



**2022-2023**  
**ROTATING**  
**METALCUTTING TOOLS**

# THREAD MAKING



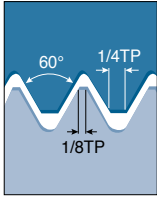
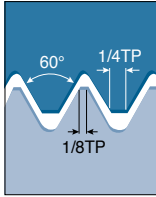
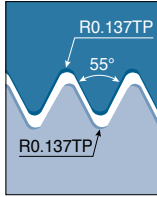














# Tool Selection Guide

## 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
MTEC  General type	● C15	● C21	● C25
MTECB  Internal coolant hole	● C13	● C20	● C25
MTECZ  Internal coolant in the flutes	● C14	● C22	● C25
MTECS  Short head	● C17-C18	● C23	
MTECSH  Short head for hard materials	● C19	● C24	
MTECQ  Reduced neck diameter for deep threading	● C16		
MTECI  Partial profile	● C29	● C29	
MTEC E  External threading	● C16	● C22	

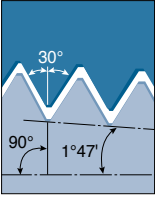
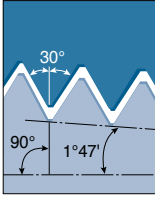
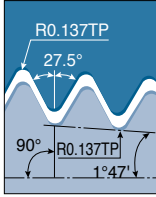
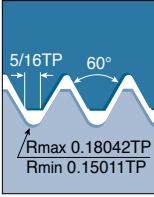
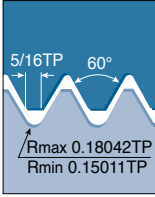
• For correct tool choice and CNC programming, use the 'TS-thread guide' software (Available at [www.taegutec.com](http://www.taegutec.com))



# Tool Selection Guide

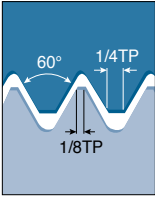
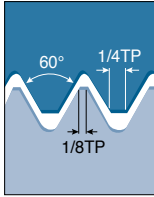
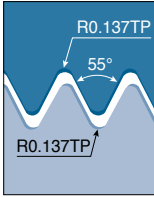
## Solid carbide threading end mills

**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
● C26	● C26	● C27		
● C26		● C27		
	● C26	● C27		
			● C28	● C28

# Tool Selection Guide

## Indexable insert type

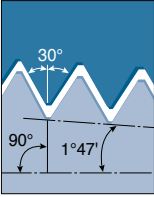
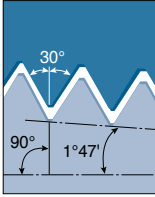
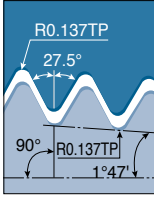
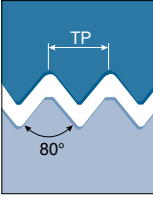
Thread	<b>TS-THREAD</b>		
	Metric ISO	American UN	Whitworth
			
<b>Insert page</b>	C39, C47	C40, C41, C48	C42, C49
<b>Application</b>	General usage for all industries	General usage for all industries	General industries. Pipe fittings and couplings
MTE D C31 Single insert	•	•	•
MTE D-C C32 Solid carbide shank	•	•	•
MTE D-W C33 Twin insert	•	•	•
TMTSRH C34 Helical end mill	•	•	•
MTF D C35 Large diameter thread	•	•	•
MTFLE D C36 Multi tooth-external threading	•	•	•
TMTSRH C37 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

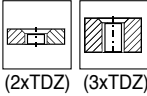
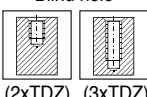
**TS-THREAD**

NPT	NPTF	BSPT	PG
			
C43, C49	C44	C45, C50	C46
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

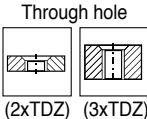
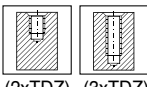
## Straight flute with spiral point tap

Series		<b>T-TAP</b>		
		<b>Straight flute with spiral point tap</b>		
		<b>TPH...52B</b>	<b>TPH...52B05</b>	<b>TPH...52B10</b>
<b>Pages</b>		C56	C57	C58
<b>Coating type</b>		Uncoated	Steam tempered	TiN coated
<b>Chamfer form</b>		Form B 4-5 threads chamfer	Form B 4-5 threads chamfer	Form B 4-5 threads chamfer
<b>Range (ISO metric)</b>	Coarse threads	M2 - M20	M2 - M20	M2 - M20
	Fine threads	M8 - M16	M8 - M16	M8 - M16
<b>Tolerance</b>		ISO 2-6H	ISO 2-6H	ISO 2-6H
<b>Material</b>	<b>P</b>	○	●	●
	<b>M</b>		●	●
	<b>K</b>	○	○	○
	<b>N</b>	●	○	○
	<b>S</b>			○
<b>Application</b>	Through hole  (2xTDZ) (3xTDZ)	●	●	●
	Blind hole  (2xTDZ) (3xTDZ)			

● Recommended, ○ Suitable

# Tool Selection Guide

## 40° right hand spiral flute tap

Series		<b>T-TAP</b>		
		<b>40° right hand spiral flute tap</b>		
		<b>TPH...54C</b>	<b>TPH...54C05</b>	<b>TPH...54C10</b>
<b>Pages</b>		C59	C60	C61
<b>Coating type</b>		Uncoated	Steam tempered	TiN coated
<b>Chamfer form</b>		Form C 2-3 threads chamfer	Form C 2-3 threads chamfer	Form C 2-3 threads chamfer
<b>Range (ISO metric)</b>	Coarse threads	M2 - M20	M2 - M20	M2 - M20
	Fine threads	M8 - M16	M8 - M16	M8 - M16
<b>Tolerance</b>		ISO 2-6H	ISO 2-6H	ISO 2-6H
<b>Material</b>	<b>P</b>	○	●	●
	<b>M</b>		●	●
	<b>K</b>	○	○	○
	<b>N</b>	●	○	○
	<b>S</b>			○
<b>Application</b>	Through hole  (2xTDZ) (3xTDZ)			
	Blind hole  (2xTDZ) (3xTDZ)	●	●	●

● Recommended, ○ Suitable

# Grades

## Thread making grades

Grades	ISO	Characteristics & applications									
<b>TT9030</b> PVD coated	<table border="1"><tr><td>P20</td><td>—</td><td>P40</td></tr><tr><td>M20</td><td>—</td><td>M40</td></tr><tr><td>S20</td><td>—</td><td>S40</td></tr></table>	P20	—	P40	M20	—	M40	S20	—	S40	<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>
P20	—	P40									
M20	—	M40									
S20	—	S40									



# ***TS-THREAD***

**Thread Milling**



**MTEC**  **06** **04** **C** **14** **1.0** **ISO** **TT9030**

1 2 3 4 5 6 7 8 9

## 1 TaeguTec mill thread

MT - Mill thread  
E - End mill  
C - Carbide

## 2 End mill type

B - Axial coolant bore  
Z - Coolant hole in the flutes  
S - Short head  
SH - Short head for threading hard materials  
Q - Reduced diameter neck  
I - Partial profile

## 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

## 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

## 9 Grades

Coated  
TT9030  
TT1040





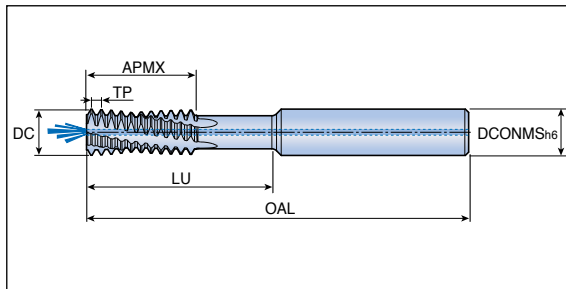
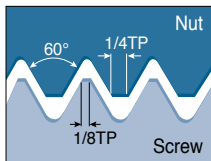




# MTECQ-ISO

TS-THREAD

Solid carbide thread end mills with internal coolant holes and a reduced diameter neck for deep internal threading



Designation	TP (mm)	TDZ	Dimension (mm)					NOF	Grade TT9030
			DCONMS	DC	APMX	LU	OAL		
<b>MTECQ 1010D32 1.0 ISO</b>	1.0	$\varnothing \geq 12$	10	10.0	18.0	32.0	73	4	●
<b>1212D38 1.0 ISO</b>	1.0	$\varnothing \geq 14$	12	12.0	21.0	38.0	84	4	●
<b>1010D30 1.5 ISO</b>	1.5	$\varnothing \geq 13$	10	10.0	18.0	30.0	73	4	●
<b>2020F56 2.0 ISO</b>	2.0	$\varnothing \geq 24$	20	20.0	34.0	56.0	105	6	●



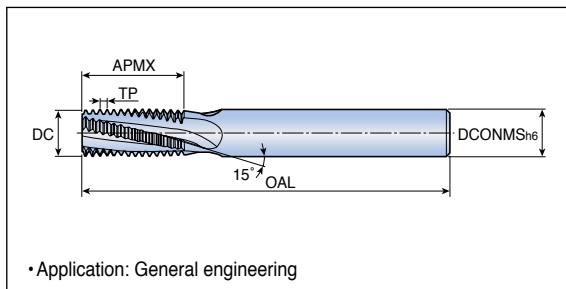
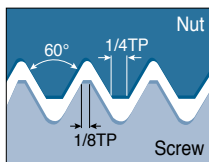
- TDZ: Thread diameter size
- NOF: Number of flutes

●: Standard items

# MTEC E-ISO

TS-THREAD

Solid carbide end mills for external threading



Designation	TP (mm)	Dimension (mm)				NOF	Grade TT9030
		DCONMS	DC	APMX	OAL		
<b>MTEC E 1010D16 1.0 ISO</b>	1.0	10	10.0	16.5	73	4	●
<b>1010D16 1.25 ISO</b>	1.25	10	10.0	16.9	73	4	●
<b>1010D15 1.5 ISO</b>	1.5	10	10.0	15.8	73	4	●
<b>1212D20 1.5 ISO</b>	1.5	12	12.0	20.3	84	4	●
<b>1212D21 2.0 ISO</b>	2.0	12	12.0	21.0	84	4	●



- NOF: Number of flutes

●: Standard items





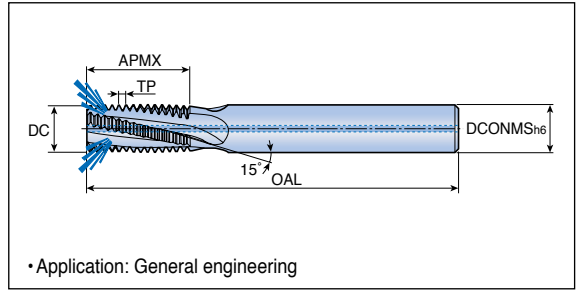
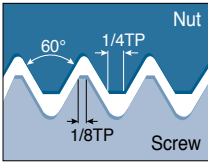








Solid carbide with internal coolant in the flutes for internal threading



Designation	TPI	UNC	UNF	UNEF	Dimension (mm)				NOF	Grade TT9030
					DCONMS	DC	APMX	OAL		
<b>MTECZ 1010D22 20 UN</b>	20	-	1/2	-	10	10.0	22.3	73	4	●
<b>12113D26 18 UN</b>	18	-	9/16-5/8	11/8-15/8	12	11.3	26.1	84	4	●
<b>08067C16 16 UN</b>	16	3/8	-	-	8	6.7	16.7	64	3	●
<b>10092C22 13 UN</b>	13	1/2	-	-	10	9.2	22.5	73	3	●

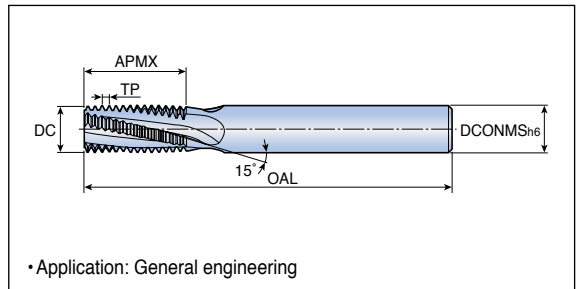
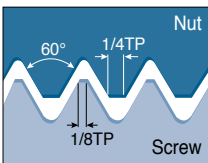


• NOF: Number of flutes

●: Standard items

# MTEC E-UN

Solid carbide end mills for external threading



Designation	TPI	Dimension (mm)				NOF	Grade TT9030
		DCONMS	DC	APMX	OAL		
<b>MTEC E 1010D16 24 UN</b>	24	10	10.0	16.4	73	4	●



• NOF: Number of flutes

●: Standard items

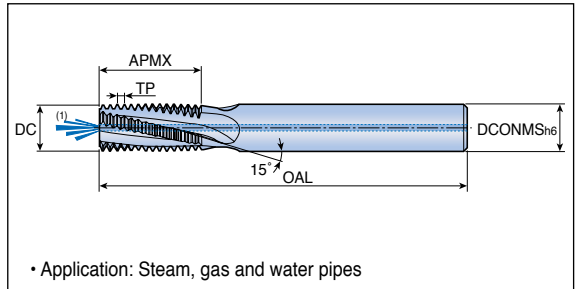
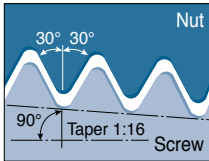






# MTECB-NPT / MTEC-NPT

Solid carbide end mills for internal or external threading



Designation	TPI	TDZ	Dimension (mm)				NOF	Grade
			DCONMS	DC	APMX	OAL		
<b>MTECB 08076C10 27 NPT</b>	27	1/8	8	7.6	10.8	64	3	●
<b>1010D16 18 NPT</b>	18	1/4-3/8	10	10.0	16.2	73	4	●
<b>16155D22 14 NPT</b>	14	1/2-3/4	16	15.5	22.7	105	4	●
<b>MTEC 0606C9 27 NPT</b>	27	1/8	6	6.0	9.9	58	3	●
<b>0808C14 18 NPT</b>	18	1/4-3/8	8	8.0	14.8	64	3	●
<b>1212D20 14 NPT</b>	14	1/2-3/4	12	12.0	20.9	84	4	●
<b>1616D27 11.5 NPT</b>	11.5	1-2	16	16.0	27.6	105	4	●

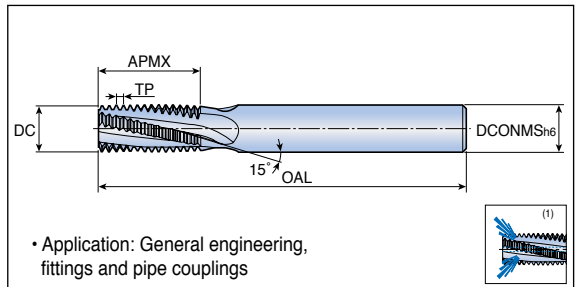
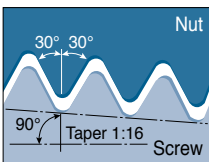


- TDZ: Thread diameter size
- NOF: Number of flutes
- <sup>(1)</sup> B type

●: Standard items

# MTECZ-NPTF / MTEC-NPTF

Solid carbide end mills for internal or external threading



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



- TDZ: Thread diameter size
- NOF: Number of flutes
- <sup>(1)</sup> Z type

●: Standard items









## End mills

**MT** **E** **D25** - **1** - **W** **20** **(C)** - **21**

**1** **2** **3** **4** **5** **6** **7** **8**

### 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

**MT** **F** **D063** - **5** - **22** - **21**

**1** **2** **3** **4** **5** **6**

### 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

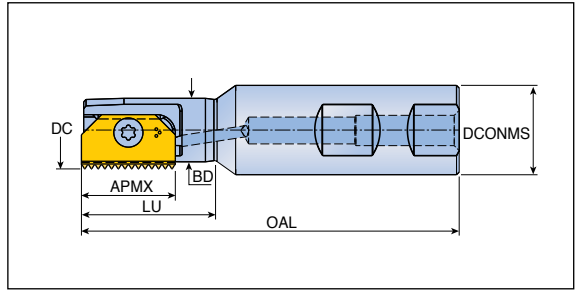
### 5 Bore diameter

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

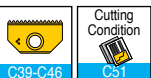


Designation	Dimension (mm)						Shank	Kg	Insert
	APMX	DC	DCONMS	BD	LU	OAL			
<b>MTE D09.5-1-W20-12</b> <sup>(1)</sup>	12	9.5	20	7.5	15.5	85	W	0.16	TTMT12
<b>D09.9-1-W20-12</b>	12	9.9	20	7.5	16.0	85	W	0.16	TTMT12
<b>D12.2-1-W20-14</b>	14	12.2	20	8.8	20.0	75	W	0.15	TTMT14
<b>D14.5-1-W20-14</b>	14	14.5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

















**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

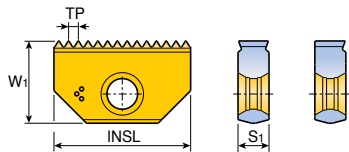
0.5 - 6.0 mm (Thread pitch)  
32 - 4 TPI (Threads per inch)

### 5 Thread standard

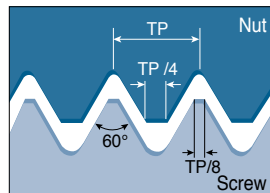
ISO  
UN  
WHIT  
NPT  
NPTF  
BSPT

### 6 Grades

Coated  
TT9030



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



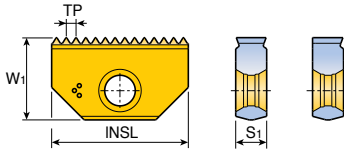
Insert	Designation	TP (mm)	Dimension (mm)			Grade
			INSL	W1	S1	
	<b>TTMT12 I 0.5 ISO<sup>(1)</sup></b>	0.50	12	6.5	2.9	●
	<b>TTMT12 I 0.75 ISO<sup>(1)</sup></b>	0.75	12	6.5	2.9	●
	<b>TTMT12 I 1.0 ISO<sup>(1)</sup></b>	1.00	12	6.5	2.9	●
	<b>TTMT12 I 1.25 ISO<sup>(1)</sup></b>	1.25	12	6.5	2.9	●
	<b>TTMT12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



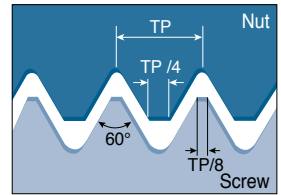
• <sup>(1)</sup> TTMT12 insert is only available with a single cutting edge

●: Standard items

UN, UNC, UNF, UNEF, UNS



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



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

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

●: Standard items















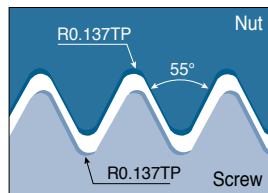
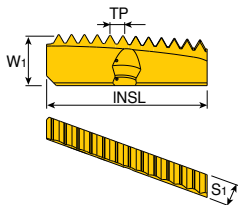






# TMTH-W

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



Insert	Designation	TPI	THID	THOD	Dimension (mm)			Tool	Grade TT9030
					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	●

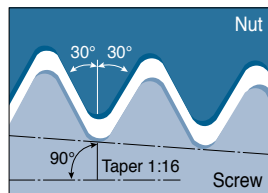
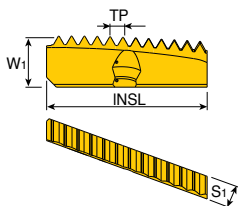


- THID: Thread designation inside
- THOD: Thread designation outside

● Standard item

# TMTH-NPT

Helical inserts for NPT threads (Internal and external)



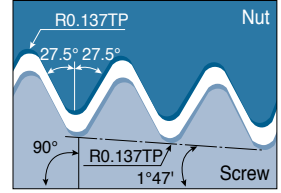
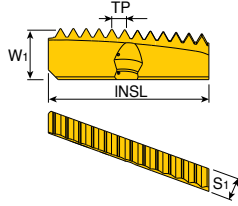
Insert	Designation	TPI	THID	THOD	Dimension (mm)			Tool	Grade TT9030
					INSL	W1	S1		
	<b>TMTH 23 11.5 NPT</b>	11.5	1"-2" NPT	1"-2" NPT	27	8.0	3.5	TMTSRH 23-2	●
	<b>TMTH 32 11.5 NPT</b>	11.5	1 1/4"-2" NPT	1"-2" NPT	32	9.0	4.0	TMTSRH 32-5	●
	<b>TMTH 45 11.5 NPT</b>	11.5	2" NPT	1"-2" NPT	37	11.9	5.0	TMTSRH 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

## Helical inserts for BSPT threads (Internal and external)



Insert	Designation	TPI	THID	THOD	Dimension (mm)			Tool	Grade TT9030
					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	●

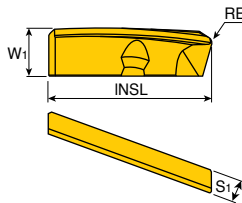


- THID: Thread designation inside
- THOD: Thread designation outside

●: Standard Item

# TMTH-F

## Helical long edge finishing inserts



Insert	Designation	Dimension (mm)				Tool	Grade TT9030
		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

# Recommended Cutting Conditions

## Machining data for indexable insert of threading cutters

ISO	Material	Condition	Tensile strength (N/mm <sup>2</sup> )	Hardness HB	Material No.	Cutting speed Vc(m/min)	
						TT9030	
P	Non-alloy steel, cast steel, free cutting steel	<0.25%C	Annealed	420	125	1	100-200
		>=0.25%C	Annealed	650	190	2	95-190
		<0.55%C	Quenched and tempered	850	250	3	90-180
		>=0.55%C	Annealed	750	220	4	90-170
			Quenched and tempered	1000	300	5	80-150
	Low alloy steel and cast steel (Less than 5% of alloying elements)	Quenched and tempered	600	200	6	120-170	
			930	275	7	115-160	
			1000	300	8	105-150	
			1200	350	9	140	
	High alloy steel, cast steel and tool steel	Annealed	680	200	10	90-170	
Quenched and tempered		1100	325	11	75-145		
M	Stainless steel 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 (GG)	Ferritic		160	15	65-135	
		Pearlitic		250	16	65-110	
	Cast iron nodular (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-cast, alloyed	<=12% Si	Not cureable		75	23	145-350
		Cured		90	24	145-275	
	>12% Si	High temp.		130	25	95-225	
	Copper alloys	>1% Pb	Free cutting		110	26	145-350
		Brass		90	27	145-350	
		Electrolytic copper		100	28	145-350	
	Non-metallic	Duroplastics, fiber plastics			29	90-370	
		Hard rubber			30	80-330	
S	High temp. alloys	Fe based	Annealed		200	31	20-60
			Cured		280	32	20-50
		Ni or Co based	Annealed		250	33	20-30
			Cured		350	34	10-20
			Cast		320	35	15-25
	Titanium, Ti alloys		Rm 400		36	30-90	
Alpha+beta alloys cured		Rm 1050		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 solid carbide threading end mills

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

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

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



# Recommended Cutting Conditions

## Machining data for short solid carbide thread mills

ISO	Material	Hardness (HRC)	Cutting speed Vc (m/min)	Feed (mm/tooth) for diameter (mm)													
				Ø1.5	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	Ø15	
P	Low & medium carbon steels		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	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	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	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	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	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	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	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	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	45-50	60-70	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08					
		51-55	50-60	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07					
		56-62	40-50	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06					

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

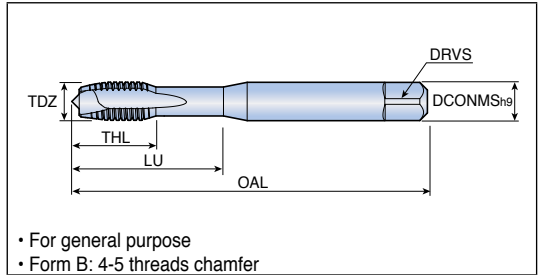
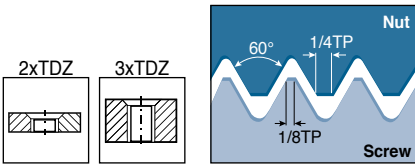
■ Steel   
 ■ Stainless steel   
 ■ Cast iron   
 ■ Nonferrous   
 ■ High temp. alloys   
 ■ Hardened steel

# T-TAP

Tapping



## Straight flute with spiral point - Uncoated



Metric ISO standard thread DIN 13 standard

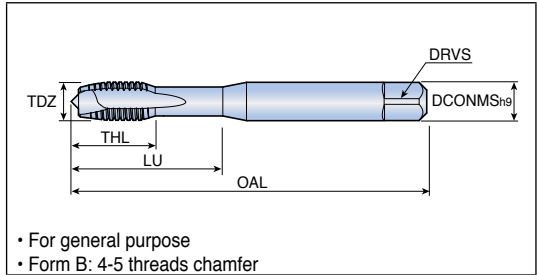
Designation	TDZ	TP (mm)	Standard (DIN)	Tolerance	Dimension (mm)							
					OAL	THL	LU	DCONMS	DRVS	Core hole		
<b>TPH452B M2x0.4</b>	M2	0.4	DIN371	ISO 2-6H	45	8	-	2.8	2.1	1.6		
<b>TPH452B M2.5x0.45</b>	M2.5	0.45			50	9	-	2.8	2.1	2.05		
<b>TPH452B M3x0.5</b>	M3	0.5			56	10	18	3.5	2.7	2.5		
<b>TPH452B 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

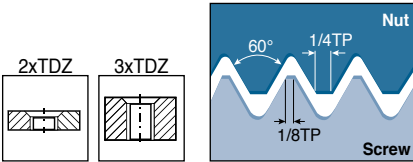
Designation	TDZ	TP (mm)	Standard (DIN)	Tolerance	Dimension (mm)					
					OAL	THL	LU	DCONMS	DRVS	Core hole
<b>TPH552B MF8x1.0</b>	M8	1	DIN374	ISO 2-6H	90	15	-	6	4.9	7
<b>TPH552B MF10x1.25</b>	M10	1.25			100	18	-	7	5.5	8.8
<b>TPH552B MF12x1.5</b>	M12	1.5			100	18	-	9	7	10.5
<b>TPH552B MF14x1.5</b>	M14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



- For general purpose
- Form B: 4-5 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		
<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

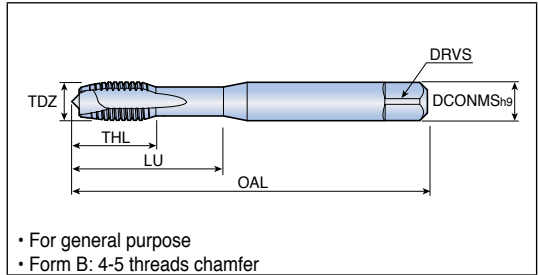
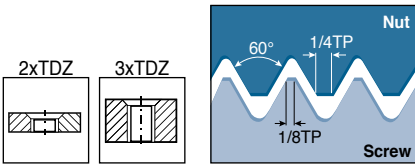
Designation	TDZ	TP (mm)	Standard (DIN)	Tolerance	Dimension (mm)					
					OAL	THL	LU	DCONMS	DRVS	Core hole
<b>TPH552B05 MF8x1.0</b>	M8	1	DIN374	ISO 2-6H	90	15	-	6	4.9	7
<b>TPH552B05 MF10x1.25</b>	M10	1.25			100	18	-	7	5.5	8.8
<b>TPH552B05 MF12x1.5</b>	M12	1.5			100	18	-	9	7	10.5
<b>TPH552B05 MF14x1.5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

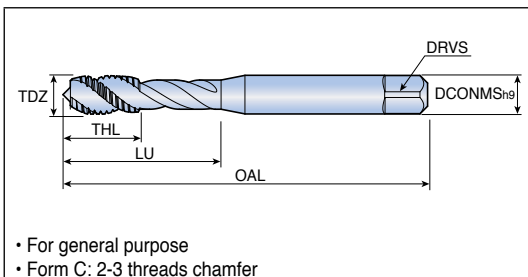
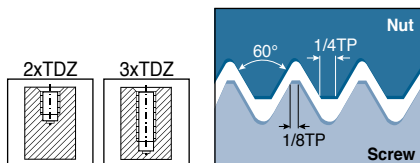
Designation	TDZ	TP (mm)	Standard (DIN)	Tolerance	Dimension (mm)							
					OAL	THL	LU	DCONMS	DRVS	Core hole		
<b>TPH452B10 M2x0.4</b>	M2	0.4	DIN371	ISO 2-6H	45	8	-	2.8	2.1	1.6		
<b>TPH452B10 M2.5x0.45</b>	M2.5	0.45			50	9	-	2.8	2.1	2.05		
<b>TPH452B10 M3x0.5</b>	M3	0.5			56	10	18	3.5	2.7	2.5		
<b>TPH452B10 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



## Right hand spiral flute (40°) - 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>TPH454C M2x0.4</b>	M2	0.4	DIN371	ISO 2-6H	45	6	10	2.8	2.1	1.6		
<b>TPH454C M2.5x0.45</b>	M2.5	0.45			50	6	12	2.8	2.1	2.05		
<b>TPH454C M3x0.5</b>	M3	0.5			56	7	18	3.5	2.7	2.5		
<b>TPH454C M4x0.7</b>	M4	0.7			63	8	21	4.5	3.4	3.3		
<b>TPH454C M5x0.8</b>	M5	0.8			70	10	25	6	4.9	4.2		
<b>TPH454C M6x1.0</b>	M6	1			80	12	30	6	4.9	5		
<b>TPH454C M8x1.25</b>	M8	1.25			90	15	35	8	6.2	6.8		
<b>TPH454C M10x1.5</b>	M10	1.5			100	18	39	10	8	8.5		
<b>TPH654C M12x1.75</b>	M12	1.75			DIN376	ISO 2-6H	110	18	-	9	7	10.2
<b>TPH654C M14x2.0</b>	M14	2					110	20	-	11	9	12
<b>TPH654C M16x2.0</b>	M16	2	110	20			-	12	9	14		
<b>TPH654C M20x2.5</b>	M20	2.5	140	25			-	16	12	17.5		

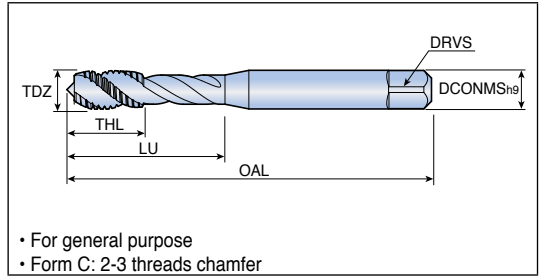
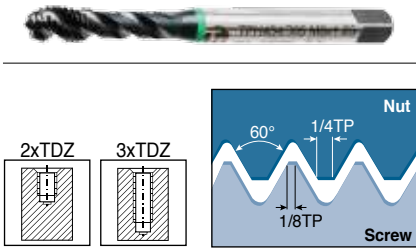
Metric ISO fine thread DIN 13 standard

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





## 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		
<b>TPH454C05 M2x0.4</b>	M2	0.4	DIN371	ISO 2-6H	45	6	10	2.8	2.1	1.6		
<b>TPH454C05 M2.5x0.45</b>	M2.5	0.45			50	6	12	2.8	2.1	2.05		
<b>TPH454C05 M3x0.5</b>	M3	0.5			56	7	18	3.5	2.7	2.5		
<b>TPH454C05 M4x0.7</b>	M4	0.7			63	8	21	4.5	3.4	3.3		
<b>TPH454C05 M5x0.8</b>	M5	0.8			70	10	25	6	4.9	4.2		
<b>TPH454C05 M6x1.0</b>	M6	1			80	12	30	6	4.9	5		
<b>TPH454C05 M8x1.25</b>	M8	1.25			90	15	35	8	6.2	6.8		
<b>TPH454C05 M10x1.5</b>	M10	1.5			100	18	39	10	8	8.5		
<b>TPH654C05 M12x1.75</b>	M12	1.75			DIN376	ISO 2-6H	110	18	-	9	7	10.2
<b>TPH654C05 M14x2.0</b>	M14	2					110	20	-	11	9	12
<b>TPH654C05 M16x2.0</b>	M16	2	110	20			-	12	9	14		
<b>TPH654C05 M20x2.5</b>	M20	2.5	140	25			-	16	12	17.5		

