  | CB50<br>CB7525                               | KB1630<br>KB1345 | MB4020<br>MB710                     | KBN475<br>KBN60M<br>KBN65B | CBN200                                           |
|           |                 | IB05S<br>IB10S | BX470<br>BX480                   | BN700<br>BNC500            | CB7050                                       | KB5630<br>KB9640 | MB730                               | KBN65M<br>KBN70M<br>KBN570 | CH3515                                           |
|           | TB7020          |                | BX90S<br>BXC90                   | BNS800                     | CB7925                                       |                  | MBS140                              | KBN900                     | CBN200<br>CBN300<br>CBN300P<br>CBN350<br>CBN400C |

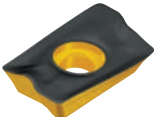
## ► PCD grades

| ISO class | TaeguTec | Iscar | Tungaloy       | Sumitomo         | Sandvik | Kennametal | Mitsubishi | Kyocera | Seco            | NTK |
|-----------|----------|-------|----------------|------------------|---------|------------|------------|---------|-----------------|-----|
| N01-N10   | TD1010   | ID8   | DX180<br>DX160 | DA90             |         | KD1405     | MD203      | KPD230  | PCD30M<br>PCD30 |     |
| N05-N20   | TD1020   | ID5   | DX140          | DA150            | CD10    | KD1400     | MD220      | KPD010  | PCD20           | PD1 |
| N15-N30   | TD1030   |       | DX120<br>DX110 | DA2200<br>DA1000 |         | KD1425     | MD205      | KPD001  | PCD10<br>PCD05  | PD2 |

# SFEED-RUSH Grades

## ► Milling SFEED-RUSH grades

SFEED-RUSH grades have upgraded toughness and chipping resistance through special post-coating treatment process of CVD grades. Through the post-coating treatment process, single color inserts have been transformed into two different colors, on the side and the top (see the illustrations below).

| ISO class | Grade  | ISO Rage | Insert color                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
|-----------|--------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| P         | TT8625 | P30-P45  | <div> <div>  <p>All yellow color</p> </div> <div> <p>Special post-coating treatment</p>  </div> <div> <p>Upgraded SFEED-RUSH Grade</p>  <p>Two colors: yellow and black</p> </div> </div> |  |
|           |        |          |                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|           |        |          |                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|           |        |          |                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|           |        |          |                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|           |        |          |                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |



# Hardness Conversion Table

| Vickers<br>50kg<br><br>HV | Brinell HB10mm ball<br>LOAD 3000kgf |                             | Rockwell                                    |                                            |                                              |                                              | Shore's<br><br>HS | Tensile<br>strength<br>N/mm <sup>2</sup><br>(kgf/mm <sup>2</sup> ) |
|---------------------------|-------------------------------------|-----------------------------|---------------------------------------------|--------------------------------------------|----------------------------------------------|----------------------------------------------|-------------------|--------------------------------------------------------------------|
|                           | Standard<br>ball                    | Tungsten<br>carbide<br>ball | A scale<br>60kgf<br>diamond<br>brale<br>HRA | B scale<br>100kgf<br>1/16in<br>ball<br>HRB | C scale<br>150kgf<br>diamond<br>brale<br>HRC | D scale<br>100kgf<br>diamond<br>brale<br>HRD |                   |                                                                    |
| 1900                      |                                     |                             | 93.1                                        |                                            | 80.5                                         |                                              |                   |                                                                    |
| 1800                      |                                     |                             | 92.6                                        |                                            | 79.2                                         |                                              |                   |                                                                    |
| 1700                      |                                     |                             | 91.9                                        |                                            | 77.9                                         |                                              |                   |                                                                    |
| 1600                      |                                     |                             | 91.3                                        |                                            | 76.6                                         |                                              |                   |                                                                    |
| 1500                      |                                     |                             | 90.5                                        |                                            | 75.3                                         |                                              |                   |                                                                    |
| 1450                      |                                     |                             | 90.1                                        |                                            | 74.6                                         |                                              |                   |                                                                    |
| 1400                      |                                     |                             | 89.6                                        |                                            | 74.0                                         |                                              |                   |                                                                    |
| 1350                      |                                     |                             | 89.1                                        |                                            | 73.4                                         |                                              |                   |                                                                    |
| 1300                      |                                     |                             | 88.7                                        |                                            | 72.7                                         |                                              |                   |                                                                    |
| 1250                      |                                     |                             | 88.3                                        |                                            | 72.1                                         |                                              |                   |                                                                    |
| 1200                      |                                     |                             | 87.9                                        |                                            | 71.5                                         |                                              |                   |                                                                    |
| 1150                      |                                     |                             | 87.5                                        |                                            | 70.9                                         |                                              |                   |                                                                    |
| 1100                      |                                     |                             | 87.1                                        |                                            | 70.3                                         |                                              |                   |                                                                    |
| 1050                      |                                     |                             | 86.6                                        |                                            | 69.6                                         |                                              |                   |                                                                    |
| 1000                      |                                     |                             | 86.2                                        |                                            | 68.9                                         |                                              |                   |                                                                    |
| 940                       |                                     |                             | 85.6                                        |                                            | 68.0                                         | 76.9                                         | 97                |                                                                    |
| 920                       |                                     |                             | 85.3                                        |                                            | 67.5                                         | 76.5                                         | 96                |                                                                    |
| 900                       |                                     |                             | 85.0                                        |                                            | 67.0                                         | 76.1                                         | 95                |                                                                    |
| 880                       |                                     | (767)                       | 84.7                                        |                                            | 66.4                                         | 75.7                                         | 93                |                                                                    |
| 860                       |                                     | (757)                       | 84.4                                        |                                            | 65.9                                         | 75.3                                         | 92                |                                                                    |
| 840                       |                                     | (745)                       | 84.1                                        |                                            | 65.3                                         | 74.8                                         | 91                |                                                                    |
| 820                       |                                     | (733)                       | 83.8                                        |                                            | 64.7                                         | 74.3                                         | 90                |                                                                    |
| 800                       |                                     | (722)                       | 83.4                                        |                                            | 64.0                                         | 74.8                                         | 88                |                                                                    |
| 780                       |                                     | (710)                       | 83.0                                        |                                            | 63.3                                         | 73.3                                         | 87                |                                                                    |
| 760                       |                                     | (698)                       | 82.6                                        |                                            | 62.5                                         | 72.6                                         | 86                |                                                                    |
| 740                       |                                     | (684)                       | 82.2                                        |                                            | 61.8                                         | 72.1                                         | 84                |                                                                    |
| 720                       |                                     | (670)                       | 81.8                                        |                                            | 61.0                                         | 71.5                                         | 83                |                                                                    |
| 700                       |                                     | (656)                       | 81.3                                        |                                            | 60.1                                         | 70.8                                         | 81                |                                                                    |
| 690                       |                                     | (647)                       | 81.1                                        |                                            | 59.7                                         | 70.5                                         |                   |                                                                    |
| 680                       |                                     | (638)                       | 80.8                                        |                                            | 59.2                                         | 70.1                                         | 80                |                                                                    |
| 670                       |                                     | 630                         | 80.6                                        |                                            | 58.8                                         | 69.8                                         |                   |                                                                    |
| 660                       |                                     | 620                         | 80.3                                        |                                            | 58.3                                         | 69.4                                         | 79                |                                                                    |
| 650                       |                                     | 611                         | 80.0                                        |                                            | 57.8                                         | 69.0                                         |                   |                                                                    |
| 640                       |                                     | 601                         | 79.8                                        |                                            | 57.3                                         | 68.7                                         | 77                | 2205(210)                                                          |
| 630                       |                                     | 591                         | 79.5                                        |                                            | 56.8                                         | 68.3                                         |                   | 2020(206)                                                          |
| 620                       |                                     | 582                         | 79.2                                        |                                            | 56.3                                         | 67.9                                         | 75                | 1985(202)                                                          |
| 610                       |                                     | 573                         | 78.9                                        |                                            | 55.7                                         | 67.5                                         |                   | 1950(199)                                                          |
| 600                       |                                     | 564                         | 78.6                                        |                                            | 55.2                                         | 67.0                                         | 74                | 1905(194)                                                          |
| 590                       |                                     | 554                         | 78.4                                        |                                            | 54.7                                         | 66.7                                         |                   | 1860(190)                                                          |
| 580                       |                                     | 515                         | 78.0                                        |                                            | 54.1                                         | 66.2                                         | 72                | 1825(186)                                                          |
| 570                       |                                     | 535                         | 77.8                                        |                                            | 53.6                                         | 65.8                                         |                   | 1795(183)                                                          |
| 560                       |                                     | 525                         | 77.4                                        |                                            | 53.0                                         | 65.4                                         | 71                | 1750(179)                                                          |
| 550                       | (505)                               | 517                         | 77.0                                        |                                            | 52.3                                         | 64.8                                         |                   | 1750(174)                                                          |
| 540                       | (496)                               | 507                         | 76.7                                        |                                            | 51.7                                         | 64.4                                         | 69                | 1660(169)                                                          |
| 530                       | (488)                               | 497                         | 76.4                                        |                                            | 51.1                                         | 66.2                                         |                   | 1620(165)                                                          |
| 520                       | (480)                               | 488                         | 76.1                                        |                                            | 50.5                                         | 63.5                                         | 67                | 1570(160)                                                          |
| 510                       | (473)                               | 479                         | 75.7                                        |                                            | 49.8                                         | 62.9                                         |                   | 1530(156)                                                          |
| 500                       | (465)                               | 471                         | 75.3                                        |                                            | 49.1                                         | 62.2                                         | 66                | 1459(153)                                                          |
| 490                       | (456)                               | 460                         | 74.9                                        |                                            | 48.4                                         | 61.6                                         |                   | 1460(149)                                                          |
| 480                       | 488                                 | 452                         | 74.5                                        |                                            | 47.7                                         | 61.3                                         | 64                | 1410(144)                                                          |

► Note: Gray figures come from ASTM E 140 table (Calculated by SAE-ASM-ASTM together)

| Vickers<br>50kg<br><br>HV | Brinell HB10mm ball<br>LOAD 3000kgf |                             | Rockwell                                    |                                            |                                              |                                              | Shore's<br><br>HS | Tensile<br>strength<br>N/mm <sup>2</sup><br>(kgf/mm <sup>2</sup> ) |
|---------------------------|-------------------------------------|-----------------------------|---------------------------------------------|--------------------------------------------|----------------------------------------------|----------------------------------------------|-------------------|--------------------------------------------------------------------|
|                           | Standard<br>ball                    | Tungsten<br>carbide<br>ball | A scale<br>60kgf<br>diamond<br>brale<br>HRA | B scale<br>100kgf<br>1/16in<br>ball<br>HRB | C scale<br>150kgf<br>diamond<br>brale<br>HRC | D scale<br>100kgf<br>diamond<br>brale<br>HRD |                   |                                                                    |
| 470                       | 441                                 | 442                         | 74.1                                        |                                            | 46.9                                         | 60.7                                         |                   | 1570(160)                                                          |
| 460                       | 433                                 | 433                         | 73.6                                        |                                            | 46.1                                         | 60.1                                         | 62                | 1530(156)                                                          |
| 450                       | 425                                 | 425                         | 73.3                                        |                                            | 45.3                                         | 59.4                                         |                   | 1459(153)                                                          |
| 440                       | 415                                 | 415                         | 72.8                                        |                                            | 44.5                                         | 58.8                                         | 59                | 1460(149)                                                          |
| 430                       | 405                                 | 405                         | 72.3                                        |                                            | 43.6                                         | 58.2                                         |                   | 1410(144)                                                          |
| 420                       | 397                                 | 397                         | 71.8                                        |                                            | 42.7                                         | 57.5                                         | 57                | 1370(140)                                                          |
| 410                       | 388                                 | 388                         | 71.4                                        |                                            | 41.8                                         | 56.8                                         |                   | 1330(136)                                                          |
| 400                       | 379                                 | 379                         | 70.8                                        |                                            | 40.8                                         | 56.0                                         | 55                | 1290(131)                                                          |
| 390                       | 369                                 | 369                         | 70.3                                        |                                            | 39.8                                         | 55.2                                         |                   | 1240(127)                                                          |
| 380                       | 360                                 | 360                         | 69.8                                        | (110.0)                                    | 38.8                                         | 54.4                                         | 52                | 1250(123)                                                          |
| 370                       | 350                                 | 350                         | 69.2                                        |                                            | 37.7                                         | 53.6                                         |                   | 1170(120)                                                          |
| 360                       | 341                                 | 341                         | 68.7                                        | (109.0)                                    | 36.6                                         | 52.8                                         | 50                | 1130(115)                                                          |
| 350                       | 331                                 | 331                         | 68.1                                        |                                            | 35.5                                         | 51.9                                         |                   | 1095(112)                                                          |
| 340                       | 322                                 | 322                         | 67.6                                        | (108.0)                                    | 34.4                                         | 51.1                                         | 47                | 1070(109)                                                          |
| 330                       | 313                                 | 313                         | 67.0                                        |                                            | 33.3                                         | 50.2                                         |                   | 1035(105)                                                          |
| 320                       | 303                                 | 303                         | 66.4                                        | (107.0)                                    | 32.2                                         | 49.4                                         | 45                | 1005(103)                                                          |
| 310                       | 294                                 | 294                         | 65.8                                        |                                            | 31.0                                         | 48.4                                         |                   | 980(100)                                                           |
| 300                       | 284                                 | 284                         | 65.2                                        | (105.5)                                    | 29.8                                         | 47.5                                         | 42                | 950(97)                                                            |
| 295                       | 280                                 | 280                         | 64.8                                        |                                            | 29.2                                         | 47.1                                         |                   | 935(96)                                                            |
| 290                       | 275                                 | 275                         | 64.5                                        | (104.5)                                    | 28.5                                         | 46.5                                         | 41                | 915(94)                                                            |
| 285                       | 270                                 | 270                         | 64.2                                        |                                            | 27.8                                         | 46.0                                         |                   | 905(92)                                                            |
| 280                       | 265                                 | 265                         | 63.8                                        | (103.5)                                    | 27.1                                         | 45.3                                         | 40                | 890(91)                                                            |
| 275                       | 261                                 | 261                         | 63.5                                        |                                            | 26.4                                         | 44.9                                         |                   | 875(89)                                                            |
| 270                       | 256                                 | 256                         | 63.1                                        | (102.0)                                    | 25.6                                         | 44.3                                         | 38                | 855(87)                                                            |
| 265                       | 252                                 | 252                         | 62.7                                        |                                            | 24.8                                         | 43.7                                         |                   | 840(86)                                                            |
| 260                       | 247                                 | 247                         | 62.4                                        | (101.0)                                    | 24.0                                         | 43.1                                         | 37                | 825(84)                                                            |
| 255                       | 243                                 | 243                         | 62.0                                        |                                            | 23.1                                         | 42.2                                         |                   | 805(82)                                                            |
| 250                       | 238                                 | 238                         | 61.6                                        | 99.5                                       | 22.2                                         | 41.7                                         | 36                | 795(81)                                                            |
| 245                       | 233                                 | 233                         | 61.2                                        |                                            | 21.3                                         | 41.1                                         |                   | 780(79)                                                            |
| 240                       | 228                                 | 228                         | 60.7                                        | 98.1                                       | 20.3                                         | 40.3                                         | 34                | 765(78)                                                            |
| 230                       | 219                                 | 219                         |                                             | 96.7                                       | (18.0)                                       |                                              | 33                | 730(75)                                                            |
| 220                       | 209                                 | 209                         |                                             | 95.0                                       | (15.7)                                       |                                              | 32                | 695(71)                                                            |
| 210                       | 200                                 | 200                         |                                             | 93.4                                       | (13.4)                                       |                                              | 30                | 670(68)                                                            |
| 200                       | 190                                 | 190                         |                                             | 91.5                                       | (11.0)                                       |                                              | 29                | 635(65)                                                            |
| 190                       | 181                                 | 181                         |                                             | 89.5                                       | (8.5)                                        |                                              | 28                | 605(62)                                                            |
| 180                       | 171                                 | 171                         |                                             | 87.1                                       | (6.0)                                        |                                              | 26                | 580(59)                                                            |
| 170                       | 162                                 | 162                         |                                             | 85.0                                       | (3.0)                                        |                                              | 25                | 545(56)                                                            |
| 160                       | 152                                 | 152                         |                                             | 81.7                                       | (0.0)                                        |                                              | 24                | 515(53)                                                            |
| 150                       | 143                                 | 143                         |                                             | 78.7                                       |                                              |                                              | 22                | 490(50)                                                            |
| 140                       | 133                                 | 133                         |                                             | 75.0                                       |                                              |                                              | 21                | 455(45)                                                            |
| 130                       | 124                                 | 124                         |                                             | 71.2                                       |                                              |                                              | 20                | 425(44)                                                            |
| 127                       | 121                                 |                             |                                             | 69.8                                       |                                              |                                              | 19                | (42)                                                               |
| 122                       | 116                                 |                             |                                             | 67.6                                       |                                              |                                              | 18                | (41)                                                               |
| 117                       | 111                                 |                             |                                             | 65.7                                       |                                              |                                              | 15                | (39)                                                               |

► Note: Gray figures come from ASTM E 140 table (Calculated by SAE-ASM-ASTM together)



# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                     |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR               |
| 1              | A 366 (1012)<br>1008                                                              | 0.0030 C10                                                                        | 040 A 10<br>045 M 10<br>1449 10 CS                                                |                                                                                    | AF 34 C 10<br>XC 10 |
| 1              |                                                                                   | 1.0028 Ust 34-2 (S250G1T)                                                         |                                                                                   |                                                                                    | A 34-2              |
| 1              |                                                                                   | 1.0034 RSt 34-2 (S250G2T)                                                         | 1449 34/20 HR,<br>HS, CR, CS                                                      |                                                                                    | A 34-2 NE           |
| 1              |                                                                                   | 1.0035 St185 (Fe 310-0)<br>St 33                                                  | Fe 310-0<br>1449 15 HR, HS                                                        |                                                                                    | A 33                |
| 1              | A 570<br>Gr. 33,36                                                                | 1.0036 S235JRG1 (Fe 360 B)<br>Ust 37-2                                            | Fe 360 B<br>4360-40 B                                                             |                                                                                    |                     |
| 1              |                                                                                   | 1.0037 S235JR (Fe 360 B)<br>St 37-2                                               | Fe 360 B<br>4360-40 B                                                             |                                                                                    | E 24-2              |
| 1              | 1115                                                                              | 1.0038 GS-CK16                                                                    | 030A04                                                                            | 1A                                                                                 |                     |
| 1              | A 570 Gr. 40                                                                      | 1.0044 S275JR (Fe 430 B)<br>St44-2                                                | Fe 430 B FN<br>1449 43/25 HR, HS<br>4360-43 B                                     |                                                                                    | E 28-2              |
| 1              |                                                                                   | 1.0045 S355JR                                                                     | 4360-50 B                                                                         |                                                                                    | E 36-2              |
| 1              | A 570 Gr.50<br>A 572 Gr.50                                                        | 1.0050 E295 (Fe 490-2)<br>St 50-2                                                 | Fe 490-2 FN<br>4360-50 B                                                          |                                                                                    | A 50-2              |
| 1              | A 572 Gr. 65                                                                      | 1.0060 E335 (Fe 590-2)<br>St 60-2                                                 | Fe 60-2<br>4360-55 E; 55 C                                                        |                                                                                    | A 60-2              |
| 1              |                                                                                   | 1.0060 St 60-2                                                                    |                                                                                   |                                                                                    |                     |
| 1              |                                                                                   | 1.0070 E360 (Fe 690-2)<br>St 70-2                                                 | Fe 690-2 FN                                                                       |                                                                                    | A 70-2              |
| 1              |                                                                                   | 1.0112 P235S                                                                      | 1501-164-360B LT20                                                                |                                                                                    | A37AP               |
| 1              |                                                                                   | 1.0114 S235JU;St 37-3 U                                                           | 4360-40C                                                                          |                                                                                    | E 24-3              |
| 1              | A 284 Gr.D<br>A 573 Gr.58<br>A 570 Gr 36;C<br>A 611 Gr. C                         | 1.0116 S235J2G3 (Fe 360 D 1)<br>St 37-3                                           | Fe 360 D1 FF<br>1449 37/23 CR<br>4360-40 D                                        |                                                                                    | E 24-3<br>E 24-4    |
| 1              |                                                                                   | 1.0130 P265S                                                                      | 1501-164-400B LT 20                                                               |                                                                                    | A 42 AP             |
| 1              |                                                                                   | 1.0143 S275J0; St 44-3 U                                                          | 4360-43C                                                                          |                                                                                    | E 28-3              |

|  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                              |
|                                                                                   | C 10<br>1 C 10                                                                    | F.1511<br>F.151A                                                                  | S 10C                                                                             | SM 10C                                                                            | 10                                                                                |
|                                                                                   | Fe 330, Fe 330 B FU                                                               |                                                                                   | SS 330                                                                            | SS 330                                                                            |                                                                                   |
|                                                                                   | Fe 330 B FU                                                                       |                                                                                   |                                                                                   |                                                                                   | St2sp                                                                             |
| 1300                                                                              | Fe 320                                                                            | Fe 310-0                                                                          |                                                                                   |                                                                                   | St0                                                                               |
| 1311<br>1312                                                                      | FE37BFU                                                                           | AE 235 B<br>Fe 360 B                                                              |                                                                                   |                                                                                   | 16D, 18Kp<br>St3Kp                                                                |
| 1311                                                                              | Fe 360 B<br>1449 37/23 HR                                                         | AE 235 B<br>Fe 360 B                                                              | STKM 12A;C                                                                        | STKM 12A;C                                                                        |                                                                                   |
| 1325                                                                              | Fe 330, Fe 330 B FU                                                               |                                                                                   | SS 330                                                                            | SS 330                                                                            |                                                                                   |
| 1412                                                                              | Fe 430 B<br>Fe 430 B FN                                                           | AE 275 B<br>Fe 430 B FN                                                           | SM 400 A;B;C                                                                      | SM 400 A;B;C                                                                      | St4ps; sp                                                                         |
| 2172                                                                              | Fe 510 B                                                                          | AE 355 B                                                                          |                                                                                   |                                                                                   |                                                                                   |
| 1550<br>2172                                                                      | Fe 490                                                                            | a 490-2<br>Fe 490-2 FN                                                            | SS 490                                                                            | SS 490                                                                            | ST5ps; sp                                                                         |
| 1650                                                                              | Fe 60-2<br>Fe 590<br>Fe 60-2                                                      | A 590-2<br>Fe 590-2 FN                                                            | SM 570                                                                            | SM 570                                                                            | St6ps; sp                                                                         |
| 1655                                                                              | Fe 70-2<br>Fe 690<br>Fe 360 C                                                     | A 690-2<br>Fe 690-2 FN<br>AE 235 C                                                |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   | Fe 360 C                                                                          | AE 235 C                                                                          |                                                                                   |                                                                                   |                                                                                   |
| 1312<br>1313                                                                      | Fe 360 D1 FF<br>Fe 360 C FN<br>Fe 360 D FF<br>Fe 37-2                             | AE 235 D<br>Fe 360 D1 FF                                                          |                                                                                   |                                                                                   | St3kp; ps; sp<br>16D                                                              |
|                                                                                   |                                                                                   | SPH 265                                                                           |                                                                                   |                                                                                   |                                                                                   |
| 1414-01                                                                           | Fe 430 D                                                                          | AE 275 D                                                                          |                                                                                   |                                                                                   |                                                                                   |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |              |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR        |
| 1              | A 573 Gr. 70                                                                      | 1.0144 S275J2G3 (Fe 430 D 1)                                                      | Fe 430 D1 FF                                                                      |                                                                                    | E 28-3       |
|                | A 611 Gr.D                                                                        | St 44-3                                                                           | 4360-43 C; 43 D                                                                   |                                                                                    | E 28-4       |
| 1              |                                                                                   | 1.0149 S275JOH; RoSt 44-2                                                         | 4360-43C                                                                          |                                                                                    |              |
| 1              |                                                                                   | 1.0226 DX51D; St 02 Z                                                             | Z2                                                                                |                                                                                    | GC           |
| 1              | M 1010                                                                            | 1.0301 C10                                                                        | 040 A 10                                                                          |                                                                                    | AF 34 C 10   |
|                |                                                                                   |                                                                                   | 045 M 10                                                                          |                                                                                    | XC 10        |
|                |                                                                                   |                                                                                   | 1449 10 CS                                                                        |                                                                                    |              |
| 1              | A 621 (1008)                                                                      | 1.0330 DC 01                                                                      | 1449 4 CR                                                                         |                                                                                    |              |
|                |                                                                                   | St 2; St 12                                                                       | 1449 3 CS                                                                         |                                                                                    | TE           |
| 1              | A 619 (1008)                                                                      | 1.0333 Ust 3 (DC03G1)                                                             | 1449 2 CR;3 CR                                                                    |                                                                                    | E            |
|                |                                                                                   | Ust 13                                                                            |                                                                                   |                                                                                    |              |
| 1              | A 621 (1008)                                                                      | 1.0334 UStW 23 (DD12G1)                                                           |                                                                                   |                                                                                    | SC           |
| 1              | A 622 (1008)                                                                      | 1.0335 DD13; StW 24                                                               | 1449 1 HR                                                                         |                                                                                    | 3C           |
| 1              | A 620 (1008)                                                                      | 1.0338 DC04                                                                       | 1449 1 CR;2 CR                                                                    |                                                                                    | ES           |
|                |                                                                                   | St4; St 14                                                                        |                                                                                   |                                                                                    |              |
| 1              | A 516 Gr. 65; 55                                                                  | 1.0345 P235GH                                                                     | 1501 Gr. 141-360                                                                  |                                                                                    | A 37 CP;AP   |
|                | A 515 Gr. 65;55                                                                   | HI                                                                                | 1501 Gr. 161-360; 151-360                                                         |                                                                                    |              |
|                | A 414 Gr. C                                                                       |                                                                                   | 1501 Gr. 161-400; 154-360                                                         |                                                                                    |              |
|                | A 442 Gr.55                                                                       |                                                                                   | 1501 Gr. 164-360; 161-360                                                         |                                                                                    |              |
| 1              | (M) 1020                                                                          | 1.0402 C22                                                                        | 055 M 15, 070 M 20 2C/2D                                                          |                                                                                    | AF 42 C 20;  |
|                | M 1023                                                                            |                                                                                   | 1499 22 HS, CS                                                                    |                                                                                    | XC 25;1 C 22 |
| 1              | 1020                                                                              | 1.0402 C22                                                                        | 050A20                                                                            | 2C/2D                                                                              | CC20         |
| 1              | 1020;1023                                                                         | 1.0402 C22                                                                        | 055 M 15, 070 M 20 2C                                                             |                                                                                    | AF 42 C 20;  |
|                |                                                                                   |                                                                                   |                                                                                   |                                                                                    | XC 25;1 C 22 |
| 1              |                                                                                   | 1.0425 P265GH H II                                                                | 1501 Gr. 161-400;151-400                                                          |                                                                                    | A 42 CP; AP  |
|                |                                                                                   |                                                                                   | 1501 Gr. 164-360; 161-400                                                         |                                                                                    |              |
|                |                                                                                   |                                                                                   | 1501 Gr. 164-400;154-400                                                          |                                                                                    |              |
| 1              | A27 65-35                                                                         | 1.0443 GS-45                                                                      | A1                                                                                |                                                                                    | E 23-45 M    |
| 1              |                                                                                   | 1.0539 S355NH;StE 335                                                             |                                                                                   |                                                                                    | TSE 355-4    |
| 1              |                                                                                   | 1.0545 S355N; StE 355                                                             | 4360-50E                                                                          |                                                                                    | E 355 R      |
| 1              |                                                                                   | 1.0546 S355NL;TSStE 355                                                           | 4360-50EE                                                                         |                                                                                    | E 355 FP     |
| 1              |                                                                                   | 1.0547 S355JOH                                                                    | 4360-50C                                                                          |                                                                                    | TSE 355-3    |
| 1              |                                                                                   | 1.0549 S355 NLH;TSStE 355                                                         |                                                                                   |                                                                                    |              |
| 1              |                                                                                   | 1.0553 S355JO;St 52-3U                                                            | 4360-50C                                                                          |                                                                                    | E 36-3       |

|  |  |  |  |  |  |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| SS                                                                               | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 1411, 1412                                                                       | Fe 430 B, Fe 430 C (FN)                                                           | AE 275 D                                                                          | SM 400 A;B;C                                                                      | SM 400 A;B;C                                                                      | St4kp> ps; sp                                                                      |
| 1414                                                                             | Fe 430 D (FF)                                                                     | Fe 430 D1 FF                                                                      |                                                                                   |                                                                                   |                                                                                    |
| 1412-04                                                                          | Fe 430 C                                                                          | Fe 430 C                                                                          |                                                                                   |                                                                                   |                                                                                    |
| 1151 10                                                                          | FeP 02 G                                                                          | FeP 02 G                                                                          |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | C 10<br>1 C 10                                                                    | F.1511<br>F.151.A                                                                 | S 10C                                                                             | SM 10C                                                                            | 10                                                                                 |
| 1142                                                                             | FeP 00<br>FeP 01                                                                  | AP 11                                                                             | SPHD                                                                              | SPHD                                                                              | 15kp                                                                               |
|                                                                                  | FeP 02                                                                            | AP 02                                                                             | SPCD                                                                              | SPCD                                                                              |                                                                                    |
|                                                                                  | FeP 12                                                                            | AP 12                                                                             | SPHE                                                                              | SPHE                                                                              | 10kp                                                                               |
|                                                                                  | FeP 13                                                                            | AP 13                                                                             | SPHE                                                                              | SPHE                                                                              | 08kp                                                                               |
| 1147                                                                             | FeP 04                                                                            | AP 04                                                                             | SPCE                                                                              | SPCE                                                                              | 08jU; JUA                                                                          |
| 1331                                                                             | FeE235, Fe 360 1 KW;KG                                                            | A 37 RC I                                                                         | SGV 410, SGV                                                                      | SGV 410, SGV 450,                                                                 |                                                                                    |
| 1330                                                                             | Fe 360 2 KW;KG                                                                    | RA II                                                                             | 450, SGV 48, SPV<br>450;SPV 480                                                   | SGV 480, SPPV<br>450;SPPV 480                                                     |                                                                                    |
| 1450                                                                             | C 20<br>C 21, C 25                                                                | 1 C 22 F.112                                                                      | S20C                                                                              | SM 20C                                                                            | 20                                                                                 |
| 1450                                                                             | C20, C21                                                                          | F.112                                                                             | S22C                                                                              | SM 22C                                                                            | 20                                                                                 |
| 1450                                                                             | C 20;<br>C 21;C 25                                                                | 1 C 22F.112                                                                       | S 20 C;S 22 C                                                                     | SM 20 C;SM 22C                                                                    |                                                                                    |
| 1431                                                                             | Fe 410 1 KW; KG;                                                                  | A 42 RC I                                                                         | SPV 315; SPV 355                                                                  | SPPV 315; SPPV 355                                                                | 16K                                                                                |
| 1430                                                                             | KT Fe 410 2 KW; KG                                                                | A 42 RC II                                                                        | SG 295; SGV 410                                                                   | SG 295; SGV 410                                                                   | 20K                                                                                |
| 1432                                                                             |                                                                                   |                                                                                   | SGV 450; SGV 480                                                                  | SGV 450; SGV 480                                                                  |                                                                                    |
| 1305                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2134-04                                                                          | Fe 510 B                                                                          | Fe 355 KGN                                                                        |                                                                                   |                                                                                   |                                                                                    |
| 2334-01                                                                          | FeE 355 KG                                                                        | AE 355 KG                                                                         |                                                                                   |                                                                                   |                                                                                    |
| 2135-01                                                                          | FeE 355 KT                                                                        | AE 355 KT                                                                         |                                                                                   |                                                                                   |                                                                                    |
| 2172-04                                                                          | Fe 510 C                                                                          | Fe 510 C                                                                          |                                                                                   |                                                                                   |                                                                                    |
| 2135                                                                             | Fe 510 D                                                                          | FeE 355 KTM                                                                       |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | Fe 510 C                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                                         |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR                                   |
| 1              | A 633 Gr.C<br>A 588                                                               | 1.0562 P355N<br>StE 355                                                           | 1501 Gr.225-490A LT 20                                                            |                                                                                    | FeE 355 KG N<br>E 355 R/FP;<br>A 510 AP |
| 1              |                                                                                   | 1.0565 P355NH; WStE 355                                                           | 1501-225-490B LT 20                                                               |                                                                                    | A 510 AP                                |
| 1              |                                                                                   | 1.0566 P355NL1; TStE 355                                                          | 1501-225-490A LT 50                                                               |                                                                                    | A 510 FP                                |
| 1              | 1                                                                                 | 1.0570 S355J2G3<br>St 52-3                                                        | Fe 510 D1 FF<br>1449 50/35 HR>HS<br>4360-50 D                                     |                                                                                    | E 36-3<br>E 36-4                        |
| 1              | 1213                                                                              | 1.0715 9 SMn 28 (1SMn30)                                                          | 230 M 07                                                                          |                                                                                    | S 250                                   |
| 1              | 1213                                                                              | 1.0715 9 SMn 28                                                                   | 230 M 07                                                                          |                                                                                    | S 250                                   |
| 1              | 12 L 13                                                                           | 1.0718 9 SMnPb 28<br>(11SMnPb30)                                                  |                                                                                   |                                                                                    | S 250 Pb                                |
| 1              | 1108<br>1109                                                                      | 1.0721 10 S 20                                                                    | (210 M 15)                                                                        |                                                                                    | 10S20<br>10F 2                          |
| 1              | 11 L 08                                                                           | 1.0722 10 SPb 20                                                                  |                                                                                   |                                                                                    | 10PbF 2                                 |
| 1              | 11 L 08                                                                           | 1.0722 10 SPb 20                                                                  |                                                                                   |                                                                                    | 10PbF 2                                 |
| 1              | 1215                                                                              | 1.0736 9 SMn 36 11SMn37)                                                          |                                                                                   |                                                                                    | S 300                                   |
| 1              | 12 L 14                                                                           | 1.0737 9 SMnPb 36<br>(11SMnPb37)                                                  |                                                                                   |                                                                                    |                                         |
| 1              |                                                                                   | 1.0972 S315MC; QStE 300 TM                                                        | 1501-40F30                                                                        |                                                                                    | E 315 D                                 |
| 1              |                                                                                   | 1.0976 S355MC; QStE 360 TM                                                        | 1501-43F35                                                                        |                                                                                    | E 355 D                                 |
| 1              |                                                                                   | 1.0982 S460MC; QStE 460 TM                                                        | 1501-50F45                                                                        |                                                                                    |                                         |
| 1              |                                                                                   | 1.0984 S500MC; QStE 500 TM                                                        |                                                                                   |                                                                                    | E 490 D                                 |
| 1              |                                                                                   | 1.0986 S500MC; QStE 500 TM                                                        | 1501 - 60F55                                                                      |                                                                                    | E 560 D                                 |
| 1              | 1010                                                                              | 1.1121 CK 10<br>(C10E)                                                            | 040 A 10                                                                          |                                                                                    | XC 10                                   |
| 1              |                                                                                   | 1.1121 St 37-1                                                                    | 4360 40 A                                                                         |                                                                                    |                                         |
| 1              | 1015                                                                              | 1.1141 CK 15<br>(C15E)                                                            | 040 A 15<br>080 M 15                                                              | 32C                                                                                | XC 12 XC 15<br>XC 18                    |
| 1              | 1020<br>1023                                                                      | 1.1151 C22E<br>CK 22                                                              | 055 M 15<br>(070 M 20)                                                            |                                                                                    | 2 C 22 XC 18<br>XC 25                   |
| 1              | D 3                                                                               | 1.2080 X 210 Cr 12                                                                | BD 3                                                                              |                                                                                    | Z 200 C 12                              |

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|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| SS                                                                               | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 2106                                                                             | FeE 355 KG;KW                                                                     | AEE 355 KG;DD                                                                     | SM 490 A;B;C;<br>YA;YB                                                            | SM 490 A;B;C; YA;YB                                                               | 15GF                                                                               |
| 2106                                                                             | FeE 355-2                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2107-01                                                                          | FeE 355-3                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2132, 2133                                                                       | 17GS                                                                              | AE 355 D                                                                          | SM 490 A;B;C;<br>YA;YB                                                            | SM 490 A;B;C;<br>YA;YB                                                            | 17GS                                                                               |
| 2134,<br>2174                                                                    | 17G1S                                                                             | Fe 510, D1 FF                                                                     |                                                                                   |                                                                                   | 17G1S                                                                              |
| 1912                                                                             | CF SMn 28                                                                         | F.2111 - 11 SMn 28                                                                | SUM 22                                                                            | SUM 22                                                                            |                                                                                    |
| 1912                                                                             | CF 9 SMn 28                                                                       | 11 SMn 28                                                                         | SUM 22                                                                            | SUM 22                                                                            |                                                                                    |
| 1914                                                                             | CF 9 SMnPb 28                                                                     | F.2112-11 SMnPb<br>28                                                             | SUM 22 L<br>SUM 23 L, SUM 24 L                                                    | SUM 22 L<br>SUM 23 L, SUM 24 L                                                    |                                                                                    |
|                                                                                  | CF 10 S 20                                                                        | F. 2121 - 10 S 20                                                                 |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | CF 10 SPb 20                                                                      | F.2122-10 SPb 20                                                                  |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | CF 10 SPb 20                                                                      | 10 SPb 20                                                                         |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | CF 9 Mn 36                                                                        | F.2113 - 12 SMn 35                                                                | SUM25                                                                             | SUM25                                                                             |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2642                                                                             | FeE 355TM                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2662                                                                             | FeE 490 TM                                                                        |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | FeE 560 TM                                                                        |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1265                                                                             | C 10, 2 C 10<br>2 C 15                                                            | F-1510-C 10 K                                                                     | S 9 CK<br>S 10 C                                                                  | S 9 CK<br>S 10 C                                                                  | 08;10                                                                              |
| 1300                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1370                                                                             | C 15                                                                              | C 16 F.1110-C 15<br>F.1511-C 16 K                                                 | S 15<br>S 15 CK                                                                   | SM 15C<br>SM 15CK                                                                 | 15                                                                                 |
| 1450                                                                             | C 20                                                                              | C 25 F.1120-C 25 K                                                                | S 20 C, S 20 CK<br>S 22 C                                                         | SM 20 C, SM20 CK<br>SM22 C                                                        | 20                                                                                 |
| 2642                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                               |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR                         |
| 1              | A36                                                                               | St 44-2                                                                           | 4360 43 A                                                                         |                                                                                    | NFA 35-501 E 28               |
| 1              |                                                                                   | StE 320-3Z                                                                        | 1 501 160                                                                         |                                                                                    |                               |
| 1              | A572-60                                                                           | 1.8900 StE 380                                                                    | 4360 55 E                                                                         |                                                                                    |                               |
| 2              | (M) 1025                                                                          | 1.0406 C 25                                                                       | 070 M 26                                                                          |                                                                                    | 1 C 25                        |
| 2              |                                                                                   | 1.0416 GS-38                                                                      |                                                                                   |                                                                                    | 20-400 M                      |
| 2              | A 537 Cl.1<br>A 414 Gr. G<br>A 612                                                | 1.0473 P355GH                                                                     | 19 Mn 6                                                                           |                                                                                    | A 52 CP                       |
| 2              | 1035                                                                              | 1.0501 C 35                                                                       | 080 A 32, 080 A 35<br>080 M 36,<br>1449 40 CS                                     |                                                                                    | 1 C 35<br>AF 55 C 35<br>XC 38 |
| 2              | 1045                                                                              | 1.0503 CF 45<br>(C45G)                                                            | 060 A 47<br>080 M 46                                                              |                                                                                    | XC 42 H 1 TS                  |
| 2              | 1040                                                                              | 1.0511 C 40                                                                       | 080 M 40                                                                          |                                                                                    | 1 C 40<br>AF 60 C 40          |
| 2              |                                                                                   | 1.0540 C 50                                                                       |                                                                                   |                                                                                    |                               |
| 2              | A27 70-36                                                                         | 1.0551 GS-52                                                                      | A2                                                                                |                                                                                    | 280-480 M                     |
| 2              | A148 80-40                                                                        | 1.0553 GS-60                                                                      | A3                                                                                |                                                                                    | 320-560 M                     |
| 2              | A738                                                                              | 1.0577 S355J2G4 (Fe 510 D 2)                                                      | Fe 510 D2 FF<br>1501 Gr.224-460<br>1501 Gr. 224-490                               |                                                                                    | A 52 FP                       |
| 2              | 1140                                                                              | 1.0726 35 S 20                                                                    | 212 M 36                                                                          | 8M                                                                                 | 35MF 6                        |
| 2              | 1146                                                                              | 1.0727 45 S 20 (46S20)                                                            |                                                                                   |                                                                                    | 45 MF 4                       |
| 2              | 1035<br>1041                                                                      | 1.1157 40Mn4                                                                      | 150 M 36                                                                          | 15                                                                                 | 35 M 5<br>40 M 5              |
| 2              | 1025                                                                              | 1.1158 C25E<br>CK 25                                                              | (070 M 25)                                                                        |                                                                                    | 2 C 25<br>XC 25               |
| 2              | 1536                                                                              | 1.1166 34Mn5                                                                      |                                                                                   |                                                                                    |                               |
| 2              | 1330                                                                              | 1.1170 28Mn6                                                                      | (150 M 28), (150 M 18)                                                            |                                                                                    | 20 M 5, 28 Mn 6               |
| 2              | 1330                                                                              | 1.1170 28Mn6                                                                      | 150 M 5                                                                           |                                                                                    | 20 M 5                        |
| 2              | 1330                                                                              | 1.1170 28Mn6                                                                      |                                                                                   | 14A                                                                                | 20 M 5                        |
| 2              |                                                                                   | 1.1178 C30E; CK 30                                                                | 080M30                                                                            |                                                                                    | XC 32                         |

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| SS                                                                               | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 1411                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1421                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2145                                                                             | FeE390KG                                                                          |                                                                                   | S 25C                                                                             | SM 25C                                                                            |                                                                                    |
|                                                                                  | C 25                      1 C 25                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1306                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2101                                                                             | Fe E 355-2                                                                        | A 52 RC I   RA II                                                                 | SGV 410                                                                           | SGV 410                                                                           |                                                                                    |
| 2102                                                                             |                                                                                   |                                                                                   | SGV 450                                                                           | SGV 450                                                                           |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   | SGV 480                                                                           | SGV 480                                                                           |                                                                                    |
| 1572                                                                             | C 35                                                                              | F.113                                                                             | S35C                                                                              | SM35C                                                                             | 35                                                                                 |
| 1550                                                                             | 1 C 35                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1672                                                                             | C 43                                                                              |                                                                                   | S 45 C                                                                            | SM 45 C                                                                           | 45                                                                                 |
|                                                                                  | C 46                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | C 40                                                                              | 1 C 40                                                                            | S 40 C                                                                            | SM 40 C                                                                           |                                                                                    |
| 1674                                                                             | C 50                                                                              | 1 C 50                                                                            |                                                                                   |                                                                                   |                                                                                    |
| 1505                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1606                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2107                                                                             |                                                                                   | A 52 RB II<br>AE 355 D                                                            |                                                                                   |                                                                                   |                                                                                    |
| 1957                                                                             |                                                                                   | F.210.G                                                                           |                                                                                   |                                                                                   |                                                                                    |
| 1973                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   | S 09CK                                                                            | SMn 433                                                                           |                                                                                    |
| C 25                                                                             | F.1120 - C 25 K                                                                   | S 25 C<br>S 28 C                                                                  | S 25 C                                                                            | SM 25 C                                                                           |                                                                                    |
|                                                                                  | TO.B                                                                              | SMn 433 H                                                                         |                                                                                   |                                                                                   |                                                                                    |
| 1421                                                                             | C 28 Mn                                                                           | 28 Mn 6                                                                           | SCMn 1                                                                            | SCMn 1                                                                            | 30G                                                                                |
| 2145                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | C 28 Mn                                                                           |                                                                                   | SCMn 1                                                                            | SCMn 1                                                                            |                                                                                    |
|                                                                                  | C 30                                                                              | 2 C 30                                                                            |                                                                                   |                                                                                   |                                                                                    |



# Material Conversion Table

## ► According to VDI 3323 standard

| Material group |  |  |  |  |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                | AISI/SAE                                                                          | Material No. DIN                                                                  | BS EN                                                                             | AFNOR                                                                              |
| 2              | 1035                                                                              | 1.1180 C35R<br>Cm 35                                                              | 080 A 35                                                                          | 3 C 35<br>XC 32                                                                    |
| 2              | 1035                                                                              | 1.1181 C35E                                                                       | 080 A 35                                                                          | 2 C 35, XC 32                                                                      |
|                | 1038                                                                              | CK 35                                                                             | (080 M 36)                                                                        | XC 38 H 1                                                                          |
| 2              | 1035                                                                              | 1.1181 C35E<br>CK 35                                                              | 080 A 35<br>(080 M 36)                                                            |                                                                                    |
| 2              | 1042                                                                              | 1.1191 GS- Ck 45                                                                  | 080 A 46                                                                          | XC 45                                                                              |
| 2              | 1049                                                                              | 1.1206 C50E                                                                       | 080 M 50                                                                          | 2 C 50                                                                             |
|                | 1050                                                                              | CK 50                                                                             |                                                                                   | XC 48 H 1;<br>XC 50 H 1                                                            |
| 2              | 1050                                                                              | 1.1213 Cf 53<br>(C53G)                                                            | 070 M 55                                                                          | XC 48 H TS                                                                         |
|                | 1055                                                                              |                                                                                   |                                                                                   |                                                                                    |
| 2              | 4520                                                                              | 1.5423 22Mo4                                                                      | 1503-245-420                                                                      |                                                                                    |
| 3              |                                                                                   | 1.0050 St50-2                                                                     |                                                                                   |                                                                                    |
| 3              | A 516 Gr.70<br>A 515 Gr. 70<br>A 414 Gr.F; G                                      | 1.0481 P295GH<br>17 Mn 4                                                          | 1501 Gr. 224                                                                      | a 48 Cp;AP                                                                         |
| 3              | 1043                                                                              | 1.0503 C35                                                                        | 060 A 47<br>080 M 46<br>1449 50 HS, CS                                            | 1 C 45<br>AF 65 C 45                                                               |
| 3              | 1074                                                                              | 1.0614 C 76 D; D 75-2                                                             |                                                                                   | XC 75                                                                              |
| 3              | 1086                                                                              | 1.0616 C 86 D; D 85-2                                                             |                                                                                   | XC 80                                                                              |
| 3              | 1095                                                                              | 1.0618 C 92 D; D 95-2                                                             |                                                                                   | XC 90                                                                              |
| 3              | 1036                                                                              | 1.1165 30Mn5                                                                      | 120 M 36                                                                          | 35 M 5                                                                             |
|                | 1330                                                                              |                                                                                   | (150 M 28)                                                                        |                                                                                    |
| 3              | 1335                                                                              | 1.1167 30Mn5                                                                      | 150 M 36                                                                          | 40 M 5                                                                             |
| 3              | 1040                                                                              | 1.1186 C40E<br>CK 40                                                              | 060 A 40, 080 A 40<br>080 M 40                                                    | 2 C 40<br>XC 42 H 1                                                                |
| 3              | 1045                                                                              | 1.1191 C45E<br>CK 45                                                              | 080 M 46<br>060 A 47                                                              | 2 C 45<br>XC 42 H 1<br>XC 45<br>XC 48 H 1                                          |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 1572                                                                              |                                                                                   | F.1130-C 35 K-1                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1550                                                                              | C35                                                                               | F.1130-C 35 K                                                                     | S 35 C                                                                            | SM 35 C                                                                           | 35                                                                                 |
| 1572                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1572                                                                              | C36                                                                               |                                                                                   | S 35 C                                                                            | SM 35 C                                                                           |                                                                                    |
| 1660                                                                              | C45                                                                               | F-1140                                                                            |                                                                                   |                                                                                   |                                                                                    |
| 1674                                                                              | C 50                                                                              |                                                                                   |                                                                                   |                                                                                   | 50                                                                                 |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1674                                                                              | C 53                                                                              |                                                                                   | S 50 C                                                                            | SM 50 C                                                                           | 50                                                                                 |
|                                                                                   | 16 Mo 5 KG; KW                                                                    | F.2602- 16 Mo 5                                                                   | SB 450 M                                                                          | SB 450 M                                                                          | SB 480 M                                                                           |
|                                                                                   | FE50                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | Fe 510 KG;KT;KW<br>Fe 510-2 KG;KT;KW<br>FeE 295                                   | A 47 RC I    RA II                                                                | SG 365, SGV 410<br>SGV 450<br>SGV 480                                             | SG 365, SGV 410<br>SGV 450<br>SGV 480                                             | 14G2                                                                               |
| 1672                                                                              | C 45                                                                              | F.114                                                                             | S 45 C                                                                            | SM 45 C                                                                           | 45                                                                                 |
| 1650                                                                              | 1 C 45                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| C 85                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   | F.8211-30 Mn 5<br>f.8311-AM 30 Mn 5                                               | SMn 433 H<br>SCMn 2                                                               | SMn 433 H<br>SCMn 2                                                               | 27ChGSNMDTL<br>30GSL                                                               |
| 2120                                                                              |                                                                                   | F. 1203-36 Mn 6<br>F. 8212-36 Mn 5                                                | SMn 438 (H)<br>SCMn 3                                                             | SMn 438 (H)<br>SCMn 3                                                             | 35G2<br>35GL                                                                       |
|                                                                                   | C 40                                                                              |                                                                                   | S 40 C                                                                            | SM 40 C                                                                           |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1672                                                                              | C 45<br>C 46                                                                      | F.1140-C 45 K<br>F.1142-C48 K                                                     | S 45 C<br>S 48 C                                                                  | S 45 C<br>S 48 C                                                                  | 45                                                                                 |