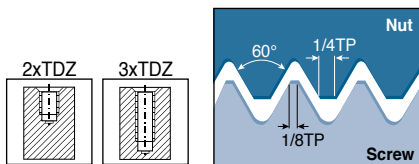
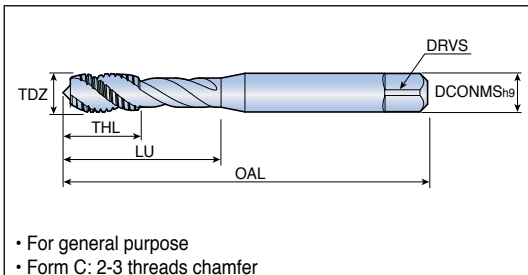
Metric ISO fine thread DIN 13 standard

Designation	TDZ	TP (mm)	Standard (DIN)	Tolerance	Dimension (mm)					
					OAL	THL	LU	DCONMS	DRVS	Core hole
<b>TPH554C05 MF8x1.0</b>	M8	1	DIN374	ISO 2-6H	90	15	-	6	4.9	7
<b>TPH554C05 MF10x1.25</b>	M10	1.25			100	18	-	7	5.5	8.8
<b>TPH554C05 MF12x1.5</b>	M12	1.5			100	18	-	9	7	10.5
<b>TPH554C05 MF14x1.5</b>	M14	1.5			100	18	-	11	9	12.5
<b>TPH554C05 MF16x1.5</b>	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		
<b>TPH454C10 M2x0.4</b>	M2	0.4	DIN371	ISO 2-6H	45	6	10	2.8	2.1	1.6		
<b>TPH454C10 M2.5x0.45</b>	M2.5	0.45			50	6	12	2.8	2.1	2.05		
<b>TPH454C10 M3x0.5</b>	M3	0.5			56	7	18	3.5	2.7	2.5		
<b>TPH454C10 M4x0.7</b>	M4	0.7			63	8	21	4.5	3.4	3.3		
<b>TPH454C10 M5x0.8</b>	M5	0.8			70	10	25	6	4.9	4.2		
<b>TPH454C10 M6x1.0</b>	M6	1			80	12	30	6	4.9	5		
<b>TPH454C10 M8x1.25</b>	M8	1.25			90	15	35	8	6.2	6.8		
<b>TPH454C10 M10x1.5</b>	M10	1.5			100	18	39	10	8	8.5		
<b>TPH654C10 M12x1.75</b>	M12	1.75			DIN376	ISO 2-6H	110	18	-	9	7	10.2
<b>TPH654C10 M14x2.0</b>	M14	2					110	20	-	11	9	12
<b>TPH654C10 M16x2.0</b>	M16	2	110	20			-	12	9	14		
<b>TPH654C10 M20x2.5</b>	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
<b>TPH554C10 MF8x1.0</b>	M8	1	DIN374	ISO 2-6H	90	15	-	6	4.9	7
<b>TPH554C10 MF10x1.25</b>	M10	1.25			100	18	-	7	5.5	8.8
<b>TPH554C10 MF12x1.5</b>	M12	1.5			100	18	-	9	7	10.5
<b>TPH554C10 MF14x1.5</b>	M14	1.5			100	18	-	11	9	12.5
<b>TPH554C10 MF16x1.5</b>	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	
	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	10-25	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	
		Electrolytic 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
	Titanium, Ti alloys	Cast	-	-	2-4	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
	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	
		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	
Electrolytic 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
	Titanium, Ti alloys	Cast	-	-	2-4	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



# HOLEMAKING



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<b>Grades</b>	D14
<b>Drilling Tools</b>	
TOP-DRILL	D16
T-DRILL	D32
DRILL-SFEED	D49
DRILL-RUSH	D51
Chamfering Tool	D61
MODU-R-DRILL	D62
SPADE-RUSH	D66
SOLID-3-DRILL	D69
H-DRILL	D71
T-CHAMFER	D89
TOP-CAP	D91
T-DEEP	D98
<b>Drilling Heads &amp; Inserts</b>	D151
<b>Recommended Cutting Conditions (Drilling)</b>	D192

## Guide to Icons



➤ External Coolant



➤ Internal Coolant



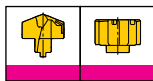
➤ Through Hole



➤ Blind Hole



➤ Tube Page



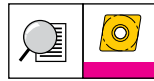
➤ Head Page



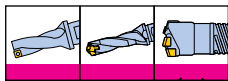
➤ Pad Page



➤ Cartridge Page



➤ Insert Page



➤ Drill Body & Deep Drill Head Page



➤ Assembly Page



➤ Technical Data Page



➤ Cutting Condition Page



### Reaming Tools

TS-REAM

D226

TM-REAM

D228

TB-REAM

D230

### Reaming Heads & Blades

D233

### Recommended Cutting Conditions (Reaming)

D236

### Technical Data

D244

### Tailor-made Order Form

D252



# Tool Selection Guide

## Drilling tools

Series		Indexable drill					
		TOPDRILL		TDRILL		TDEEP	
		TOP 2/3/4/5	TOP-CA	TDR 2/3/4/5	TDR-CA	TRGD/TRGD3	
							
<b>Pages</b>		D16 - D27	D28 - D31	D32 - D44	D45 - D47	D144 - D150	
<b>DC(mm)</b>		Ø12.0 - Ø50.0	Ø51.0 - Ø80.0	Ø12.5 - Ø50.0	Ø51.0 - Ø80.0	Ø14.0 - Ø36.0	
<b>Drilling depth(L/D)</b>		2, 3, 4, 5 x Dc	2, 3, 4 x Dc	2, 3, 4, 5 x Dc	2.5, 3.5 x Dc	10-25 x Dc	
<b>Hole tolerance</b>		IT 11-13	IT 12-13	IT 12-13	IT 12-13	IT 10-11	
<b>Application</b>	General drilling		●	●	●	●	●
	Cross hole drilling		●	●	●	●	○
	Irregular surface drilling		○	○	○	○	
	Interrupted drilling		○	○	○	○	
	Chamfering						
<b>Coolant supply</b>		Internal	Internal	Internal	Internal	Internal	

# Tool Selection Guide












## Drilling tools

Head changeable drill					Solid carbide drill
<i>DRILLSPEED</i>	<i>DRILLRUSH</i>		<i>MODURDRILL</i>	<i>SPADERUSH</i>	<i>SOLID3DRILL</i>
3ED	TCD	TCD-M	TNDH-TP/MDB	LCD	3HD
					
D49 - D50	D51 - D59	D60	D62 - D65	D66 - D68	D69 - D70
Ø15.0 - Ø20.9	Ø6.0 - Ø25.9	M8 - M24 (ISO)	Ø26.0 - Ø50.0	Ø20.0 - Ø41.0	Ø4.0 - Ø12.0
3, 5 x Dc	1.5, 3, 5, 8, 12 x Dc		3, 5 x Dc	3, 5, 8 x Dc	3, 5 x Dc
IT 9-10	IT 9-10	IT 9-10	IT 10-12	IT 9-10	IT 8-10
●	●	●	●	●	●
○	●		●	●	●
		●			
Internal	Internal	Internal	Internal	Internal	Internal

● Recommended, ○ Suitable

# Tool Selection Guide


## Drilling tools

Series		Solid carbide drill					Multi-function tool
		<i>HDRILL</i>					<i>TOPCAP</i>
		NHD-PE/PI	NHD-KI	SHO 10/15/20	SHO-M	CDF	TCAP
							
<b>Pages</b>		D71 - D82	D83 - D84	D86	D87	D88	D91 - D95
<b>DC(mm)</b>		Ø3.0 - Ø12.0	Ø3.0 - Ø12.0	Ø4.0 - Ø10.0	M4 - M10 (ISO)	Ø3.0 - Ø12.7	Ø8.0 - Ø32.0
<b>Drilling depth(L/D)</b>		3, 5 x Dc	3, 5 x Dc	10, 15, 20 x Dc			2.25, 3 x Dc
<b>Hole tolerance</b>		IT 8-10	IT 8-10	IT 8-10	IT 8-10	IT 8-10	IT 10-12
<b>Application</b>	General drilling		●	●	●	●	●
	Cross hole drilling		●	●	○		
	Irregular surface drilling						●
	Interrupted drilling						
	Chamfering					●	
<b>Coolant supply</b>		External / Internal	Internal	Internal	Internal	External	Internal


● Recommended, ○ Suitable

# Tool Selection Guide

## Deep drilling tools

Series		Indexable deep drill head				
						
		TBTA3	TBTA5	TBTA7	TBTA9	TBTA-FB
<b>Pages</b>		D99 - D104	D105 - D108	D109 - D111	D112 - D114	D115 - D120
<b>DC(mm)</b>		Ø38.00 - Ø106.99	Ø107.00 - Ø168.99	Ø169.00 - Ø232.99	Ø233.00 - Ø293.99	Ø25.00 - Ø89.00
<b>Drilling depth(L/D)</b>		100 x Dc	100 x Dc	100 x Dc	100 x Dc	100 x Dc
<b>Hole tolerance</b>		IT 10	IT 10	IT 10	IT 10	IT 10
<b>Surface finish</b>		3µm	3µm	3µm	3µm	3µm
<b>Single tube</b>	Outer four thread	●	●	●	●	●
	Inner single thread	●	●	●★	●	●
<b>Double tube</b>	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-TR	TBTA-R	BTA-SE/DE	BTS-SE
<b>Pages</b>		D127 - D130	D121 - D126	D131 - D133	D134
<b>DC(mm)</b>		Ø16.00 - Ø40.00	Ø25.00 - Ø110.99	Ø12.60 - Ø65.00	Ø8.00 - Ø20.00
<b>Drilling depth(L/D)</b>		100 x Dc	100 x Dc	100 x Dc	100 x Dc
<b>Hole tolerance</b>		IT 10	IT 7 - IT 9	IT 9	IT 9
<b>Surface finish</b>		3µm	1-2µm	2µm	2µm
<b>Single tube</b>	Outer four thread	●	●	●	●★
	Inner single thread	●	●		
<b>Double tube</b>	Outer four thread	●		●	

★ Two start thread: Diameter 12.60 to 15.59mm

● Recommended

# Tool Selection Guide

## Reaming tools

Series				Solid reamer	Indexable reamer	
				<i>TSREAM</i>	<i>TMREAM</i>	<i>TBREAM</i>
				TS	TM	TB
						
<b>Pages</b>				D226 - D227	D228 - D229	D230 - D232
<b>DC(mm)</b>				Ø3.000 - Ø12.000	Ø11.501 - Ø32.000	Ø8.000 - Ø32.000
<b>Reaming depth(L/D)</b>				7.5-10 x Dc	3, 5, 8 x Dc	5-9 x Dc
<b>Hole tolerance</b>				IT 7	IT 7 ★	IT 6 ★★
<b>Application</b>		<b>Through</b>	<b>Blind</b>			
	General reaming			●	●	●
	Cross hole reaming			●		●
	Irregular surface reaming			●		●
	Interrupted reaming			●	●	●
<b>Coolant supply</b>				Internal	Internal	Internal











★ Up to IT 6 tolerance

★★ Up to IT 5 tolerance

● Recommended

# Tool Selection Guide










## Drill inserts

		TOPDRILL		TDRILL	DRILLSPEED	DRILLRUSH	
		SOMT	SPMG / SPGG	3ED-P+	TCD-P/M/K/N	TCD-P+	
<b>Series</b>							
<b>Pages</b>		D152 - D153	D154 - D155	D156 - D157	D158 - D164	D165 - D169	
<b>Size</b>		04/05/06/07/08 09/11/13/15	05/06/07/09 11/12/14	Ø15.0 - Ø20.9	Ø6.0 - Ø25.9	Ø6.0 - Ø25.9	
<b>Chip former</b>		DP, DK, DL, DA	DG, DK, DA	P+	P/M/K/N	P+	
<b>Grades</b>		TT9080, TT9300 TT8020, TT6080 K10	TT9030, TT8020 TT7400, TT6030 K10	TT5130	TT9080 UF10	TT9080	
<b>Application</b>	General drilling		●	●	●	●	●
	Cross hole drilling		●	●	●	●	●
	Irregular surface drilling		○	○	○	○	○
	Interrupted drilling		○	○			
	Chamfering						

● Recommended, ○ Suitable

# Tool Selection Guide

## Drill inserts

		<i>DRILLRUSH</i>		<i>MODURDRILL</i>	
		TCD-F	AOMT	TCD-P-CO+	SPGX...DW
<b>Series</b>					
<b>Pages</b>		D170 - D171	D172	D173	D173
<b>Size</b>		Ø8.0 - Ø25.5	06 - C45	Ø15.9 - Ø25.9	06/07/09/11/14
<b>Chip former</b>		F	-	P-CO+	DW
<b>Grades</b>		TT9080	TT9080	TT9080	TT9080
<b>Application</b>	General drilling		•	•	•
	Cross hole drilling		•	•	•
	Irregular surface drilling		○	○	○
	Interrupted drilling				
	Chamfering			•	

# Tool Selection Guide

## Drill inserts










<i>SPADERUSH</i>		<i>DRILLRUSH</i>	<i>TCHAMFER</i>	<i>TOPCAP</i>
LCD-P	LCD-F	CRNG	XCGT	XCGT XCMT
				
D174 - D175	D176 - D177	D172	D178	D179 - D180
Ø20.0 - Ø41.0	Ø20.0 - Ø41.0	08 - 45CD	06/09	04/05/06/07/08 10/13/17
P	F	-	C30/C45/C60	TA/GV/TC
TT9080	TT9080	TT9080	TT9080	TT9080, TT8020, TT9030, K10
●				●
●				
○				
	●		●	

● Recommended, ○ Suitable













# Tool Selection Guide

## Drill inserts

		<i>TDEEP</i>			
		NPHT NPMT	NPMX TPMX	TOGT	TPMX XPMT
<b>Series</b>					
<b>Pages</b>		D181 - D183	D184	D185	D186
<b>Size</b>		06/07/08/09 /11/13	08/14/17/24/28	07/08/09/10/11 /12/13/14	14/16/17/24
<b>Chip former</b>		R(L)-G... /R(L)-HF...	R-B/R-G	RS/GF	LG/-45
<b>Grades</b>		TT9030, TT9130, TT8125, TT6130, TT5030	TT9030, TT9130, TT8125, TT7200, TT6130, TT6020, TT5100, TT5030	TT9030	TT9030, TT9130, TT6020, TT5100
<b>Application</b>	General drilling		●	●	●
	Cross hole drilling		○	○	○
	Irregular surface drilling				
	Interrupted drilling				
	Chamfering				

# Tool Selection Guide

## Reamer heads & blades

			<i>TM</i> REAM	<i>TB</i> REAM	
Series			<b>TM</b> 	<b>TB</b> 	
Pages			D233 - D234	D235	
Size			Ø11.501 - Ø32.000	1/2/3/4	
Chip former			BL/AS	A06/B06/B12	
Grades			TT9030	TT5030, TT5050	
Application		Through	Blind		
	General reaming			●	●
	Cross hole reaming				
	Irregular surface reaming				
	Interrupted reaming				

● Recommended, ○ Suitable

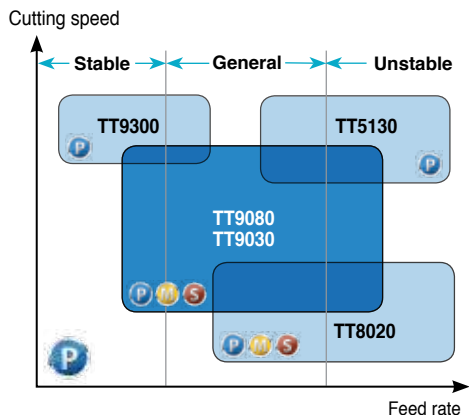
# Grades

## Holemaking grades

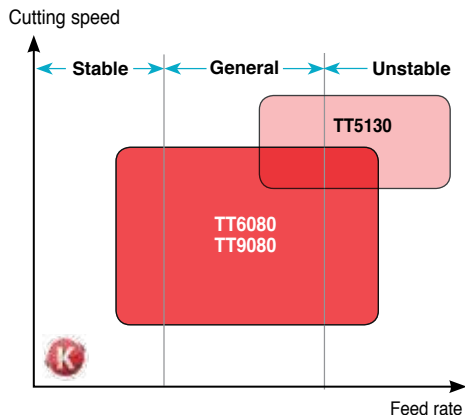
Grades	ISO	Characteristics & applications
<b>TT6080</b> PVD carbide	<b>K05</b> – <b>K25</b> <b>H05</b> – <b>H25</b>	<ul style="list-style-type: none"> <li>• General machining for gray and ductile cast iron</li> <li>• Finish and medium machining of hardened steel</li> </ul>
<b>TT9300</b> CVD carbide	<b>P10</b> – <b>P25</b>	<ul style="list-style-type: none"> <li>• High speed drilling of carbon &amp; alloy steel</li> </ul>
<b>TT5130</b> PVD carbide	<b>P20</b> – <b>P40</b> <b>K20</b> – <b>K40</b>	<ul style="list-style-type: none"> <li>• High speed drilling of carbon &amp; alloy steel</li> </ul>
<b>TT9080</b> PVD carbide	<b>P20</b> – <b>P40</b> <b>M20</b> – <b>M40</b> <b>S20</b> – <b>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> PVD carbide	<b>P20</b> – <b>P40</b> <b>M20</b> – <b>M40</b> <b>S20</b> – <b>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> PVD carbide	<b>P30</b> – <b>P50</b> <b>M30</b> – <b>M50</b> <b>S30</b> – <b>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> Uncoated	<b>K05</b> – <b>K15</b> <b>N05</b> – <b>N15</b> <b>S05</b> – <b>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> Uncoated	<b>N10</b> – <b>N25</b> <b>S10</b> – <b>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



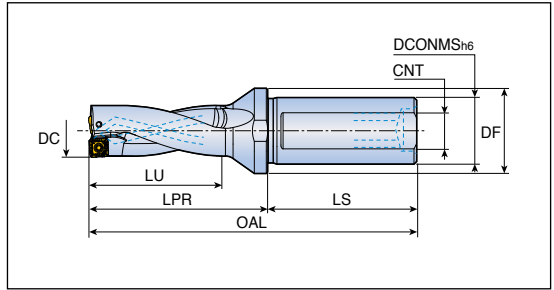
# Drilling Tools



## 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	D152
<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	SOMT 05...DP/DL/DK/DA D152-153
<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>2155-20T2-05</b>	15.5	20	25	32	52	50	M13X1.0	
<b>2160-20T2-05</b>	16.0	20	25	32	52	50	M13X1.0	SOMT 06...DP/DL/DK/DA D152-153
<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	
<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 D152-153
<b>2200-25T2-07</b>	20.0	25	32	40	63	56	M16X1.5	
<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	
<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	
<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	SOMT 08...DP/DL/DK/DA D152-153
<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	
<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	
<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	

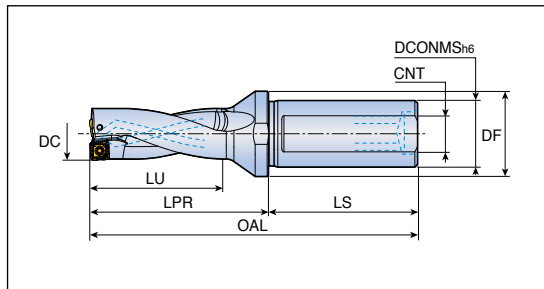
- OAL = LPR + LS



## Indexable drill holders



- Drilling depth: 2xdiameter



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 D152-153	
<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		
<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	SOMT 11...DP/DL/DK/DA D152-153	
<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		
<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		SOMT 13...DP/DL/DK/DA D152-153
<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		

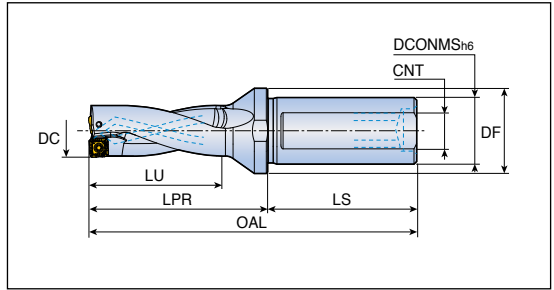
- OAL = LPR+LS



## Indexable drill holders



- Drilling depth: 2x diameter



Designation	Dimension (mm)							Insert
	DC	DCONMS	DF	LU	LPR	LS	CNT	
<b>TOP 2440-40T2-15</b>	44.0	40	60	88	123	70	M30X2.0	SOMT 15...DP/DL/DK/DA D152-153
<b>2450-40T2-15</b>	45.0	40	60	90	125	70	M30X2.0	
<b>2460-40T2-15</b>	46.0	40	60	92	127	70	M30X2.0	
<b>2470-40T2-15</b>	47.0	40	60	94	129	70	M30X2.0	
<b>2480-40T2-15</b>	48.0	40	60	96	131	70	M30X2.0	
<b>2490-40T2-15</b>	49.0	40	60	98	133	70	M30X2.0	
<b>2500-40T2-15</b>	50.0	40	60	100	135	70	M30X2.0	

- OAL = LPR+LS

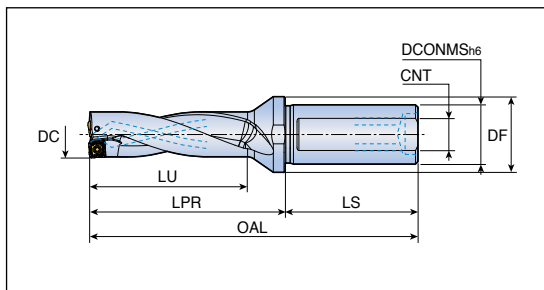
## Spare parts

Designation	Screw	Wrench	Plug*	
<b>TOP 2120 - 2135</b>	TS 18041/HG	TD 6P	SL 20M	
<b>TOP 2140 - 2160</b>	TS 20043/HG-P	TD 6P	SL 20M	
<b>TOP 2165 - 2220</b>	TS 22052/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

## 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	D152-153
<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	SOMT 05...DP/DL/DK/DA
<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	D152-153
<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	SOMT 06...DP/DL/DK/DA
<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	D152-153
<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	SOMT 07...DP/DL/DK/DA
<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	D152-153
<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	SOMT 08...DP/DL/DK/DA
<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	D152-153
<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	SOMT 09...DP/DL/DK/DA
<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	D152-153
<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	SOMT 10...DP/DL/DK/DA
<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	D152-153
<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	SOMT 11...DP/DL/DK/DA
<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	D152-153
<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	SOMT 12...DP/DL/DK/DA
<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	D152-153
<b>3254-25T2-08 *</b>	25.4	25	32	75	97	56	M16X1.5	



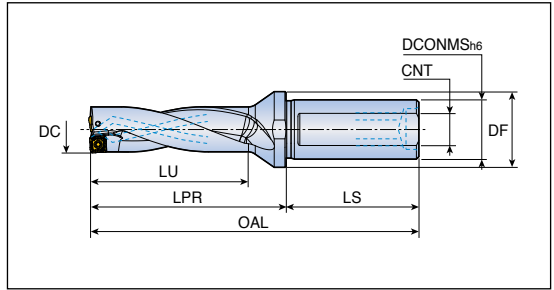
- \*! Marked items are for inch sized hole
- OAL = LPR+LS



## 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 D152-153
<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	SOMT 09...DP/DL/DK/DA D152-153
<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 D152-153
<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	SOMT 11...DP/DL/DK/DA D152-153
<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	SOMT 11...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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	SOMT 13...DP/DL/DK/DA D152-153
<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 D152-153
<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	SOMT 13...DP/DL/DK/DA

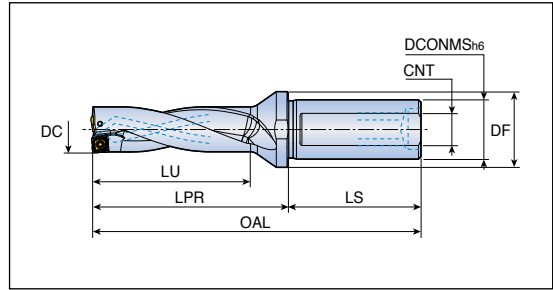
• OAL = LPR + LS



## Indexable drill holders



- Drilling depth: 3x diameter



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 D152-153
<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	
<b>3440-40T2-15</b>	44.0	40	60	132	167	70	M30X2.0	SOMT 15...DP/DL/DK/DA D152-153
<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	

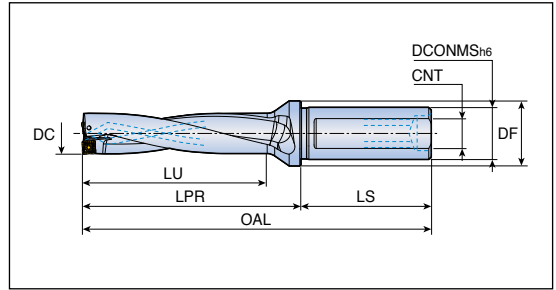
- \*Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm : SL 25M



## 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	D152
<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	D152-153
<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	D152-153
<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	D152-153
<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	D152-153
<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	

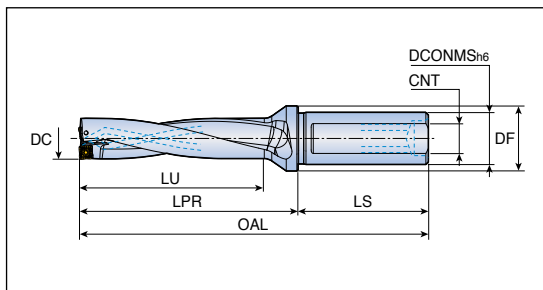


- \*'1' Marked items are for inch sized hole
- OAL = LPR+LS

## Indexable drill holders



- Drilling depth: 4xdiameter



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 D152-153
<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 D152-153
<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 D152-153
<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 D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<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 11...DP/DL/DK/DA D152-153
<b>4371-40T2-13 *</b>	37.1	40	50	148	176	70	M30X2.0	

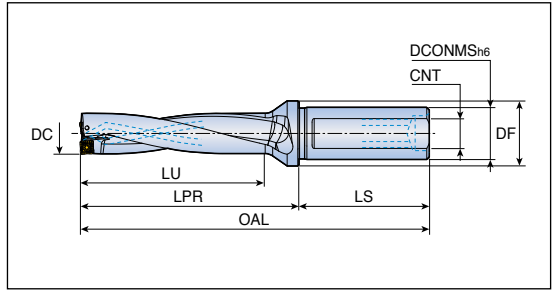


- '\* ' Marked items are for inch sized hole
- OAL = LPR+LS

## 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 D152-153
<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	
<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	

- \*' \* Marked items are for inch sized hole
- OAL = LPR+LS

## Spare parts

Designation	Screw 	Wrench 	Plug* 	
<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	

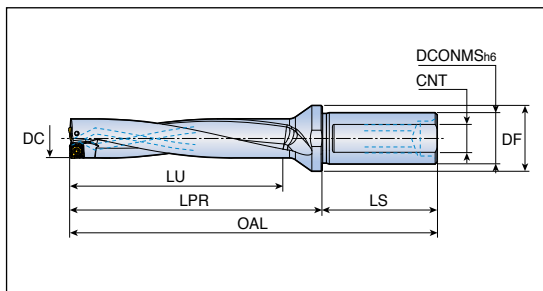


- \*Notice: Cooling hole plug for lathe should be ordered separately  
Order example) Plug for shank diameter 25.0mm : SL 25M

## Indexable drill holders



- Drilling depth: 5x diameter



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
<b>5125-20T2-04</b>	12.5	20	25	65	85	50	M13X1.0	D152
<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
<b>5145-20T2-05</b>	14.5	20	25	75	94	50	M13X1.0	D152-153
<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	
<b>5165-25T2-06</b>	16.5	25	32	85	105	56	M16X1.5	SOMT 06...DP/DL/DK/DA
<b>5170-25T2-06</b>	17.0	25	32	85	105	56	M16X1.5	D152-153
<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>5195-25T2-07</b>	19.5	25	32	100	123	56	M16X1.5	SOMT 07...DP/DL/DK/DA
<b>5200-25T2-07</b>	20.0	25	32	100	123	56	M16X1.5	D152-153
<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	
<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	SOMT 08...DP/DL/DK/DA
<b>5230-25T2-08</b>	23.0	25	32	115	137	56	M16X1.5	D152-153
<b>5230-32T2-08</b>	23.0	32	40	115	137	60	M22X2.0	
<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	
<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	
<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	

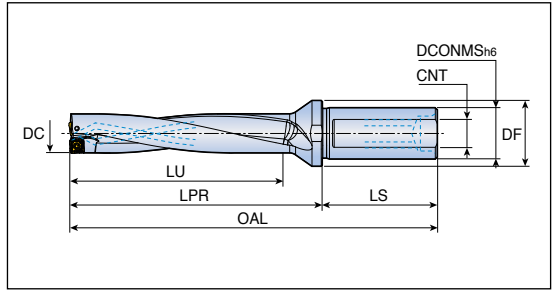


- \*1 Marked items are for inch sized hole
- OAL = LPR+LS

## Indexable drill holders



- Drilling depth: 5x diameter

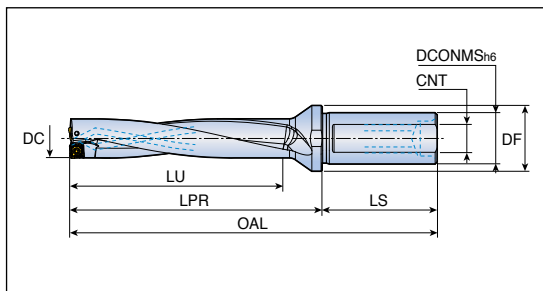


Designation	Dimension (mm)							Insert
	DC	DCONMS	DF	LU	LPR	LS	CNT	
<b>TOP 5260-25T2-08</b>	26.0	25	32	130	151	56	M16X1.5	SOMT 08...DP/DL/DK/DA
<b>5260-32T2-08</b>	26.0	32	40	130	151	60	M22X2.0	D152-153
<b>5265-32T2-09</b>	26.5	32	40	135	158	60	M22X2.0	SOMT 09...DP/DL/DK/DA
<b>5270-25T2-09</b>	27.0	25	40	135	158	56	M16X1.5	D152-153
<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	D152-153
<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	D152-153
<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	



- '\*1' Marked items are for 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 5410-40T2-13</b>	41.0	40	50	205	233	70	M30X2.0	SOMT 13...DP/DL/DK/DA
<b>5420-40T2-13</b>	42.0	40	50	210	238	70	M30X2.0	D152-153
<b>5430-40T2-13</b>	43.0	40	50	215	243	70	M30X2.0	
<b>5440-40T2-15</b>	44.0	40	60	220	255	70	M30X2.0	SOMT 15...DP/DL/DK/DA
<b>5450-40T2-15</b>	45.0	40	60	225	260	70	M30X2.0	D152-153
<b>5460-40T2-15</b>	46.0	40	60	230	265	70	M30X2.0	
<b>5470-40T2-15</b>	47.0	40	60	235	270	70	M30X2.0	
<b>5480-40T2-15</b>	48.0	40	60	240	275	70	M30X2.0	
<b>5490-40T2-15</b>	49.0	40	60	245	280	70	M30X2.0	
<b>5500-40T2-15</b>	50.0	40	60	250	285	70	M30X2.0	