# Material Conversion Table

## ► According to VDI 3323 standard

| Material group |  |  |  |  |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                | AISI/SAE                                                                          | Material No. DIN                                                                  | BS EN                                                                             | AFNOR                                                                              |
| 3              | 1049                                                                              | 1.1201 C45R<br>Cm 45                                                              | 080 M 46                                                                          | 3 C 45<br>XC 42 H 1<br>XC 48 H 1                                                   |
| 3              |                                                                                   | 1.7242 18 CrMo 4                                                                  |                                                                                   |                                                                                    |
| 3              | A 387 Gr. 12 Cl                                                                   | 1.7337 16 CrMo 4 4                                                                |                                                                                   |                                                                                    |
| 3              | A 387 Gr. 12 Cl                                                                   | 1.7337 16 CrMo 4 4                                                                |                                                                                   |                                                                                    |
| 3              |                                                                                   | 1.7362 12 CrMo 19 5                                                               | 3606-625                                                                          | Z 10 CD 5.05                                                                       |
| 3              | A572-60                                                                           | 17 MnV 6                                                                          | 436055 E                                                                          | NFA 35-501 E 36                                                                    |
| 4              | 1055                                                                              | 1.0535 C55                                                                        | 070 M 55                                                                          | 1 C 55<br>AF 70 C 55                                                               |
| 4              | 1060                                                                              | 1.0601 C60                                                                        | 060 A 62 43D<br>1449 HS,CS                                                        | 1 C 60<br>AF 70 C 55                                                               |
| 4              | 1070                                                                              | 1.0603 C67                                                                        | 080 A 67<br>1449 70HS                                                             | XC65                                                                               |
| 4              | 1074<br>1075                                                                      | 1.0605 C75                                                                        | 1449 80 HS                                                                        |                                                                                    |
| 4              | 1055                                                                              | 1.1203 C55E<br>CK 55                                                              | 060 A 57<br>070 M 55                                                              | 2 C 5<br>XC 55 H 1                                                                 |
| 4              | 1055                                                                              | 1.1209 C55R<br>Cm 55                                                              | 070 M 55                                                                          | 3 C 55<br>XC 55 H 1                                                                |
| 4              | 1060<br>1064                                                                      | 1.1221 C60E<br>CK 60                                                              | 060 A 62 43D                                                                      | 2 C 60<br>XC 60 H 1                                                                |
| 4              | 1070                                                                              | 1.1231 CK 67<br>(C67E)                                                            | 060 A 67                                                                          | XC 68                                                                              |
| 4              | 1074<br>1075<br>1078                                                              | 1.1248 CK 75<br>(C75E)                                                            | 060 A 78                                                                          | XC 75                                                                              |
| 4              | 1086                                                                              | 1.1269 CK 85 (C85E)                                                               |                                                                                   | XC 90                                                                              |
| 4              | 1095                                                                              | 1.1274 Ck 101 (C101E)                                                             |                                                                                   | XC 100                                                                             |
| 4              | W 112                                                                             | 1.1663 C 125 W                                                                    |                                                                                   | Y2 120                                                                             |
| 4              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 5              |                                                                                   | 1.0070 St70-2                                                                     |                                                                                   |                                                                                    |
| 5              |                                                                                   | 1.7238 49 CrMo 4                                                                  |                                                                                   |                                                                                    |
| 5              |                                                                                   | 1.7701 51 CrMoV 4                                                                 |                                                                                   |                                                                                    |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 1660                                                                              | C 45                                                                              | F.1145-C 45K-1<br>F.1147C 48 K-1                                                  | S 50 C                                                                            | SM 50 C                                                                           |                                                                                    |
| 18 CrMo 4                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | A 18 CrMo 4 5 KW                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | A 18 CrMo 4 5 KW                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 16 CrMo 20 5                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2142                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1655                                                                              | C 55                                                                              |                                                                                   | S 55 C                                                                            | SM 55 C                                                                           | 55                                                                                 |
|                                                                                   | 1 C 55                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | C 60                                                                              |                                                                                   | S 58 C                                                                            | SM 58 C                                                                           | 60(G)                                                                              |
|                                                                                   | 1 C 60                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | C 67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | C 75                                                                              |                                                                                   |                                                                                   |                                                                                   | 75                                                                                 |
| 1655                                                                              | C 55                                                                              | F.1150-C 55 K                                                                     | S 55 C                                                                            | SM 55 C                                                                           | 55                                                                                 |
|                                                                                   | C 55                                                                              | F.1155-C 55 K-1                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1655                                                                              | C 60                                                                              |                                                                                   | S 58 C                                                                            | SM 58 C                                                                           | 60                                                                                 |
| 1678                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 60G, 60GA                                                                          |
| 1770                                                                              | C 70                                                                              |                                                                                   |                                                                                   |                                                                                   | 65GA<br>68GA , 70                                                                  |
| 774                                                                               | C 75                                                                              |                                                                                   |                                                                                   |                                                                                   | 75(A)                                                                              |
|                                                                                   | C 90                                                                              |                                                                                   |                                                                                   |                                                                                   | 85(A)                                                                              |
|                                                                                   | C 100                                                                             | F-5117                                                                            | SUP 4                                                                             | SPS 4                                                                             |                                                                                    |
| 1870                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2223                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | FE70-2                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 51 CrMoV 4                                                                        |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                           |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR                     |
| 6              | A573-81 65                                                                        | 1.0116 St 37-3                                                                    | 4360 40 B                                                                         |                                                                                    | E 24-U                    |
| 6              | A515 65                                                                           | 1.0345 H1                                                                         | 1 501 161                                                                         |                                                                                    | A 37 CP                   |
| 6              | 5120                                                                              | 1.0841 St 52-3                                                                    | 150 M 19                                                                          |                                                                                    | 20 MC 5                   |
| 6              | 9255                                                                              | 1.0904 55 Si 7                                                                    | 250A53                                                                            | 45                                                                                 | 55S7                      |
| 6              | 9254                                                                              | 1.0904 55 Si 7                                                                    | 250 A 53                                                                          |                                                                                    | 55 S 7                    |
| 6              | 9262                                                                              | 1.0961 60SiCr7                                                                    | 1 501 161                                                                         |                                                                                    | 60SC6                     |
| 6              | L3                                                                                | 1.2067 100Cr6                                                                     | BL3                                                                               |                                                                                    | Y100C6                    |
| 6              | L1                                                                                | 1.2108 90 CrSi 5                                                                  |                                                                                   |                                                                                    |                           |
| 6              | L2                                                                                | 1.2210 115CrV3                                                                    |                                                                                   |                                                                                    | 100C3                     |
| 6              |                                                                                   | 1.2241 51CrV4                                                                     |                                                                                   |                                                                                    |                           |
| 6              |                                                                                   | 1.2311 40 CrMnMo 7                                                                |                                                                                   |                                                                                    |                           |
| 6              | 4135                                                                              | 1.2330 35 CrMo 4                                                                  | 708 A 37                                                                          |                                                                                    | 34 CD 4                   |
| 6              |                                                                                   | 1.2419 105WCr6                                                                    | BO1                                                                               |                                                                                    | 105WC13                   |
| 6              | 0 1                                                                               | 1.2510 100 MnCrW 4                                                                | BS1                                                                               |                                                                                    | 8 MO 8                    |
| 6              | S1                                                                                | 1.2542 45 WCrV7                                                                   |                                                                                   |                                                                                    |                           |
| 6              | S1                                                                                | 1.255 60WCrV7                                                                     |                                                                                   |                                                                                    | 55WC20                    |
| 6              | L6                                                                                | 1.2713 55NiCrMoV6                                                                 |                                                                                   |                                                                                    | 55NCDV7                   |
| 6              | L6                                                                                | 1.2721 50NiCr13                                                                   |                                                                                   |                                                                                    | 55 NCV 6                  |
| 6              | O2                                                                                | 1.2842 90MnCrV8                                                                   | BO2                                                                               |                                                                                    | 90 MV8                    |
| 6              | E 50100                                                                           | 1.3501 100 Cr 2                                                                   |                                                                                   |                                                                                    | 55WC20                    |
| 6              | 52100                                                                             | 1.3505 100Cr6                                                                     | 2 S 135<br>535 A 99                                                               | 31                                                                                 | 100 C 6                   |
| 6              |                                                                                   | 1.5024 46Si7                                                                      |                                                                                   |                                                                                    | 45 S 7; Y 46<br>7;46 Si 7 |
| 6              | 9255                                                                              | 1.5025 51Si7                                                                      |                                                                                   |                                                                                    | 51 S 7<br>51 Si 7         |
| 6              | 9255                                                                              | 1.5026 55Si7                                                                      | 251 a 58                                                                          |                                                                                    | 55 S 7                    |
| 6              | 9260                                                                              | 1.5027 60Si7                                                                      | 251 A 60<br>251 H 60                                                              |                                                                                    | 60 S 7                    |
| 6              | 9260 H                                                                            | 1.5028 65Si7                                                                      |                                                                                   |                                                                                    | 60 S 7                    |
| 6              |                                                                                   | 1.5120 38 MnSi 4                                                                  |                                                                                   |                                                                                    |                           |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 1312                                                                              | Fe37-3                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 1330                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2172                                                                              | Fe 52                                                                             | F-431                                                                             |                                                                                   |                                                                                   |                                                                                    |
| 2085                                                                              | 55Si8                                                                             | 56Si7                                                                             |                                                                                   |                                                                                   |                                                                                    |
| 2090                                                                              |                                                                                   | F-431                                                                             |                                                                                   |                                                                                   |                                                                                    |
| 60SiCr8                                                                           | 60SiCr8                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 100Cr6                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2092                                                                              | 105WCR 5                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 107CrV3KU                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 35 cRmO 8 KU                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2234                                                                              | 35CrMo4                                                                           | 34CrMo4                                                                           | SCM435TK                                                                          | SCM435TK                                                                          |                                                                                    |
| 2140                                                                              | 10WCr6                                                                            | 105WCr5                                                                           |                                                                                   |                                                                                   |                                                                                    |
| 2140                                                                              | 10WCr6                                                                            | 105WCr5                                                                           | SKS 31                                                                            | STS 31                                                                            |                                                                                    |
| 2710                                                                              | 45 WCrV8 KU                                                                       | 45WCrSi8                                                                          |                                                                                   |                                                                                   |                                                                                    |
| 2710                                                                              | 58WCr9KU                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   | F.520.S                                                                           | SKT 4                                                                             | STF 4                                                                             |                                                                                    |
| 2550                                                                              |                                                                                   | f-528                                                                             |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2258                                                                              | 100Cr6                                                                            | F.1310 - 100 Cr 6                                                                 | SUJ2                                                                              | STB 2                                                                             | SchCh 15                                                                           |
|                                                                                   |                                                                                   | F. 1451 - 46 Si 7                                                                 |                                                                                   |                                                                                   |                                                                                    |
| 2090                                                                              | 48 Si 7                                                                           | F.1450-50 Si 7                                                                    |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 50 Si 7                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2085 2090                                                                         | 55 Si 7                                                                           | F.1440 - 56 Si 7                                                                  |                                                                                   |                                                                                   | 55S2                                                                               |
|                                                                                   | 60 Si 7                                                                           | F. 1441 - 60 Si 7                                                                 |                                                                                   |                                                                                   | 60S2                                                                               |
|                                                                                   |                                                                                   |                                                                                   | 50 P 7 SUP 6                                                                      | SPS 6                                                                             |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |

# Material Conversion Table

## ► According to VDI 3323 standard

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|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR       |
| 6              | A 204 Gr.A<br>4017                                                                | 1.5415 16Mo3<br>15 Mo 3                                                           | 1503-243 B                                                                        |                                                                                    | 15 D 3      |
| 6              | 4419                                                                              | 1.5419 20Mo4                                                                      | 1503-243-430                                                                      |                                                                                    |             |
| 6              | A 350-LF 5                                                                        | 1.5622 14Ni6                                                                      |                                                                                   |                                                                                    | 16N6        |
| 6              | 3415                                                                              | 1.5732 1 NiCr10                                                                   |                                                                                   |                                                                                    | 14 NC 11    |
| 6              | 3310; 3314                                                                        | 1.5752 14NiCr14                                                                   | 655M13                                                                            | 36A                                                                                | 12NC15      |
| 6              |                                                                                   | 1.6587 17CrNiMo6                                                                  | 820A16                                                                            |                                                                                    | 18NCD6      |
| 6              |                                                                                   | 1.6657 14NiCrMo134                                                                |                                                                                   |                                                                                    |             |
| 6              | 5515                                                                              | 1.7015 15 Cr 3                                                                    | 523 M 15                                                                          |                                                                                    | 12 C 3      |
| 6              | 5132                                                                              | 1.7033 34Cr4                                                                      | 530A32                                                                            | 18B                                                                                | 32C4        |
| 6              | 5140                                                                              | 1.7035 41C r4                                                                     | 530M40                                                                            | 18                                                                                 | 42C4        |
| 6              | 5140                                                                              | 1.7045 42Cr41                                                                     | 530 A 40                                                                          |                                                                                    | 42 C 4 TS   |
| 6              | 5115                                                                              | 1.7131 16MnCr5                                                                    | 527 M 17                                                                          |                                                                                    | 16 MC 5     |
| 6              |                                                                                   | 1.7139 16MnCr5                                                                    |                                                                                   |                                                                                    |             |
| 6              | 5515                                                                              | 1.7176 55Cr3                                                                      | 527 A 60                                                                          | 48                                                                                 | 55 C 3      |
| 6              | 4135; 4137                                                                        | 1.7220 34CrMo4                                                                    | 708 Aa 37                                                                         |                                                                                    | 35 CD 4     |
| 6              | 4142                                                                              | 1.7223 41CrMo4                                                                    |                                                                                   |                                                                                    |             |
| 6              | 4140                                                                              | 1.7225 42CrMo4                                                                    | 708 M 0                                                                           |                                                                                    | 42 CD 4     |
| 6              |                                                                                   | 1.7228 55NiCrMoV6G                                                                | 823M30                                                                            | 33                                                                                 |             |
| 6              |                                                                                   | 1.7262 15CrMo5                                                                    |                                                                                   |                                                                                    | 12 CD 4     |
| 6              |                                                                                   | 1.7321 20 mOcR 4                                                                  |                                                                                   |                                                                                    |             |
| 6              | ASTM A182 F-12                                                                    | 1.7335 13CrMo4 4                                                                  | 1501-620Gr27                                                                      |                                                                                    |             |
| 6              | A 182-F11;12                                                                      | 1.7335 13 CrMo 4 4                                                                | 1 501 620 Gr. 27                                                                  |                                                                                    | 15 CD 4.5   |
| 6              | ASTM A 182 F.22                                                                   | 1.7380 10CrMo9 10                                                                 | 1501-622gR31; 45                                                                  |                                                                                    |             |
| 6              | A182 F-22                                                                         | 1.7380 10 CrMo 9 10                                                               | 1501-622                                                                          |                                                                                    | 12 CD 9.10  |
| 6              |                                                                                   | 1.7715 14MoV6 3                                                                   | 1503-660-440                                                                      |                                                                                    |             |
| 6              | A355A                                                                             | 1.8509 41CrAlMo 7                                                                 | 905 M 39                                                                          | 41B                                                                                | 40 CAD 6.12 |
| 7              | A570.36                                                                           | 1.0038 S235JRG2 (Fe 360 B)<br>RSt 37-2                                            | Fe 360 B FU<br>1449 27/23 CR<br>4360-40 B                                         |                                                                                    | E 24-2NE    |
| 7              | 3135                                                                              | 1.5710 36NiCr6                                                                    | 640A35                                                                            |                                                                                    | 35NC6       |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 2912                                                                              | 16Mo3(KG;KW)                                                                      | F. 2601 - 16 Mo 3                                                                 |                                                                                   |                                                                                   |                                                                                    |
| -2512                                                                             | G 20 Mo 5    G 22 Mo5                                                             |                                                                                   | SCPH 11                                                                           | SCPH 11                                                                           |                                                                                    |
| 14 Ni 6 KG;KT                                                                     | F.2641 - 15 Ni 6                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 16NiCr11                                                                          | 15NiCr11                                                                          | SNC415(H)                                                                         |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   | SNC815(H)                                                                         |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 14NiCrMo13                                                                        |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 14NiCrMo131                                                                       |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   | SCr415(H)                                                                         | SCr415(H)                                                                         |                                                                                    |
|                                                                                   | 34Cr4(KB)                                                                         | 35Cr4                                                                             | SCr430(H)                                                                         | SCr430(H)                                                                         |                                                                                    |
|                                                                                   | 41Cr4                                                                             | 42Cr4                                                                             | SCr440(H)                                                                         | SCr440(H)                                                                         |                                                                                    |
| 2245                                                                              | 41Cr4                                                                             | 42Cr4                                                                             | SCr440                                                                            | SCr440                                                                            |                                                                                    |
| 2511                                                                              | 16MnCr5                                                                           | 16MnCr5                                                                           |                                                                                   |                                                                                   |                                                                                    |
| 2127                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2253                                                                              |                                                                                   |                                                                                   | SUP9(A)                                                                           | SPS 9(A)                                                                          |                                                                                    |
| 2234                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 41CrMo4                                                                           | 42CrMo4                                                                           | SNB 22-1                                                                          | SNB 22-1                                                                          |                                                                                    |
| 2244                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2512                                                                              | 653M31                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2216                                                                              |                                                                                   | 12CrMo4                                                                           |                                                                                   |                                                                                   |                                                                                    |
| 2625                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 14CrMo4 5                                                                         | 14CrMo45                                                                          |                                                                                   |                                                                                   |                                                                                    |
| 2216                                                                              |                                                                                   | 12CrMo4                                                                           | SCM415(H)                                                                         | SCM415(H)                                                                         |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2218                                                                              | 12CrMo9,10                                                                        | TU.H                                                                              |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   | 13MoCrV6                                                                          |                                                                                   |                                                                                   |                                                                                    |
| 2940                                                                              | 41CrAlMo7                                                                         | 41CrAlMo7                                                                         |                                                                                   |                                                                                   |                                                                                    |
| 1312                                                                              | Fe 360 B FN                                                                       | AE 235 B FN;FU<br>Fe 360 B FN; FU                                                 |                                                                                   |                                                                                   | St3ps; sp                                                                          |



# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                     |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR               |
| 7              |                                                                                   | 1.5755 31 NiCr 14                                                                 | 653 M 31                                                                          |                                                                                    | 18 NC 13            |
| 7              | 8620                                                                              | 1.6523 2 NiCrMo2                                                                  | 805M20                                                                            | 362                                                                                | 20 NCD 2            |
| 7              | 8740                                                                              | 1.6546 40 NiCrMo 22                                                               | 311-Tyre 7                                                                        |                                                                                    |                     |
| 7              | 4130                                                                              | 1.7218 25CrMo4                                                                    | CDS 110                                                                           |                                                                                    | 25 CD 4             |
| 7              |                                                                                   | 1.7733 24 CrMoV 5 5                                                               |                                                                                   |                                                                                    | 20 CDV 6            |
| 7              |                                                                                   | 1.7755 GS-45 CrMOV 10 4                                                           |                                                                                   |                                                                                    |                     |
| 7              |                                                                                   | 1.8070 21 CrMoV 5 11                                                              |                                                                                   |                                                                                    |                     |
| 8              | 4142                                                                              | 1.2332 47 CrMo 4                                                                  | 708 M 40                                                                          | 19A                                                                                | 42 CD 4             |
| 8              | A128 (A)                                                                          | 1.3401 G-X120 Mn 12                                                               |                                                                                   |                                                                                    | Z 120 M 12          |
| 8              | 3435                                                                              | 1.5736 36 NiCr 10                                                                 |                                                                                   |                                                                                    | 30 NC 11            |
| 8              | 9840                                                                              | 1.6511 36CrNiMo4                                                                  | 816M40                                                                            | 110                                                                                | 40NCD3              |
| 8              | 4340                                                                              | 1.6582 35CrNiM 6                                                                  | 817 M 40                                                                          | 24                                                                                 | 35 NCD 6            |
| 8              |                                                                                   | 1.7361 32 CeMo12                                                                  | 722 M 24                                                                          | 40B                                                                                | 30 CD 12            |
| 8              | 6150                                                                              | 1.8159 50 CrV 4                                                                   | 735 A 50                                                                          | 47                                                                                 | 50CrV4              |
| 8              |                                                                                   | 1.8161 58 CrV 4                                                                   |                                                                                   |                                                                                    |                     |
| 8              |                                                                                   | 1.8515 32 CrMo 12                                                                 | 722 M 24                                                                          | 40B                                                                                | 30 CD 12            |
| 8              |                                                                                   | 1.8523 39CrMoV13 9                                                                | 897M39                                                                            | 40C                                                                                |                     |
| 9              |                                                                                   | 1.4882 X 50 CrMnNiNbN 21 9                                                        |                                                                                   |                                                                                    | Z 50 CMNNb<br>21.09 |
| 9              | 3135                                                                              | 1.5710 36NiCr6                                                                    | 640A35                                                                            | 111A                                                                               | 35NC6               |
| 9              |                                                                                   | 1.5864 35 niCr 18                                                                 |                                                                                   |                                                                                    |                     |
| 9              |                                                                                   | 31 NiCrMo 13 4                                                                    | 830 m 31                                                                          |                                                                                    |                     |
| 10             | A573-81                                                                           | 1.0144 ST 44-3                                                                    | 4360 43 C                                                                         |                                                                                    | E 28-3              |
| 10             | A 619                                                                             | 1.0347 DCO3<br>RSt;RRSt 13                                                        | 1449 3 CR<br>1449 2 CR                                                            |                                                                                    | E                   |
| 10             | M 1015<br>M 1016<br>M 1017                                                        | 1.0401 C15                                                                        | 080 M 15<br>080 M 15<br>1449 17 CS                                                |                                                                                    | AF 37 C12<br>XC 18  |
| 10             |                                                                                   | 1.0570 ST 52-3                                                                    | 4360 50 B                                                                         |                                                                                    | E 36-3              |
| 10             | 12L13                                                                             | 1.0718 9SMnPb28                                                                   |                                                                                   |                                                                                    | S250Pb              |
| 10             | (12L13)                                                                           | 1.0718 9 SMnPb 28                                                                 |                                                                                   |                                                                                    | S 250 Pb            |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 2506                                                                              | 20NiCrMo2                                                                         | 20NiCrMo2                                                                         | SNCM220(H)                                                                        | SNCM220(H)                                                                        |                                                                                    |
|                                                                                   | 40NiCrMo2(KB)                                                                     | 40NiCrMo2                                                                         | SNCM240                                                                           | SNCM240                                                                           |                                                                                    |
| 2225                                                                              | 25CrMo4(KB)                                                                       | 55Cr3                                                                             | SCM420/430                                                                        | SCM420/430                                                                        |                                                                                    |
|                                                                                   | 21 CrMoV 5 11                                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 35 NiCr 9                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2244                                                                              | 42CrMo4                                                                           | 42CrMo4                                                                           | SCM (440)                                                                         | SCM (440)                                                                         |                                                                                    |
| 2183                                                                              | GX120Mn12                                                                         | F. 8251-AM-X120Mn12                                                               | SCMnH 1, SCMn H 11                                                                | SCMnH 1, SCMn H 11                                                                | 110G13L                                                                            |
|                                                                                   | 36NiCrMo4(KB)                                                                     | 35NiCrMo4                                                                         | SUP 10                                                                            | SPS 10                                                                            |                                                                                    |
| 2541                                                                              | 35NiCrMo6(KB)                                                                     |                                                                                   | SNCM 447                                                                          | SNCM 447                                                                          |                                                                                    |
| 2240                                                                              | 30CrMo12                                                                          | F.124.A                                                                           |                                                                                   |                                                                                   |                                                                                    |
| 2230                                                                              | 50CrV4                                                                            | 51CrV4                                                                            |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2240                                                                              | 32CrMo12                                                                          | F.124.A                                                                           |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 36CrMoV12                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   | SNC236                                                                            | SNC236                                                                            |                                                                                    |
| 2534                                                                              |                                                                                   | f-1270                                                                            |                                                                                   |                                                                                   |                                                                                    |
| 1412                                                                              |                                                                                   |                                                                                   | SM 400A;B;C                                                                       | SM 400A;B;C                                                                       |                                                                                    |
|                                                                                   | Fep 02                                                                            | AP 02                                                                             |                                                                                   |                                                                                   | 08JU                                                                               |
| 1350                                                                              | C15                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | C16                                                                               | F.111                                                                             | S 15 C                                                                            | SM 15 C                                                                           |                                                                                    |
|                                                                                   | 1 C 15                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2132                                                                              | Fe52BFN/Fe52CFN                                                                   |                                                                                   | SM490A;B;C;YA;YB                                                                  | SM490A;B;C;YA;YB                                                                  |                                                                                    |
| 1914                                                                              | CF9SMnPb28                                                                        | 11SMnPb28                                                                         |                                                                                   |                                                                                   |                                                                                    |
| 1914                                                                              | CF 9 SMnPb 28                                                                     | 11 SMnPb 28                                                                       | SUM 22L                                                                           | SUM 22L                                                                           |                                                                                    |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                         |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR                   |
| 10             |                                                                                   | 1.0723 15 S 22<br>15 S 20                                                         | 210 A 15<br>210 M 15                                                              |                                                                                    |                         |
| 10             |                                                                                   | 1.2083                                                                            |                                                                                   |                                                                                    |                         |
| 10             | H 11                                                                              | 1.2343 x 38 CrMoV 5 1                                                             | BH 11                                                                             |                                                                                    | Z 38 CDV 5              |
| 10             | H 13                                                                              | 1.2344 X 40 CrMoV 5 1                                                             | BH 13                                                                             |                                                                                    | Z 40 CDV 5              |
| 10             | A 2                                                                               | 1.2363 X100 CrMoV 5 1                                                             | BA 2                                                                              |                                                                                    | Z 100 CDV 5             |
| 10             | D 2                                                                               | 1.2379 X 155 CrVMo 12 1                                                           | BD2                                                                               |                                                                                    | Z 160 CDV 12            |
| 10             | HNv3                                                                              | 1.2379 X210Cr12G                                                                  | BD2                                                                               |                                                                                    | Z160CDV12               |
| 10             | D 4 (D 6)                                                                         | 1.2436 X 210 CrW 12                                                               | BD6                                                                               |                                                                                    | Z 200 CD 12             |
| 10             | H 21                                                                              | 1.2581 X 30 WCrV 9 3                                                              | BH 21                                                                             |                                                                                    | Z 30 WCV 9              |
| 10             |                                                                                   | 1.2601 X 165 CrMoV 12                                                             |                                                                                   |                                                                                    |                         |
| 10             | H 12                                                                              | 1.2606 X 37 CrMoW 5 1                                                             | BH 12                                                                             |                                                                                    | Z 35 CWDV 5             |
| 10             | D3                                                                                | 1.3343 S 6-5-2                                                                    | BM2                                                                               |                                                                                    | Z200C12                 |
| 10             | N08028                                                                            | 1.4563                                                                            |                                                                                   |                                                                                    | Z1NCDU31-27-03          |
| 10             | ASTM A353                                                                         | 1.5662 X8Ni9                                                                      | 1501-509;510                                                                      |                                                                                    |                         |
| 10             | ASM A353                                                                          | 1.5662 X8Ni9                                                                      | 502-650                                                                           |                                                                                    | 9 Ni                    |
| 10             | 2517                                                                              | 1.5680 12Ni19                                                                     | 12Ni19                                                                            |                                                                                    | Z18N5                   |
| 10             | 2515                                                                              | 1.5680 12 Ni 19                                                                   |                                                                                   |                                                                                    | Z 18 N 5                |
| 11             |                                                                                   | 1.3202 S 12-1-4-5                                                                 | BT 15                                                                             |                                                                                    |                         |
| 11             |                                                                                   | 1.3207 S 10-4-3-10                                                                | BT 42                                                                             |                                                                                    | Z130WKCDV               |
| 11             | T15                                                                               | 1.3243 S 6-5-2-5                                                                  |                                                                                   |                                                                                    | KCV<br>06-05-05-04-02   |
| 11             |                                                                                   | 1.3246 S 7-4-2-5                                                                  |                                                                                   |                                                                                    | Z110 WKCDV<br>07-05-04  |
| 11             |                                                                                   | 1.3247 S 2-10-1-8                                                                 | BM 42                                                                             |                                                                                    | Z110 DKCWW<br>09-08-04  |
| 11             | M 42                                                                              | 1.3249 S 2-9-2-8                                                                  | BM 34                                                                             |                                                                                    |                         |
| 11             | T 4                                                                               | 1.3255 S 18-1-2-5                                                                 | BT 4                                                                              |                                                                                    | Z 80 WKCV<br>18-05-04-0 |
| 11             | M 2                                                                               | 1.3343 S6-5-2                                                                     | BM2                                                                               |                                                                                    | Z 85 WDCV               |
| 11             | M 7                                                                               | 1.3348 S2-9-2                                                                     |                                                                                   |                                                                                    | Z 100 DCWW<br>09-04-02- |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
| 1922                                                                              |                                                                                   | F.210.F                                                                           | SUM 32                                                                            | SUM 32                                                                            |                                                                                    |
| 2314                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | X 37 CrMoV 5 1 KU                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2242                                                                              | X40CrMoV511KU                                                                     | F-5318                                                                            | SKD61                                                                             | STD61                                                                             |                                                                                    |
| 2260                                                                              | X100CrMoV51KU                                                                     | F-5227                                                                            | SKD12                                                                             | STD12                                                                             |                                                                                    |
| 2310                                                                              | X165CrMoW12KU                                                                     | X160CrMoW12KU                                                                     |                                                                                   |                                                                                   |                                                                                    |
| 2736                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2312                                                                              | X215CrW 12 1 KU                                                                   | F-5213                                                                            |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | X30WCrV 9 3 KU                                                                    | F-526                                                                             | SKD5                                                                              | STD5                                                                              |                                                                                    |
| 2310                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | X 35 CrMoW 05 KU                                                                  | F.537                                                                             |                                                                                   |                                                                                   |                                                                                    |
| 2715                                                                              | X210Cr13KU                                                                        | X210Cr12                                                                          | SUH3                                                                              | STR3                                                                              |                                                                                    |
| 2584                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | 14 Ni 6 KG;KT                                                                     | XBNI09                                                                            |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | X10Ni9                                                                            | F-2645                                                                            | SL9N60(53)                                                                        | SL9N590(520)                                                                      |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | HS 12-1-5-5                                                                       | 12-1-5-5                                                                          |                                                                                   |                                                                                   |                                                                                    |
| 2723                                                                              | HS 6-5-2-5                                                                        | 6-5-2-5                                                                           | SKH55                                                                             | SKH55                                                                             |                                                                                    |
| 7-4-2-5                                                                           | HS 7-4-2-5                                                                        | M 35                                                                              |                                                                                   |                                                                                   |                                                                                    |
| 2-10-1-8                                                                          | HS 2-9-1-8<br>2-9-2-8                                                             | M 41                                                                              |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2722                                                                              | HS 652                                                                            | F-5604                                                                            | SKH 51                                                                            | SKH 51                                                                            |                                                                                    |
| 2782                                                                              | HS 292                                                                            | F-5607                                                                            |                                                                                   |                                                                                   |                                                                                    |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                  |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR            |
| 11             | T 1                                                                               | 1.3355 S 18-0-1                                                                   | BT 1                                                                              |                                                                                    | Z 80 WCV 18-4-01 |
| 11             | 630                                                                               | 1.4548                                                                            |                                                                                   |                                                                                    | Z7CNU17-04       |
| 11             | HNV 3                                                                             | 1.4718 X45CrSi 9 3                                                                | 401S45                                                                            | 52                                                                                 | Z45CS9           |
| 11             | 422                                                                               | 1.4935 x20 CrMoWV 12 1                                                            |                                                                                   |                                                                                    |                  |
| 12             | 403                                                                               | 1.4000 X6Cr13                                                                     | 403 S 17                                                                          |                                                                                    | Z 6 C 13         |
| 12             |                                                                                   | 1.4001 X6Cr14                                                                     |                                                                                   |                                                                                    |                  |
| 12             | (410S)                                                                            | 1.4001 X7 Cr 13                                                                   | (403 S 7)                                                                         |                                                                                    | Z 8 C 13         |
| 12             | 405                                                                               | 1.4002 X6CrA12                                                                    | 405S17                                                                            |                                                                                    | Z8CA12           |
| 12             | 405                                                                               | 1.4002 X6 CrAl 13                                                                 | 405 S 17                                                                          |                                                                                    | Z6CA13           |
| 12             | 416                                                                               | 1.4005 X12CrS 13                                                                  | 416 S 21                                                                          |                                                                                    | Z11 CF 13        |
| 12             | 410; CA-15                                                                        | 1.4006 (G-)X10 Cr 13                                                              | 410S21                                                                            | 56A                                                                                | Z10 C 13         |
| 12             | 430                                                                               | 1.4016 X8Cr17                                                                     | Z8C17                                                                             |                                                                                    | 430S15           |
| 12             | 430                                                                               | 1.4016 X6 Cr 17                                                                   | 430 S 15                                                                          | 60                                                                                 | Z 8 C 17         |
| 12             |                                                                                   | 1.4027 G-X20Cr14                                                                  | 420 C 29                                                                          |                                                                                    | Z20 C 13M        |
| 12             |                                                                                   | 1.4027 G-X 20 Cr 14                                                               | 420 C 29                                                                          |                                                                                    | Z 20 C 13M       |
| 12             | 420                                                                               | 1.4028 X30 Cr 13                                                                  | 420 S 45                                                                          |                                                                                    | Z 30 C 13        |
| 12             |                                                                                   | 1.4086 G-X120Cr29                                                                 | 452C11                                                                            |                                                                                    |                  |
| 12             | 430 F                                                                             | 1.4104 X12CrMoS17                                                                 | 420 S 37                                                                          |                                                                                    | Z 10 CF 17       |
| 12             | 440B                                                                              | 1.4112 X90 CrMoV 18                                                               |                                                                                   |                                                                                    |                  |
| 12             | 434                                                                               | 1.4113 X6CrMo 17                                                                  | 434 S 17                                                                          |                                                                                    | Z 8 CD 17.01     |
| 12             |                                                                                   | 1.4340 G-X40CrNi27 4                                                              |                                                                                   |                                                                                    |                  |
| 12             | S31500                                                                            | 1.4417 X2CrNiMoSi19 5                                                             |                                                                                   |                                                                                    |                  |
| 12             | S31500                                                                            | 1.4417 X2 CrNoMoSi 18 5 3                                                         |                                                                                   |                                                                                    |                  |
| 12             |                                                                                   | 1.4418 X4 CrNiMo16 5                                                              |                                                                                   |                                                                                    | Z6CND16-04-01    |
| 12             | XM 8                                                                              | 1.4510                                                                            |                                                                                   |                                                                                    | Z 4 CT 17        |
|                | 430 Ti                                                                            |                                                                                   |                                                                                   |                                                                                    |                  |
|                | 439                                                                               |                                                                                   |                                                                                   |                                                                                    |                  |
| 12             | 430tl                                                                             | 1.4510 X6 CrTi 17                                                                 |                                                                                   |                                                                                    | Z 4 CT 17        |
| 12             |                                                                                   | 1.4511 X 6 CrNb 17(X 6 CrNb 17                                                    |                                                                                   |                                                                                    | Z 4 CNb 17       |
| 12             | 409                                                                               | 1.4512 X 6 CrTi 12 (X2CrTi12)                                                     | LW 19<br>409 S 19                                                                 |                                                                                    | Z 3 CT 12        |
| 12             |                                                                                   | 1.4720 X20CrMo13                                                                  |                                                                                   |                                                                                    |                  |

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| SS                                                                               | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
|                                                                                  | X45CrSi8                                                                          | F322                                                                              | SUH1                                                                              | STR1                                                                              |                                                                                    |
| 2301                                                                             | X6Cr13                                                                            | F.3110                                                                            | SUS403                                                                            | STS 403                                                                           |                                                                                    |
|                                                                                  |                                                                                   | F8401                                                                             |                                                                                   |                                                                                   |                                                                                    |
| 2301                                                                             | X6CrAl13                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2302                                                                             | X6CrAl13                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2380                                                                             | X12 CrSC13                                                                        | F-3411                                                                            | SUS 416                                                                           | SUS 416                                                                           |                                                                                    |
| 2302                                                                             | X12Cr13                                                                           | F.3401                                                                            | SUS 410                                                                           | SUS 410                                                                           |                                                                                    |
| 2320                                                                             | X8Cr17                                                                            | F.3113                                                                            |                                                                                   |                                                                                   |                                                                                    |
| 2320                                                                             | X8Cr17                                                                            | F.3113                                                                            | SUS 430                                                                           | SUS 430                                                                           |                                                                                    |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2304                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2383                                                                             | X10CrS17                                                                          | F.3117                                                                            | SUS430F                                                                           | STS 430F                                                                          |                                                                                    |
| 2325                                                                             | X8CrMo17                                                                          |                                                                                   | SUS434                                                                            | STS 434                                                                           |                                                                                    |
| 2376                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2376                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2387                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                  | X 6 CrTi 17                                                                       | F.3115-X 5 CrTi 17                                                                | SUS 430 LK                                                                        | STS 430 LX                                                                        | 08 Ch17T                                                                           |
|                                                                                  | X 6 CrNb 17                                                                       | F.3122-X 5 CrNb 17                                                                | SUS 430 LK                                                                        | STS 430 LX                                                                        |                                                                                    |
|                                                                                  | X 6 CrTi 17                                                                       |                                                                                   | SUH 409                                                                           | STR 409                                                                           |                                                                                    |