- OAL = LPR+LS

## Spare parts

Designation	Screw 	Wrench 	Plug* 	
<b>TOP 5120 - 5135</b>	TS 18041/HG	TD 6P	SL 20M	
<b>TOP 5140 - 5160</b>	TS 200431/HG-P	TD 6P	SL 20M	
<b>TOP 5165 - 5220</b>	TS 220521/HG-P	TD 7P	SL 25M	
<b>TOP 5225 - 5260</b>	SO 25065I	TD 7	SL 25M / SL 32M	
<b>TOP 5265 - 5360</b>	TS 35088I	TD 10	SL 25M / SL 32M / SL 40M	
<b>TOP 5370 - 5430</b>	TS 40093I	TD 15	SL 32M / SL 40M	
<b>TOP 5440 - 5500</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

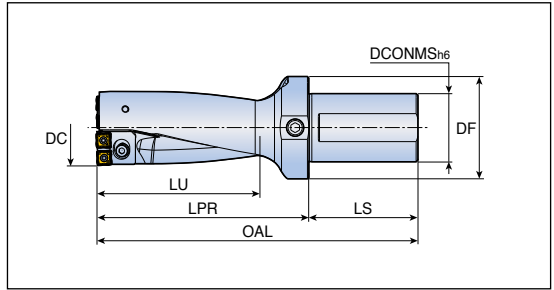




## Indexable drill holders for cartridge



- Drilling depth: 2x diameter



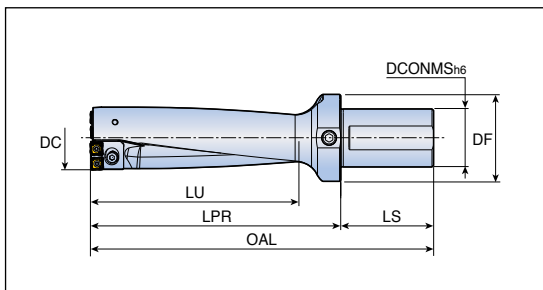
Designation	Dimension (mm)							Setting Plate	Insert
	DC	DCONMS	DF	OAL	LU	LPR	LS		
<b>TOP 2051-55-50T2-09CA</b>	51	50	75	223	110	143	80	-	SOMT 09...
	52	50	75	223	110	143	80	TOP-0901	DP/DL/DK/DA
	53	50	75	223	110	143	80	TOP-0902	D152-153
	54	50	75	223	110	143	80	TOP-0903	
	55	50	75	223	110	143	80	TOP-0904	
<b>TOP 2056-60-50T2-11CA</b>	56	50	75	236	120	156	80	-	SOMT 11...
	57	50	75	236	120	156	80	TOP-0901	DP/DL/DK/DA
	58	50	75	236	120	156	80	TOP-0902	D152-153
	59	50	75	236	120	156	80	TOP-0903	
	60	50	75	236	120	156	80	TOP-0904	
<b>TOP 2061-65-50T2-11CA</b>	61	50	75	249	130	169	80	-	SOMT 11...
	62	50	75	249	130	169	80	TOP-0901	DP/DL/DK/DA
	63	50	75	249	130	169	80	TOP-0902	D152-153
	64	50	75	249	130	169	80	TOP-0903	
	65	50	75	249	130	169	80	TOP-0904	
<b>TOP 2066-70-50T2-11CA</b>	66	50	75	262	140	182	80	-	SOMT 11...
	67	50	75	262	140	182	80	TOP-0901	DP/DL/DK/DA
	68	50	75	262	140	182	80	TOP-0902	D152-153
	69	50	75	262	140	182	80	TOP-0903	
	70	50	75	262	140	182	80	TOP-0904	
<b>TOP 2071-75-50T2-13CA</b>	71	50	75	275	150	195	80	-	SOMT 13...
	72	50	75	275	150	195	80	TOP-0901	DP/DL/DK/DA
	73	50	75	275	150	195	80	TOP-0902	D152-153
	74	50	75	275	150	195	80	TOP-0903	
	75	50	75	275	150	195	80	TOP-0904	
<b>TOP 2076-80-50T2-13CA</b>	76	50	75	288	160	208	80	-	SOMT 13...
	77	50	75	288	160	208	80	TOP-0901	DP/DL/DK/DA
	78	50	75	288	160	208	80	TOP-0902	D152-153
	79	50	75	288	160	208	80	TOP-0903	
	80	50	75	288	160	208	80	TOP-0904	



## 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	75	278	165	198	80	-	SOMT 09... DP/DL/DK/DA D152-153
	52	50	75	278	165	198	80	TOP-0901	
	53	50	75	278	165	198	80	TOP-0902	
	54	50	75	278	165	198	80	TOP-0903	
	55	50	75	278	165	198	80	TOP-0904	
<b>TOP 3056-60-50T2-11CA</b>	56	50	75	296	180	216	80	-	SOMT 11... DP/DL/DK/DA D152-153
	57	50	75	296	180	216	80	TOP-0901	
	58	50	75	296	180	216	80	TOP-0902	
	59	50	75	296	180	216	80	TOP-0903	
	60	50	75	296	180	216	80	TOP-0904	
<b>TOP 3061-65-50T2-11CA</b>	61	50	75	314	195	234	80	-	SOMT 11... DP/DL/DK/DA D152-153
	62	50	75	314	195	234	80	TOP-0901	
	63	50	75	314	195	234	80	TOP-0902	
	64	50	75	314	195	234	80	TOP-0903	
	65	50	75	314	195	234	80	TOP-0904	
<b>TOP 3066-70-50T2-11CA</b>	66	50	75	332	210	252	80	-	SOMT 11... DP/DL/DK/DA D152-153
	67	50	75	332	210	252	80	TOP-0901	
	68	50	75	332	210	252	80	TOP-0902	
	69	50	75	332	210	252	80	TOP-0903	
	70	50	75	332	210	252	80	TOP-0904	
<b>TOP 3071-75-50T2-13CA</b>	71	50	75	350	225	270	80	-	SOMT 13... DP/DL/DK/DA D152-153
	72	50	75	350	225	270	80	TOP-0901	
	73	50	75	350	225	270	80	TOP-0902	
	74	50	75	350	225	270	80	TOP-0903	
	75	50	75	350	225	270	80	TOP-0904	
<b>TOP 3076-80-50T2-13CA</b>	76	50	75	368	240	288	80	-	SOMT 13... DP/DL/DK/DA D152-153
	77	50	75	368	240	288	80	TOP-0901	
	78	50	75	368	240	288	80	TOP-0902	
	79	50	75	368	240	288	80	TOP-0903	
	80	50	75	368	240	288	80	TOP-0904	

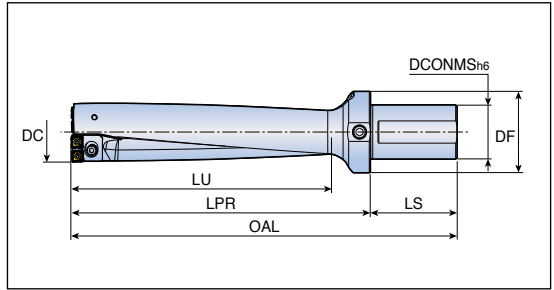


# TOP 40...CA

## Indexable drill holders for cartridge



- Drilling depth: 4x diameter






Designation	Dimension (mm)							Setting Plate	Insert
	DC	DCONMS	DF	OAL	LU	LPR	LS		
<b>TOP 4051-55-50T2-09CA</b>	51	50	75	333	220	253	80	-	SOMT 09 ...
	52	50	75	333	220	253	80	TOP-0901	DP/DL/DK/DA
	53	50	75	333	220	253	80	TOP-0902	D152-153
	54	50	75	333	220	253	80	TOP-0903	
	55	50	75	333	220	253	80	TOP-0904	
<b>TOP 4056-60-50T2-11CA</b>	56	50	75	356	240	276	80	-	SOMT 11 ...
	57	50	75	356	240	276	80	TOP-0901	DP/DL/DK/DA
	58	50	75	356	240	276	80	TOP-0902	D152-153
	59	50	75	356	240	276	80	TOP-0903	
	60	50	75	356	240	276	80	TOP-0904	
<b>TOP 4061-65-50T2-11CA</b>	61	50	75	379	260	299	80	-	SOMT 11 ...
	62	50	75	379	260	299	80	TOP-0901	DP/DL/DK/DA
	63	50	75	379	260	299	80	TOP-0902	D152-153
	64	50	75	379	260	299	80	TOP-0903	
	65	50	75	379	260	299	80	TOP-0904	
<b>TOP 4066-70-50T2-11CA</b>	66	50	75	402	280	322	80	-	SOMT 11 ...
	67	50	75	402	280	322	80	TOP-0901	DP/DL/DK/DA
	68	50	75	402	280	322	80	TOP-0902	D152-153
	69	50	75	402	280	322	80	TOP-0903	
	70	50	75	402	280	322	80	TOP-0904	
<b>TOP 4071-75-50T2-13CA</b>	71	50	75	425	300	345	80	-	SOMT 13 ...
	72	50	75	425	300	345	80	TOP-0901	DP/DL/DK/DA
	73	50	75	425	300	345	80	TOP-0902	D152-153
	74	50	75	425	300	345	80	TOP-0903	
	75	50	75	425	300	345	80	TOP-0904	
<b>TOP 4076-80-50T2-13CA</b>	76	50	75	448	320	368	80	-	SOMT 13 ...
	77	50	75	448	320	368	80	TOP-0901	DP/DL/DK/DA
	78	50	75	448	320	368	80	TOP-0902	D152-153
	79	50	75	448	320	368	80	TOP-0903	
	80	50	75	448	320	368	80	TOP-0904	



## Indexable drill holders for cartridge

### Spare parts

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

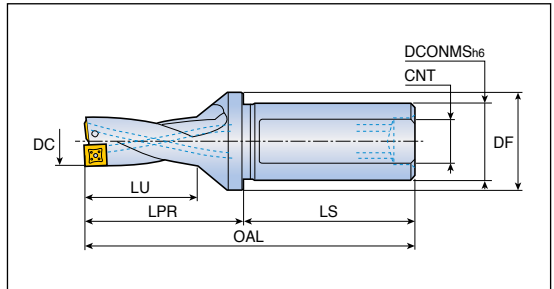
### Spare parts for cartridge

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	-

## 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...
<b>2130-20T2-05</b>	13.0	20	25	26	44	50	M13X1.0	DG/DK
<b>2135-20T2-05</b>	13.5	20	25	28	46	50	M13X1.0	SPGG 05..DA
<b>2140-20T2-05</b>	14.0	20	25	28	46	50	M13X1.0	D154-155
<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	SPMG 06...
<b>2160-25T2-06</b>	16.0	25	32	32	52	56	M16X1.5	DG/DK
<b>2165-25T2-06</b>	16.5	25	32	34	54	56	M16X1.5	SPGG 06..DA
<b>2170-25T2-06</b>	17.0	25	32	34	54	56	M16X1.5	D154-155
<b>2175-25T2-06</b>	17.5	25	32	36	57	56	M16X1.5	
<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...
<b>2225-25T2-07</b>	22.5	25	32	46	71	56	M16X1.5	DG/DK
<b>2225-32T2-07</b>	22.5	32	40	46	71	60	M22X2.0	SPGG 07..DA
<b>2230-25T2-07</b>	23.0	25	32	46	71	56	M16X1.5	D154-155
<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

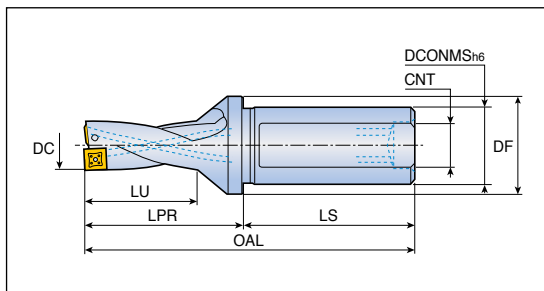


# TDR 2...-T2

## 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... DG/DK SPGG 07..DA D154-155
<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... DG/DK SPGG 09..DA D154-155
<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	
<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	SPMG 11... DG/DK SPGG 11..DA D154-155
<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	

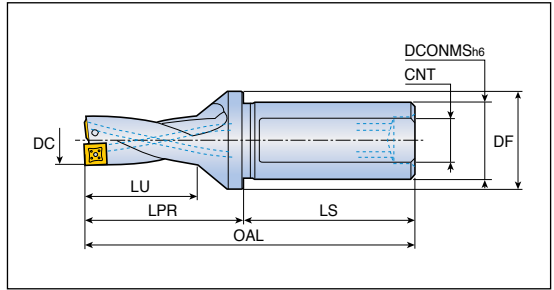
- OAL = LPR+LS



## 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... DG/DK SPGG 11..DA D154-155
<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	
<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	-	

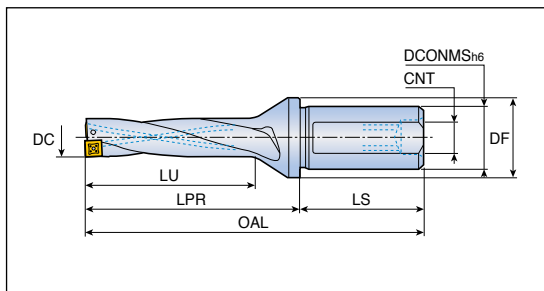


# TDR 3...-T2

## 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... DG/DK
<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	SPGG 05..DA D154-155
<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	SPMG 06... DG/DK
<b>3150-20T2-05</b>	15.0	20	25	45	64	50	M13X1.0	
<b>3155-25T2-06</b>	15.5	25	32	48	68	56	M16X1.5	SPGG 06..DA D154-155
<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	SPMG 07... DG/DK
<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	SPGG 07..DA D154-155
<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	SPMG 07... DG/DK
<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	SPGG 07..DA D154-155
<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	SPMG 07... DG/DK
<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	SPGG 07..DA D154-155
<b>3215-25T2-06</b>	21.5	25	32	66	89	56	M16X1.5	
<b>3220-25T2-07</b>	22.0	25	32	66	89	56	M16X1.5	SPMG 07... DG/DK
<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	SPGG 07..DA D154-155
<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	SPMG 07... DG/DK
<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	SPGG 07..DA D154-155
<b>3239-25T2-07 *</b>	23.9	25	32	72	98	56	M16X1.5	
<b>3239-32T2-07 *</b>	23.9	32	45	72	98	60	M22X2.0	SPMG 07... DG/DK
<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	SPGG 07..DA D154-155
<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	SPMG 07... DG/DK
<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	



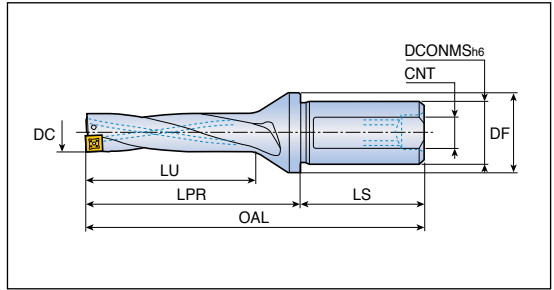
- \*! Marked items are for pre-thread hole making
- OAL = LPR+LS



## 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... DG/DK SPGG 07..DA D154-155	
<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... DG/DK SPGG 09..DA D154-155
<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		



- !\*! Marked items are for pre-thread hole making
- OAL = LPR + LS



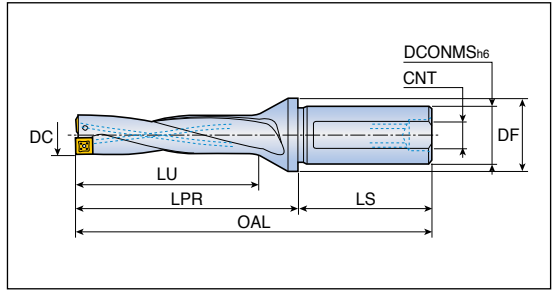
# TDR 3...-T2



## Indexable drill holders



- Drilling depth: 3x diameter



Designation	Dimension (mm)							Insert
	DC	DCONMS	DF	LU	LPR	LS	CNT	
<b>TDR 3420-40T2-14</b>	42.0	40	60	126	165	70	Rc 1/4	SPMG 14...
<b>3430-40T2-14</b>	43.0	40	60	129	169	70	Rc 1/4	DG/DK
<b>3440-40T2-14</b>	44.0	40	60	132	172	70	Rc 1/4	SPGG 14..DA
<b>3450-40T2-14</b>	45.0	40	60	135	177	70	Rc 1/4	D154-155
<b>3460-40T2-14</b>	46.0	40	60	138	181	70	Rc 1/4	
<b>3470-40T2-14</b>	47.0	40	60	141	184	70	Rc 1/4	
<b>3480-40T2-14</b>	48.0	40	60	144	188	70	Rc 1/4	
<b>3490-40T2-14</b>	49.0	40	60	147	191	70	Rc 1/4	
<b>3500-40T2-14</b>	50.0	40	60	150	195	70	Rc 1/4	

- 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	-	



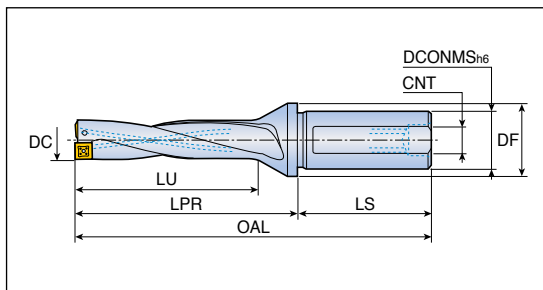
# TDR 4...-T2



## 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...
<b>4130-20T2-05</b>	13.0	20	25	52	70	50	M13X1.0	DG/DK
<b>4135-20T2-05</b>	13.5	20	25	56	74	50	M13X1.0	SPGG 05..DA
<b>4140-20T2-05</b>	14.0	20	25	56	74	50	M13X1.0	D154-155
<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	
<b>4155-25T2-06</b>	15.5	25	32	64	84	56	M16X1.5	SPMG 06...
<b>4160-25T2-06</b>	16.0	25	32	64	84	56	M16X1.5	DG/DK
<b>4165-25T2-06</b>	16.5	25	32	68	88	56	M16X1.5	SPGG 06..DA
<b>4170-25T2-06</b>	17.0	25	32	68	88	56	M16X1.5	D154-155
<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...
<b>4225-25T2-07</b>	22.5	25	32	92	117	56	M16X1.5	DG/DK
<b>4225-32T2-07</b>	22.5	32	40	92	117	60	M22X2.0	SPGG 07..DA
<b>4230-25T2-07</b>	23.0	25	32	92	117	56	M16X1.5	D154-155
<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	

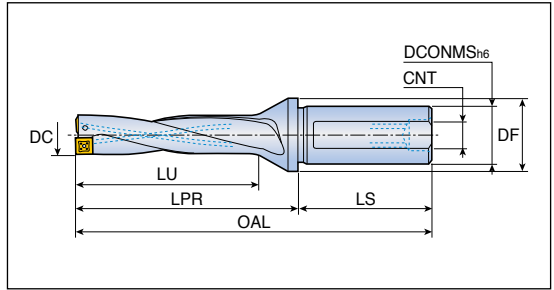
- OAL = LPR+LS



## 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...
<b>4265-25T2-07</b>	26.5	25	32	108	135	56	M16X1.5	DG/DK
<b>4265-32T2-07</b>	26.5	32	40	108	135	60	M22X2.0	SPGG 07..DA
<b>4270-25T2-07</b>	27.0	25	32	108	135	56	M16X1.5	D154-155
<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...
<b>4280-32T2-09</b>	28.0	32	40	112	140	60	Rc 1/4	DG/DK
<b>4285-25T2-09</b>	28.5	25	40	116	144	56	Rc 1/8	SPGG 09..DA
<b>4285-32T2-09</b>	28.5	32	40	116	144	60	Rc 1/4	D154-155
<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	
<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	SPMG 11...
<b>4340-40T2-11</b>	34.0	40	55	136	169	70	Rc 1/4	DG/DK
<b>4350-32T2-11</b>	35.0	32	50	140	174	60	Rc 1/4	SPGG 11..DA
<b>4350-40T2-11</b>	35.0	40	55	140	174	70	Rc 1/4	D154-155
<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	

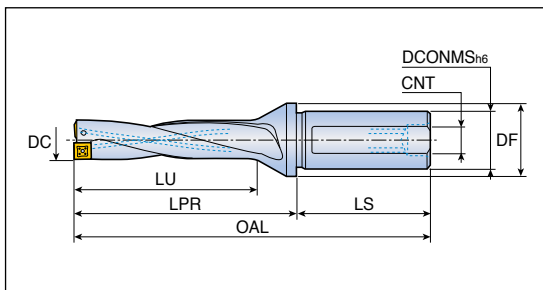
- OAL = LPR+LS



## Indexable drill holders



- Drilling depth: 4x diameter



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... DG/DK SPGG 11..DA D154-155
<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	
<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

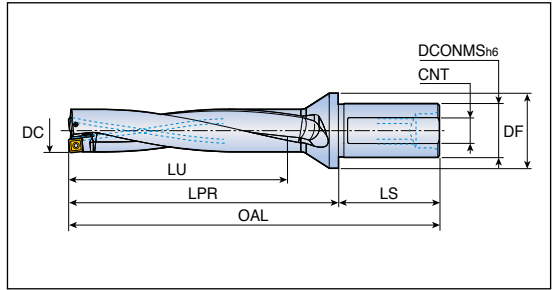
Designation	Screw 	Wrench 	Plug 	
<b>TDR 4125 - 4150</b>	TS 20043I/HG-P	TD 6P	SL 20 M	
<b>TDR 4155 - 4215</b>	TS 22052I/HG	TD 7	SL 25 M	
<b>TDR 4220 - 4270</b>	TS 25064I	TD 8	SL 25 M / SL 32 M	
<b>TDR 4275</b>	TS 25064I	TD 8	-	
<b>TDR 4280 - 4330</b>	TS 35088I	TD 10	-	
<b>TDR 4340 - 4390</b>	TS 40093I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



## 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	D154-155
<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	D154-155
<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	D154-155
<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	

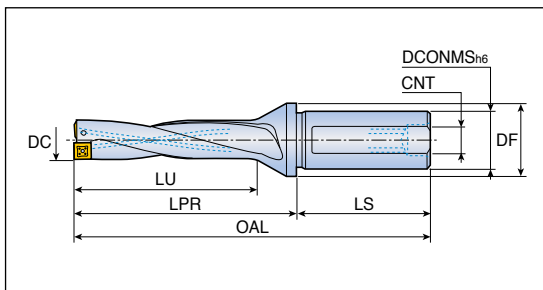
- OAL = LPR+LS



## Indexable drill holders



- Drilling depth: 5x diameter



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... DG/DK SPGG 09..DA D154-155	
<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	SPMG 11... DG/DK SPGG 11..DA D154-155	
<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		
<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





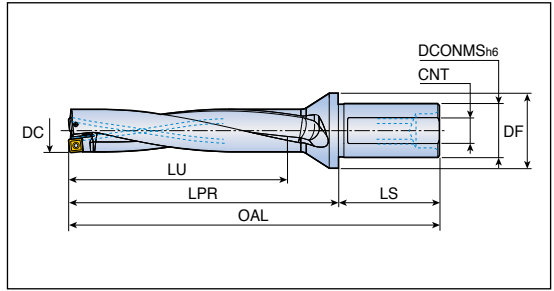
# TDR 5...-T2



## Indexable drill holders



- Drilling depth: 5x diameter



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... DG/DK SPGG 14..DA D154-155
<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

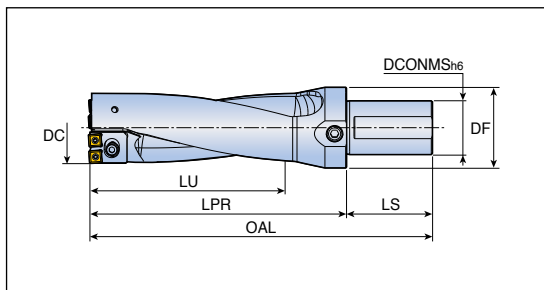
Designation	Screw	Wrench	Plug	
<b>TDR 5125 - 5150</b>	TS 20043I/HG-P	TD 6P	SL 20 M	
<b>TDR 5155 - 5215</b>	TS 22052I/HG	TD 7	SL 25 M	
<b>TDR 5220 - 5270</b>	TS 25064I	TD 8	SL 25 M / SL 32 M	
<b>TDR 5275</b>	TS 25064I	TD 8	-	
<b>TDR 5280 - 5330</b>	TS 35088I	TD 10	-	
<b>TDR 5340 - 5390</b>	TS 40093I	TD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



# 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	75	133	170	80	-	SPMG 07... DG/DK SPGG 07..DA D154-155
	52	50	75	133	170	80	TDP-0701	
	53	50	75	133	170	80	TDP-0702	
<b>2554-56-50T2-07CA-T</b>	54	50	75	140	180	80	-	SPMG 07... DG/DK SPGG 07..DA D154-155
	55	50	75	140	180	80	TDP-0701	
	56	50	75	140	180	80	TDP-0702	
<b>2557-62-50T2-09CA-T</b>	57	50	75	155	201	80	-	SPMG 09... DG/DK SPGG 09..DA D154-155
	58	50	75	155	201	80	TDP-0901	
	59	50	75	155	201	80	TDP-0902	
	60	50	75	155	201	80	TDP-0903	
	61	50	75	155	201	80	TDP-0904	
	62	50	75	155	201	80	TDP-0905	
<b>2563-66-50T2-09CA-T</b>	63	50	75	165	215	80	-	SPMG 09... DG/DK SPGG 09..DA D154-155
	64	50	75	165	215	80	TDP-0901	
	65	50	75	165	215	80	TDP-0902	
	66	50	75	165	215	80	TDP-0903	
<b>2567-73-50T2-11CA-T</b>	67	50	75	183	240	80	-	SPMG 11... DG/DK SPGG 11..DA D154-155
	68	50	75	183	240	80	TDP-1101	
	69	50	75	183	240	80	TDP-1102	
	70	50	75	183	240	80	TDP-1103	
	71	50	75	183	240	80	TDP-1104	
	72	50	75	183	240	80	TDP-1105	
	73	50	75	183	240	80	TDP-1106	
<b>2574-80-50T2-12CA-T</b>	74	50	75	200	250	80	-	SPMG 12...DG D154
	75	50	75	200	250	80	TDP-1101	
	76	50	75	200	250	80	TDP-1102	
	77	50	75	200	250	80	TDP-1103	
	78	50	75	200	250	80	TDP-1104	
	79	50	75	200	250	80	TDP-1105	
	80	50	75	200	250	80	TDP-1106	

- OAL = LPR+LS



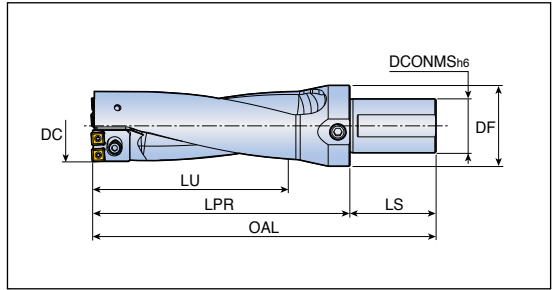
# TDR 35...CA-T



## 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	75	186	223	80	-	SPMG 07...
	52	50	75	186	223	80	TDP-0701	DG/DK SPGG 07..DA
	53	50	75	186	223	80	TDP-0702	SPGG 07..DA D154-155
<b>3554-56-50T2-07CA-T</b>	54	50	75	196	236	80	-	SPMG 07...
	55	50	75	196	236	80	TDP-0701	DG/DK SPGG 07..DA
	56	50	75	196	236	80	TDP-0702	SPGG 07..DA D154-155
<b>3557-62-50T2-09CA-T</b>	57	50	75	217	263	80	-	SPMG 09...
	58	50	75	217	263	80	TDP-0901	DG/DK
	59	50	75	217	263	80	TDP-0902	SPGG 09..DA
	60	50	75	217	263	80	TDP-0903	D154-155
	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...
	64	50	75	231	281	80	TDP-0901	DG/DK
	65	50	75	231	281	80	TDP-0902	SPGG 09..DA
	66	50	75	231	281	80	TDP-0903	D154-155
<b>3567-73-50T2-11CA-T</b>	67	50	75	256	313	80	-	SPMG 11...
	68	50	75	256	313	80	TDP-1101	DG/DK
	69	50	75	256	313	80	TDP-1102	SPGG 11..DA
	70	50	75	256	313	80	TDP-1103	D154-155
	71	50	75	256	313	80	TDP-1104	
	72	50	75	256	313	80	TDP-1105	
	73	50	75	256	313	80	TDP-1106	

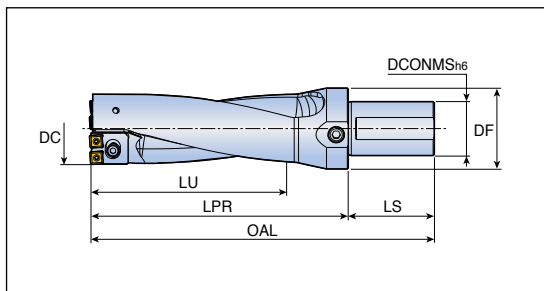
• OAL = LPR+LS



## Indexable cartridge drill holders



- Drilling depth:  $3.5 \times \text{diameter}$



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 D154
	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 250641	TDR 07CA-P1-T	TDR 07CA-C1-T
<b>TDR.. 54-56...</b>	TS 250641	TDR 07CA-P2-T	TDR 07CA-C2-T
<b>TDR.. 57-62...</b>	TS 350881	TDR 09CA-P1-T	TDR 09CA-C1-T
<b>TDR.. 63-66...</b>	TS 350881	TDR 09CA-P2-T	TDR 09CA-C2-T
<b>TDR.. 67-73...</b>	TS 400931	TDR 11CA-P1-T	TDR 11CA-C1-T
<b>TDR.. 74-80...</b>	TS 400931	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	-



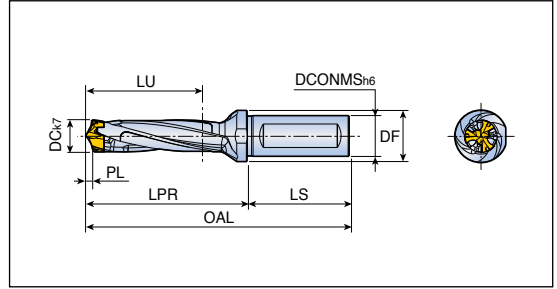


# 3ED...T...-3D

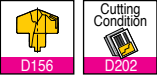
## Head changeable 3 flute drill holders - Weldon type shank



- Drilling depth: 3xdiameter



Designation	Dimension (mm)								Clamping key
	DC	DCONMS	DF	LU	LPR	LS	PL	SSC	
<b>3ED 150-159-20T3-3D</b>	15.0-15.9	20	25	49	73.9	50	3.31	15	K 3ED D14-D15
<b>160-169-20T3-3D</b>	16.0-16.9	20	25	52	79.0	50	3.70	16	K 3ED D16-D17
<b>170-179-20T3-3D</b>	17.0-17.9	20	25	55	84.0	50	3.88	17	K 3ED D16-D17
<b>180-189-25T2-3D</b>	18.0-18.9	25	32	58	90.1	56	4.07	18	K 3ED D18-D19
<b>190-199-25T2-3D</b>	19.0-19.9	25	32	61	94.7	56	4.26	19	K 3ED D18-D19
<b>200-209-25T2-3D</b>	20.0-20.9	25	32	64	99.3	56	4.44	20	K 3ED D20-D21



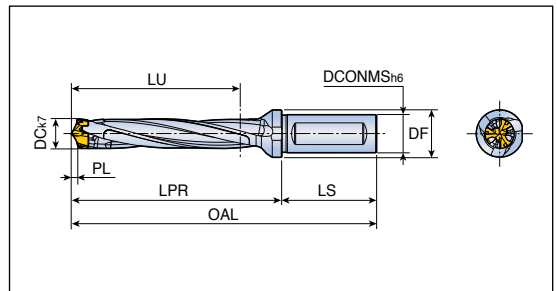
- OAL = LPR+LS
- SSC : Seat size code

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

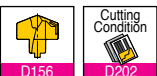
## Head changeable 3 flute drill holders - Weldon type shank



- Drilling depth: 5xdiameter



Designation	Dimension (mm)								Clamping key
	DC	DCONMS	DF	LU	LPR	LS	PL	SSC	
<b>3ED 150-159-20T3-5D</b>	15.0-15.9	20	25	79	103.9	50	3.31	15	K 3ED D14-D15
<b>160-169-20T3-5D</b>	16.0-16.9	20	25	84	111.0	50	3.70	16	K 3ED D16-D17
<b>170-179-20T3-5D</b>	17.0-17.9	20	25	89	118.0	50	3.88	17	K 3ED D16-D17
<b>180-189-25T2-5D</b>	18.0-18.9	25	32	94	126.1	56	4.07	18	K 3ED D18-D19
<b>190-199-25T2-5D</b>	19.0-19.9	25	32	99	132.7	56	4.26	19	K 3ED D18-D19
<b>200-209-25T2-5D</b>	20.0-20.9	25	32	104	139.3	56	4.44	20	K 3ED D20-D21



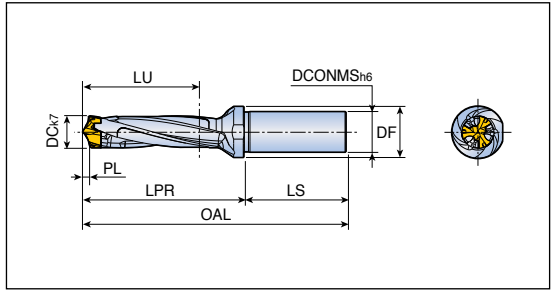
- OAL = LPR+LS
- SSC : Seat size code

# 3ED...T0...-3D

Head changeable 3 flute drill holders - Cylindrical type shank



- Drilling depth: 3x diameter



Designation	Dimension (mm)								Clamping key
	DC	DCONMS	DF	LU	LPR	LS	PL	SSC	
<b>3ED 150-159-20T0-3D</b>	15.0-15.9	20	25	49	73.9	50	3.31	15	K 3ED D14-D15
<b>160-169-20T0-3D</b>	16.0-16.9	20	25	52	79.0	50	3.70	16	K 3ED D16-D17
<b>170-179-20T0-3D</b>	17.0-17.9	20	25	55	84.0	50	3.88	17	K 3ED D16-D17
<b>180-189-25T0-3D</b>	18.0-18.9	25	32	58	90.1	56	4.07	18	K 3ED D18-D19
<b>190-199-25T0-3D</b>	19.0-19.9	25	32	61	94.7	56	4.26	19	K 3ED D18-D19
<b>200-209-25T0-3D</b>	20.0-20.9	25	32	64	99.3	56	4.44	20	K 3ED D20-D21



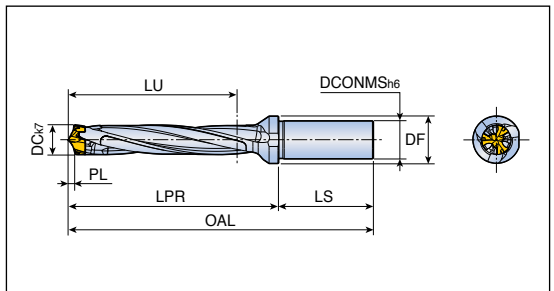
- OAL = LPR+LS
- SSC : Seat size code

# 3ED...T0...-5D

Head changeable 3 flute drill holders - Cylindrical type shank



- Drilling depth: 5x diameter



Designation	Dimension (mm)								Clamping key
	DC	DCONMS	DF	LU	LPR	LS	PL	SSC	
<b>3ED 150-159-20T0-5D</b>	15.0-15.9	20	25	79	103.9	50	3.31	15	K 3ED D14-D15
<b>160-169-20T0-5D</b>	16.0-16.9	20	25	84	111.0	50	3.70	16	K 3ED D16-D17
<b>170-179-20T0-5D</b>	17.0-17.9	20	25	89	118.0	50	3.88	17	K 3ED D16-D17
<b>180-189-25T0-5D</b>	18.0-18.9	25	32	94	126.1	56	4.07	18	K 3ED D18-D19
<b>190-199-25T0-5D</b>	19.0-19.9	25	32	99	132.7	56	4.26	19	K 3ED D18-D19
<b>200-209-25T0-5D</b>	20.0-20.9	25	32	104	139.3	56	4.44	20	K 3ED D20-D21

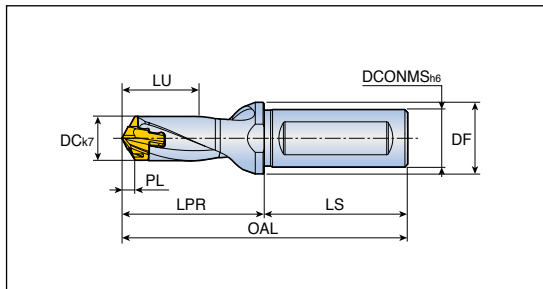


- OAL = LPR+LS
- SSC : Seat size code

# TCD...T...-1.5D



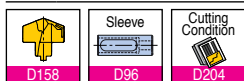
## Head changeable drill holders - Weldon type shank



• Drilling depth: 1.5xdiameter



Designation	Dimension (mm)								Clamping key	
	DC	DCONMS	DF	LU	LPR	LS	PL	SSC		
<b>TCD 060-064-12T3-1.5D</b>	6.0-6.4	12	16	10	23.0	45	0.96	6	K TCD D060-D099	
<b>065-069-12T3-1.5D</b>	6.5-6.9	12	16	11	24.1	45	1.18	6.5		
<b>070-074-12T3-1.5D</b>	7.0-7.4	12	16	12	25.1	45	1.01	7		
<b>075-079-12T3-1.5D</b>	7.5-7.9	12	16	12	25.9	45	1.10	7		
<b>080-089-12T3-1.5D</b>	8.0-8.9	12	16	13	27.4	45	1.20	8		
<b>090-099-12T3-1.5D</b>	9.0-9.9	12	16	15	29.3	45	1.35	9		
<b>100-109-16T3-1.5D</b>	10.0-10.9	16	20	17	31.2	48	1.50	10		K TCD D100-D199
<b>110-119-16T3-1.5D</b>	11.0-11.9	16	20	19	33.1	48	1.67	11		
<b>120-129-16T3-1.5D</b>	12.0-12.9	16	20	20	35.0	48	1.82	12		
<b>130-139-16T3-1.5D</b>	13.0-13.9	16	20	22	37.1	48	1.96	13		
<b>140-149-16T3-1.5D</b>	14.0-14.9	16	20	23	41.1	48	2.12	14		
<b>150-159-20T3-1.5D</b>	15.0-15.9	20	25	25	46.2	50	2.27	15		
<b>160-169-20T3-1.5D</b>	16.0-16.9	20	25	26	49.3	50	2.42	16		
<b>170-179-20T3-1.5D</b>	17.0-17.9	20	25	29	52.4	50	2.59	17		
<b>180-189-25T2-1.5D</b>	18.0-18.9	25	32	30	55.5	56	2.73	18		
<b>190-199-25T2-1.5D</b>	19.0-19.9	25	32	32	58.5	56	2.88	19	K TCD D200-D269	
<b>200-209-25T2-1.5D</b>	20.0-20.9	25	32	33	61.6	56	3.02	20		
<b>210-219-25T2-1.5D</b>	21.0-21.9	25	32	35	64.7	56	3.18	21		
<b>220-229-25T2-1.5D</b>	22.0-22.9	25	32	36	67.8	56	3.24	22		
<b>230-239-32T2-1.5D</b>	23.0-23.9	32	42	38	70.8	60	3.46	23		
<b>240-249-32T2-1.5D</b>	24.0-24.9	32	42	40	73.9	60	3.62	24		
<b>250-259-32T2-1.5D</b>	25.0-25.9	32	42	42	77.0	60	3.80	25		



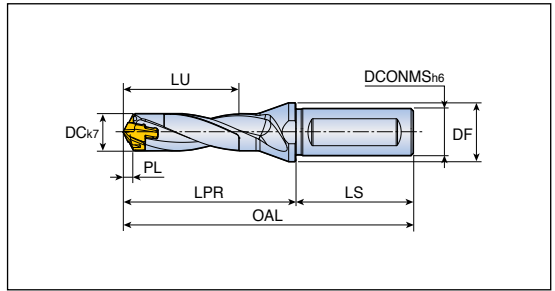
• OAL = LPR+LS  
• SSC : Seat size code





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

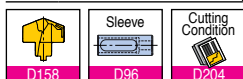
## Head changeable drill holders - Weldon type shank



• 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		



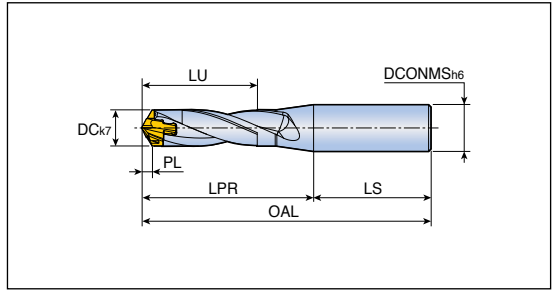
• OAL = LPR+LS  
• SSC : Seat size code

# TCD...S0-3D

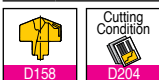
## Head changeable drill holders - Cylindrical type shank



- 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		



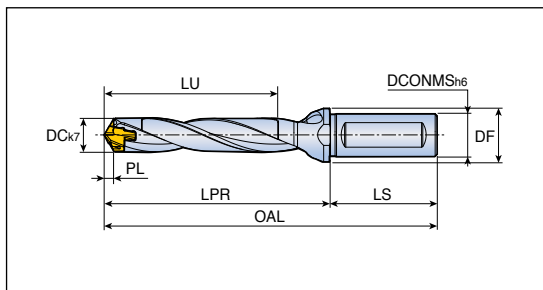
- OAL = LPR+LS
- SSC : Seat size code

# TCD...T...-5D

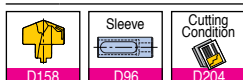
## Head changeable drill holders - Weldon type shank



- Drilling depth: 5x diameter



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

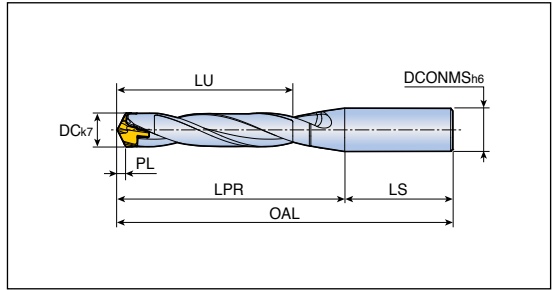
# TCD...S0-5D



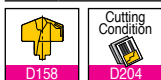
## Head changeable drill holders - Cylindrical type shank



- 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		



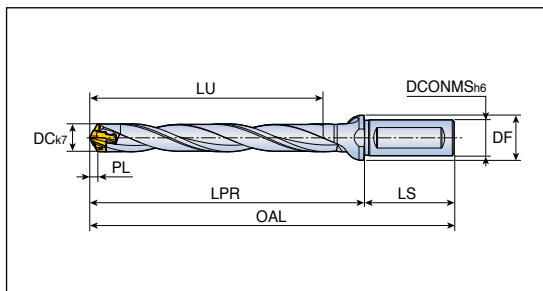
- OAL = LPR+LS
- SSC : Seat size code

# TCD...T...-8D

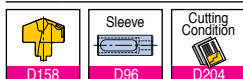
## Head changeable drill holders - Weldon type shank



- 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	



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

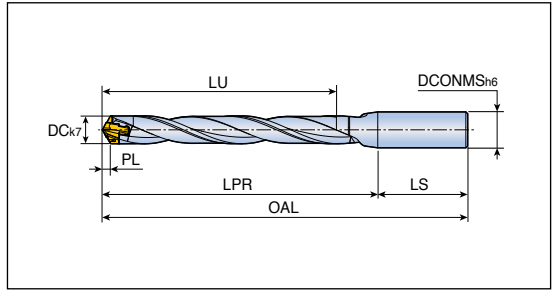
# TCD...S0-8D



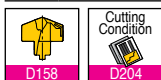
## Head changeable drill holders - Cylindrical type shank



- 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		

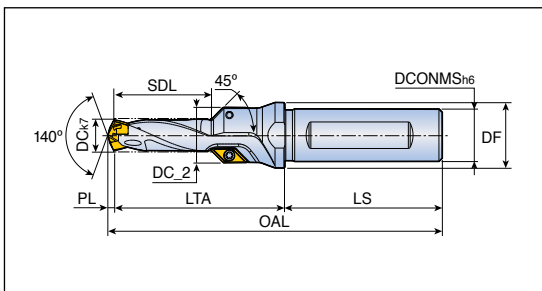


- It is recommended to make the pilot hole with a 1.5D holder
- OAL = LPR+LS
- SSC : Seat size code





## 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 D172
<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 220461	TD 7	K TCD D060-D099	
<b>TCD 085</b>	TS 220461	TD 7	K TCD D060-D099	
<b>TCD 102 - 175</b>	TS 220461	TD 7	K TCD D100-D199	
<b>TCD 210</b>	TS 220461	TD 7	K TCD D200-D269	



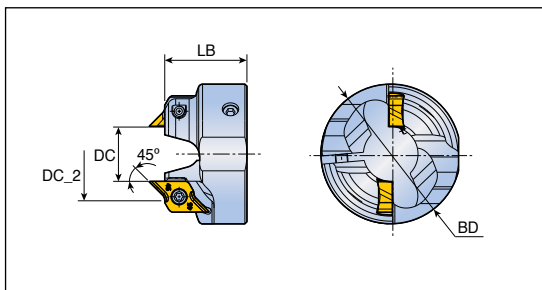
## Plug for coolant supply in a stationary machines

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 D172
<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	

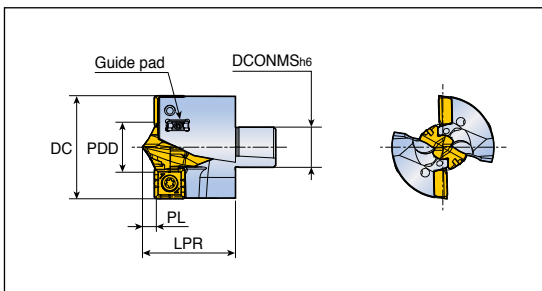
## Spare parts

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]



## 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+	SPGX 06...DW
<b>2800-C28-TP</b>	28	11.2	26.9	4.29	17.9	K TCD D17-D19 CO	TCD-179-P-CO+	SPGX 06...DW
<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+	SPGX 07...DW
<b>3100-C30-TP</b>	31	12.0	28.5	4.30	17.9	K TCD D17-D19 CO	TCD-179-P-CO+	SPGX 07...DW
<b>3200-C32-TP</b>	32	12.8	30.3	4.46	18.9	K TCD D17-D19 CO	TCD-189-P-CO+	SPGX 07...DW
<b>3300-C32-TP</b>	33	12.8	29.8	3.97	15.9	K TCD D15-D16 CO	TCD-159-P-CO+	SPGX 09...DW
<b>3400-C34-TP</b>	34	13.6	31.6	4.14	16.9	K TCD D15-D16 CO	TCD-169-P-CO+	SPGX 09...DW
<b>3500-C34-TP</b>	35	13.6	31.8	4.30	17.9	K TCD D17-D19 CO	TCD-179-P-CO+	SPGX 09...DW
<b>3600-C36-TP</b>	36	14.4	33.5	4.46	18.9	K TCD D17-D19 CO	TCD-189-P-CO+	SPGX 09...DW
<b>3700-C36-TP</b>	37	14.4	33.3	4.14	16.9	K TCD D15-D16 CO	TCD-169-P-CO+	SPGX 11...DW
<b>3800-C38-TP</b>	38	15.2	35.0	4.30	17.9	K TCD D17-D19 CO	TCD-179-P-CO+	SPGX 11...DW
<b>3900-C38-TP</b>	39	15.2	35.2	4.46	18.9	K TCD D17-D19 CO	TCD-189-P-CO+	SPGX 11...DW
<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+	SPGX 11...DW
<b>4200-C42-TP</b>	42	16.8	38.9	4.95	21.9	K TCD D20-D21 CO	TCD-219-P-CO+	SPGX 11...DW
<b>4300-C42-TP</b>	43	16.8	38.9	5.11	22.9	K TCD D22-D23 CO	TCD-229-P-CO+	SPGX 11...DW



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

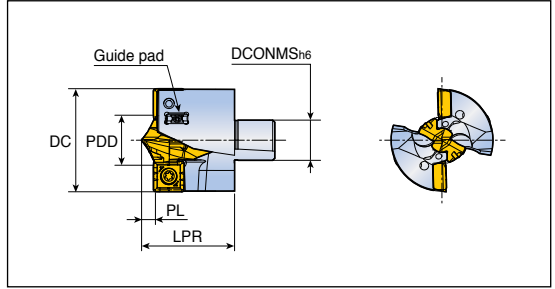
## Spare parts

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



# TNDH-TP

## Modular drill heads

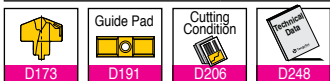


Designation	Dimension (mm)					Clamping Key	Insert	
	DC	DCONMS	LPR	PL	PDD		Center	Outer
<b>TNDH 4400-C44-TP</b>	44	17.6	40.8	5.28	23.9	K TCD D22-D23 CO	TCD-239-P-CO+	SPGX 11...DW
<b>4500-C44-TP</b>	45	17.6	41.0	5.44	24.9	K TCD D24-D25 CO	TCD-249-P-CO+	SPGX 11...DW
<b>4600-C46-TP</b>	46	18.4	42.2	4.95	21.9	K TCD D20-D21 CO	TCD-219-P-CO+	SPGX 14...DW
<b>4700-C46-TP</b>	47	18.4	42.3	5.11	22.9	K TCD D22-D23 CO	TCD-229-P-CO+	SPGX 14...DW
<b>4800-C48-TP</b>	48	19.2	44.0	5.28	23.9	K TCD D22-D23 CO	TCD-239-P-CO+	SPGX 14...DW
<b>4900-C48-TP</b>	49	19.2	44.3	5.44	24.9	K TCD D24-D25 CO	TCD-249-P-CO+	SPGX 14...DW
<b>5000-C48-TP</b>	50	19.2	46.0	5.61	25.9	K TCD D24-D25 CO	TCD-259-P-CO+	SPGX 14...DW
								D173

- 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 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

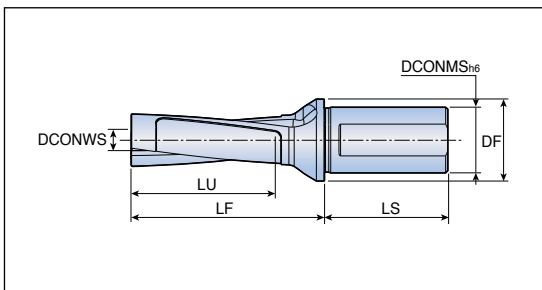


# MDB...T2-3

## Modular drill holders - Weldon type shank



- Drilling depth: 3x diameter



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

- DC : Cutting diameter range
- DCONWS : Modular head connection size

## Spare parts

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

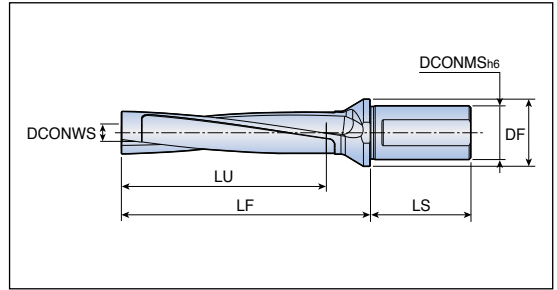
- Wrench: Disassemble the modular head from the modular body (Insert from the rear shank)



## 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

## 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		

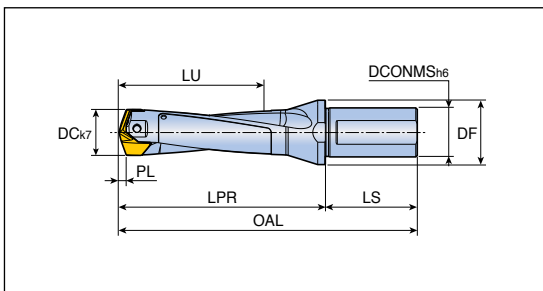
- Wrench: Disassemble the modular head from the modular body (Insert from the rear shank)



## 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

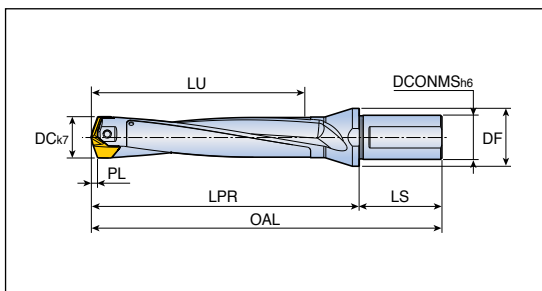
Designation	Screw	Wrench	Wrench handle	
<b>LCD 200-219-3D</b>	TS 40178D25	BLD T20/S7	SW6-T-SH	
<b>LCD 220-239-3D</b>	TS 40198D28	BLD T20/S7	SW6-T-SH	
<b>LCD 240-259-3D</b>	TS 40210D3	BLD T20/S7	SW6-T-SH	
<b>LCD 260-279-3D</b>	TS 50230D3	BLD T20/S7	SW6-T-SH	
<b>LCD 280-299-3D</b>	TS 50250D35	BLD T25/S7	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	



## Head changeable drill holders - Weldon type shank



- Drilling depth: 5x diameter

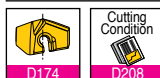


Designation	Dimension (mm)							
	DC	DCONMS	DF	LU	LPR	LS	PL	SSC
<b>LCD 200-209-25T2-5D</b>	20.0-20.9	25	32	103	132.1	56	3.11	20
<b>210-219-25T2-5D</b>	21.0-21.9	25	32	108	137.3	56	3.29	21
<b>220-229-25T2-5D</b>	22.0-22.9	25	32	113	142.4	56	3.42	22
<b>230-239-25T2-5D</b>	23.0-23.9	25	32	119	147.6	56	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	

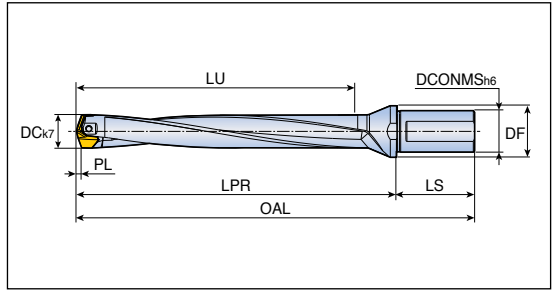




## Head changeable drill holders - Weldon type shank



- 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

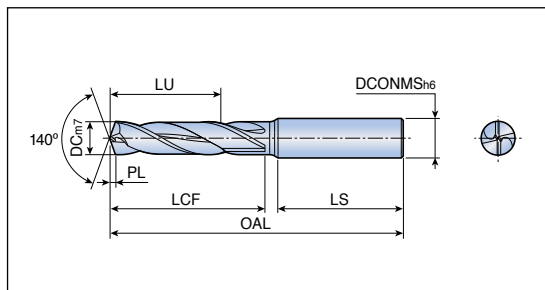
Designation	Screw	Wrench	Wrench handle	
<b>LCD 200-219-8D</b>	TS 40178D25	BLD T20/S7	SW6-T-SH	
<b>LCD 220-239-8D</b>	TS 40198D28	BLD T20/S7	SW6-T-SH	
<b>LCD 240-259-8D</b>	TS 40210D3	BLD T20/S7	SW6-T-SH	
<b>LCD 260-279-8D</b>	TS 50230D3	BLD T20/S7	SW6-T-SH	
<b>LCD 280-299-8D</b>	TS 50250D35	BLD T25/S7	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	







## 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	6.0	62	14	21	34	0.5	●
<b>031-014-06 PE3</b>	3.1	6.0	62	14	21	34	0.5	●
<b>032-014-06 PE3</b>	3.2	6.0	62	14	21	34	0.5	●
<b>033-014-06 PE3</b>	3.3	6.0	62	14	21	34	0.5	●
<b>034-014-06 PE3</b>	3.4	6.0	62	14	21	34	0.5	●
<b>035-014-06 PE3</b>	3.5	6.0	62	14	21	34	0.6	●
<b>036-014-06 PE3</b>	3.6	6.0	62	14	21	34	0.6	●
<b>037-014-06 PE3</b>	3.7	6.0	62	14	21	34	0.6	●
<b>038-017-06 PE3</b>	3.8	6.0	66	17	25	35	0.6	●
<b>039-017-06 PE3</b>	3.9	6.0	66	17	25	35	0.6	●
<b>040-017-06 PE3</b>	4.0	6.0	66	17	25	35	0.6	●
<b>041-017-06 PE3</b>	4.1	6.0	66	17	25	35	0.7	●
<b>042-017-06 PE3</b>	4.2	6.0	66	17	25	35	0.7	●
<b>043-017-06 PE3</b>	4.3	6.0	66	17	25	35	0.7	●
<b>044-017-06 PE3</b>	4.4	6.0	66	17	25	35	0.7	●
<b>045-017-06 PE3</b>	4.5	6.0	66	17	25	35	0.7	●
<b>046-017-06 PE3</b>	4.6	6.0	66	17	25	35	0.7	●
<b>047-017-06 PE3</b>	4.7	6.0	66	17	25	35	0.8	●
<b>048-020-06 PE3</b>	4.8	6.0	66	20	29	36	0.8	●
<b>049-020-06 PE3</b>	4.9	6.0	66	20	29	36	0.8	●
<b>050-020-06 PE3</b>	5.0	6.0	66	20	29	36	0.8	●
<b>051-020-06 PE3</b>	5.1	6.0	66	20	29	36	0.8	●
<b>052-020-06 PE3</b>	5.2	6.0	66	20	29	36	0.8	●
<b>053-020-06 PE3</b>	5.3	6.0	66	20	29	36	0.8	●
<b>054-020-06 PE3</b>	5.4	6.0	66	20	29	36	0.8	●
<b>055-020-06 PE3</b>	5.5	6.0	66	20	29	36	0.9	●
<b>056-020-06 PE3</b>	5.6	6.0	66	20	29	36	0.9	●
<b>057-020-06 PE3</b>	5.7	6.0	66	20	29	36	0.9	●
<b>058-020-06 PE3</b>	5.8	6.0	66	20	29	36	0.9	●
<b>059-020-06 PE3</b>	5.9	6.0	66	20	29	36	0.9	●
<b>060-020-06 PE3</b>	6.0	6.0	66	20	29	36	0.9	●
<b>061-024-08 PE3</b>	6.1	8.0	79	24	35	36	1.0	●
<b>062-024-08 PE3</b>	6.2	8.0	79	24	35	36	1.0	●
<b>063-024-08 PE3</b>	6.3	8.0	79	24	35	36	1.0	●
<b>064-024-08 PE3</b>	6.4	8.0	79	24	35	36	1.0	●

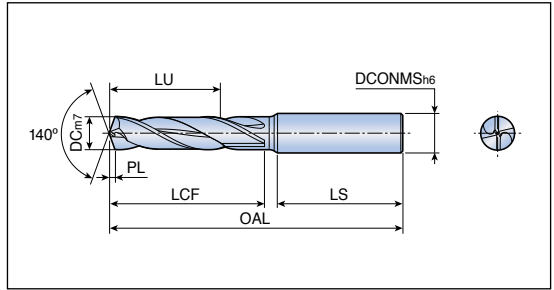


●: Standard items

## Solid carbide drills without oil holes



• Drilling depth: 3xdiameter



Designation	Dimension (mm)							Grade
	DC	DCONMS	OAL	LU	LCF	LS	PL	TT9030
<b>NHD 065-024-08 PE3</b>	6.5	8.0	79	24	35	36	1.0	●
<b>066-024-08 PE3</b>	6.6	8.0	79	24	35	36	1.0	●
<b>067-024-08 PE3</b>	6.7	8.0	79	24	35	36	1.1	●
<b>068-024-08 PE3</b>	6.8	8.0	79	24	35	36	1.1	●
<b>069-024-08 PE3</b>	6.9	8.0	79	24	35	36	1.1	●
<b>070-024-08 PE3</b>	7.0	8.0	79	24	35	36	1.1	●
<b>071-029-08 PE3</b>	7.1	8.0	79	29	42	36	1.1	●
<b>072-029-08 PE3</b>	7.2	8.0	79	29	42	36	1.1	●
<b>073-029-08 PE3</b>	7.3	8.0	79	29	42	36	1.1	●
<b>074-029-08 PE3</b>	7.4	8.0	79	29	42	36	1.2	●
<b>075-029-08 PE3</b>	7.5	8.0	79	29	42	36	1.2	●
<b>076-029-08 PE3</b>	7.6	8.0	79	29	42	36	1.2	●
<b>077-029-08 PE3</b>	7.7	8.0	79	29	42	36	1.2	●
<b>078-029-08 PE3</b>	7.8	8.0	79	29	42	36	1.2	●
<b>079-029-08 PE3</b>	7.9	8.0	79	29	42	36	1.3	●
<b>080-029-08 PE3</b>	8.0	8.0	79	29	42	36	1.3	●
<b>081-035-10 PE3</b>	8.1	10.0	89	35	48	40	1.3	●
<b>082-035-10 PE3</b>	8.2	10.0	89	35	48	40	1.3	●
<b>083-035-10 PE3</b>	8.3	10.0	89	35	48	40	1.3	●
<b>084-035-10 PE3</b>	8.4	10.0	89	35	48	40	1.3	●
<b>085-035-10 PE3</b>	8.5	10.0	89	35	48	40	1.3	●
<b>086-035-10 PE3</b>	8.6	10.0	89	35	48	40	1.4	●
<b>087-035-10 PE3</b>	8.7	10.0	89	35	48	40	1.4	●
<b>088-035-10 PE3</b>	8.8	10.0	89	35	48	40	1.4	●
<b>089-035-10 PE3</b>	8.9	10.0	89	35	48	40	1.4	●
<b>090-035-10 PE3</b>	9.0	10.0	89	35	48	40	1.4	●
<b>091-035-10 PE3</b>	9.1	10.0	89	35	48	40	1.4	●
<b>092-035-10 PE3</b>	9.2	10.0	89	35	48	40	1.4	●
<b>093-035-10 PE3</b>	9.3	10.0	89	35	48	40	1.5	●
<b>094-035-10 PE3</b>	9.4	10.0	89	35	48	40	1.5	●
<b>095-035-10 PE3</b>	9.5	10.0	89	35	48	40	1.5	●
<b>096-035-10 PE3</b>	9.6	10.0	89	35	48	40	1.5	●
<b>097-035-10 PE3</b>	9.7	10.0	89	35	48	40	1.5	●
<b>098-035-10 PE3</b>	9.8	10.0	89	35	48	40	1.6	●
<b>099-035-10 PE3</b>	9.9	10.0	89	35	48	40	1.6	●