# Material Conversion Table

## ► According to VDI 3323 standard

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|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                 | AFNOR           |
| 12             | 405                                                                               | 1.4724 X10CrA113                                                                  | 403S17                                                                            |                                                                                    | Z10C13          |
| 12             | 430                                                                               | 1.4742 X10CrA118                                                                  | 439S15                                                                            | 60                                                                                 | Z10CAS18        |
| 12             | HNv6                                                                              | 1.4747 X80CrNiSi20                                                                | 443S65                                                                            | 59                                                                                 | Z80CSN20.02     |
| 12             | 446                                                                               | 1.4749 x18 cRn 28                                                                 |                                                                                   |                                                                                    |                 |
| 12             | 446                                                                               | 1.4762 X10CrA124                                                                  |                                                                                   |                                                                                    | Z10CAS24        |
| 12             | EV 8                                                                              | 1.4871 X 53 CrMnNiN 21 9                                                          | 349 S 54                                                                          |                                                                                    | Z 52 CMN 21.09  |
| 12             | 302                                                                               | x12 CrNi 18 9                                                                     | 302 S 31                                                                          |                                                                                    | Z 10 CN 18-09   |
| 12             | 429                                                                               | X10 CrNi 15                                                                       |                                                                                   |                                                                                    |                 |
| 13             | 420                                                                               | 1.4021 X20Cr13                                                                    | 420S37                                                                            |                                                                                    | Z 20 C 13       |
| 13             | 420                                                                               | 1.4031 X40 Cr 13                                                                  |                                                                                   |                                                                                    | Z 40 C 14       |
| 13             |                                                                                   | 1.4034 X46Cr13                                                                    | 420 S 45                                                                          |                                                                                    | Z40 C 14        |
| 13             | 431                                                                               | 1.4057 X20CrNi172                                                                 | 431 S 29                                                                          | 57                                                                                 | Z 15 CN 16.02   |
| 13             |                                                                                   | 1.4125 X 105 CrMo 17                                                              |                                                                                   |                                                                                    | Z 100 CD 17     |
| 13             | CA6-NM                                                                            | 1.4313 G-X4 CrNi 13 4                                                             | 425 C 11                                                                          |                                                                                    | Z 4 CND 13-04 M |
| 13             | 630                                                                               | 1.4542 X 5 CrNiCuNb 17 4<br>(X5CrNiCuNb 16-4)                                     |                                                                                   |                                                                                    |                 |
| 13             |                                                                                   | 1.4544                                                                            | S. 524<br>S. 526                                                                  |                                                                                    |                 |
| 13             | 348                                                                               | 1.4546 X5CrNiNb 18-10                                                             | 347 S 31<br>2 S. 130<br>2 S. 143/144/145<br>S.525/527                             |                                                                                    |                 |
| 13             |                                                                                   | 1.4922 x20cRmV12-1                                                                |                                                                                   |                                                                                    |                 |
| 13             |                                                                                   | 1.4923 X22 CrMoV12 1                                                              |                                                                                   |                                                                                    |                 |
| 14             | 304                                                                               | 1.4301 X 5 CrNi 18 9                                                              | 304 S 15                                                                          |                                                                                    | Z 5 CN 18.09    |
| 14             | 303                                                                               | 1.4305 X10 CrNiS 18 9                                                             | 303 S 21                                                                          | 58M                                                                                | Z 8 CNF 18-09   |
| 14             | 304L                                                                              | 1.4306 X2CrNi18 9                                                                 | 304S12                                                                            |                                                                                    | Z2CrNi18 10     |
| 14             | 304L                                                                              | 1.4306 X2 CrNi 18 10                                                              | 304 S 11                                                                          |                                                                                    | Z 3 CN 19-11    |
| 14             | CF-8                                                                              | 1.4308 X6 CrNi 18 9                                                               | 304 C 15                                                                          | 58E                                                                                | Z 6 CN 18-10 M  |
| 14             | 301                                                                               | 1.4310 X12CrN i17 7                                                               | 301 S 21                                                                          |                                                                                    | Z 12 CN 17.07   |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
|                                                                                   | X10CrA112                                                                         | F.311                                                                             |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | X8Cr17                                                                            | F.3113                                                                            | SUS430                                                                            | STS430                                                                            |                                                                                    |
|                                                                                   | X80CrSiNi20                                                                       | F.320B                                                                            | SUH4                                                                              | STR4                                                                              |                                                                                    |
| 2322                                                                              | X16Cr26                                                                           |                                                                                   | SUH446                                                                            | STR446                                                                            |                                                                                    |
|                                                                                   | X53CrMnNiN21 9                                                                    |                                                                                   | SUH35,SUH36                                                                       | STR35,STR36                                                                       |                                                                                    |
| 2330                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2303                                                                              | 14210                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| -2304                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | X40Cr14                                                                           | F.3405                                                                            | SUS420J2                                                                          | STS420J2                                                                          |                                                                                    |
| 2321                                                                              | X16CrNi16                                                                         | F.3427                                                                            | SUS431                                                                            | STS431                                                                            |                                                                                    |
|                                                                                   | X 105 CrMo 17                                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2385                                                                              | (G)X6CrNi304                                                                      |                                                                                   | SCS5                                                                              | SSC5                                                                              |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   | X 6 CrNiTi 18 11                                                                  |                                                                                   |                                                                                   |                                                                                   | 08Ch 18N12T                                                                        |
|                                                                                   | X 6 CrNiNb 18 11                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2317                                                                              | x20cRmOnl 12 01                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2332;2333                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2346                                                                              | X10CrNiS18.09                                                                     | F.3508                                                                            | SUS303                                                                            | STS303                                                                            |                                                                                    |
| 2352                                                                              | x2cRnl18 11                                                                       | F.3503                                                                            | SCS19                                                                             | SSC19                                                                             |                                                                                    |
| 2352                                                                              | X2CrNi18 11                                                                       |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2333                                                                              |                                                                                   |                                                                                   | SUS304L                                                                           | STS304L                                                                           |                                                                                    |
| 2331                                                                              | X2CrNi18 07                                                                       | F.3517                                                                            |                                                                                   |                                                                                   |                                                                                    |



# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |       |  |                                                                                                                     |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                     | EN                                                                                | AFNOR                                                                                                               |
| 14             | 304 LN                                                                            | 1.4311 X2 CrNiN 18 10                                                             | 304 S 62                                                                               |                                                                                   | Z 2 CN18.10                                                                                                         |
| 14             |                                                                                   | 1.4312 G-X10CrNi18 8                                                              | 302C25                                                                                 |                                                                                   | Z10CN18.9M                                                                                                          |
| 14             | 305                                                                               | 1.4312 X8 CrNi 18 12                                                              | 305 S 19                                                                               |                                                                                   |                                                                                                                     |
| 14             |                                                                                   | 1.4332 X2 CrNi 18-8                                                               |                                                                                        |                                                                                   |                                                                                                                     |
| 14             | 304                                                                               | 1.4350 X5CrNi18 9                                                                 | 304S15                                                                                 | 58E                                                                               | Z6CN18.09                                                                                                           |
| 14             | S32304                                                                            | 1.4362 X2 CrNiN 23 4                                                              |                                                                                        |                                                                                   | Z 2 CN 23-04 AZ                                                                                                     |
| 14             | 202                                                                               | 1.4371 X3 CrMnNiN 188 8 7                                                         | 284 S 16                                                                               |                                                                                   | Z 8 CMN<br>18- 08-05                                                                                                |
| 14             | 316                                                                               | 1.4401 X 5 CrNiMo 17 12 2<br>(X4 CrNiMo 17 -12-2)                                 | 316 S 13<br>316 S 17<br>316 S 19<br>316 S 31<br>316 S 33                               |                                                                                   | Z 3 CND 17 -11-01<br>Z 6 CND 17-11<br>Z 6 CND 17-11-02<br>Z 7 CND 17-11-02<br>Z 7 CND 17-12-02                      |
| 14             | 316L                                                                              | 1.4404 X2 CrNiMo 17 13 2<br>(X2 CrNiMo 17-12-2)<br>GX 2 CrNiMoN 18-10             | 316 S 11, 316 S 13<br>316 S 14, 316 S 31;<br>316 S 42, S.537;316<br>C 12, T.75, S. 161 |                                                                                   | Z 2 CND 17-12<br>Z 2 CND 18-13<br>Z 3 CND 17-11-02<br>Z 3 CND<br>17-12-02 FF<br>Z 3 CND 18-12-03<br>Z 3 CND 19.10 M |
| 14             | 316LN                                                                             | 1.4406 X2 CrNiMoN 17 12 2<br>(X2CrNiMoN 18-10)                                    | 316 S 61<br>316 S 63                                                                   |                                                                                   | Z2 CND 17-12 AZ                                                                                                     |
| 14             | CF-8M                                                                             | 1.4408 GX 5 CrNiMoN 7 12 2<br>G-X 6 CrNiMo 18 10                                  | 316 C 16 (LT 196)<br>ANC 4 B                                                           |                                                                                   |                                                                                                                     |
| 14             |                                                                                   | 1.4410 G-X10CrNiMo18 9                                                            |                                                                                        |                                                                                   | Z5CNaD20.12M                                                                                                        |
| 14             | 316 Ln                                                                            | 1.4429 X2 CrNiMo 17 -13-3                                                         | 316 S 62                                                                               |                                                                                   | Z 2 CND 17-13 Az                                                                                                    |
| 14             | 316L                                                                              | 1.4435 X2 CrNiMo18 14 3                                                           | 316 S 11;316 S 13<br>316 S 14;316 S 31<br>LW 22<br>LWCF 22                             |                                                                                   | Z 3 CND 17-12-03<br>Z 3 CND 18-14-03                                                                                |
| 14             | 316                                                                               | 1.4436 X 5 CrNiMo 17 13 3<br>(X4CRNiMO 17-13-3)                                   | 316 S 19; 316 S 31<br>316 S 33<br>LW 23<br>LWCF 23                                     |                                                                                   | Z 6 CND 18-12-03<br>Z 7 CND 18-12-03                                                                                |

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|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| SS                                                                               | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                              |
| 2371                                                                             | X2CrNi18 10                                                                       |                                                                                   | SUS304LN                                                                          | STS304LN                                                                          |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2332                                                                             | X5CrNi18 10                                                                       | F.3551                                                                            | SUS304                                                                            | STS304                                                                            |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2347                                                                             | X 5 CrNiMo 17 12                                                                  | F.3534-X 5 CrNiMo<br>17 12 2                                                      | SUS 316                                                                           | STS 316                                                                           |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2348                                                                             | X 2 CrNiMo 17 12                                                                  | F.3533 - X 2 CrNiMo<br>17 13 2                                                    |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | G-X 2 CrNiMo 19 11                                                                | F.3537 - X 2 CrNiMo<br>17 13 3                                                    | SUS 316 L                                                                         | STS 316 L                                                                         |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | X 2 CrNiMoN 17 12                                                                 | F.3542-X 2 CrNiMoN<br>17 12 2                                                     | SUS316LN                                                                          | STS316LN                                                                          |                                                                                   |
| 2343                                                                             |                                                                                   | F.8414-AM-X 7<br>CrNiMo 20 10                                                     | SCS 14                                                                            | SSC 14                                                                            | 07 Ch<br>18N10G2S2MSL                                                             |
| 2328                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2375                                                                             | X 2 CrNiMoN 17 13                                                                 | F.3543-X 2 CrNiMoN 17 13 3                                                        | SUS 316 LN                                                                        | STS 316 LN                                                                        |                                                                                   |
| 2375                                                                             | X 2 CrNiMoN 17 13                                                                 | F.3533-X 2 CrNiMo<br>17 13 2                                                      | SUS 316 L                                                                         | STS 316 L                                                                         | 03 Ch 17N14M3                                                                     |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2343                                                                             | X 5 CrNiMo 117 13<br>X 8 cRnImO 17 13                                             | F.3543-X 5 CrNiMo 17 12 2<br>F.3538-X 5 CrNiMo 17 13                              | SUS 316                                                                           | STS 316                                                                           |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                                                                   |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                | AFNOR                                                             |
| 14             | 317L                                                                              | 1.4438 X2 CrNiMo 18 16 4<br>(X2CrNiMo 18-15-4)                                    | 317 S 12                                                                          |                                                                                   | Z 2 CND 19-15-04<br>z 3 cnd 19-15-04                              |
| 14             | (s31726)                                                                          | 1.4439 X2 CrNiMoN 17 13 5                                                         |                                                                                   |                                                                                   | Z 3 CND<br>18-14-06 AZ                                            |
| 14             |                                                                                   | 1.4440 X 2 CrNiMo 18 13                                                           |                                                                                   |                                                                                   |                                                                   |
| 14             | 317                                                                               | 1.4449 X5 CrNiMo 17 13 3                                                          | 317 S 16                                                                          |                                                                                   |                                                                   |
| 14             | 329                                                                               | 1.4449 X 4 CrNiMo 27 5 2<br>1.4460 (X3CrNiMo27-5-2)                               |                                                                                   |                                                                                   | (Z 3 CND 25-07 Az)<br>Z 5 CND 27-05 Az                            |
| 14             | 329                                                                               | 1.4460 X8CrNiMo27 5                                                               |                                                                                   |                                                                                   |                                                                   |
| 14             |                                                                                   | 1.4462 X2CrNiMoN22 5 3                                                            | 318 S 13                                                                          |                                                                                   | Z 3 CND 22-05 Az<br>(Z 2 CND 24 -08 Az )<br>(Z 3 CND 25-06-03 Az) |
| 14             |                                                                                   | 1.4500 G-X7NiCrMoCuNb25 20                                                        |                                                                                   |                                                                                   | Z3NCDU25.20M                                                      |
| 14             | 17-7PH                                                                            | 1.4504                                                                            | 316S111                                                                           |                                                                                   |                                                                   |
| 14             | 443<br>444                                                                        | 1.4521 X2CrMoTi18-2                                                               | 317 S 16                                                                          |                                                                                   |                                                                   |
| 14             | UNS N 08904                                                                       | 1.4539 X1NiCrMoCuN25-20-5                                                         |                                                                                   |                                                                                   | Z 2 NCDU 25-20                                                    |
| 14             | CN-7M                                                                             | 1.4539 (G-)X1 NiCrMoCu 25 20 5                                                    |                                                                                   |                                                                                   | Z1 NCDU 25-02 M                                                   |
| 14             | 321                                                                               | 1.4541 Z 6 CrNiTi 18-10                                                           | 321 S 31<br>321 S 51 (1010;1105)<br>LW 24<br>LWCF 24                              |                                                                                   | Z 6 CNT 18-10                                                     |
| 14             | 630                                                                               | 1.4542 X5 CrNiCuNb 17 4<br>(X5 CrNiChNb 16-4)                                     |                                                                                   |                                                                                   | Z 7 CNU 15-05<br>Z 7 CNU 17-04                                    |
| 14             | 17-4PH                                                                            | 1.4542                                                                            |                                                                                   |                                                                                   | Z7CNU17-04                                                        |
| 14             | S31254                                                                            | 1.4547 X1 CrNiMoN 20 18 7                                                         |                                                                                   |                                                                                   |                                                                   |
| 14             | 17-4PH                                                                            | 1.4548                                                                            |                                                                                   |                                                                                   | Z7CNU17-04                                                        |
| 14             | 347                                                                               | 1.4550 X6 CrNiNb 18 10                                                            | 347 S 17                                                                          | 58F                                                                               | Z 6 CNNb 18.10                                                    |
| 14             |                                                                                   | 1.4552 G-X7CrNiNb18 9                                                             |                                                                                   |                                                                                   | Z4CNNb19.10M                                                      |
| 14             | 17-7PH                                                                            | 1.4568                                                                            | 316S111                                                                           |                                                                                   |                                                                   |
| 14             | 316Ti                                                                             | 1.4571 X6 CrNiMoTi 17 12 2                                                        | 320 S 31                                                                          |                                                                                   | Z 6 CNDT 17-12002                                                 |
| 14             |                                                                                   | 1.4581 G-X 5 CrNiMoNb                                                             | 318 C 17                                                                          |                                                                                   | Z 4 CNDNb 18.12 M                                                 |
| 14             | 318                                                                               | 1.4583 X 10CrNiMoNb 18 12                                                         | 303 S 21                                                                          |                                                                                   | Z15CNS20.12                                                       |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                              |
| 2367                                                                              | X2CrNiMo18 16                                                                     | f.3539-x 2 cRnlmO 18 16 4                                                         | SUS317L                                                                           | STS317L                                                                           |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   | X 5 CrNiMo 18 15                                                                  |                                                                                   | SUS 317                                                                           | STS 317                                                                           |                                                                                   |
| 2324                                                                              |                                                                                   | F.3309-X 8 CrNiMo 17 12 2<br>F.3552-X 8 CrNiMo 18 16 4                            | SUS 329 J 1                                                                       | STS 329 J 1                                                                       |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2377                                                                              |                                                                                   |                                                                                   | SUS 329 J3L                                                                       | STS 329 J3L                                                                       |                                                                                   |
|                                                                                   | Z8CNA17-07                                                                        | X2CrNiMo1712                                                                      |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2326                                                                              |                                                                                   | F.3123-X 2 CrMoTiNb 18 2                                                          | SUS 444                                                                           | STS 444                                                                           |                                                                                   |
| 2562                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2564                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2337                                                                              | X 6 CrNiTi 18 11                                                                  | F.3523 - X 6 CrNiTi<br>18 10                                                      | SUS 321                                                                           | STS 321                                                                           | 06Ch18N10T<br>08Ch18N10T<br>09Ch18N10T<br>12Ch18N10T                              |
|                                                                                   |                                                                                   |                                                                                   | SCS 24<br>SUS 630                                                                 | SSC 24<br>STS 630                                                                 |                                                                                   |
| 2378                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2338                                                                              | X6CrNiNb18 11                                                                     | F.3552                                                                            | SUS347                                                                            | STS347                                                                            |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   | Z8CNA17-07                                                                        | X2CrNiMo1712                                                                      |                                                                                   |                                                                                   |                                                                                   |
| 2350                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   | x15cRnsl2 12                                                                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                      |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                | AFNOR                |
| 14             |                                                                                   | 1.4585 G-X7CrNiMoCuNb18 18                                                        |                                                                                   |                                                                                   |                      |
| 14             |                                                                                   | 1.4821 X20CrNiSi25 4                                                              |                                                                                   |                                                                                   | Z20CNS25.04          |
| 14             |                                                                                   | 1.4823 G-X40CrNiSi27 4                                                            |                                                                                   |                                                                                   |                      |
| 14             | 309                                                                               | 1.4828 X15CrNiSi20 12                                                             | 309 S 24                                                                          | 58C                                                                               | Z15CNS20.12          |
| 14             | 309S                                                                              | 1.4833 X6 CrNi 22 13                                                              | 309 S 13                                                                          |                                                                                   | Z 15 CN 24-13        |
| 14             | 310 S                                                                             | 1.4845 X12 CrNi 25 21                                                             | 310S24                                                                            |                                                                                   | Z 12 CN 25-20        |
| 14             | 321                                                                               | 1.4878 X6 CrNiTi 18 9                                                             | 32 1 S 20                                                                         | 58B                                                                               | Z 6 CNT 18-12 (B)    |
| 14             | Ss30415                                                                           | 1.4891 X5 CrNiNb 18 10                                                            |                                                                                   |                                                                                   | Z20CNS25.04          |
| 14             | S30815                                                                            | 1.4893 X8 CrNiNb 11                                                               |                                                                                   |                                                                                   |                      |
| 14             | 304H                                                                              | 1.4948 X6 CrNi 18 11                                                              | 304 S 51                                                                          |                                                                                   | Z 5 CN 18-09         |
| 14             | 660                                                                               | 1.498 X5 NiCrTi 25 15                                                             |                                                                                   |                                                                                   | Zz 8 nctv 25-15 b ff |
| 14             |                                                                                   | X5 NiCrN 35 25                                                                    |                                                                                   |                                                                                   |                      |
| 14             | S31753                                                                            | X2 CrNiMoN 18 13 4                                                                |                                                                                   |                                                                                   |                      |
| 14             |                                                                                   | X2 CrNiMoN 25 22 7                                                                |                                                                                   |                                                                                   |                      |
| 15             | CLASS20                                                                           | 0.6010 GG10                                                                       |                                                                                   |                                                                                   | Ft10D                |
| 15             | A48-20B                                                                           | 0.6010 GG-10                                                                      |                                                                                   |                                                                                   | Ft 10 D              |
| 15             | NO 25 B                                                                           | 0.6015 GG 15                                                                      | Grade 150                                                                         |                                                                                   | Ft 15 D              |
| 15             | CLASS25                                                                           | 0.6015 GG 15                                                                      | Grade 150                                                                         |                                                                                   | Ft 15D               |
| 15             | A48 25 B                                                                          | 0.6015 GG 15                                                                      | Grade 150                                                                         |                                                                                   | Ft 15 D              |
| 15             | A48-30B                                                                           | 0.6020 GG-20                                                                      | Grade 220                                                                         |                                                                                   | Ft 20 D              |
| 15             | NO 30 B                                                                           | 0.6020 GG 20                                                                      | Grade 220                                                                         |                                                                                   | Ft 20 D              |
| 15             | A436 Type 2                                                                       | 0.6660 GGL-NiCr202                                                                | L-NiCuCr202                                                                       |                                                                                   | L-NC 202             |
| 15             | 60-40-18                                                                          | 0.7040 GGG 40                                                                     | SNG 420/12                                                                        |                                                                                   | FCS 400-12           |
| 15             | No 20 B                                                                           | GG 10                                                                             |                                                                                   |                                                                                   | Ft 10 D              |
| 16             | CLASS30                                                                           | 0.6020 GG 20                                                                      | Grade 220                                                                         |                                                                                   | Ft 20D               |
| 16             | CLASS45                                                                           | 0.6030 GG 30                                                                      | Grade 300                                                                         |                                                                                   | Ft 30D               |
| 16             | A48-45 B                                                                          | 0.6030                                                                            | Grade 350                                                                         |                                                                                   | Ft 30D               |
| 16             | A48-50                                                                            | 0.6035 GG-35                                                                      | Grade 350                                                                         |                                                                                   | Ft 35 D              |
| 16             | A48-60 B                                                                          | 0.6040 GG40                                                                       | Grade 400                                                                         |                                                                                   | Ft 40 D              |
| 16             | 100/70/03                                                                         | 0.7070 GGG-70                                                                     | SNG700/2                                                                          |                                                                                   | FGS 700-2            |