●: Standard items

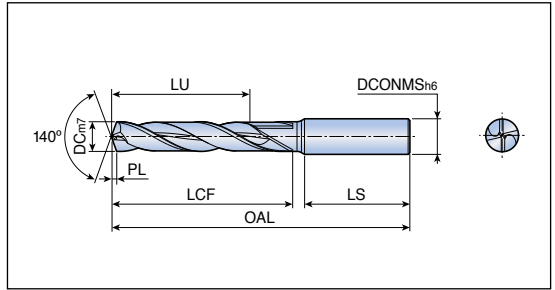




## Solid carbide drills without oil holes



• Drilling depth: 4-5x diameter



Designation	Dimension (mm)							Grade
	DC	DCONMS	OAL	LU	LCF	LS	PL	TT9030
<b>NHD 030-023-06 PE5</b>	3.0	6.0	66	23	29	34	0.5	●
<b>031-023-06 PE5</b>	3.1	6.0	66	23	29	34	0.5	●
<b>032-023-06 PE5</b>	3.2	6.0	66	23	29	34	0.5	●
<b>033-023-06 PE5</b>	3.3	6.0	66	23	29	34	0.5	●
<b>034-023-06 PE5</b>	3.4	6.0	66	23	29	34	0.5	●
<b>035-023-06 PE5</b>	3.5	6.0	66	23	29	34	0.6	●
<b>036-023-06 PE5</b>	3.6	6.0	66	23	29	34	0.6	●
<b>037-023-06 PE5</b>	3.7	6.0	66	23	29	34	0.6	●
<b>038-029-06 PE5</b>	3.8	6.0	74	29	37	35	0.6	●
<b>039-029-06 PE5</b>	3.9	6.0	74	29	37	35	0.6	●
<b>040-029-06 PE5</b>	4.0	6.0	74	29	37	35	0.6	●
<b>041-029-06 PE5</b>	4.1	6.0	74	29	37	35	0.7	●
<b>042-029-06 PE5</b>	4.2	6.0	74	29	37	35	0.7	●
<b>043-029-06 PE5</b>	4.3	6.0	74	29	37	35	0.7	●
<b>044-029-06 PE5</b>	4.4	6.0	74	29	37	35	0.7	●
<b>045-029-06 PE5</b>	4.5	6.0	74	29	37	35	0.7	●
<b>046-029-06 PE5</b>	4.6	6.0	74	29	37	35	0.7	●
<b>047-029-06 PE5</b>	4.7	6.0	74	29	37	35	0.8	●
<b>048-035-06 PE5</b>	4.8	6.0	82	35	45	36	0.8	●
<b>049-035-06 PE5</b>	4.9	6.0	82	35	45	36	0.8	●
<b>050-035-06 PE5</b>	5.0	6.0	82	35	45	36	0.8	●
<b>051-035-06 PE5</b>	5.1	6.0	82	35	45	36	0.8	●
<b>052-035-06 PE5</b>	5.2	6.0	82	35	45	36	0.8	●
<b>053-035-06 PE5</b>	5.3	6.0	82	35	45	36	0.8	●
<b>054-035-06 PE5</b>	5.4	6.0	82	35	45	36	0.8	●
<b>055-035-06 PE5</b>	5.5	6.0	82	35	45	36	0.9	●
<b>056-035-06 PE5</b>	5.6	6.0	82	35	45	36	0.9	●
<b>057-035-06 PE5</b>	5.7	6.0	82	35	45	36	0.9	●
<b>058-035-06 PE5</b>	5.8	6.0	82	35	45	36	0.9	●
<b>059-035-06 PE5</b>	5.9	6.0	82	35	45	36	0.9	●
<b>060-035-06 PE5</b>	6.0	6.0	82	35	45	36	0.9	●
<b>061-043-08 PE5</b>	6.1	8.0	91	43	54	36	1.0	●
<b>062-043-08 PE5</b>	6.2	8.0	91	43	54	36	1.0	●
<b>063-043-08 PE5</b>	6.3	8.0	91	43	54	36	1.0	●
<b>064-043-08 PE5</b>	6.4	8.0	91	43	54	36	1.0	●

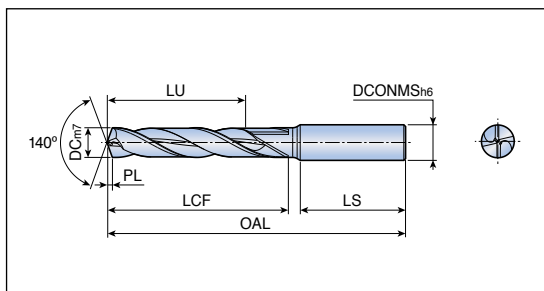
●: Standard items



## Solid carbide drills without oil holes



- Drilling depth: 4-5xdiameter



Designation	Dimension (mm)							Grade TT9030
	DC	DCONMS	OAL	LU	LCF	LS	PL	
<b>NHD 065-043-08 PE5</b>	6.5	8.0	91	43	54	36	1.0	●
<b>066-043-08 PE5</b>	6.6	8.0	91	43	54	36	1.0	●
<b>067-043-08 PE5</b>	6.7	8.0	91	43	54	36	1.1	●
<b>068-043-08 PE5</b>	6.8	8.0	91	43	54	36	1.1	●
<b>069-043-08 PE5</b>	6.9	8.0	91	43	54	36	1.1	●
<b>070-043-08 PE5</b>	7.0	8.0	91	43	54	36	1.1	●
<b>071-043-08 PE5</b>	7.1	8.0	91	43	54	36	1.1	●
<b>072-043-08 PE5</b>	7.2	8.0	91	43	54	36	1.1	●
<b>073-043-08 PE5</b>	7.3	8.0	91	43	54	36	1.1	●
<b>074-043-08 PE5</b>	7.4	8.0	91	43	54	36	1.2	●
<b>075-043-08 PE5</b>	7.5	8.0	91	43	54	36	1.2	●
<b>076-043-08 PE5</b>	7.6	8.0	91	43	54	36	1.2	●
<b>077-043-08 PE5</b>	7.7	8.0	91	43	54	36	1.2	●
<b>078-043-08 PE5</b>	7.8	8.0	91	43	54	36	1.2	●
<b>079-043-08 PE5</b>	7.9	8.0	91	43	54	36	1.3	●
<b>080-043-08 PE5</b>	8.0	8.0	91	43	54	36	1.3	●
<b>081-049-10 PE5</b>	8.1	10.0	103	49	62	40	1.3	●
<b>082-049-10 PE5</b>	8.2	10.0	103	49	62	40	1.3	●
<b>083-049-10 PE5</b>	8.3	10.0	103	49	62	40	1.3	●
<b>084-049-10 PE5</b>	8.4	10.0	103	49	62	40	1.3	●
<b>085-049-10 PE5</b>	8.5	10.0	103	49	62	40	1.3	●
<b>086-049-10 PE5</b>	8.6	10.0	103	49	62	40	1.4	●
<b>087-049-10 PE5</b>	8.7	10.0	103	49	62	40	1.4	●
<b>088-049-10 PE5</b>	8.8	10.0	103	49	62	40	1.4	●
<b>089-049-10 PE5</b>	8.9	10.0	103	49	62	40	1.4	●
<b>090-049-10 PE5</b>	9.0	10.0	103	49	62	40	1.4	●
<b>091-049-10 PE5</b>	9.1	10.0	103	49	62	40	1.4	●
<b>092-049-10 PE5</b>	9.2	10.0	103	49	62	40	1.4	●
<b>093-049-10 PE5</b>	9.3	10.0	103	49	62	40	1.5	●
<b>094-049-10 PE5</b>	9.4	10.0	103	49	62	40	1.5	●
<b>095-049-10 PE5</b>	9.5	10.0	103	49	62	40	1.5	●
<b>096-049-10 PE5</b>	9.6	10.0	103	49	62	40	1.5	●
<b>097-049-10 PE5</b>	9.7	10.0	103	49	62	40	1.5	●
<b>098-049-10 PE5</b>	9.8	10.0	103	49	62	40	1.6	●
<b>099-049-10 PE5</b>	9.9	10.0	103	49	62	40	1.6	●



- : Standard items

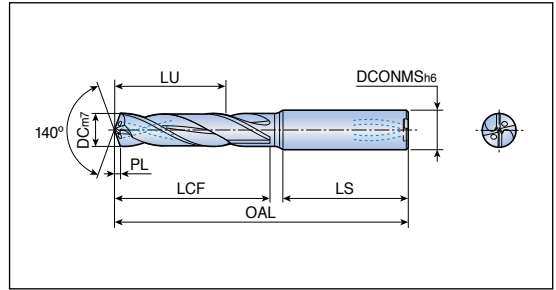




## Solid carbide drills with oil holes



- Drilling depth: 3xdiameter



Designation	Dimension (mm)							Grade
	DC	DCONMS	OAL	LU	LCF	LS	PL	TT9030
<b>NHD 030-014-06 PI3</b>	3.0	6.0	62	14	21	34	0.5	●
<b>031-014-06 PI3</b>	3.1	6.0	62	14	21	34	0.5	●
<b>032-014-06 PI3</b>	3.2	6.0	62	14	21	34	0.5	●
<b>033-014-06 PI3</b>	3.3	6.0	62	14	21	34	0.5	●
<b>034-014-06 PI3</b>	3.4	6.0	62	14	21	34	0.5	●
<b>035-014-06 PI3</b>	3.5	6.0	62	14	21	34	0.6	●
<b>036-014-06 PI3</b>	3.6	6.0	62	14	21	34	0.6	●
<b>037-014-06 PI3</b>	3.7	6.0	62	14	21	34	0.6	●
<b>038-017-06 PI3</b>	3.8	6.0	66	17	25	35	0.6	●
<b>039-017-06 PI3</b>	3.9	6.0	66	17	25	35	0.6	●
<b>040-017-06 PI3</b>	4.0	6.0	66	17	25	35	0.6	●
<b>041-017-06 PI3</b>	4.1	6.0	66	17	25	35	0.7	●
<b>042-017-06 PI3</b>	4.2	6.0	66	17	25	35	0.7	●
<b>043-017-06 PI3</b>	4.3	6.0	66	17	25	35	0.7	●
<b>044-017-06 PI3</b>	4.4	6.0	66	17	25	35	0.7	●
<b>045-017-06 PI3</b>	4.5	6.0	66	17	25	35	0.7	●
<b>046-017-06 PI3</b>	4.6	6.0	66	17	25	35	0.7	●
<b>047-017-06 PI3</b>	4.7	6.0	66	17	25	35	0.8	●
<b>048-020-06 PI3</b>	4.8	6.0	66	20	29	36	0.8	●
<b>049-020-06 PI3</b>	4.9	6.0	66	20	29	36	0.8	●
<b>050-020-06 PI3</b>	5.0	6.0	66	20	29	36	0.8	●
<b>051-020-06 PI3</b>	5.1	6.0	66	20	29	36	0.8	●
<b>052-020-06 PI3</b>	5.2	6.0	66	20	29	36	0.8	●
<b>053-020-06 PI3</b>	5.3	6.0	66	20	29	36	0.8	●
<b>054-020-06 PI3</b>	5.4	6.0	66	20	29	36	0.8	●
<b>055-020-06 PI3</b>	5.5	6.0	66	20	29	36	0.9	●
<b>056-020-06 PI3</b>	5.6	6.0	66	20	29	36	0.9	●
<b>057-020-06 PI3</b>	5.7	6.0	66	20	29	36	0.9	●
<b>058-020-06 PI3</b>	5.8	6.0	66	20	29	36	0.9	●
<b>059-020-06 PI3</b>	5.9	6.0	66	20	29	36	0.9	●
<b>060-020-06 PI3</b>	6.0	6.0	66	20	29	36	0.9	●
<b>061-024-08 PI3</b>	6.1	8.0	79	24	35	36	1.0	●
<b>062-024-08 PI3</b>	6.2	8.0	79	24	35	36	1.0	●
<b>063-024-08 PI3</b>	6.3	8.0	79	24	35	36	1.0	●
<b>064-024-08 PI3</b>	6.4	8.0	79	24	35	36	1.0	●

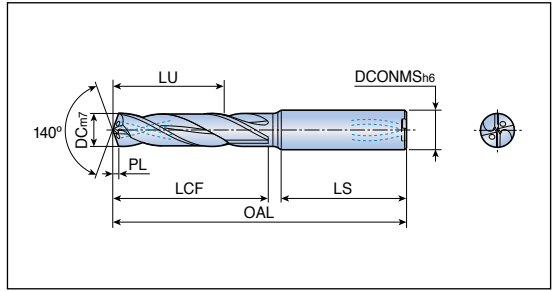
●: Standard items



## Solid carbide drills with oil holes



- Drilling depth: 3x diameter



Designation	Dimension (mm)							Grade
	DC	DCONMS	OAL	LU	LCF	LS	PL	TT9030
<b>NHD 065-024-08 PI3</b>	6.5	8.0	79	24	35	36	1.0	●
<b>066-024-08 PI3</b>	6.6	8.0	79	24	35	36	1.0	●
<b>067-024-08 PI3</b>	6.7	8.0	79	24	35	36	1.1	●
<b>068-024-08 PI3</b>	6.8	8.0	79	24	35	36	1.1	●
<b>069-024-08 PI3</b>	6.9	8.0	79	24	35	36	1.1	●
<b>070-024-08 PI3</b>	7.0	8.0	79	24	35	36	1.1	●
<b>071-029-08 PI3</b>	7.1	8.0	79	29	42	36	1.1	●
<b>072-029-08 PI3</b>	7.2	8.0	79	29	42	36	1.1	●
<b>073-029-08 PI3</b>	7.3	8.0	79	29	42	36	1.1	●
<b>074-029-08 PI3</b>	7.4	8.0	79	29	42	36	1.2	●
<b>075-029-08 PI3</b>	7.5	8.0	79	29	42	36	1.2	●
<b>076-029-08 PI3</b>	7.6	8.0	79	29	42	36	1.2	●
<b>077-029-08 PI3</b>	7.7	8.0	79	29	42	36	1.2	●
<b>078-029-08 PI3</b>	7.8	8.0	79	29	42	36	1.2	●
<b>079-029-08 PI3</b>	7.9	8.0	79	29	42	36	1.3	●
<b>080-029-08 PI3</b>	8.0	8.0	79	29	42	36	1.3	●
<b>081-035-10 PI3</b>	8.1	10.0	89	35	48	40	1.3	●
<b>082-035-10 PI3</b>	8.2	10.0	89	35	48	40	1.3	●
<b>083-035-10 PI3</b>	8.3	10.0	89	35	48	40	1.3	●
<b>084-035-10 PI3</b>	8.4	10.0	89	35	48	40	1.3	●
<b>085-035-10 PI3</b>	8.5	10.0	89	35	48	40	1.3	●
<b>086-035-10 PI3</b>	8.6	10.0	89	35	48	40	1.4	●
<b>087-035-10 PI3</b>	8.7	10.0	89	35	48	40	1.4	●
<b>088-035-10 PI3</b>	8.8	10.0	89	35	48	40	1.4	●
<b>089-035-10 PI3</b>	8.9	10.0	89	35	48	40	1.4	●
<b>090-035-10 PI3</b>	9.0	10.0	89	35	48	40	1.4	●
<b>091-035-10 PI3</b>	9.1	10.0	89	35	48	40	1.4	●
<b>092-035-10 PI3</b>	9.2	10.0	89	35	48	40	1.4	●
<b>093-035-10 PI3</b>	9.3	10.0	89	35	48	40	1.5	●
<b>094-035-10 PI3</b>	9.4	10.0	89	35	48	40	1.5	●
<b>095-035-10 PI3</b>	9.5	10.0	89	35	48	40	1.5	●
<b>096-035-10 PI3</b>	9.6	10.0	89	35	48	40	1.5	●
<b>097-035-10 PI3</b>	9.7	10.0	89	35	48	40	1.5	●
<b>098-035-10 PI3</b>	9.8	10.0	89	35	48	40	1.6	●
<b>099-035-10 PI3</b>	9.9	10.0	89	35	48	40	1.6	●

●: Standard items

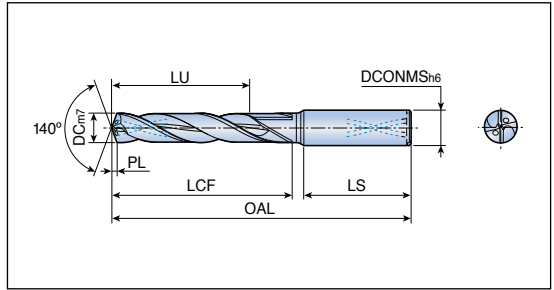




## Solid carbide drills with oil holes



• Drilling depth: 4-5x diameter



Designation	Dimension (mm)							Grade
	DC	DCONMS	OAL	LU	LCF	LS	PL	TT9030
<b>NHD 030-023-06 PI5</b>	3.0	6.0	66	23	29	34	0.5	●
<b>031-023-06 PI5</b>	3.1	6.0	66	23	29	34	0.5	●
<b>032-023-06 PI5</b>	3.2	6.0	66	23	29	34	0.5	●
<b>033-023-06 PI5</b>	3.3	6.0	66	23	29	34	0.5	●
<b>034-023-06 PI5</b>	3.4	6.0	66	23	29	34	0.5	●
<b>035-023-06 PI5</b>	3.5	6.0	66	23	29	34	0.6	●
<b>036-023-06 PI5</b>	3.6	6.0	66	23	29	34	0.6	●
<b>037-023-06 PI5</b>	3.7	6.0	66	23	29	34	0.6	●
<b>038-029-06 PI5</b>	3.8	6.0	74	29	37	35	0.6	●
<b>039-029-06 PI5</b>	3.9	6.0	74	29	37	35	0.6	●
<b>040-029-06 PI5</b>	4.0	6.0	74	29	37	35	0.6	●
<b>041-029-06 PI5</b>	4.1	6.0	74	29	37	35	0.7	●
<b>042-029-06 PI5</b>	4.2	6.0	74	29	37	35	0.7	●
<b>043-029-06 PI5</b>	4.3	6.0	74	29	37	35	0.7	●
<b>044-029-06 PI5</b>	4.4	6.0	74	29	37	35	0.7	●
<b>045-029-06 PI5</b>	4.5	6.0	74	29	37	35	0.7	●
<b>046-029-06 PI5</b>	4.6	6.0	74	29	37	35	0.7	●
<b>047-029-06 PI5</b>	4.7	6.0	74	29	37	35	0.8	●
<b>048-035-06 PI5</b>	4.8	6.0	82	35	45	36	0.8	●
<b>049-035-06 PI5</b>	4.9	6.0	82	35	45	36	0.8	●
<b>050-035-06 PI5</b>	5.0	6.0	82	35	45	36	0.8	●
<b>051-035-06 PI5</b>	5.1	6.0	82	35	45	36	0.8	●
<b>052-035-06 PI5</b>	5.2	6.0	82	35	45	36	0.8	●
<b>053-035-06 PI5</b>	5.3	6.0	82	35	45	36	0.8	●
<b>054-035-06 PI5</b>	5.4	6.0	82	35	45	36	0.8	●
<b>055-035-06 PI5</b>	5.5	6.0	82	35	45	36	0.9	●
<b>056-035-06 PI5</b>	5.6	6.0	82	35	45	36	0.9	●
<b>057-035-06 PI5</b>	5.7	6.0	82	35	45	36	0.9	●
<b>058-035-06 PI5</b>	5.8	6.0	82	35	45	36	0.9	●
<b>059-035-06 PI5</b>	5.9	6.0	82	35	45	36	0.9	●
<b>060-035-06 PI5</b>	6.0	6.0	82	35	45	36	0.9	●
<b>061-043-08 PI5</b>	6.1	8.0	91	43	54	36	1.0	●
<b>062-043-08 PI5</b>	6.2	8.0	91	43	54	36	1.0	●
<b>063-043-08 PI5</b>	6.3	8.0	91	43	54	36	1.0	●
<b>064-043-08 PI5</b>	6.4	8.0	91	43	54	36	1.0	●

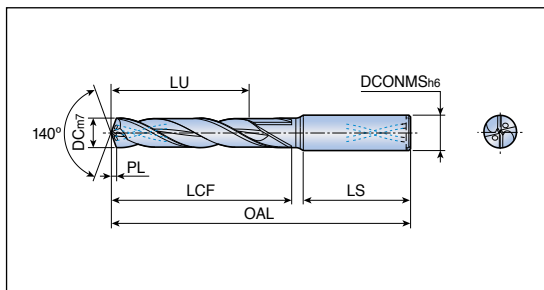
●: Standard items



## Solid carbide drills with oil holes



- Drilling depth: 4-5xdiameter



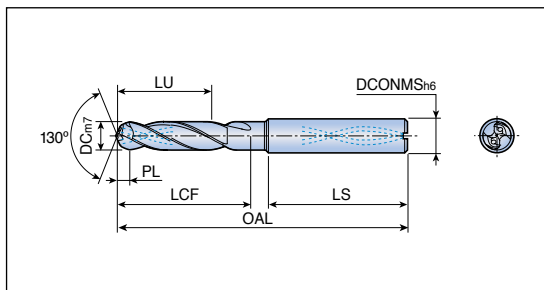
Designation	Dimension (mm)							Grade TT9030
	DC	DCONMS	OAL	LU	LCF	LS	PL	
<b>NHD 065-043-08 PI5</b>	6.5	8.0	91	43	54	36	1.0	●
<b>066-043-08 PI5</b>	6.6	8.0	91	43	54	36	1.0	●
<b>067-043-08 PI5</b>	6.7	8.0	91	43	54	36	1.1	●
<b>068-043-08 PI5</b>	6.8	8.0	91	43	54	36	1.1	●
<b>069-043-08 PI5</b>	6.9	8.0	91	43	54	36	1.1	●
<b>070-043-08 PI5</b>	7.0	8.0	91	43	54	36	1.1	●
<b>071-043-08 PI5</b>	7.1	8.0	91	43	54	36	1.1	●
<b>072-043-08 PI5</b>	7.2	8.0	91	43	54	36	1.1	●
<b>073-043-08 PI5</b>	7.3	8.0	91	43	54	36	1.1	●
<b>074-043-08 PI5</b>	7.4	8.0	91	43	54	36	1.2	●
<b>075-043-08 PI5</b>	7.5	8.0	91	43	54	36	1.2	●
<b>076-043-08 PI5</b>	7.6	8.0	91	43	54	36	1.2	●
<b>077-043-08 PI5</b>	7.7	8.0	91	43	54	36	1.2	●
<b>078-043-08 PI5</b>	7.8	8.0	91	43	54	36	1.2	●
<b>079-043-08 PI5</b>	7.9	8.0	91	43	54	36	1.3	●
<b>080-043-08 PI5</b>	8.0	8.0	91	43	54	36	1.3	●
<b>081-049-10 PI5</b>	8.1	10.0	103	49	62	40	1.3	●
<b>082-049-10 PI5</b>	8.2	10.0	103	49	62	40	1.3	●
<b>083-049-10 PI5</b>	8.3	10.0	103	49	62	40	1.3	●
<b>084-049-10 PI5</b>	8.4	10.0	103	49	62	40	1.3	●
<b>085-049-10 PI5</b>	8.5	10.0	103	49	62	40	1.3	●
<b>086-049-10 PI5</b>	8.6	10.0	103	49	62	40	1.4	●
<b>087-049-10 PI5</b>	8.7	10.0	103	49	62	40	1.4	●
<b>088-049-10 PI5</b>	8.8	10.0	103	49	62	40	1.4	●
<b>089-049-10 PI5</b>	8.9	10.0	103	49	62	40	1.4	●
<b>090-049-10 PI5</b>	9.0	10.0	103	49	62	40	1.4	●
<b>091-049-10 PI5</b>	9.1	10.0	103	49	62	40	1.4	●
<b>092-049-10 PI5</b>	9.2	10.0	103	49	62	40	1.4	●
<b>093-049-10 PI5</b>	9.3	10.0	103	49	62	40	1.5	●
<b>094-049-10 PI5</b>	9.4	10.0	103	49	62	40	1.5	●
<b>095-049-10 PI5</b>	9.5	10.0	103	49	62	40	1.5	●
<b>096-049-10 PI5</b>	9.6	10.0	103	49	62	40	1.5	●
<b>097-049-10 PI5</b>	9.7	10.0	103	49	62	40	1.5	●
<b>098-049-10 PI5</b>	9.8	10.0	103	49	62	40	1.6	●
<b>099-049-10 PI5</b>	9.9	10.0	103	49	62	40	1.6	●

●: Standard items





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



- Drilling depth: 3xdiameter



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



●: Standard items







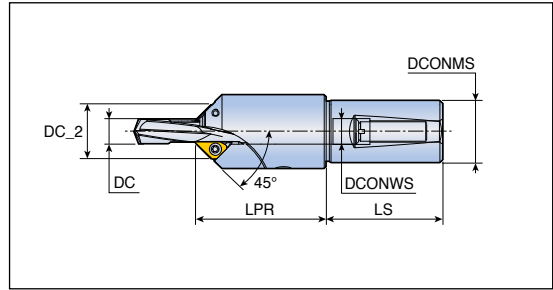






# T-CHAMFER...T1

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	D178
<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	D178
<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





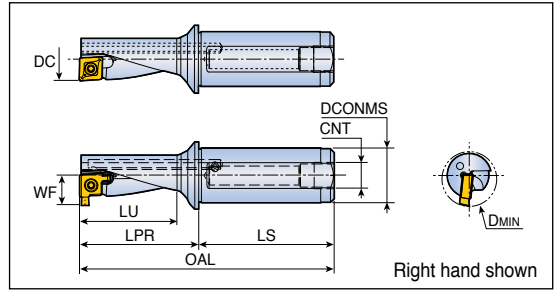
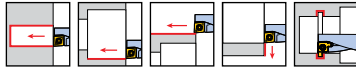
# TCAP...-2.25DN



## Multi-function toolholders - 2.25xD



- Internal coolant



Designation	Dimension (mm)								Insert	
	DC	DCONMS	WF	LU	LPR	LS	DMIN	CNT	For drilling, boring, turning	For grooving
<b>TCAP 08R/L-2.25DN</b>	8	12	-	18.0	22.5	42	-	G 1/16	XCM(G)T 04...TC/TA	-
<b>10R/L-2.25DN-GV</b>	10	12	7.1	22.5	27.5	42	12.0	G 1/16	XCM(G)T 05...TC/TA	XCMT 05R...GV
<b>12R/L-2.25DN-GV</b>	12	16	8.5	27.0	33.0	45	14.5	G 1/8	XCM(G)T 06...TC/TA	XCMT 06R...GV
<b>14R/L-2.25DN-GV</b>	14	16	9.5	31.5	38.5	45	16.5	G 1/8	XCM(G)T 07...TC/TA	XCMT 07R...GV
<b>16R/L-2.25DN-GV</b>	16	20	11.1	36.0	44.0	50	19.0	G 1/8	XCM(G)T 08...TC/TA	XCMT 08R...GV
<b>20R/L-2.25DN-GV</b>	20	25	13.2	45.0	55.0	56	23.5	G 1/8	XCM(G)T 10...TC/TA	XCMT 10R...GV
<b>25R/L-2.25DN-GV</b>	25	32	16.5	56.2	69.0	61	29.0	G 1/8	XCM(G)T 13...TC/TA	XCMT 13R...GV
<b>32R/L-2.25DN-GV</b>	32	40	20.5	72.0	86.0	74	36.5	G 1/8	XCM(G)T 17...TC/TA	XCMT 17R...GV
									D179-180	D179

- $OAL = LPR + LS$
- Grooving insert is available for right handed type

## Spare parts

Designation	Screw	Wrench	
<b>TCAP 08</b>	TS 18034I/HG-P	T 6P	
<b>TCAP 10</b>	TS 20038I/HG-P	T 6P	
<b>TCAP 12</b>	TS 22052I/HG-P	T 7P	
<b>TCAP 14</b>	TS 25064I/HG-P	T 8P	
<b>TCAP 16</b>	TS 30100I/HG-P		TD 9P
<b>TCAP 20</b>	TS 35088I/HG-P		TD10P
<b>TCAP 25</b>	TS 45A100I/HG		TD 20
<b>TCAP 32</b>	TS 45A100I/HG		TD 20





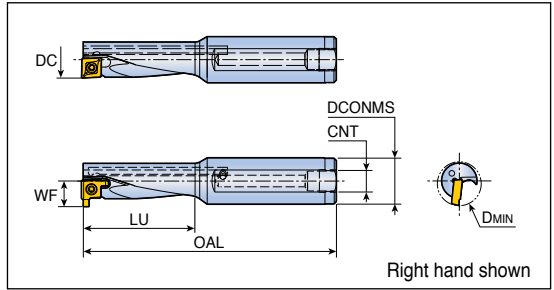
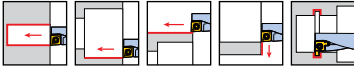
# TCAP...-3.0DN



## Multi-function toolholders - 3.0xD



- Internal coolant



Designation	Dimension (mm)							Insert	
	DC	DCONMS	WF	LU	OAL	DMIN	CNT	For drilling, boring, turning	For grooving
<b>TCAP 08R/L-3.0DN12</b>	8	12	-	24	80	-	G 1/16	XCM(G)T 04...TC/TA	-
<b>10R/L-3.0DN-GV</b>	10	12	7.1	30	85	12.0	G 1/16	XCM(G)T 05...TC/TA	XCMT 05R...GV
<b>12R/L-3.0DN-GV</b>	12	16	8.5	36	95	14.5	G 1/8	XCM(G)T 06...TC/TA	XCMT 06R...GV
<b>14R/L-3.0DN-GV</b>	14	16	9.5	42	100	16.5	G 1/8	XCM(G)T 07...TC/TA	XCMT 07R...GV
<b>16R/L-3.0DN-GV</b>	16	20	11.1	48	110	19.0	G 1/8	XCM(G)T 08...TC/TA	XCMT 08R...GV
<b>20R/L-3.0DN-GV</b>	20	25	13.2	60	130	23.5	G 1/8	XCM(G)T 10...TC/TA	XCMT 10R...GV
<b>25R/L-3.0DN-GV</b>	25	32	16.5	75	150	29.0	G 1/8	XCM(G)T 13...TC/TA	XCMT 13R...GV
<b>32R/L-3.0DN-GV</b>	32	40	20.5	96	185	36.5	G 1/8	XCM(G)T 17...TC/TA	XCMT 17R...GV
								D179-180	D179

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

## Spare parts

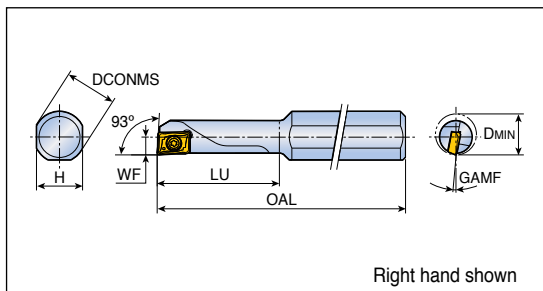
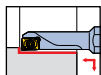
Designation	Screw	Wrench	
<b>TCAP 08</b>	TS 18034I/HG-P	T 6P	
<b>TCAP 10</b>	TS 20038I/HG-P	T 6P	
<b>TCAP 12</b>	TS 22052I/HG-P	T 7P	
<b>TCAP 14</b>	TS 25064I/HG-P	T 8P	
<b>TCAP 16</b>	TS 30100I/HG-P		TD 9P
<b>TCAP 20</b>	TS 35088I/HG-P		TD10P
<b>TCAP 25</b>	TS 45A100I/HG		TD 20
<b>TCAP 32</b>	TS 45A100I/HG		TD 20



## Boring bars with TOP-CAP inserts



- For boring
- External coolant



Designation	Dimension (mm)							Insert
	DCONMS	H	OAL	LU	WF	D <sub>MIN</sub>	GAMF	
<b>S10H SXUCR/L 04-06</b> <sup>(1)</sup>	10	9	100	21	3.0	6	9°	XCMT 04...R/L TC
<b>S10J SXUCR/L 04-07</b> <sup>(1)</sup>	10	9	110	24.5	3.5	7	5°	D180
<b>S10J SXUCR/L 04-08</b> <sup>(1)</sup>	10	9	110	28	4.0	8	2°	
<b>S10K SXUCR/L 05-10</b>	10	9	125	35	5.0	10	2°	XCMT 05..TC D180

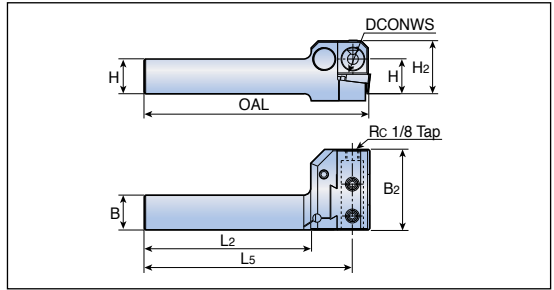
<sup>(1)</sup> Right hand Insert should be used in right hand boring bar

## 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		



## Clamping units (Centre alignment system)

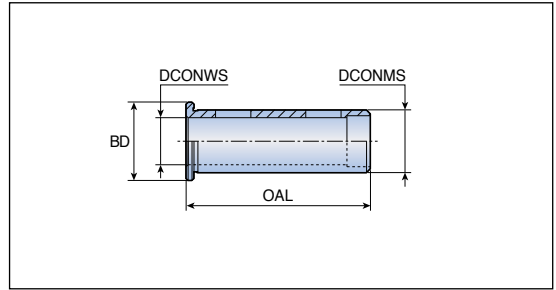


Designation	Dimension (mm)								Toolholders
	H	B	DCONWS	H <sub>2</sub>	B <sub>2</sub>	L <sub>2</sub>	L <sub>5</sub>	OAL	
<b>TGHR 2020-D16</b>	20	20	16	38	58	120	150	161	TCAP 08R/L... TCAP 10R/L... TCAP 12R/L... TCAP 14R/L...
<b>2525-D16</b>	25	25	16	38	58	120	150	161	
<b>2525-D25</b>	25	25	25	56	75	120	157	174	TCAP 16R/L... TCAP 20R/L...

## Spare parts

Designation	Block	Wedge	Snap ring	Wedge screw	Mounting pin	Mounting pin screw	Mounting screw		Lock screw	Wrench
<b>TGHR 2020-D16</b> <b>TGHR 2525-D16</b>	TGHR-D16-BL	TGHR-WD	WSR 4	TGH-WS	TGH-MPI	TGH-MPS	SSxM8 1.25X10-C	SSxM8 x1.25x8	-	L-W 4
<b>TGHR 2525-D25</b>	TGHR-D25-BL	TGHR-WD-25	WSR 4	TGH-WS-25	TGH-MPI-25	TGH-MPS-25	SS M10 x1.5x12-C	SS M101.5x10	SH M6x1x20	L-W 4 L-W 5

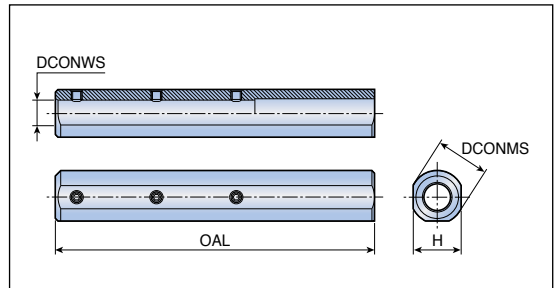
## Sleeves for clamping unit



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



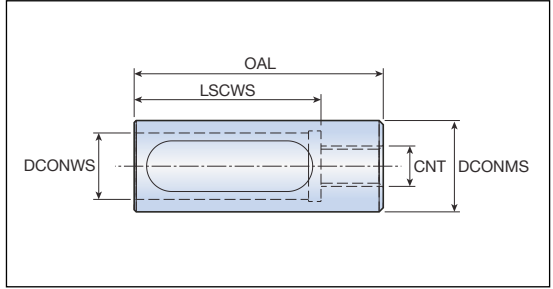
Designation	Dimension (mm)			
	DCONMS	DCONWS	OAL	H
<b>TBSL 20-10-120</b>	20	10	120	18

## Spare parts

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

# TSL-NC

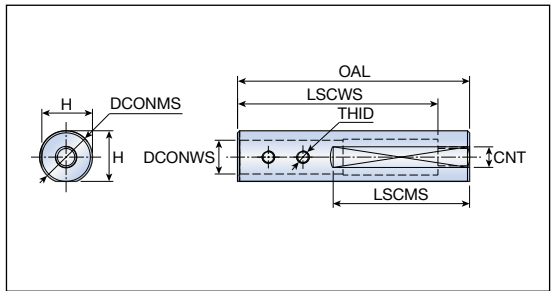
Drill sleeves for Swiss type automatic lathes (Fixed type, internal coolant)



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

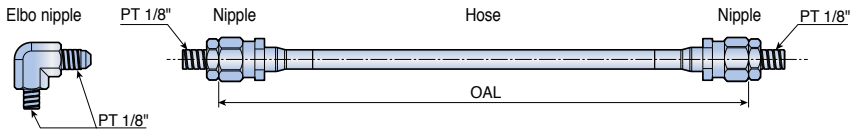
Drill sleeves for Swiss type automatic lathes (Adjustable type, internal coolant)



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		

# Deep Drilling Tools



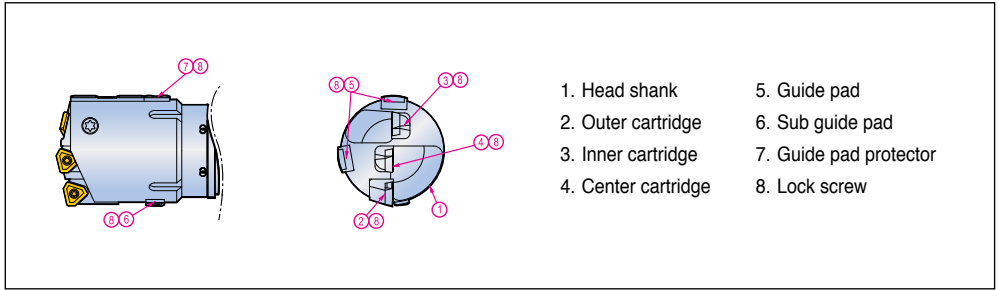








## Assembly of TBTA3 series



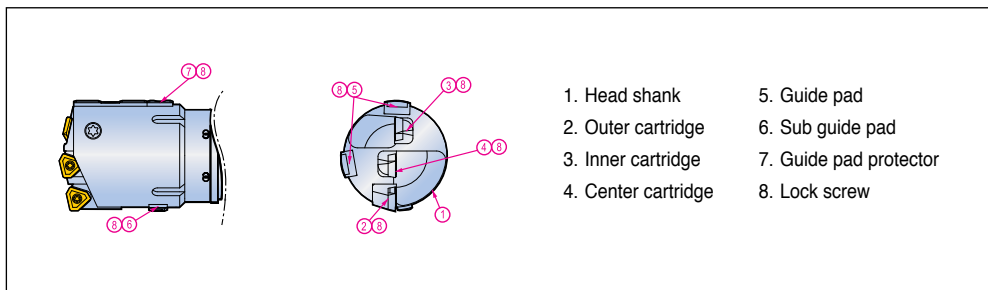
Parts		Diameter (mm)				
		38.00-39.99	40.00-44.99	45.00-47.99	48.00-51.99	52.00-54.99
Cartridge	Outer	PERC 05R	PERC 402-04	PERC 402-04	PERC 402-04	PERC 402-32
	Adjust screw	AS0003-5	AS0004-8	AS0004-8	AS0004-8	AS0005-10
	Wrench	H1.5	H2	H2	H2	H2.5
	Screw	LS1803RH	LS1803.5RH	LS1803.5RH	LS1803.5RH	LS1805RH
	Wrench	H2	H2.5	H2.5	H2.5	H3
	Inner	CENC 05R	CENC 05R	CENC 05R	CENC 402-04	CENC 402-04
	Screw	CSTB3	CSTB3	CSTB3	CSTB3.5	CSTB3.5
	Wrench	T-9D	T-9D	T-9D	T-15D	T-15D
	Center	CENC 05R	CENC 05R	CENC 402-04	CENC 402-04	CENC 402-04
	Screw	CSTB3	CSTB3	CSTB3.5	CSTB3.5	CSTB3.5
Insert	Outer	NPMX 080308R-G	TPMX 140308R-G	TPMX 140308R-G	TPMX 140308R-G	TPMX 170408R-G
	Screw	CSTB2.2	CSTB2.5	CSTB2.5	CSTB2.5	CSTB3.5D
	Wrench	T-7D	T-8D	T-8D	T-8D	T-9D
	Inner	NPMX 080308R-G	NPMX 080308R-G	NPMX 080308R-G	TPMX 140308R-G	TPMX 140308R-G
	Screw	CSTB2.2	CSTB2.2	CSTB2.2	CSTB2.5	CSTB2.5
	Wrench	T-7D	T-7D	T-7D	T-8D	T-8D
	Center	NPMX 080308R-G	NPMX 080308R-G	TPMX 140308R-G	TPMX 140308R-G	TPMX 140308R-G
	Screw	CSTB2.2	CSTB2.2	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T-7D	T-7D	T-8D	T-8D	T-8D
	Pad	Guide pad	PAD-GP08-25-155-DC-SB PAD-GP08-25-155-DC-SC	PAD-GP08-25-155-DC-SB PAD-GP08-25-155-DC-SC	PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC	PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC
Screw		CSTB3S	CSTB3S	CSTB4S	CSTB4S	CSTB4S
Wrench		T-9D	T-9D	T-15D	T-15D	T-15D
Guide pad protector		PAD-P08	PAD-P08	PAD-P10	PAD-P10	PAD-P10
Screw		CSTB3S	CSTB3S	CSTB4S	CSTB4S	CSTB4S
Wrench		T-9D	T-9D	T-15D	T-15D	T-15D
Sub guide pad		PAD-S08	PAD-S08	PAD-S08	PAD-S08	PAD-S08
Screw		CSTB3S	CSTB3S	CSTB3S	CSTB3S	CSTB3S
Wrench		T-9D	T-9D	T-9D	T-9D	T-9D



# TBTA3 Series



## Assembly of TBTA3 series

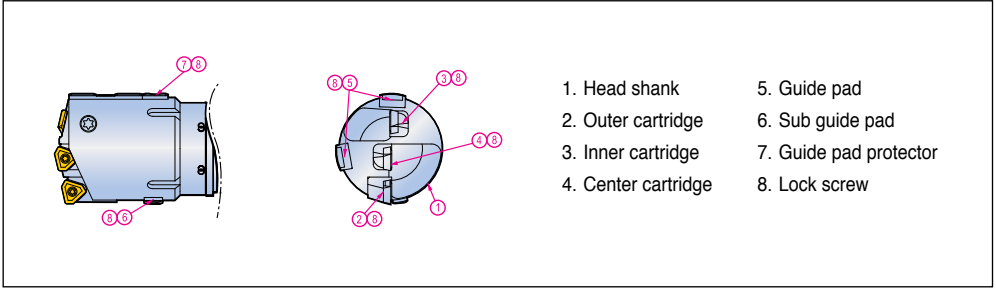


- |                     |                        |
|---------------------|------------------------|
| 1. Head shank       | 5. Guide pad           |
| 2. Outer cartridge  | 6. Sub guide pad       |
| 3. Inner cartridge  | 7. Guide pad protector |
| 4. Center cartridge | 8. Lock screw          |

Parts	Diameter (mm)					
	55.00-57.99	58.00-59.99	60.00-63.99	64.00-67.99	68.00-77.99	
<b>Cartridge</b>	Outer	PERC 402-32	PERC 402-32	PERC 402-32	PERC 402-43	PERC 402-32
	Adjust screw	AS0005-10	AS0005-10	AS0005-10	AS0005-15	AS0005-10
	Wrench	H2.5	H2.5	H2.5	H2.5	H2.5
	Screw	LS1805RH	LS1805RH	LS1805RH	LS1806RH	LS1805RH
	Wrench	H3	H3	H3	H4	H3
	Inner	CENC 402-04	CENC 402-32	CENC 402-32	CENC 402-32	CENC 402-43
	Screw	CSTB3.5	CSTA5	CSTA5	CSTA5	LS1206
	Wrench	T-15D	T-15D	T-15D	T-15D	H3
	Center	CENC 402-32	CENC 402-32	CENC 402-32	CENC 402-32	CENC 402-43
	Screw	CSTA5	CSTA5	CSTA5	CSTA5	LS1206
Wrench	T-15D	T-15D	T-15D	T-15D	H3	
<b>Insert</b>	Outer	TPMX 170408R-G	TPMX 170408R-G	TPMX 170408R-G	TPMX 240512R-G	TPMX 170408R-G
	Screw	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB4M	CSTB3.5D
	Wrench	T-9D	T-9D	T-9D	T-15D	T-9D
	Inner	TPMX 140308R-G	TPMX 170408R-G	TPMX 170408R-G	TPMX 170408R-G	TPMX 240512R-G
	Screw	CSTB2.5	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB4M
	Wrench	T-8D	T-9D	T-9D	T-9D	T-15D
	Center	TPMX 170408R-G	TPMX 170408R-G	TPMX 170408R-G	TPMX 170408R-G	TPMX 240512R-G
Screw	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB3.5D	CSTB4M	
Wrench	T-9D	T-9D	T-9D	T-9D	T-15D	
<b>Pad</b>	Guide pad	PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC	PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC	PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC	PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC	PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC
	Screw	CSTB4S	CSTB4S	CSTA5S	CSTA5S	CSTA5S
	Wrench	T-15D	T-15D	T-15D	T-15D	T-15D
	Guide pad protector	PAD-P10	PAD-P10	PAD-P14	PAD-P14	PAD-P14
	Screw	CSTB4S	CSTB4S	CSTA5S	CSTA5S	CSTA5S
	Wrench	T-15D	T-15D	T-15D	T-15D	T-15D
	Sub guide pad	PAD-S08	PAD-S08	PAD-S08	PAD-S10	PAD-S10
	Screw	CSTB3S	CSTB3S	CSTB3S	CSTB3S	CSTB3S
	Wrench	T-9D	T-9D	T-9D	T-9D	T-9D



## Assembly of TBTA3 series



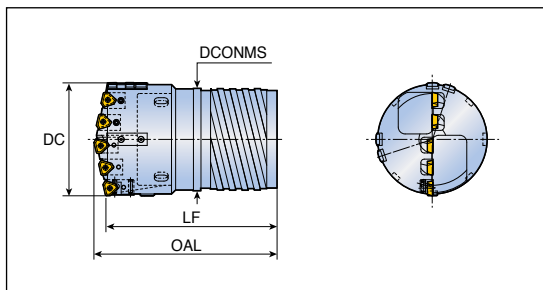
Parts		Diameter (mm)			
		78.00-84.99	85.00-91.99	92.00-98.99	99.00-106.99
Cartridge	Outer	PERC 402-43	PERC 402-63	PERC 402-43	PERC 402-63
	Adjust screw	AS0005-15	AS0006-15	AS0005-15	AS0006-15
	Wrench	H2.5	H3	H2.5	H3
	Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
	Wrench	H4	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206	LS1206
	Wrench	H3	H3	H3	H3
	Center	CENC 402-43	CENC 402-43	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206	LS1206
Insert	Outer	TPMX 240512R-G	TPMX 280716R-G	TPMX 240512R-G	TPMX 280716R-G
	Screw	CSTB4M	CSTB5	CSTB4M	CSTB5
	Wrench	T-15D	T-20D	T-15D	T-20D
	Inner	TPMX 240512R-G	TPMX 240512R-G	TPMX 280716R-G	TPMX 280716R-G
	Screw	CSTB4M	CSTB4M	CSTB5	CSTB5
	Wrench	T-15D	T-15D	T-20D	T-20D
	Center	TPMX 240512R-G	TPMX 240512R-G	TPMX 280716R-G	TPMX 280716R-G
	Screw	CSTB4M	CSTB4M	CSTB5	CSTB5
	Wrench	T-15D	T-15D	T-20D	T-20D
	Pad	Guide pad	PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC	PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC	PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC
Screw		CSTA5S	CSTA5S	CSTA5S	LS1206S
Wrench		T-15D	T-15D	T-15D	H3
Guide pad protector		PAD-P14	PAD-P14	PAD-P14	PAD-P18
Screw		CSTB5S	CSTB5S	CSTA5S	LS1206S
Wrench		T-15D	T-15D	T-15D	H3
Sub guide pad		PAD-S10	PAD-S10	PAD-S10	PAD-S14
Screw		CSTB3S	CSTB3S	CSTB3S	CSTA5S
Wrench		T-9D	T-9D	T-9D	T-15D



# TBTA5...SE4



## Single tube system



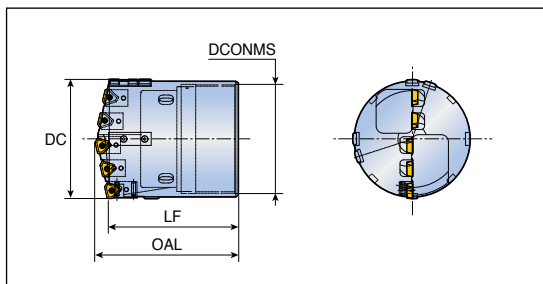
- Outer four start thread

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

# TBTA5...SI1

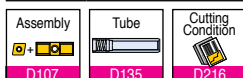


## Single tube system



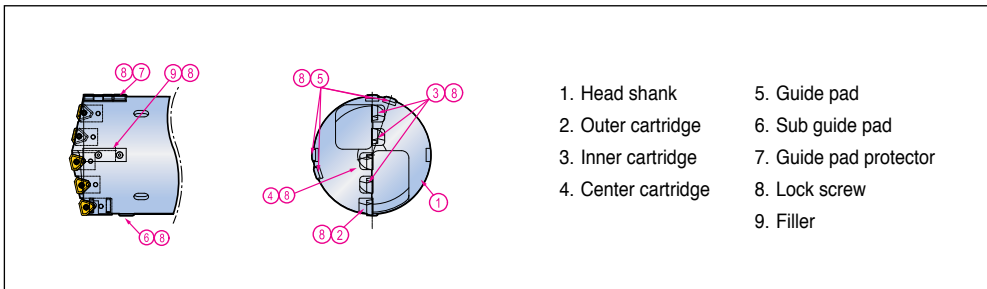
- Inner single start thread

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 of TBTA5 series

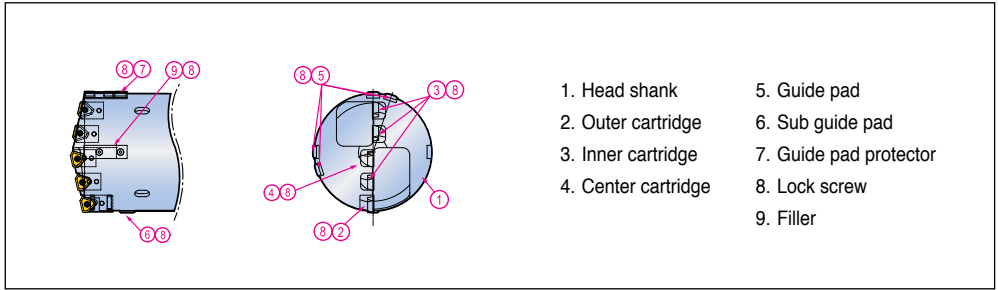


Parts		Diameter (mm)			
		107.00-117.99	118.00-135.99	136.00-144.99	145.00-150.99
Cartridge	Outer	PERC 402-43	PERC 402-43	PERC 402-43	PERC 402-43
	Adjust screw	AS0005-15	AS0005-15	AS0005-15	AS0005-15
	Wrench	H2.5	H2.5	H2.5	H2.5
	Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
	Wrench	H4	H4	H4	H4
	Inner	CENC 402-32	CENC 402-43	CENC 402-43	CENC 402-43
	Screw	CSTA5	LS1206	LS1206	LS1206
	Wrench	T-15D	H3	H3	H3
	Center	CENC 402-43	CENC 402-43	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206	LS1206	LS1206
Insert	Outer	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
	Wrench	T-15D	T-15D	T-15D	T-15D
	Inner	TPMX 170408R-G	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G
	Screw	CSTB3.5D	CSTB4M	CSTB4M	CSTB4M
	Wrench	T-9D	T-15D	T-15D	T-15D
	Center	TPMX 240512R-G	TPMX 240512R-G	TPMX 280716R-G	TPMX 280716R-G
Pad	Screw	CSTB4M	CSTB4M	CSTB5	CSTB5
	Wrench	T-15D	T-15D	T-20D	T-20D
	Guide pad	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB
	Screw	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC
	Wrench	LS1206S	LS1206S	LS1206S	LS1206S
	Guide pad protector	H3	H3	H3	H3
	Screw	PAD-P18	PAD-P18	PAD-P18	PAD-P18
	Wrench	LS1206S	LS1206S	LS1206S	LS1206S
	Sub guide pad	H3	H3	H3	H3
	Screw	PAD-S14	PAD-S14	PAD-S14	PAD-S14
Wrench	CSTA5S	CSTA5S	CSTA5S	CSTA5S	
		T-15D	T-15D	T-15D	





## Assembly of TBTA5 series



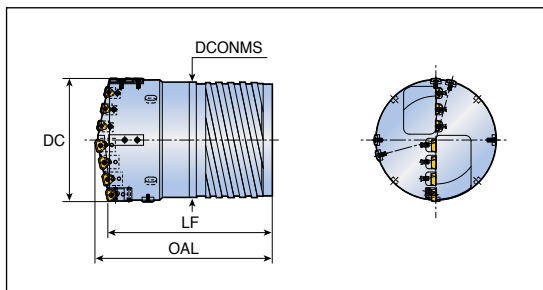
Parts		Diameter (mm)		
		151.00-156.99	157.00-162.99	163.00-168.99
Cartridge	Outer	PERC 402-63	PERC 402-63	PERC 402-63
	Adjust screw	AS0006-15	AS0006-15	AS0006-15
	Wrench	H3	H3	H3
	Screw	LS1806RH	LS1806RH	LS1806RH
	Wrench	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-63
	Screw	LS1206	LS1206	LS1206
	Wrench	H3L	H3L	H3L
	Center	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206S	LS1206S	LS1206S
Wrench	H3L	H3L	H3L	
Insert	Outer	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
	Screw	CSTB5	CSTB5	CSTB5
	Wrench	T-20D	T-20D	T-20D
	Inner	TPMX 240512R-G	TPMX 240512R-G	TPMX 280716R-G
	Screw	CSTB4M	CSTB4M	CSTB5
	Wrench	T-15D	T-15D	T-20D
	Center	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
Screw	CSTB5	CSTB5	CSTB5	
Wrench	T-20D	T-20D	T-20D	
Pad	Guide pad	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB
		PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC
	Screw	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3L
	Guide pad protector	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3
	Sub guide pad	PAD-S14	PAD-S14	PAD-S14
	Screw	CSTA5S	CSTA5S	CSTA5S
	Wrench	T-15D	T-15D	T-15D



# TBTA7...SE4



## Single tube system



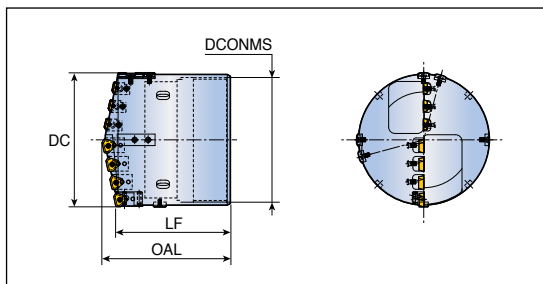
- Outer four start thread
- Double tube system also available on request

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

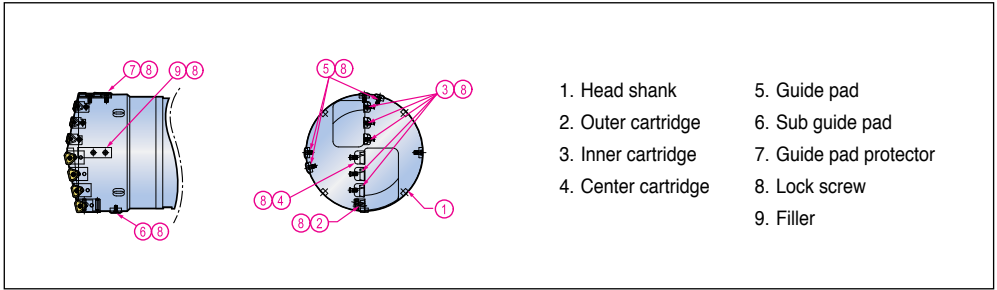


- Inner single start thread

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 D110	 Tube D135	 Cutting Condition D216
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## Assembly of TBTA7 series



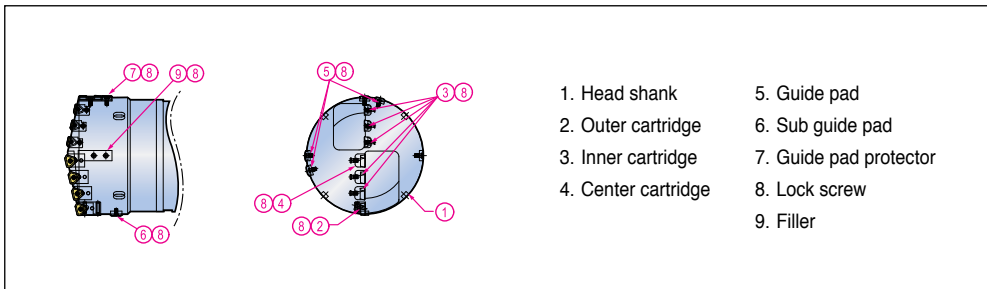
Parts		Diameter (mm)			
		169.00-188.99	189.00-196.99	197.00-202.99	203.00-208.99
Cartridge	Outer	PERC 402-43	PERC 402-43	PERC 402-43	PERC 402-43
	Adjust screw	AS0005-15	AS0005-15	AS0005-15	AS0005-15
	Wrench	H2.5	H2.5	H2.5	H2.5
	Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
	Wrench	H4	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-43	CENC 402-43
	Screw	LS1206	LS1206	LS1206	LS1206
	Wrench	H3L	H3L	H3L	H3L
	Center	CENC 402-43	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206	LS1206S	LS1206S	LS1206S
Insert	Outer	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
	Wrench	T-15D	T-15D	T-15D	T-15D
	Inner	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
	Wrench	T-15D	T-15D	T-15D	T-15D
	Center	TPMX 240512R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
Pad	Screw	CSTB4M	CSTB5	CSTB5	CSTB5
	Wrench	T-15D	T-15D	T-15D	T-15D
	Guide pad	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB
		PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Guide pad protector	PAD-P18	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Sub guide pad	PAD-S14	PAD-S14	PAD-S14	PAD-S14
Screw	CSTA5S	CSTA5S	CSTA5S	CSTA5S	
Wrench	T-15D	T-15D	T-15D	T-15D	



# TBTA7 Series



## Assembly of TBTA7 series



Parts		Diameter (mm)			
		209.00-214.99	215.00-220.99	221.00-226.99	227.00-232.99
Cartridge	Outer	PERC 402-63	PERC 402-63	PERC 402-63	PERC 402-63
	Adjust screw	AS0006-15	AS0006-15	AS0006-15	AS0005-15
	Wrench	H3	H3	H3	H3
	Screw	L1806RH	L1806RH	L1806RH	L1806RH
	Wrench	H4	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-43	CENC 402-63
	Screw	LS1206	LS1206	LS1206	LS1206
	Wrench	H3L	H3L	H3L	H3L
	Center	CENC 402-63	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206S	LS1206	LS1206	LS1206S
Insert	Outer	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
	Screw	CSTB5	CSTB5	CSTB5	CSTB5
	Wrench	T-20D	T-20D	T-20D	T-20D
	Inner	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G	TPMX 280716R-G
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB5
	Wrench	T-15D	T-15D	T-15D	T-15D
	Center	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
Pad	Screw	CSTB5	CSTB5	CSTB5	CSTB5
	Wrench	T-20D	T-20D	T-20D	T-20D
	Guide pad	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB
		PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Guide pad protector	PAD-P18	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Sub guide pad	PAD-S14	PAD-S14	PAD-S14	PAD-S14
Screw	CSTA5S	CSTA5S	CSTA5S	CSTA5S	
Wrench	T-15D	T-15D	T-15D	T-15D	



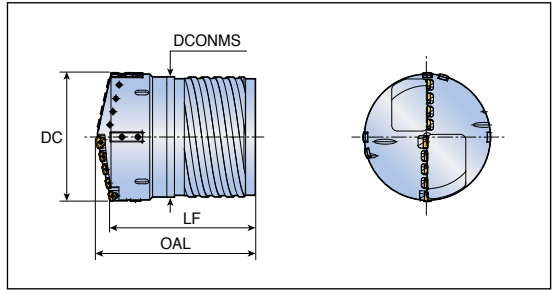
# TBTA9...SE4



## Single tube system



- Outer four start thread



Designation	DC	Dimension (mm)			Tube	
		LF	OAL	DCONMS	Part	Diameter (mm)
<b>TBTA9 - xxx.xxSE4-226</b>	233.00-243.99	265	294	220	BTSI 226	226
<b>xxx.xxSE4-238</b>	244.00-255.99	265	294	232	BTSI 238	238
<b>xxx.xxSE4-250</b>	256.00-267.99	290	322	244	BTSI 250	250
<b>xxx.xxSE4-262</b>	268.00-279.99	290	323	256	BTSI 262	262
<b>xxx.xxSE4-274</b>	280.00-291.99	290	325	268	BTSI 274	274

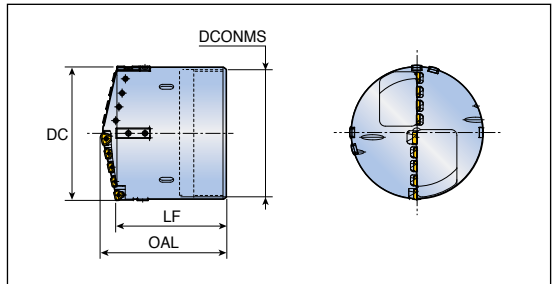
# TBTA9...SI1



## Single tube system



- Inner single start thread



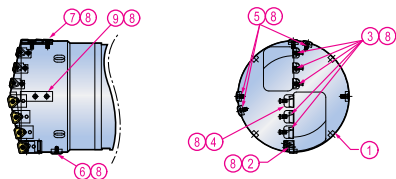
Designation	DC	Dimension (mm)			Tube	
		LF	OAL	DCONMS	Part	Diameter (mm)
<b>TBTA9 - xxx.xxSI1-214</b>	233.00-233.99	190	217	211	BTSE 214	214
<b>xxx.xxSI1-226</b>	234.00-245.99	190	219	223	BTSE 226	226
<b>xxx.xxSI1-238</b>	246.00-257.99	190	221	235	BTSE 238	238
<b>xxx.xxSI1-250</b>	258.00-269.99	210	242	245	BTSE 250	250
<b>xxx.xxSI1-262</b>	270.00-281.99	210	244	259	BTSE 262	262
<b>xxx.xxSI1-274</b>	282.00-293.99	210	245	271	BTSE 274	274

Assembly D113	Tube D135	Cutting Condition D216
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# TBTA9 Series



## Assembly of TBTA9 series

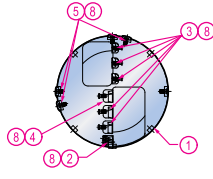
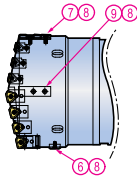


1. Head shank
2. Outer cartridge
3. Inner cartridge
4. Center cartridge
5. Guide pad
6. Sub guide pad
7. Guide pad protector
8. Lock screw
9. Filler