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| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                               |
|                                                                                   | X6CrNiMoTi17 12                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   | F.8414                                                                            | SCS17                                                                             | SSC17                                                                             |                                                                                    |
| 2361                                                                              | X6CrNi25 20                                                                       | F.331                                                                             | SUH310                                                                            | STR310                                                                            |                                                                                    |
| 2337                                                                              | X6CrNiTi18 11                                                                     | F.3553                                                                            | SUS321                                                                            | STS321                                                                            |                                                                                    |
| 2372                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2368                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2333                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 2570                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 110                                                                               | G 10                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 0110-00                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 0115-00                                                                           | G 15                                                                              | FG 15                                                                             | FC150                                                                             | GC150                                                                             |                                                                                    |
| 115                                                                               | G 15                                                                              | FG 15                                                                             |                                                                                   |                                                                                   |                                                                                    |
| 01 15-00                                                                          | G 14                                                                              | FG 15                                                                             |                                                                                   |                                                                                   |                                                                                    |
| 0120-00                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 120                                                                               | G 20                                                                              |                                                                                   | FC200                                                                             | GC200                                                                             |                                                                                    |
| 0523-00                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 0717-02                                                                           | GS 370-17                                                                         | FGE 38-17                                                                         | FCD400                                                                            | GCD400-18,15                                                                      |                                                                                    |
| 110                                                                               |                                                                                   |                                                                                   | FC100                                                                             | GC100                                                                             |                                                                                    |
| 120                                                                               | G 20                                                                              | FG 20                                                                             |                                                                                   |                                                                                   |                                                                                    |
| 130                                                                               | G 30                                                                              | FG 30                                                                             | FC300                                                                             | GC300                                                                             |                                                                                    |
| 01 30-00                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 135                                                                               | G 35                                                                              | FG 35                                                                             | FC350                                                                             | GC350                                                                             |                                                                                    |
| 140                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |
| 07 37-01                                                                          | GGG 70                                                                            | GGG 70                                                                            | FCD700                                                                            | GCD700-2                                                                          |                                                                                    |

# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |            |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                | AFNOR      |
| 16             |                                                                                   | 1.4829 X 12 CrNi 22 12                                                            |                                                                                   |                                                                                   |            |
| 17             |                                                                                   | 0.7033 GGG35.3                                                                    |                                                                                   |                                                                                   |            |
| 17             |                                                                                   | 0.7033 GGG-35.3                                                                   | 350/22 L 40                                                                       |                                                                                   | FGS 370/17 |
| 17             | 60-40-18                                                                          | 0.7040 GGG-40                                                                     | SNG 420/12                                                                        |                                                                                   | FGS 400-12 |
| 17             | 60/40/18                                                                          | 0.7043 GGG-40.3                                                                   | 370/7                                                                             |                                                                                   | FGS 370/17 |
| 17             | 80-55-06                                                                          | 0.7050 GGG50                                                                      | SNG500/7                                                                          |                                                                                   | FGS 500/7  |
| 17             | 65-45-12                                                                          | 0.7050 GGG-50                                                                     | SNG 500/7                                                                         |                                                                                   | FGS 500-7  |
| 17             |                                                                                   | 0.7652 GGG-NiMn 13 7                                                              | S-NiMn 137                                                                        |                                                                                   | S-Mn 137   |
| 17             | A43D2                                                                             | 0.7660 GGG-NiCr 20 2                                                              | Grade S6                                                                          |                                                                                   | S-NC 202   |
| 17             |                                                                                   | GGG 40.3                                                                          | SNG 370/17                                                                        |                                                                                   | FGS 370-17 |
| 18             | A48-40 B                                                                          | 0.6025 GG25                                                                       | Grade260                                                                          |                                                                                   | Ft 25 D    |
| 18             |                                                                                   | 0.7060 GGG60                                                                      | SNG600/3                                                                          |                                                                                   | FGS600-3   |
| 18             | 80/55/06                                                                          | 0.7060 GGG-60                                                                     | 600/3                                                                             |                                                                                   | FGS 600/3  |
| 18             | A48 40 B                                                                          |                                                                                   |                                                                                   |                                                                                   |            |
| 19             |                                                                                   | 0.8055 GTW55                                                                      |                                                                                   |                                                                                   |            |
| 19             | 32510                                                                             | 0.8135 GTS-35-10                                                                  | B 340/12                                                                          |                                                                                   | MN35-10    |
| 19             | A47-32510                                                                         | 0.8135 GTS-35-10                                                                  | B 340/2                                                                           |                                                                                   | Mn 35-10   |
| 19             | A220-40010                                                                        | 0.8145 GTS-45-06                                                                  | P 440/7                                                                           |                                                                                   | Mn 450-6   |
| 19             |                                                                                   | GTS-35                                                                            | B 340/12                                                                          |                                                                                   |            |
| 19             |                                                                                   |                                                                                   | 8 290/6                                                                           |                                                                                   | MN 32-8    |
| 19             | 32510                                                                             | GTS-35                                                                            | B340/12                                                                           |                                                                                   | MN 35-10   |
| 20             |                                                                                   | 0.8035 GTM-35                                                                     | W340/3                                                                            |                                                                                   | MB35-7     |
| 20             |                                                                                   | 0.8040 GTW-40                                                                     | W410/4                                                                            |                                                                                   | MB40-10    |
| 20             |                                                                                   | 0.8045                                                                            |                                                                                   |                                                                                   |            |
| 20             |                                                                                   | 0.8065 GTMW-65                                                                    |                                                                                   |                                                                                   |            |
| 20             | A220-50005                                                                        | 0.8155 GTS-55-04                                                                  | P 510/4                                                                           |                                                                                   | Mn 550-4   |
| 20             | 50005                                                                             | 0.8155 GTS-55-04                                                                  | P 510/4                                                                           |                                                                                   | MP 50-5    |
| 20             | 70003                                                                             | 0.8165 GTS-65-02                                                                  | P 570/3                                                                           |                                                                                   | Mn 650-3   |
| 20             | 90001                                                                             | 0.8170 GTS-70-02                                                                  | P 690/2                                                                           |                                                                                   | Mn 700-2   |
| 20             | A220-90001                                                                        | 0.8170 GTS-70-02                                                                  |                                                                                   |                                                                                   | Mn 700-2   |

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|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| SS                                                                               | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                              |
| 0717-15                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0717-15                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0717-02                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0717-15                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0727-02                                                                          | GGG 50                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | 0727-02                                                                           |                                                                                   | FCD 500                                                                           | GCD 500-7                                                                         |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0772-00                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0776-00                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0717-12                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 125                                                                              | G 25                                                                              | FG 25                                                                             | FC250                                                                             | GC250                                                                             |                                                                                   |
| 07 32-03                                                                         | GGG 60                                                                            | GGG 60                                                                            |                                                                                   |                                                                                   |                                                                                   |
| 0727-03                                                                          |                                                                                   |                                                                                   | FCD600                                                                            | GCD600-3                                                                          |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   | GTW 55                                                                            |                                                                                   |                                                                                   |                                                                                   |
| 810                                                                              |                                                                                   | GTS 35                                                                            |                                                                                   |                                                                                   |                                                                                   |
| 0815-00                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | 0852-00                                                                           | GMN 45                                                                            |                                                                                   |                                                                                   | FCMW370                                                                           |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0810-00                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 814                                                                              |                                                                                   |                                                                                   | AC4A                                                                              | AC4A                                                                              |                                                                                   |
| 08 15                                                                            |                                                                                   |                                                                                   | FCMW330                                                                           | FCMW330                                                                           |                                                                                   |
| 852                                                                              |                                                                                   | GTM 35                                                                            |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | GTB40                                                                             | GTM 40                                                                            |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | GMB45                                                                             | GTM 45                                                                            |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   | GTM 65                                                                            |                                                                                   |                                                                                   |                                                                                   |
| 0854-00                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 0854-00                                                                          | GMN 55                                                                            |                                                                                   | FCMP490                                                                           | PMC 490                                                                           |                                                                                   |
| 0856-00                                                                          | GMN 65                                                                            |                                                                                   | FCMP590                                                                           | PMC 590                                                                           |                                                                                   |



# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |              |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                | AFNOR        |
| 20             |                                                                                   | 0.8170 GTS-70-02                                                                  | IP 70-2                                                                           |                                                                                   |              |
| 20             | 1022                                                                              |                                                                                   |                                                                                   |                                                                                   |              |
|                | 1518                                                                              | 1.1133 20Mn5                                                                      | 120 M 19                                                                          |                                                                                   | 20 M 5       |
| 20             | 1035                                                                              | 1.1183 Cf 35 (C35G)                                                               | 080 A 35                                                                          |                                                                                   | XC 38 H 1 TS |
| 20             | 400 10                                                                            | GTS-45                                                                            | P440/7                                                                            |                                                                                   |              |
| 20             | 70003                                                                             | GTS-65                                                                            | P 570/3                                                                           |                                                                                   | MP 60-3      |
| 21             | Al99                                                                              | 3.0205                                                                            |                                                                                   |                                                                                   |              |
| 21             | 1000                                                                              | 3.0255 Al99.5                                                                     | L31/34/36                                                                         |                                                                                   | A59050C      |
| 21             |                                                                                   | 3.3315 AlMg1                                                                      |                                                                                   |                                                                                   |              |
| 22             |                                                                                   | 3.1325 AlCuMg 1                                                                   |                                                                                   |                                                                                   |              |
| 22             |                                                                                   | 3.1655 AlCuSiPb                                                                   |                                                                                   |                                                                                   |              |
| 22             |                                                                                   | 3.2315 AlMgSi1                                                                    |                                                                                   |                                                                                   |              |
| 21             | 7050                                                                              | 3.4345 AlZnMgCuO,5                                                                | L 86                                                                              |                                                                                   | AZ 4 GU/9051 |
| 23             |                                                                                   | 3.2381 G-AlSi 10 Mg                                                               |                                                                                   |                                                                                   |              |
| 23             |                                                                                   | 3.2382 GD-AlSi10Mg                                                                |                                                                                   |                                                                                   |              |
| 23             |                                                                                   | 3.2581 G-AlSi12                                                                   |                                                                                   |                                                                                   |              |
| 23             |                                                                                   | 3.3561 G-ALMg 5                                                                   |                                                                                   |                                                                                   |              |
| 23             | ZE 41                                                                             | 3.5101 G-MgZn4sE1Zr1                                                              | MAG 5                                                                             |                                                                                   |              |
| 23             | EZ 33                                                                             | 3.5103 MgSE3Zn27r1                                                                | MAG 6                                                                             |                                                                                   | G-TR3Z2      |
| 23             | AZ 81                                                                             | 3.5812 G-MgAl8Zn1                                                                 | NMAG 1                                                                            |                                                                                   |              |
| 23             | AZ 91                                                                             | 3.5912 G-MgAl9Zn1                                                                 | MAG 7                                                                             |                                                                                   |              |
| 24             |                                                                                   | 2.1871 G-AlCu 4 TiMg                                                              |                                                                                   |                                                                                   |              |
| 24             |                                                                                   | 3.1754 G-AlCu5Ni1,5                                                               |                                                                                   |                                                                                   |              |
| 24             |                                                                                   | 3.2163 G-AlSi9Cu3                                                                 |                                                                                   |                                                                                   |              |
| 24             | 4218 B                                                                            | 3.2371 G-AlSi 7 Mg                                                                |                                                                                   |                                                                                   |              |
| 24             | SC64D                                                                             | 3.2373 G-AlSi9MGWA                                                                |                                                                                   |                                                                                   | A-S7G        |
| 24             |                                                                                   | 3.2373 G-AlSi 9 Mg                                                                |                                                                                   |                                                                                   |              |
| 24             | QE 22                                                                             | 3.5106 G-MgAg3SE2Zr1                                                              | mag 12                                                                            |                                                                                   |              |
| 24             | GD-AlSi12                                                                         | G-ALMG5                                                                           | LM5                                                                               |                                                                                   | A-SU12       |
| 23-24          | A360.2                                                                            | 3.2383 G-AlSi0Mg(Cu)                                                              | LM9                                                                               |                                                                                   |              |

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|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| SS                                                                                | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                              |
| 0862-00                                                                           | GMN 70                                                                            |                                                                                   | FCMP690                                                                           | PMC 690                                                                           |                                                                                   |
| 0864-00                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 2132                                                                              | G 22 Mn 3                                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   | 20 Mn 7                                                                           | F.1515-20 Mn 6                                                                    | SMnC 420                                                                          | SMnC 420                                                                          |                                                                                   |
| 1572                                                                              | C 36; C 38                                                                        |                                                                                   | S 35 C                                                                            | SM 35 C                                                                           | 35                                                                                |
| 08 52                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 858                                                                               |                                                                                   |                                                                                   | FCMP540                                                                           | PMC 540                                                                           |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 811-04                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 4231                                                                              |                                                                                   |                                                                                   | C4BS                                                                              | C4BS                                                                              |                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 4252                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 4253                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