Parts		Diameter (mm)				
		233.00-247.99	248.00-253.99	254.00-258.99	259.00-264.99	265.00-271.99
Cartridge	Outer	PERC 402-43	PERC 402-63	PERC 402-63	PERC 402-63	PERC 402-63
	Adjust screw	AS0005-15	AS0006-15	AS0006-15	AS0006-15	AS0006-15
	Wrench	H2.5	H3	H3	H3	H3
	Screw	LS1806RH	L1806RH	L1806RH	L1806RH	L1806RH
	Wrench	H4	H4	H4	H4	H4
	Inner	CENC 402-43	CENC 402-43	CENC 402-43	CENC 402-43	CENC 402-43
	Screw	LS1206	LS1206	LS1206	LS1206	LS1206
	Wrench	H3L	H3L	H3L	H3L	H3L
	Center	CENC 402-63	CENC 402-63	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206S	LS1206S	LS1206S	LS1206S	LS1206S
Insert	Outer	TPMX 240512R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
	Screw	CSTB4M	CSTB5	CSTB5	CSTB5	CSTB5
	Wrench	T-15D	T-20D	T-20D	T-20D	T-20D
	Inner	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G	TPMX 240512R-G
	Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M	CSTB4M
	Wrench	T-15D	T-15D	T-15D	T-15D	T-15D
	Center	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
Pad	Screw	CSTB5	CSTB5	CSTB5	CSTB5	CSTB5
	Wrench	T-20D	T-20D	T-20D	T-20D	T-20D
	Guide pad	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB
	Screw	LS1206S	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3	H3
	Guide pad protector	PAD-P18	PAD-P18	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3	H3
	Sub guide pad	PAD-S14	PAD-S14	PAD-S14	PAD-S14	PAD-S14
	Screw	CSTA5S	CSTA5S	CSTA5S	CSTA5S	CSTA5S
Wrench	T-15D	T-15D	T-15D	T-15D	T-15D	



## Assembly of TBTA9 series



1. Head shank
2. Outer cartridge
3. Inner cartridge
4. Center cartridge
5. Guide pad
6. Sub guide pad
7. Guide pad protector
8. Lock screw
9. Filler

Parts		Diameter (mm)			
		272.00-275.99	276.00-284.99	285.00-289.99	290.00-293.99
Cartridge	Outer	PERC 402-63	PERC 402-63	PERC 402-63	PERC 402-63
	Adjust screw	AS0006-15	AS0006-15	AS0006-15	AS0006-15
	Wrench	H3	H3	H3	H3
	Screw	L1806RH	L1806RH	L1806RH	L1806RH
	Wrench	H4	H4	H4	H4
	Inner	CENC 402-63	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3L	H3L	H3L	H3L
	Center	CENC 402-63	CENC 402-63	CENC 402-63	CENC 402-63
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
Insert	Outer	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
	Screw	CSTB5	CSTB5	CSTB5	CSTB5
	Wrench	T-20D	T-20D	T-20D	T-20D
	Inner	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
	Screw	CSTB5	CSTB5	CSTB5	CSTB5
	Wrench	T-20D	T-20D	T-20D	T-20D
	Center	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G	TPMX 280716R-G
Pad	Screw	CSTB5	CSTB5	CSTB5	CSTB5
	Wrench	T-20D	T-20D	T-20D	T-20D
	Guide pad	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB	PAD-GP18-40-300-DC-SB
	Screw	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC	PAD-GP18-40-300-DC-SC
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Guide pad protector	PAD-P18	PAD-P18	PAD-P18	PAD-P18
	Screw	LS1206S	LS1206S	LS1206S	LS1206S
	Wrench	H3	H3	H3	H3
	Sub guide pad	PAD-S14	PAD-S14	PAD-S14	PAD-S14
Screw	CSTA5S	CSTA5S	CSTA5S	CSTA5S	
Wrench	T-15D	T-15D	T-15D	T-15D	



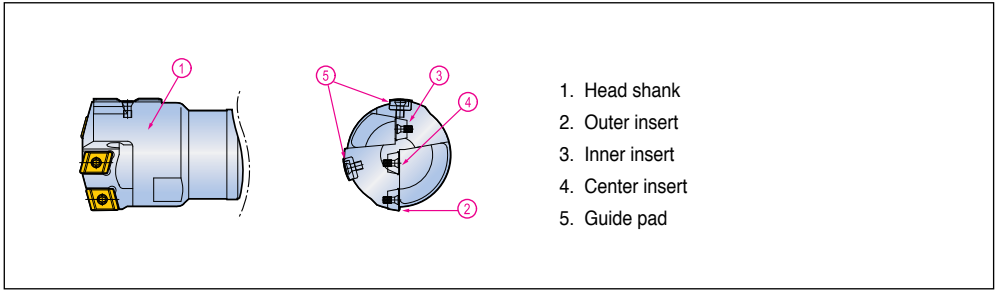








## Assembly of TBTA-FB series



1. Head shank
2. Outer insert
3. Inner insert
4. Center insert
5. Guide pad

Parts		Diameter (mm)			
		25.00-28.00	28.01-29.99	30.00-35.00	35.01-38.00
Insert	PER	NPHT 060304R-G-P	NPHT 060304R-G-P	NPHT 080404R-G-P	NPHT 080404R-G-P
	Screw	CSTB2.2	CSTB2.2	SR 14-560-HG	SR 14-560-HG
	Wrench	T-7F	T-7F	T-8F	T-8F
	INT	NPMT 060304R-G-I	NPMT 060304R-G-I	NPMT 070404R-G-I	NPMT 070404R-G-I
	Screw	CSTB2.2	CSTB2.2	SR 14-560-HG	SR 14-560-HG
	Wrench	T-7F	T-7F	T-8F	T-8F
	CEN	NPMT 060308L-G-C	NPMT 070408L-G-C	NPMT 070408L-G-C	NPMT 080480L-G-C
	Screw	CSTB2.2	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG
	Wrench	T-7F	T-8F	T-8F	T-8F
Pad	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	CSTB2.2S	CSTB2.2S	CSTB3S	CSTB3S
	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	PER	NPHT 090404R-G-P	NPHT 090404R-G-P	NPHT 090404R-G-P	NPHT 090404R-G-P
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG
	Wrench	T-8F	T-8F	T-8F	T-8F
	INT	NPMT 070404R-G-I	NPMT 070404R-G-I	NPMT 080404R-G-I	NPMT 080404R-G-I
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG
	Wrench	T-8F	T-8F	T-8F	T-8F
	CEN	NPMT 100408L-G-C	NPMT 100408L-G-C	NPMT 100408L-G-C	NPMT 100408L-G-C
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG
	Wrench	T-8F	T-8F	T-8F	T-8F
Pad	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	CSTB3S	CSTB3S	CSTB3S	CSTB3S
	Wrench	T-9F	T-9F	T-9F	T-9F

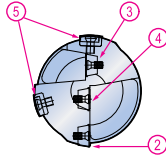
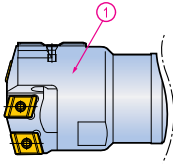
• Insert and guide pad are sold separately from drill body.



# TBTA-FB Series



## Assembly of TBTA-FB series



1. Head shank
2. Outer insert
3. Inner insert
4. Center insert
5. Guide pad

Parts		Diameter (mm)			
		45.01-47.00	47.01-51.00	51.01-54.00	54.01-57.00
Insert	PER	NPHT 090404R-G-P	NPHT 110404R-G-P	NPHT 110404R-G-P	NPHT 110404R-G-P
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG
	Wrench	T-8F	T-8F	T-8F	T-8F
	INT	NPMT 080404R-G-I	NPMT 080404R-G-I	NPMT 100404R-G-I	NPMT 100404R-G-I
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG
	Wrench	T-8F	T-8F	T-8F	T-8F
	CEN	NPMT 100408L-G-C	NPMT 100408L-G-C	NPMT 100408L-G-C	NPMT 130408L-G-C
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG	SR 14-560-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	CSTB3.5	CSTB3.5	CSTB3.5	CSTB3.5
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	PER	NPHT 110404R-G-P	NPHT 130404R-G-P	NPHT 130404R-G-P
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG
	Wrench	T-8F	T-8F	T-8F
	INT	NPMT 100404R-G-I	NPMT 100404R-G-I	NPMT 130404R-G-I
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-HG
	Wrench	T-8F	T-8F	T-8F
	CEN	NPMT 130408L-G-C	NPMT 130408L-G-C	NPMT 130408L-G-C
	Screw	SR 14-560-HG	SR 14-560-HG	SR 14-560-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	CSTB3.5	CSTB3.5	CSTB3.5
Wrench	T-15F	T-15F	T-15F	

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





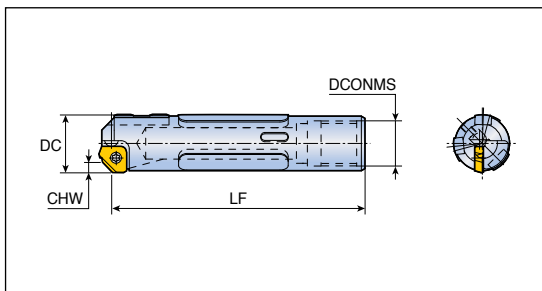




# TBTA-R...S11



## Single tube system



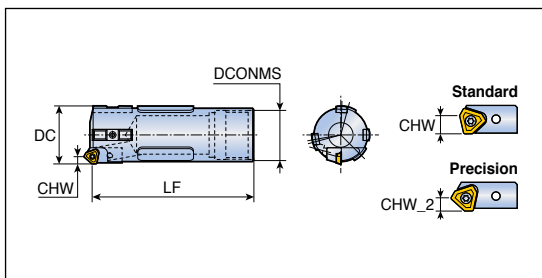
- Inner single start thread

Designation	DC	CHW (mm)	Dimension (mm)		Tube	
			LF	DCONMS	Part	Diameter (mm)
<b>TBTA-R- xxx.xxS11-22</b>	25.00-26.99	2.8	110.5	20	BTSE 022	22
<b>xxx.xxS11-24</b>	27.00-29.99	2.8	110.5	22	BTSE 024	24
<b>xxx.xxS11-26</b>	30.00-31.99	2.8	110.5	24	BTSE 026	26
<b>xxx.xxS11-28</b>	32.00-33.99	2.8	110.5	26	BTSE 028	28
<b>xxx.xxS11-30</b>	34.00-36.99	2.8	135.5	27	BTSE 030	30
<b>xxx.xxS11-33</b>	37.00-39.99	2.8	135.5	30	BTSE 033	33

# TBTA-R...S11



## Single tube system



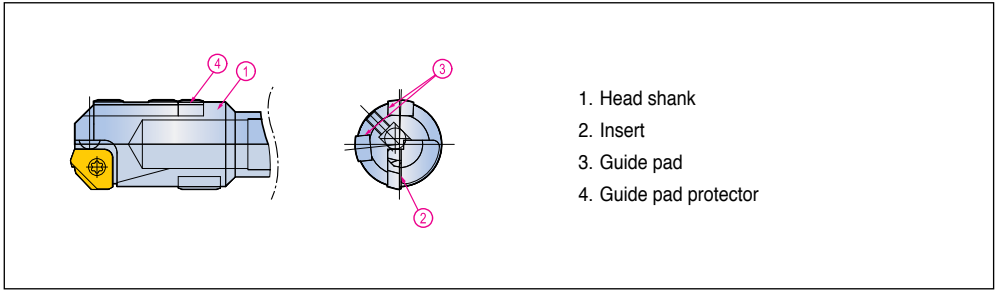
- Inner single start thread

Designation	DC	CHW (mm)		Dimension (mm)		Tube	
		Standard	Precision	LF	DCONMS	Part	Diameter (mm)
<b>TBTA-R- xxx.xxS11-36</b>	40.00-43.99	6.4	4	135	33	BTSE 036	36
<b>xxx.xxS11-39</b>	44.00-46.99	6.4	4	135	37	BTSE 039	39
<b>xxx.xxS11-43</b>	47.00-51.99	6.4	4	145	41	BTSE 043	43
<b>xxx.xxS11-47</b>	52.00-56.99	7.2	4.8	145	44	BTSE 047	47
<b>xxx.xxS11-51</b>	57.00-60.99	7.2	4.8	170	49	BTSE 051	51
<b>xxx.xxS11-56</b>	61.00-67.99	7.2/10.4	4.8/6.4	170	53	BTSE 056	56
<b>xxx.xxS11-62</b>	68.00-74.99	10.4	6.4	170	59	BTSE 062	62
<b>xxx.xxS11-68</b>	75.00-80.99	10.4	6.4	205	65	BTSE 068	68
<b>xxx.xxS11-75</b>	81.00-90.99	10.4	6.4	215	71	BTSE 075	75
<b>xxx.xxS11-82</b>	91.00-98.99	10.4	6.4	225	79	BTSE 082	82
<b>xxx.xxS11-94</b>	99.00-110.99	10.4	6.4	235	90	BTSE 094	94

 Assembly D124	 Tube D135	 Cutting Condition D216
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## Assembly of TBTA-R series



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

Parts		Diameter (mm)				
		25.00-27.99	28.00-29.99	30.00-37.99	38.00-39.99	
Close tolerance	Cartridge	Adjust ball	BALL5	BALL5	BALL5	BALL5
		Adjust screw	AS0005-5	AS0005-5	AS0005-5	AS0005-5
		Wrench	H2.5	H2.5	H2.5	H2.5
		Screw	-	-	-	-
	Insert	Wrench	-	-	-	-
		Insert	XPMT 16002-45	XPMT 16002-45	XPMT 16002-45	XPMT 16002-45
		Screw	CSTANO3	CSTANO3	CSTANO3	CSTANO3
Normal tolerance	Cartridge	Wrench	T-9D	T-9D	T-9D	T-9D
		Outer	-	-	-	-
		Adjust screw	-	-	-	-
		Wrench	-	-	-	-
		Screw	-	-	-	-
	Insert	Wrench	-	-	-	-
		Insert	XPMT 16002-45	XPMT 16002-45	XPMT 16002-45	XPMT 16002-45
		Screw	CSTANO3	CSTANO3	CSTANO3	CSTANO3
		Wrench	T-9D	T-9D	T-9D	T-9D
		Outer	-	-	-	-
Pad	Guide pad (A)	PAD-GP06-20-120-DC-SB	PAD-GP06-20-120-DC-SB	PAD-GP07-20-120-DC-SB	PAD-GP08-25-155-DC-SB	
		PAD-GP06-20-120-DC-SC	PAD-GP06-20-120-DC-SC	PAD-GP07-20-120-DC-SC	PAD-GP08-25-155-DC-SC	
	Screw	CSTB2.2S	CSTB2.2S	CSTB3S	CSTB3S	
		Wrench	T-9D	T-9D	T-9D	T-9D
	Guide pad protector (B)	-	-	-	PAD-P08	
		Screw	-	-	-	CSTB3S
	Wrench	-	-	-	T-9D	
		Resin guide pad (C)	PAD-R10	PAD-R10	PAD-R12	PAD-R15
	Screw	LS0902, 5-6	LS0902, 5-6	LS0903-8	LS0904-10	
		Wrench	-	-	H2	H2.5

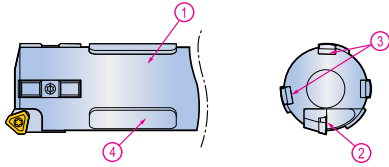


- A + B is for outer four start thread connection type
- A + C is for inner single start thread connection type

# TBTA-R Series



## Assembly of TBTA-R series



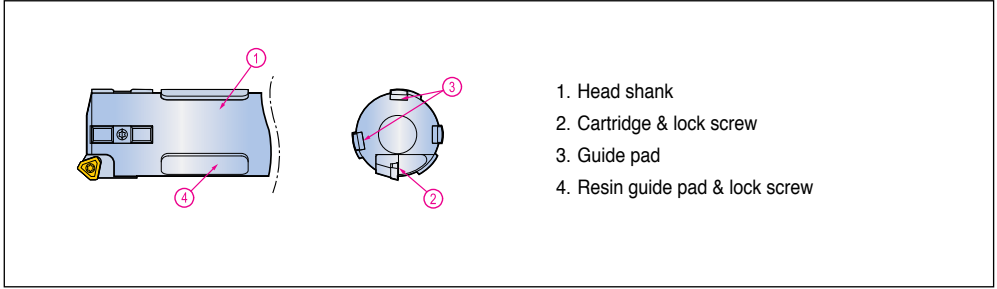
1. Head shank
2. Cartridge & lock screw
3. Guide pad
4. Resin guide pad & lock screw

Parts		Diameter (mm)				
		40.00-45.99	46.00-51.99	52.00-56.99	57.00-59.99	
Close tolerance	Cartridge	Outer	PERC-P 04R	PERC-P 04R	PERC-P 32R	PERC-P 32R
		Adjust screw	AS0004-8	AS0004-8	AS0005-10	AS0005-10
		Wrench	H2	H2	H2.5	H2.5
	Insert	Screw	LS1803.5RH	LS1803.5RH	LS1805RH	LS1805RH
		Wrench	H2.5	H2.5	H3	H3
		Wrench	T-8D	T-8D	T-8D	T-8D
Normal tolerance	Cartridge	Outer	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
	Insert	Screw	LS1803.5RH	LS1803.5RH	LS1805RH	LS1805RH
		Wrench	H2.5	H2.5	H3	H3
		Wrench	T-8D	T-8D	T-8D	T-8D
Pad	Guide pad (A)	PAD-GP08-25-155-DC-SB	PAD-GP10-30-200-DC-SB	PAD-GP10-30-200-DC-SB	PAD-GP14-40-250-DC-SB	
		PAD-GP08-25-155-DC-SC	PAD-GP10-30-200-DC-SC	PAD-GP10-30-200-DC-SC	PAD-GP14-40-250-DC-SC	
	Screw	CSTB3S	CSTB3.5	CSTB3.5	CSTB3.5	
	Wrench	T-9D	T-15D	T-15D	T-15D	
	Guide pad protector (B)	PAD-P08	PAD-P10	PAD-P10	PAD-P14	
		Screw	CSTB3S	CSTB4S	CSTB4S	CSTB4S
	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

## Assembly of TBTA-R series



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

Parts		Diameter (mm)				
		60.00-80.99	81.00-90.99	91.00-99.99	100.00-122.99	
Close tolerance	Cartridge	Outer	PERC-P 43R	PERC-P 43R	PERC-P 43R	PERC-P 43R
		Adjust screw	AS0005-15	AS0005-15	AS0005-15	AS0005-15
		Wrench	H2.5	H2.5	H2.5	H2.5
		Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
	Insert	Wrench	H4	H4	H4	H4
		Insert	TPMX 2405LG	TPMX 2405LG	TPMX 2405LG	TPMX 2405LG
		Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
Normal tolerance	Cartridge	Wrench	T-15D	T-15D	T-15D	T-15D
		Outer	PERC 402-43	PERC 402-43	PERC 402-43	PERC 402-43
		Adjust screw	AS0005-15	AS0005-15	AS0005-15	AS0005-15
		Wrench	H2.5	H2.5	H2.5	H2.5
	Insert	Screw	LS1806RH	LS1806RH	LS1806RH	LS1806RH
		Wrench	H4	H4	H4	H4
		Insert	TPMX 240512R-G	TPMX 170408R-G	TPMX 170408R-G	TPMX 170408R-G
		Screw	CSTB4M	CSTB4M	CSTB4M	CSTB4M
		Wrench	T-15D	T-15D	T-15D	T-15D
		Wrench	T-15D	T-15D	T-15D	T-15D
Pad	Guide pad (A)	PAD-GP14-40-250-DC-SB	PAD-GP14-40-250-DC-SB	PAD-GP14-40-250-DC-SB	PAD-GP18-40-300-DC-SB	
		PAD-GP14-40-250-DC-SC	PAD-GP14-40-250-DC-SC	PAD-GP14-40-250-DC-SC	PAD-GP18-40-300-DC-SC	
	Screw	CSTA5S	CSTA5S	CSTA5S	LS1206S	
	Wrench	T-15D	T-15D	T-15D	H3	
	Guide pad protector (B)	PAD-P14	PAD-P14	PAD-P14	PAD-P18	
		Screw	CSTA5S	CSTA5S	CSTA5S	LS1206S
	Wrench	T-15D	T-15D	T-15D	H3	
	Resin guide pad (C)	PAD-R20	PAD-R30	PAD-R35	PAD-R35	
		Screw	LS0905-12	LS0906-15	LS0906-15	LS0906-15
	Wrench	H3	H4	H4	H4	



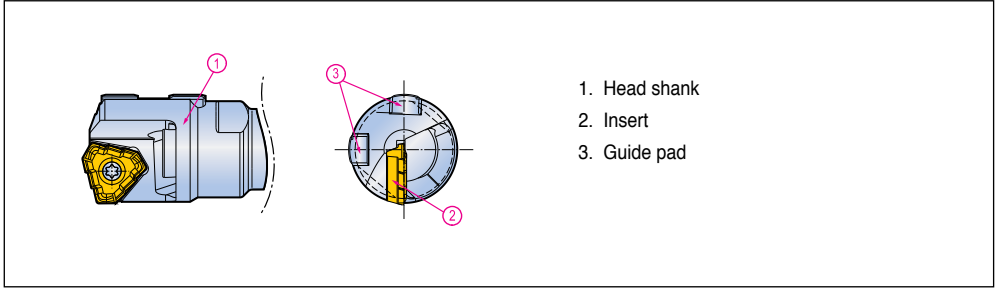
- A + B is for outer four start thread connection type
- A + C is for inner single start thread connection type







## Assembly of TBTA-TR series



1. Head shank
2. Insert
3. Guide pad

Parts		Diameter (mm)		
		16.00-18.00	18.01-20.00	20.01-21.00
Insert	Insert	TOGT 080305 RS	TOGT 090305 RS	TOGT 100305 RS
	Screw	CSTB2.5S	CSTB2.5S*	CSTB3S*
	Wrench	T-8F	T-8F	T-9F
Guide Pad	Guide Pad	PAD-GP06-20-075-DC-SB	PAD-GP06-20-085-DC-SB	PAD-GP06-20-085-DC-SB
		PAD-GP06-20-075-DC-SC	PAD-GP06-20-085-DC-SC	PAD-GP06-20-085-DC-SC
	Screw	CSTB2.2	CSTB2.2S*	CSTB2.2S*
	Wrench	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	CSTB3S*	CSTB3.5H*	CSTB4S*
	Wrench	T-9F	T-15F	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	CSTB2.2S*	CSTB2.2S*	CSTB2.2S*
	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	SR 16-212/L10	SR 16-212/L10	SR 16-212/L10	SR 16-212/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	CSTB2.2	CSTB3S	CSTB3S	CSTB3S
	Wrench	T-7F	T-9F	T-9F	T-9F

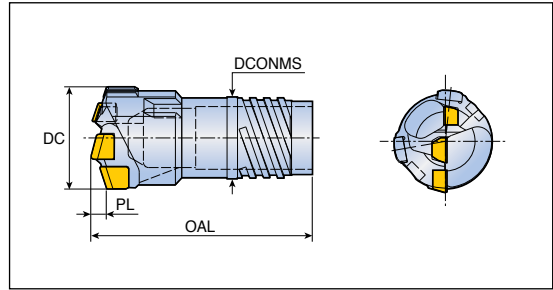
• Insert and guide pad are sold separately from drill body.



# BTA...SE2/SE4



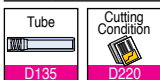
## Single tube system



- 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	BTSI011	11
<b>xxx.xx SE2-11*</b>	13.11-13.60	43.0	1.1	9.6	BTSI011	11
<b>xxx.xx SE2-12*</b>	13.61-14.10	43.0	1.2	10.6	BTSI012	12
<b>xxx.xx SE2-12*</b>	14.11-14.60	43.0	1.2	10.6	BTSI012	12
<b>xxx.xx SE2-13*</b>	14.61-15.10	43.0	1.3	11.6	BTSI013	13
<b>xxx.xx SE2-13*</b>	15.11-15.59	43.0	1.3	11.6	BTSI013	13
<b>xxx.xx SE4-14</b>	15.60-16.20	43.0	2.7	12.6	BTSI014	14
<b>xxx.xx SE4-14</b>	16.21-16.70	43.0	2.7	12.6	BTSI014	14
<b>xxx.xx SE4-15</b>	16.71-17.20	43.0	2.7	13.6	BTSI015	15
<b>xxx.xx SE4-15</b>	17.21-17.70	43.0	2.7	13.6	BTSI015	15
<b>xxx.xx SE4-16</b>	17.71-18.40	47.0	2.8	14.5	BTSI016	16
<b>xxx.xx SE4-16</b>	18.41-18.90	47.0	2.9	14.5	BTSI016	16
<b>xxx.xx SE4-17</b>	18.91-19.20	47.0	2.9	15.5	BTSI017	17
<b>xxx.xx SE4-17</b>	19.21-20.00	47.0	2.9	15.5	BTSI017	17
<b>xxx.xx SE4-18</b>	20.01-20.90	52.5	3.2	16.0	BTSI018	18
<b>xxx.xx SE4-18</b>	20.91-21.80	52.5	3.2	16.0	BTSI018	18
<b>xxx.xx SE4-20</b>	21.81-22.90	56.0	3.2	18.0	BTSI020	20
<b>xxx.xx SE4-20</b>	22.91-24.10	56.0	3.2	18.0	BTSI020	20
<b>xxx.xx SE4-22</b>	24.11-25.20	57.5	3.5	19.5	BTSI022	22
<b>xxx.xx SE4-22</b>	25.21-26.40	57.5	3.5	19.5	BTSI022	22
<b>xxx.xx SE4-24</b>	26.41-27.50	57.5	3.7	21.0	BTSI024	24
<b>xxx.xx SE4-24</b>	27.51-28.70	57.5	3.7	21.0	BTSI024	24
<b>xxx.xx SE4-26</b>	28.71-29.80	63.5	4.0	23.5	BTSI026	26
<b>xxx.xx SE4-26</b>	29.81-31.00	63.5	4.0	23.5	BTSI026	26
<b>xxx.xx SE4-28</b>	31.01-32.10	63.5	4.3	25.5	BTSI028	28
<b>xxx.xx SE4-28</b>	32.11-33.30	63.5	4.3	25.5	BTSI028	28
<b>xxx.xx SE4-30</b>	33.31-34.80	63.5	4.5	28.0	BTSI030	30
<b>xxx.xx SE4-30</b>	34.81-36.20	63.5	4.5	28.0	BTSI030	30
<b>xxx.xx SE4-33</b>	36.21-37.30	73.5	4.8	30.0	BTSI033	33
<b>xxx.xx SE4-33</b>	37.31-38.40	73.5	4.8	30.0	BTSI033	33
<b>xxx.xx SE4-33</b>	38.41-39.60	73.5	4.8	30.0	BTSI033	33
<b>xxx.xx SE4-36</b>	39.61-40.60	73.5	5.6	33.0	BTSI036	36
<b>xxx.xx SE4-36</b>	40.61-41.80	73.5	5.6	33.0	BTSI036	36
<b>xxx.xx SE4-36</b>	41.81-43.00	73.5	5.6	33.0	BTSI036	36
<b>xxx.xx SE4-39</b>	43.01-44.30	75.0	5.4	36.0	BTSI039	39

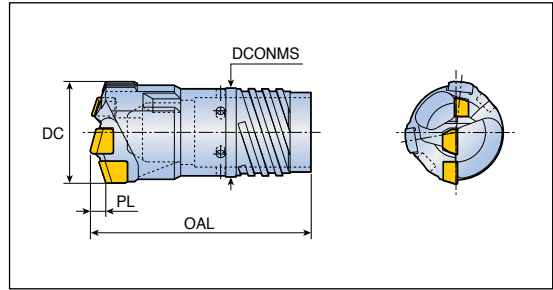
- \*1' 2 cutting edge head, 2 start thread





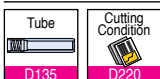


## Double tube system



- Outer four start thread

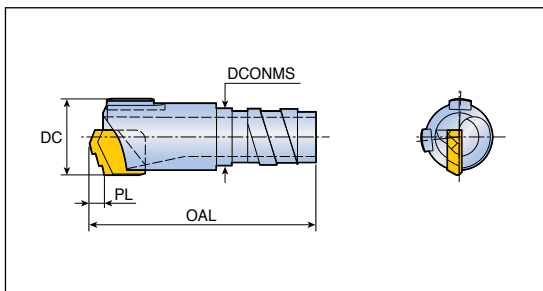
Designation	DC	Dimension (mm)			Tube		
		OAL	PL	DCONMS	Outer tube	Inner tube	Diameter (mm)
<b>BTA xxx.xx DE4-18</b>	18.41-19.20	50.0	2.9	16.0	BTDO018	BTDI012	18.0
<b>xxx.xx DE4-18</b>	19.21-20.00	50.0	2.9	16.0	BTDO018	BTDI012	18.0
<b>xxx.xx DE4-19.5</b>	20.01-20.90	56.0	3.2	18.0	BTDO019.5	BTDI014	19.5
<b>xxx.xx DE4-19.5</b>	20.91-21.80	56.0	3.2	18.0	BTDO019.5	BTDI014	19.5
<b>xxx.xx DE4-21.5</b>	21.81-22.90	56.0	3.2	19.5	BTDO021.5	BTDI015	21.5
<b>xxx.xx DE4-21.5</b>	22.91-24.10	56.0	3.2	19.5	BTDO021.5	BTDI015	21.5
<b>xxx.xx DE4-23.5</b>	24.11-25.20	57.5	3.5	21.0	BTDO023.5	BTDI016	23.5
<b>xxx.xx DE4-23.5</b>	25.21-26.40	57.5	3.5	21.0	BTDO023.5	BTDI016	23.5
<b>xxx.xx DE4-26</b>	26.41-27.50	60.5	3.7	23.5	BTDO026	BTDI018	26.0
<b>xxx.xx DE4-26</b>	27.51-28.70	60.5	3.7	23.5	BTDO026	BTDI018	26.0
<b>xxx.xx DE4-28</b>	28.71-29.80	63.5	4.0	25.5	BTDO028	BTDI020	28.0
<b>xxx.xx DE4-28</b>	29.81-31.00	63.5	4.0	25.5	BTDO028	BTDI020	28.0
<b>xxx.xx DE4-30.5</b>	31.01-32.10	63.5	4.1	28.0	BTDO030.5	BTDI022	30.5
<b>xxx.xx DE4-30.5</b>	32.11-33.30	63.5	4.1	28.0	BTDO030.5	BTDI022	30.5
<b>xxx.xx DE4-33</b>	33.31-34.80	70.5	4.5	30.0	BTDO033.0	BTDI024	33.0
<b>xxx.xx DE4-33</b>	34.81-36.20	70.5	4.5	30.0	BTDO033.0	BTDI024	33.0
<b>xxx.xx DE4-35.5</b>	36.21-37.30	73.5	4.8	33.0	BTDO035.5	BTDI026	35.5
<b>xxx.xx DE4-35.5</b>	37.31-38.40	73.5	4.8	33.0	BTDO035.5	BTDI026	35.5
<b>xxx.xx DE4-35.5</b>	38.41-39.60	73.5	4.8	33.0	BTDO035.5	BTDI026	35.5
<b>xxx.xx DE4-39</b>	39.61-40.60	73.5	5.3	36.0	BTDO039	BTDI029	39.0
<b>xxx.xx DE4-39</b>	40.61-41.80	73.5	5.3	36.0	BTDO039	BTDI029	39.0
<b>xxx.xx DE4-39</b>	41.81-43.00	73.5	5.3	36.0	BTDO039	BTDI029	39.0
<b>xxx.xx DE4-42.5</b>	43.01-44.30	75.0	5.5	39.0	BTDO042.5	BTDI032	42.5
<b>xxx.xx DE4-42.5</b>	44.31-45.60	75.0	5.5	39.0	BTDO042.5	BTDI032	42.5
<b>xxx.xx DE4-42.5</b>	45.61-47.00	75.0	5.5	39.0	BTDO042.5	BTDI032	42.5
<b>xxx.xx DE4-46.5</b>	47.01-48.50	79.0	6.1	43.0	BTDO046.5	BTDI035	46.5
<b>xxx.xx DE4-46.5</b>	48.51-50.10	79.0	6.1	43.0	BTDO046.5	BTDI035	46.5
<b>xxx.xx DE4-46.5</b>	50.11-51.70	79.0	6.1	43.0	BTDO046.5	BTDI035	46.5
<b>xxx.xx DE4-51</b>	51.71-53.20	82.0	6.5	47.0	BTDO051	BTDI039	51.0
<b>xxx.xx DE4-51</b>	53.21-54.70	82.0	6.5	47.0	BTDO051	BTDI039	51.0
<b>xxx.xx DE4-51</b>	54.71-56.20	82.0	6.5	47.0	BTDO051	BTDI039	51.0
<b>xxx.xx DE4-55.5</b>	56.21-58.40	84.0	6.6	51.0	BTDO055.5	BTDI043A	55.5
<b>xxx.xx DE4-55.5</b>	58.41-60.60	84.0	6.6	51.0	BTDO055.5	BTDI043A	55.5
<b>xxx.xx DE4-55.5</b>	60.61-62.80	84.0	6.6	51.0	BTDO055.5	BTDI043A	55.5
<b>xxx.xx DE4-55.5</b>	62.81-65.00	84.0	6.6	51.0	BTDO055.5	BTDI043A	55.5