# Material Conversion Table

## ► According to VDI 3323 standard

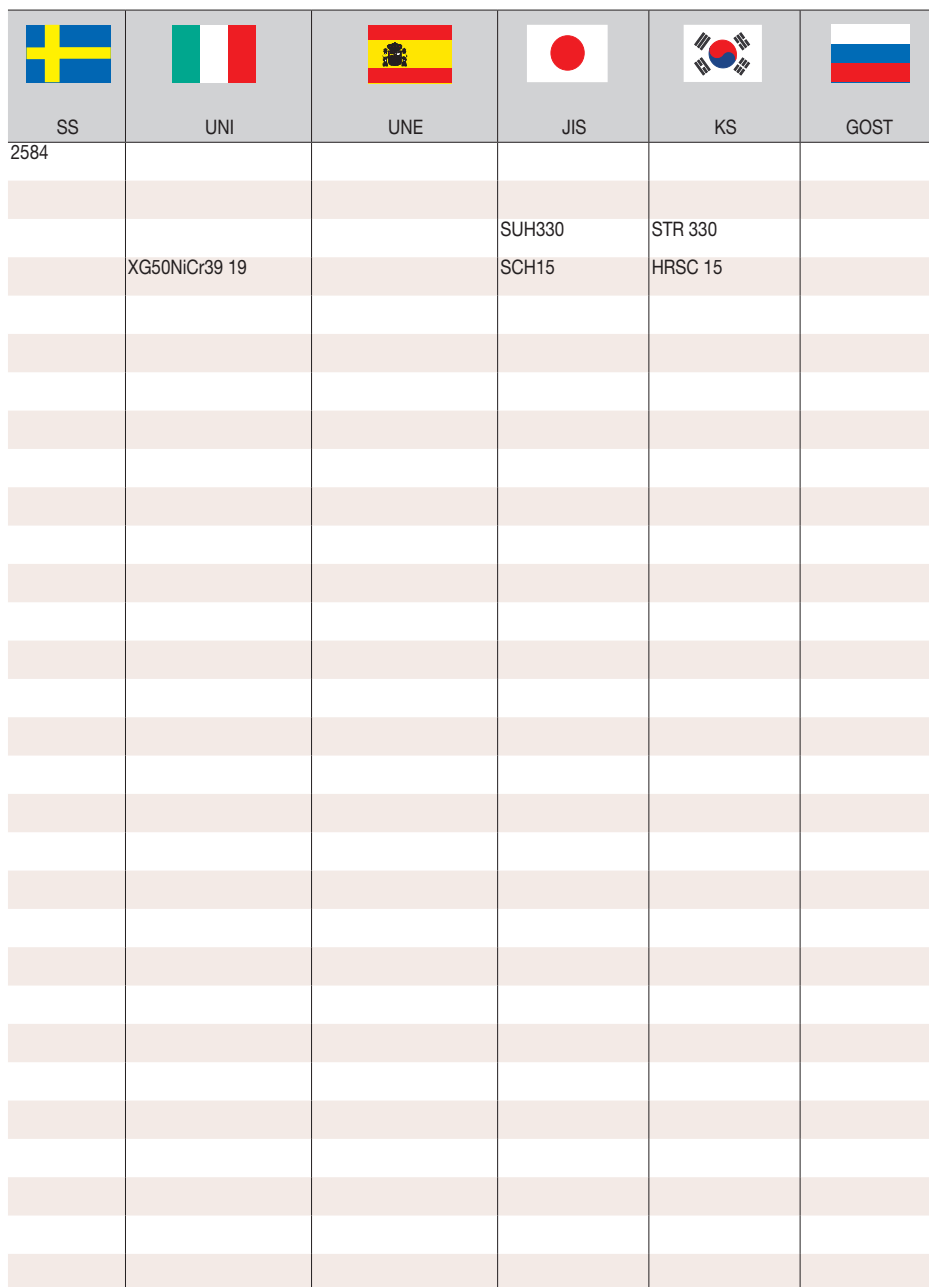
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|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                | AFNOR            |
| 23-24          | A356-72                                                                           |                                                                                   | 2789;1973                                                                         |                                                                                   | NF A32-201       |
| 23-24          | 356.1                                                                             |                                                                                   | LM25                                                                              |                                                                                   |                  |
| 23-24          | A413.2                                                                            | G-AlSi12                                                                          | LM6                                                                               |                                                                                   |                  |
| 23-24          | A413.1                                                                            | G-AlSi 12 (Cu)                                                                    | LM20                                                                              |                                                                                   |                  |
| 23-24          | A413.0                                                                            | GD-AlSi12                                                                         |                                                                                   |                                                                                   |                  |
| 23-24          | A380.1                                                                            | GD-AlSi8Cu3                                                                       | LM24                                                                              |                                                                                   |                  |
| 26             | C93200                                                                            | 2.1090 G-CuSn 7 5 pb                                                              |                                                                                   |                                                                                   | U-E 7 Z 5 pb 4   |
| 26             | C83600                                                                            | 2.1096 G-CuSn5ZnPb                                                                | LG 2                                                                              |                                                                                   |                  |
| 26             | C83600                                                                            | 2.1098 G-CuSn 2 Znpb                                                              |                                                                                   |                                                                                   |                  |
| 26             | C23000                                                                            | 2.1182 G-CuPb15Sn                                                                 | LB1                                                                               |                                                                                   | U-pb 15 E 8      |
| 26             | C93800                                                                            | 2.1182 G-CuPb15Sn                                                                 |                                                                                   |                                                                                   | Uu-PB 15e 8      |
| 27             |                                                                                   | 2.0240 CuZn 15                                                                    |                                                                                   |                                                                                   |                  |
| 27             | C27200                                                                            | 2.0321 CuZn 37                                                                    | cz 108                                                                            |                                                                                   | CuZn 36, CuZn 37 |
| 27             | C27700                                                                            | 2.0321 CuZn 37                                                                    | cz 108                                                                            |                                                                                   | CuZn 36, CuZn 37 |
| 27             |                                                                                   | 2.0590 G-CuZn40Fe                                                                 |                                                                                   |                                                                                   |                  |
| 27             | C 86500                                                                           | 2.0592 G-CuZn 35 Al 1                                                             | U-Z 36 N 3                                                                        |                                                                                   | HTB 1            |
| 27             | C 86200                                                                           | 2.0596 G-CuZn 34 Al 2                                                             | HTB 1                                                                             |                                                                                   | U-Z 36 N 3       |
| 27             | C 18200                                                                           | 2.1293 CuCrZr                                                                     | CC 102                                                                            |                                                                                   | U-Cr 0.8 Zr      |
| 28             |                                                                                   | 2.0060 E-Cu57                                                                     |                                                                                   |                                                                                   |                  |
| 28             |                                                                                   | 2.0375 CuZn36Pb3                                                                  |                                                                                   |                                                                                   |                  |
| 28             | C 94100                                                                           | 2.0596 G-CuZn 34 Al 2                                                             | HTB 1                                                                             |                                                                                   | U-Z 36 N 3       |
| 28             | C 63000                                                                           | 2.0966 CuAl 10 Ni 5 Fe 4                                                          | Ca 104                                                                            |                                                                                   | U-A 10 N         |
| 28             | B-148-52                                                                          | 2.0975 G-CuAl 10 Ni                                                               |                                                                                   |                                                                                   |                  |
| 28             | C 90700                                                                           | 2.105 G-CuSn 10                                                                   | CT1                                                                               |                                                                                   |                  |
| 28             | C 90800                                                                           | 2.1052 G-CuSn 12                                                                  | pb 2                                                                              |                                                                                   | UE 12 P          |
| 28             | C 81500                                                                           | 2.1292 G-CuCrF 35                                                                 | CC1-FF                                                                            |                                                                                   |                  |
| 28             |                                                                                   | 2.4764 CoCr20W15Ni                                                                |                                                                                   |                                                                                   |                  |
| 31             | N 08800                                                                           | 1.4558 X 2 NiCrAlTi 32 20                                                         | NA 15                                                                             |                                                                                   |                  |
| 31             | N 08031                                                                           | 1.4562 X 1 NiCrMoCu 32 28 7                                                       |                                                                                   |                                                                                   |                  |



# Material Conversion Table

## ► According to VDI 3323 standard

|                |  |  |  |  |                |
|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                | AFNOR          |
| 31             | N 08028                                                                           | 1.4563 X 1 NiCrMoCuN 32 27 4                                                      |                                                                                   |                                                                                   |                |
| 31             | N 08330                                                                           | 1.4564 X 12 NiCrSi 36 16                                                          | NA 17                                                                             |                                                                                   | Z 12 NCS 35.16 |
| 31             | 330                                                                               | 1.4564 X12 NiCrSi 36 16                                                           | NA 17                                                                             |                                                                                   | Z 12 NCS 37.18 |
| 31             |                                                                                   | 1.4865 G-X40NiCrSi38 18                                                           | 330 C 40                                                                          |                                                                                   |                |
| 31             |                                                                                   | 1.4958 X 5 NiCrAlTi 31 20                                                         |                                                                                   |                                                                                   |                |
| 31             | AMS 5544                                                                          | LW2.4668 NiCr19NbMo                                                               |                                                                                   |                                                                                   | NC20K14        |
| 32             |                                                                                   | 1.4977 X 40 CoCrNi 20 20                                                          |                                                                                   |                                                                                   | Z 42 CNKDOWNb  |
| 33             | Monel 400                                                                         | 2.4360 NiCu30Fe                                                                   | NA 13                                                                             |                                                                                   | NU 30          |
| 33             | 5390A                                                                             | 2.4603                                                                            |                                                                                   |                                                                                   | NC22FeD        |
| 33             | Hastelloy C-4                                                                     | 2.4610 NiMo16Cr16Ti                                                               |                                                                                   |                                                                                   |                |
| 33             | Nimonic75                                                                         | 2.4630 NiCr20Ti                                                                   | HR 5,203-4                                                                        |                                                                                   | NC 20 T        |
| 33             |                                                                                   | 2.4630 NiCr20Ti                                                                   | HR5,203-4                                                                         |                                                                                   | NC20T          |
| 33             | Inconel 690                                                                       | 2.4642 NiC29Fe                                                                    |                                                                                   |                                                                                   | Nnc 30 Fe      |
| 33             | Inconel 625                                                                       | 2.4856 NiCr22Mo9Nb                                                                | NA 21                                                                             |                                                                                   | NC 22 FeDNb    |
| 33             | 5666                                                                              | 2.4856 NiCr22Mo9Nb                                                                |                                                                                   |                                                                                   | Inconel 625    |
| 33             | Incoloy 825                                                                       | 2.4858 NiCr21Mo                                                                   | NA 16                                                                             |                                                                                   | NC 21 Fe DU    |
| 34             | Monel k-500                                                                       | 2.4375 NiCu30 Al                                                                  | NA 18                                                                             |                                                                                   | NU 30 AT       |
| 34             | 4676                                                                              | 2.4375 NiCu30Al                                                                   | 3072-76                                                                           |                                                                                   |                |
| 34             |                                                                                   | 2.4631 NiCr20TiAl                                                                 | Hr40;601                                                                          |                                                                                   | NC20TA         |
| 34             | Inconel 718                                                                       | 2.4668 NiCr19FeNbMo                                                               |                                                                                   |                                                                                   | NC 19 Fe Nb    |
| 34             | Inconel                                                                           | 2.4694 NiCr16fE7TiAl                                                              |                                                                                   |                                                                                   |                |
| 34             |                                                                                   | 2.4955 NiFe25Cr20NbTi                                                             |                                                                                   |                                                                                   |                |
| 34             | 5383                                                                              | LM2.4668 NiCr19Fe19NbMo                                                           | HR8                                                                               |                                                                                   | NC19eNB        |
| 34             | 5391                                                                              | LW2 4670 S-NiCr13A16MoNb                                                          | 3146-3                                                                            |                                                                                   | NC12AD         |
| 34             | 5660                                                                              | LW2.4662 NiFe35Cr14MoTi                                                           |                                                                                   |                                                                                   | ZSNCDT42       |
| 34             | 5537C                                                                             | LW2.4964 CoCr20W15Ni                                                              |                                                                                   |                                                                                   | KC20WN         |
| 34             | AMS 5772                                                                          | C0Cr22W14Ni                                                                       |                                                                                   |                                                                                   | KC22WN         |
| 35             | Inconel X-750                                                                     | 2.4669 NiCr15Fe7TiAl                                                              |                                                                                   |                                                                                   | NC 15 TNb A    |
| 35             | Hastelloy B                                                                       | 2.4685 G-NiMo28                                                                   |                                                                                   |                                                                                   |                |
| 35             | Hastelloy C                                                                       | 2.4810 G-NiMo30                                                                   |                                                                                   |                                                                                   |                |



SS



UNI



UNE



JIS



KS



GOST

2584

SUH330

STR 330

XG50NiCr39 19

SCH15

HRSC 15

# Material Conversion Table

## ► According to VDI 3323 standard

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|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------|
| Material group | AISI/SAE                                                                          | Material No. DIN                                                                  | BS                                                                                | EN                                                                                | AFNOR          |
| 35             | AMS 5399                                                                          | 2.4973                                                                            | NiCr19Co11MoTi                                                                    |                                                                                   | NC19KDT        |
| 35             |                                                                                   | 3.7115                                                                            | TiAl5Sn2                                                                          |                                                                                   |                |
| 36             | R 50250                                                                           | 3.7025                                                                            | Ti 1                                                                              | 2 TA 1                                                                            |                |
| 36             | R 52250                                                                           | 3.7225                                                                            | Ti 1 pd                                                                           | TP 1                                                                              |                |
| 36             | AMS 5397                                                                          | LW2 4674                                                                          | NiCo15Cr10MoAlTi                                                                  |                                                                                   |                |
| 37             |                                                                                   | 3.7124                                                                            | TiCu2                                                                             | 2 TA 21-24                                                                        |                |
| 37             | R 54620                                                                           | 3.7145                                                                            | TiAl6Sn2Zr4Mo2Si                                                                  |                                                                                   |                |
| 37             |                                                                                   | 3.7165                                                                            | TiAl6V4                                                                           | TA 10-13;TA 28                                                                    | T-A 6 V        |
| 37             |                                                                                   | 3.7185                                                                            | TiAl4Mo4Sn2                                                                       | TA 45-51; TA 57                                                                   |                |
| 37             |                                                                                   | 3.7195                                                                            | TiAl 3 V 2.5                                                                      |                                                                                   |                |
| 37             |                                                                                   |                                                                                   | TiAl4Mo4Sn4Si0.5                                                                  |                                                                                   |                |
| 37             | AMS R54520                                                                        |                                                                                   | TiAl5Sn2.5                                                                        | TA14/17                                                                           | T-A5E          |
| 37             | AMS R56400                                                                        |                                                                                   | TiAl6V4                                                                           | TA10-13/TA28                                                                      | T-A6V          |
| 37             | AMS R56401                                                                        |                                                                                   | TiAl6V4ELI                                                                        | TA11                                                                              |                |
| 38             | W 1                                                                               | 1.1545                                                                            | C105W1                                                                            | BW 1A                                                                             | Y1105          |
| 38             | W210                                                                              | 1.1545                                                                            | C105W1                                                                            | BW2                                                                               | Y120           |
| 38             |                                                                                   | 1.2762                                                                            | 75 CrMoNiW 6 7                                                                    |                                                                                   |                |
| 38             | 440C                                                                              | 1.4125                                                                            | X105 CrMo 17                                                                      |                                                                                   | Z 100 CD 17    |
| 38             |                                                                                   | 1.6746                                                                            | 32 nlcRmO 14 5                                                                    | 832 M 31                                                                          | 35 NCD 14      |
| 40             | Ni- Hard 2                                                                        | 0.9620                                                                            | G-X 260 NiCr 4 2                                                                  | Grade 2 A                                                                         |                |
| 40             | Ni- Hard 1                                                                        | 0.9625                                                                            | G-X 330 Ni Cr 4 2                                                                 | Grade 2 B                                                                         |                |
| 40             | Ni- Hard 4                                                                        | 0.9630                                                                            | G-X 300 CrNiSi 9 5 2                                                              |                                                                                   |                |
| 40             |                                                                                   | 0.9640                                                                            | G-X 300 CrMoNi 15 2 1                                                             |                                                                                   |                |
| 40             | A 532 III A 25% Cr                                                                | 0.9650                                                                            | G-X 260 Cr 27                                                                     | Grade 3 D                                                                         |                |
| 40             | A 532 III A 25% Cr                                                                | 0.9655                                                                            | G-X 300 CrNM0 27 1                                                                | Grade 3 E                                                                         |                |
| 40             |                                                                                   | 1.2419                                                                            | 105 WCr 6                                                                         | 105WC 13                                                                          |                |
| 40             | 310                                                                               | 1.4841                                                                            | X15 CrNiSi 25 20                                                                  | 314 S31                                                                           | Z 15 CNS 25-20 |
| 41             |                                                                                   | 0.9635                                                                            | G-X 300 CrMo 15 3                                                                 |                                                                                   |                |
| 41             |                                                                                   | 0.9645                                                                            | G-X 260 CrMoNi 20 2 1                                                             |                                                                                   |                |
| 41             |                                                                                   | 0.9655                                                                            | G-X 300 CrNM0 27 1                                                                |                                                                                   |                |

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| SS                                                                               | UNI                                                                               | UNE                                                                               | JIS                                                                               | KS                                                                                | GOST                                                                              |
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|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| 1880                                                                             | C100KU                                                                            | F-5118                                                                            | SK3                                                                               | STC 105(STC3)                                                                     |                                                                                   |
| 2900                                                                             | C120KU                                                                            | CF.515                                                                            | SUP4                                                                              | SPS 4                                                                             |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | 0512-00                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | 0513-00                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  | 0466-00                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   | 107 WCr 5 KU                                                                      |                                                                                   |                                                                                   |                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |





# ADVANCECUTTING

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