# BTS...SE1



## Single tube system



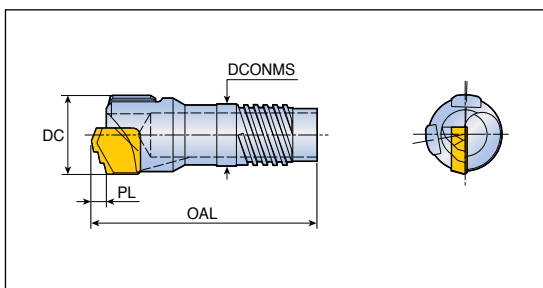
- Outer single start thread

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	BTSO071	7.1
<b>xxx.xx SE1-8.3</b>	9.00-9.99	34	2.0	7.2	BTSO083	8.3
<b>xxx.xx SE1-9</b>	10.00-10.99	34	2.2	7.6	BTSO090	9.0
<b>xxx.xx SE1-10</b>	11.00-11.99	34	2.2	8.6	BTSO100	10.0
<b>xxx.xx SE1-11</b>	12.00-13.49	34	2.3	9.1	BTSO110	11.0
<b>xxx.xx SE1-12</b>	13.50-14.79	34	2.4	10.8	BTSO120	12.0

# BTS...SE2/SE4



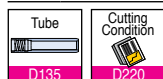
## Single tube system



- 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	BTSI011	11
<b>xxx.xx SE2-12*</b>	13.61-14.60	40	2.4	10.6	BTSI012	12
<b>xxx.xx SE2-13*</b>	14.61-15.59	40	3.0	11.6	BTSI013	13
<b>xxx.xx SE4-14</b>	15.60-16.70	40	2.4	12.6	BTSI014	14
<b>xxx.xx SE4-15</b>	16.71-17.70	40	3.0	13.6	BTSI015	15
<b>xxx.xx SE4-16</b>	17.71-18.90	40	3.3	14.5	BTSI016	16
<b>xxx.xx SE4-17</b>	18.91-20.00	40	3.3	15.5	BTSI017	17

- '\*1' Designates outer two start thread

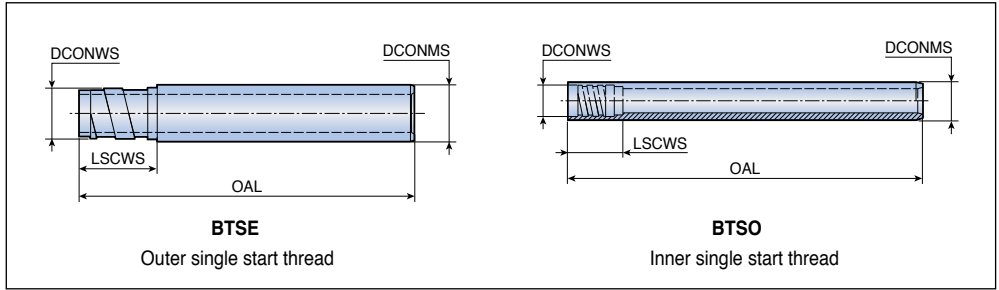








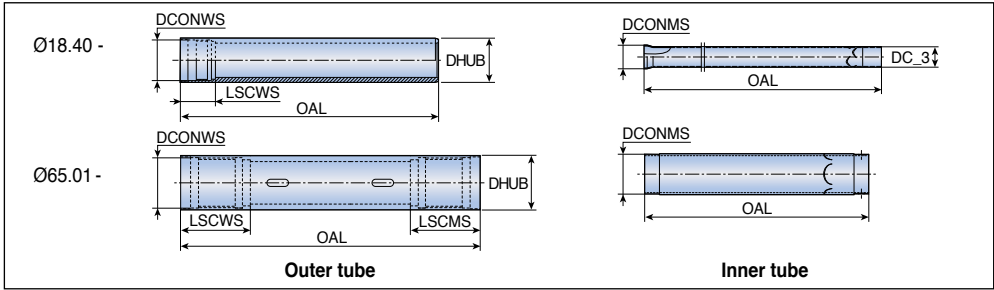
## Single tube



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

## Double tube

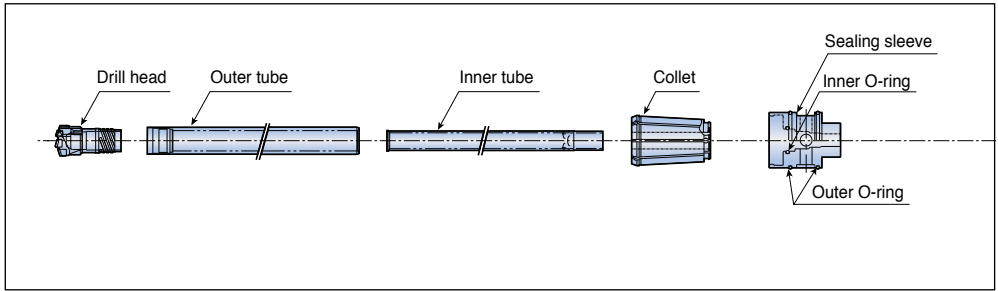


DC	Outer tube	Dimension (mm)			Inner tube	Dimension (mm)	
		DHUB	DCONWS	LSCWS		DCONMS	DC_3
18.40-20.00	<b>BTDO 018</b>	18.0	16	27.5	<b>BTDI 012</b>	12	10
20.01-21.80	<b>019.5</b>	19.5	18	30	<b>014</b>	14	12
21.81-24.10	<b>021.5</b>	21.5	19.5	30	<b>015</b>	15	13
24.11-26.40	<b>023.5</b>	23.5	21	30	<b>016</b>	16	14
26.41-28.70	<b>026</b>	26.0	23.5	33	<b>018</b>	18	16
28.71-31.00	<b>028</b>	28.0	25.5	33	<b>020</b>	20	18
31.01-33.30	<b>030.5</b>	30.5	28	33	<b>022</b>	22	20
33.31-36.20	<b>033</b>	33.0	30	40	<b>024</b>	24	22
36.21-39.60	<b>035.5</b>	35.5	33	40	<b>026</b>	26	24
39.61-43.00	<b>039</b>	39.0	36	40	<b>029</b>	29	27
43.01-47.00	<b>042.5</b>	42.5	39	40	<b>032</b>	32	30
47.01-51.70	<b>046.5</b>	46.5	43	44	<b>035</b>	35	32
51.71-56.20	<b>051</b>	51.0	47	44	<b>039</b>	39	36
56.21-65.00	<b>055.5</b>	55.5	51	44	<b>043A</b>	43	40
65.01-69.99	<b>056</b>	56.0	52	75	<b>043B</b>	40	-
70.00-72.99	<b>062</b>	62.0	58	75	<b>048</b>	44	-
73.00-79.99	<b>068</b>	68.0	63	75	<b>053</b>	48	-
80.00-86.99	<b>075</b>	75.0	70	97	<b>059</b>	54	-
87.00-99.99	<b>082</b>	82.0	77	97	<b>066</b>	60	-
100.00-111.99	<b>094</b>	94.0	89	97	<b>078</b>	70	-
112.00-123.99	<b>106</b>	106.0	101	118	<b>090</b>	80	-
124.00-135.99	<b>118</b>	118.0	113	118	<b>092</b>	80	-
136.00-147.99	<b>130</b>	130.0	125	118	<b>104</b>	95	-
148.00-159.99	<b>142</b>	142.0	137	139	<b>116</b>	100	-
160.00-171.99	<b>154</b>	154.0	149	139	<b>128</b>	120	-
172.00-183.99	<b>166</b>	166.0	161	139	<b>138</b>	130	-

- Please indicate overall length (OAL) when ordering
- For diameter range 18.40 - 65.00 (BTDO 055.5) the inner tube should be ordered 30mm longer than outer tube
- For diameter range 65.01 - 123.99 (BTDO 056 - BTDO 106) the inner tube should be ordered 190mm longer than outer tube
- For diameter range 124.00 - 183.99 (BTDO 118 - BTDO 166) the inner tube should be ordered 220mm longer than outer tube



# Assembly of Double Tube System



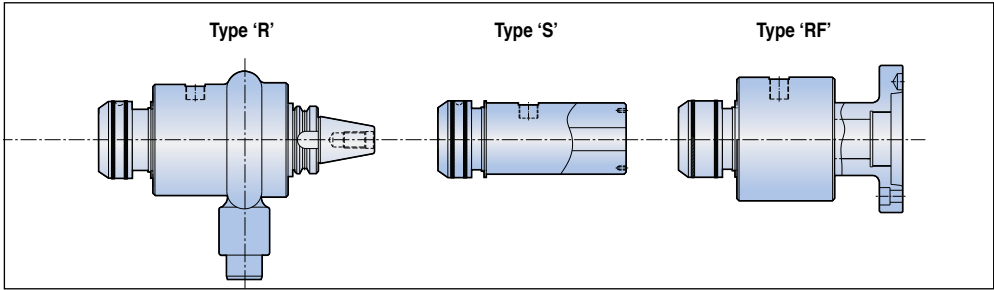
Designation		DC	Collet
<b>BTDO 018</b>	<b>BTDI 012</b>	18.40-19.20	COLLET 4-18
<b>018</b>	<b>012</b>	19.21-20.00	COLLET 4-18
<b>019.5</b>	<b>014</b>	20.01-20.90	COLLET 4-19.5
<b>019.5</b>	<b>014</b>	20.91-21.80	COLLET 4-19.5
<b>021.5</b>	<b>015</b>	21.81-22.90	COLLET 4-21.5
<b>021.5</b>	<b>015</b>	22.91-24.10	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 D135-D136 for details

# Assembly of Double Tube System



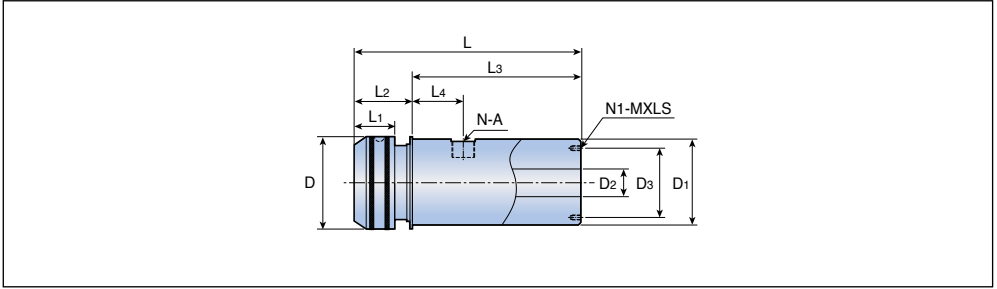
## Connector



Sealing sleeve	Outer O-ring	Inner O-ring	Connector
SEALING SLEEVE 4R-18	OOR 25.24	IOR18	DTC-4S/4R/4RF
SEALING SLEEVE 4R-18		IOR18	
SEALING SLEEVE 4R-19.5		IOR19.5	
SEALING SLEEVE 4R-19.5		IOR19.5	
SEALING SLEEVE 4R-21.5		IOR21.5	
SEALING SLEEVE 4R-21.5		IOR21.5	
SEALING SLEEVE 4R-23.5		IOR23.5	
SEALING SLEEVE 4R-23.5		IOR23.5	
SEALING SLEEVE 4R-26		IOR26	
SEALING SLEEVE 4R-26		IOR26	
SEALING SLEEVE 4R-28		IOR28	
SEALING SLEEVE 4R-28		IOR28	
SEALING SLEEVE 4R-30.5		IOR30.5	
SEALING SLEEVE 4R-30.5		IOR30.5	
SEALING SLEEVE 4R-33		IOR33	
SEALING SLEEVE 4R-33	IOR33		
SEALING SLEEVE 4R-35.5	OOR65	IOR35.5	
SEALING SLEEVE 4R-35.5		IOR35.5	
SEALING SLEEVE 4R-35.5		IOR35.5	
SEALING SLEEVE 4R-39		IOR39	
SEALING SLEEVE 4R-39		IOR39	
SEALING SLEEVE 4R-39		IOR39	
SEALING SLEEVE 4R-42.5		IOR42.5	
SEALING SLEEVE 4R-42.5		IOR42.5	
SEALING SLEEVE 4R-42.5		IOR42.5	
SEALING SLEEVE 4R-46.5		IOR46.5	
SEALING SLEEVE 4R-46.5		IOR46.5	
SEALING SLEEVE 4R-46.5		IOR46.5	
SEALING SLEEVE 4R-51		IOR51	
SEALING SLEEVE 4R-51		IOR51	
SEALING SLEEVE 4R-51		IOR51	
SEALING SLEEVE 4R-55.5	IOR55.5		
SEALING SLEEVE 4R-55.5	IOR55.5		
SEALING SLEEVE 4R-55.5	IOR55.5		
SEALING SLEEVE 4R-55.5	IOR55.5		

• Inner tube should be longer than outer tube. Please refer to page D135-D136 for details

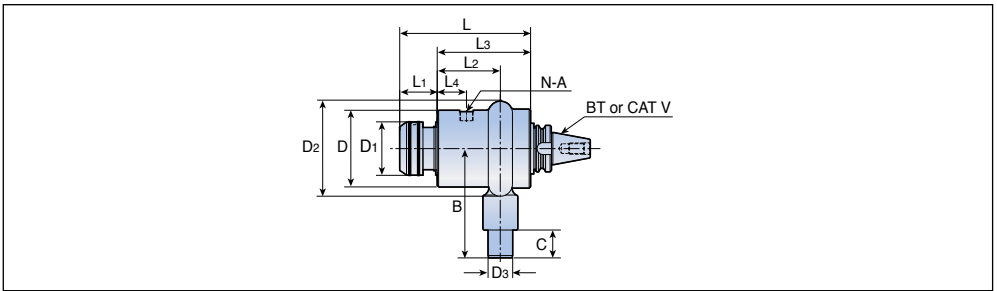
## 'S' type connector



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

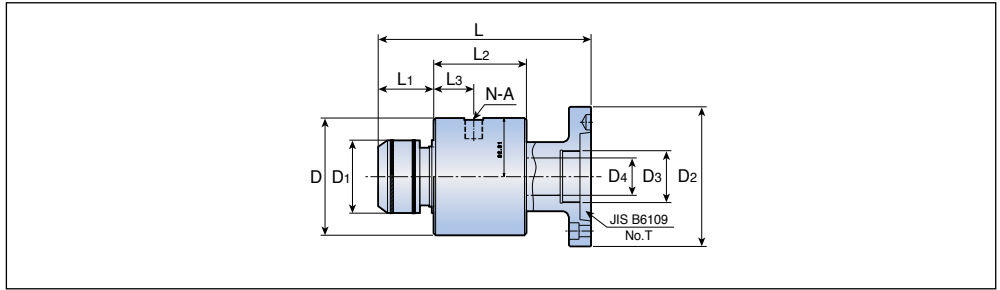
# DTC-R

## 'R' type connector



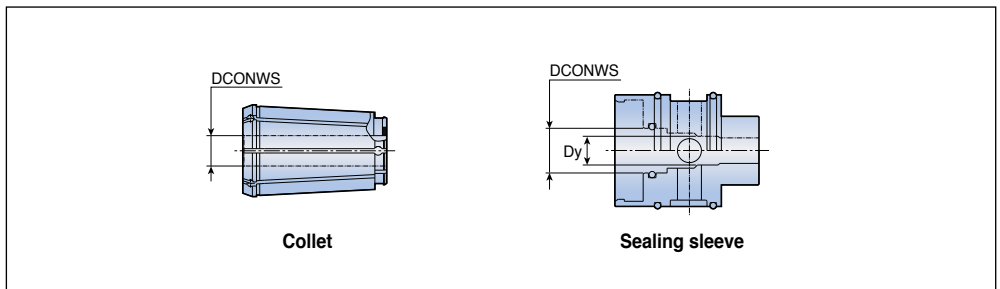
Designation	DC	D	D1	D2	D3	B	C	L	L1	L2	L3	L4	N-A
<b>DTC 4R</b>	18.4-65.0	165	115	206	53	186.5	60	319.7	59.2	152	228	75	2-PT1"
<b>5R</b>	65.0-123.9	225	164	312	100	310	100	382	62	201	320	95	2-PT1 1/4"
<b>6R</b>	124.0-183.9	350	244	445	152.4	412	120	487	75	250	412	118	4-PT1-1/4"

## 'RF' type connector



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

## Collet / Sealing Sleeve

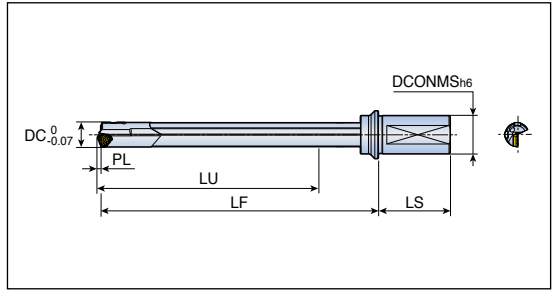


Designation	DC	DCONWS	Designation	DC	DCONWS	Dy	Outer O-ring	Inner O-ring	
<b>COLLET 4-18</b>	18.40-20.00	18.0	<b>SEALING SLEEVE 4-18</b>	<b>4-18</b>	18.40-20.00	18.0	OOR 65	IOR 18	
<b>4-19.5</b>	20.01-21.80	19.5		<b>4-19.5</b>	20.01-21.80	19.5		12	IOR 19.5
<b>4-21.5</b>	21.81-24.10	21.5		<b>4-21.5</b>	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

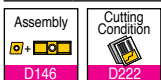
## Standard gundrill holders



- Drilling depth: 10xDC - 25xDC



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	290	360	69	40	4.57	10
<b>30.00xM40-10</b>	30.0	310	383	69	40	4.57	10
<b>31.00xM40-10</b>	31.0	310	383	69	40	4.57	10
<b>32.00xM40-10</b>	33.0	320	395	69	40	4.57	10
<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	3.6	15
<b>26.00xM40-15</b>	26.0	409	449	70	40	3.6	15
<b>27.00xM40-15</b>	27.0	424	465	70	40	3.6	15
<b>28.00xM40-15</b>	28.0	424	467	70	40	3.6	15
<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	580	650	69	40	4.57	20
<b>30.00xM40-20</b>	30.0	620	693	69	40	4.57	20



- Guide pad is sold separately from drill body.

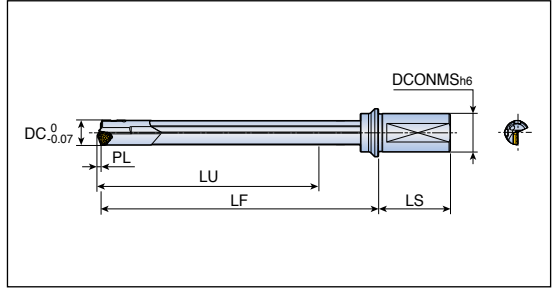
- Available upon request



## Standard gundrill holders



- Drilling depth: 10xDC - 25xDC



## Insert & guide pad

Tool dia. (mm)	Insert			Guide pad		
	Insert	Screw	Wrench	Guide pad	Screw	Wrench
14.00-15.99	TOGT 070304 RS TT9030	CSTB2.5S*	T-8F	PAD-GP05-18-060-DC-SB PAD-GP05-18-060-DC-SC	SR 34-508	T-7F
16.00-18.00	TOGT 080305 RS TT9030	CSTB2.5S*	T-8F	PAD-GP05-18-075-DC-SB PAD-GP05-18-075-DC-SC	SR 34-508	T-7F
18.01-20.00	TOGT 090305 RS TT9030	CSTB2.5S*	T-8F	PAD-GP06-20-085-DC-SB PAD-GP06-20-085-DC-SC	SR 34-508	T-7F
20.01-21.00	TOGT 100305 RS TT9030	CSTB3S*	T-9F			
21.01-21.99	TOGT 100305 RS TT9030	CSTB3S*	T-9F	PAD-GP06-20-100-DC-SB PAD-GP06-20-100-DC-SC	SR 34-508	T-7F
22.00-25.00	TOGT 110405 RS TT9030	SR14-571	T-10/5			
25.01-28.00	TOGT 120405 RS TT9030	CSTB4S*	T-15F	PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC	SR 34-508	T-7F
28.01-29.99	TOGT 130408 RS	SR 16-212/L10	T-20/5	PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC	SR 34-508	T-7F
30.00-32.00	TOGT 130408 RS	SR 16-212/L10	T-20/5	PAD-GP07-20-120-DC-SB PAD-GP07-20-120-DC-SC	CSTB-3S	T-9F

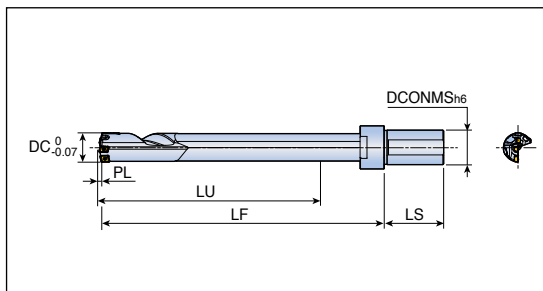
- Guide pad with "SB" is the first choice in general purpose machining.
- "SC" is an excellent toughness grade used with water-soluble coolant.
- Inserts and guide pads must be ordered separately



## Standard gundrill holders



- Drilling depth: 10xDC - 15xDC



Designation	Dimension (mm)						
	DC	LU	LF	LS	DCONMS	PL	L/D
<b>TRGD3 29.00FM40-10</b>	29.0	293	360	69	40	2.6	10
<b>30.00FM40-10</b>	30.0	313	383	69	40	2.9	10
<b>31.00FM40-10</b>	31.0	313	383	69	40	2.9	10
<b>32.00FM40-10</b>	32.0	323	395	69	40	3.0	10
<b>33.00FM40-10</b>	33.0	333	406	69	40	3.1	10
<b>34.00FM40-10</b>	34.0	343	418	69	40	3.0	10
<b>35.00FM40-10</b>	35.0	353	428	69	40	3.1	10
<b>36.00FM40-10</b>	36.0	363	441	69	40	3.1	10
<b>29.00FM40-15</b>	29.0	438	505	69	40	2.6	15
<b>30.00FM40-15</b>	30.0	468	538	69	40	2.9	15
<b>31.00FM40-15</b>	31.0	468	538	69	40	2.9	15
<b>32.00FM40-15</b>	32.0	483	555	69	40	3.0	15
<b>33.00FM40-15</b>	33.0	498	571	69	40	3.1	15
<b>34.00FM40-15</b>	34.0	513	588	69	40	3.0	15
<b>35.00FM40-15</b>	35.0	528	603	69	40	3.1	15
<b>36.00FM40-15</b>	36.0	543	621	69	40	3.1	15

- Guide pad is sold separately from drill body.
- Supply up to 40.0mm drill diameter

- Available upon request

## Insert & guide pad

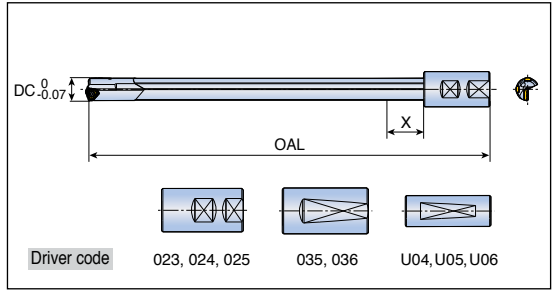
Parts	Diameter (mm)				
	29.0-29.99	30.0-33.0	33.01-35.0	35.01-36.0	
Insert	Peripheral insert	NPHT 060304R-G-P	NPHT 080404R-G-P	NPHT 080404R-G-P	NPHT 080404R-G-P
	Screw	CSTB2.2	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T-7F	T-8F	T-8F	T-8F
	Inner insert	NPMT 060304R-G-I	NPMT 070404R-G-I	NPMT 070404R-G-I	NPMT 070404R-G-I
	Screw	CSTB2.2	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T-7F	T-8F	T-8F	T-8F
	Center insert	NPMT 070408L-G-C	NPMT 070408L-G-C	NPMT 070408L-G-C	NPMT 080408L-G-C
	Screw	CSTB2.5	CSTB2.5	CSTB2.5	CSTB2.5
	Wrench	T-8F	T-8F	T-8F	T-8F
Pad	Guide pad	PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC	PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC	PAD-GP07-20-120-DC-SB PAD-GP07-20-120-DC-SC	PAD-GP07-20-120-DC-SB PAD-GP07-20-120-DC-SC
	Screw	SR 34-508	SR 34-508	CSTB3S	CSTB3S
	Wrench	T-7F	T-7F	T-9F	T-9F



- Inserts and guide pads must be ordered separately



## Standard gundrill holders



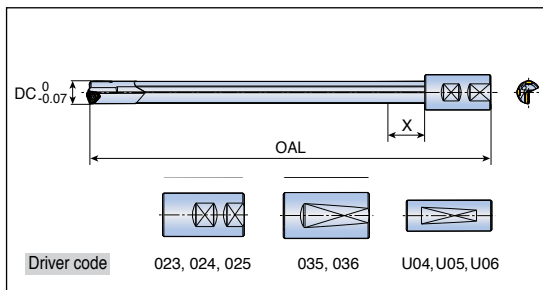
Designation	Driver code	Dimension (mm)		
		DC	OAL	X
<b>TRGDL 14.00X800-XXX</b>	U04 023	14	800	21
<b>14.00X1000-XXX</b>		14	1000	21
<b>14.00X1650-XXX</b>		14	1650	21
<b>14.50X800-XXX</b>		14.5	800	22
<b>14.50X1000-XXX</b>		14.5	1000	22
<b>14.50X1650-XXX</b>		14.5	1650	22
<b>15.00X800-XXX</b>		15	800	23
<b>15.00X1000-XXX</b>		15	1000	23
<b>15.00X1650-XXX</b>		15	1650	23
<b>16.00x800-XXX</b>	U04 023 035	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	
<b>20.00x800-XXX</b>	U05 024 036	20	800	30
<b>20.00x1000-XXX</b>		20	1000	30
<b>20.00x1500-XXX</b>		20	1500	30
<b>21.00x1000-XXX</b>		21	1000	31
<b>21.00x1500-XXX</b>		21	1500	31
<b>22.00x1000-XXX</b>		22	1000	33
<b>22.00x1500-XXX</b>		22	1500	33
<b>23.00x1000-XXX</b>		23	1000	34
<b>23.00x1500-XXX</b>		23	1500	34
<b>24.00x1000-XXX</b>		24	1000	36
<b>24.00x1500-XXX</b>		24	1500	36
<b>25.00x1000-XXX</b>		25	1000	37
<b>25.00x1500-XXX</b>	25	1500	37	



• Guide pad is sold separately from drill body.

- Available upon request
- Select "XXX" driver code

## Standard gundrill holders



Designation	Driver code	Dimension (mm)		
		DC	OAL	X
<b>TRGDL 26.00x1000-XXX</b>	U06 025 026 036	26	1000	39
<b>26.00x1500-XXX</b>		26	1500	39
<b>27.00x1000-XXX</b>		27	1000	40
<b>27.00x1500-XXX</b>		27	1500	40
<b>28.00x1000-XXX</b>		28	1000	42
<b>28.00x1500-XXX</b>		28	1500	42

• Guide pad is sold separately from drill body.

- Available upon request
- Select "XXX" driver code

## Insert & guide pad

Tool dia. (mm)	Insert			Guide pad		
	Insert	Screw	Wrench	Guide pad	Screw	Wrench
14.00-15.99	TOGT 070304 RS TT9030	SR 14-560/S	T-8F	PAD-GP05-18-060-DC-SB PAD-GP05-18-060-DC-SC	SR 34-508	T-7F
16.00-18.00	TOGT 080305 RS TT9030	SR 14-560/S	T-8F	PAD-GP05-18-075-DC-SB PAD-GP05-18-075-DC-SC	SR 34-508	T-7F
18.01-20.00	TOGT 090305 RS TT9030	CSTB2.5S*	T-8F	PAD-GP06-20-085-DC-SB PAD-GP06-20-085-DC-SC	SR 34-508	T-7F
20.01-21.00	TOGT 100305 RS TT9030	CSTB3S*	T-9F			
21.01-21.99	TOGT 100305 RS TT9030	CSTB3S*	T-9F	PAD-GP06-20-100-DC-SB PAD-GP06-20-100-DC-SC	SR 34-508	T-7F
22.00-25.00	TOGT 110405 RS TT9030	CSTB3.5H*	T-15F			
25.01-28.00	TOGT 120405 RS TT9030	CSTB4S*	T-15F	PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC	SR 34-508	T-7F



- Guide pad with "SB" is the first choice in general purpose machining.
- "SC" is an excellent toughness grade used with water-soluble coolant.
- Inserts and guide pads must be ordered separately

# Driver for TRGDL Type



Driver	Tool diameter	Driver code	Dimension (mm)	
			LS	DCONMS
	14.00-19.69	023	56	25.00
	16.00-25.69	024	60	32.00
	16.00-28.00	025	70	40.00
	16.00-28.00	026	80	50.00
	16.00-19.69	035	56	25.00
	16.00-25.69	036	60	32.00
	16.00-19.69	U04	70	25.40
	16.00-25.69	U05	70	31.75
	16.00-28.00	U06	70	38.10

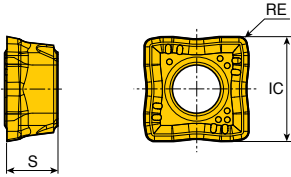
# Drilling Heads & Inserts



# SOMT...DP



Inserts for general purpose



Size	Dimension (mm)		
	IC	S	RE
<b>04</b>	4.4	2.38	0.4
<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	TT7400	K10	
	<b>SOMT 040204 DP</b>	●	●	●					
	<b>050204 DP</b>	●	●	●					
	<b>060204 DP</b>	●	●	●					
	<b>070306 DP</b>	●	●	●					
	<b>08T306 DP</b>	●	●	●					
	<b>09T308 DP</b>	●	●	●					
	<b>11T308 DP</b>	●	●	●					
	<b>130408 DP</b>	●	●	●					
	<b>150510 DP</b>	●	●	●					



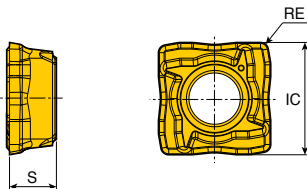
- TT9080: First choice for general purpose
- TT8020: For unstable condition
- TT9300: For high speed machining on a steel application (Peripheral **ONLY**)

●: Standard items

# SOMT...DL



Inserts for low carbon steel



Size	Dimension (mm)		
	IC	S	RE
<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	TT9030	TT8020	TT6030	TT9300	TT7400	K10	
	<b>SOMT 050204 DL</b>	●							
	<b>060204 DL</b>	●							
	<b>070306 DL</b>	●							
	<b>08T306 DL</b>	●							
	<b>09T308 DL</b>	●							
	<b>11T308 DL</b>	●							
	<b>130408 DL</b>	●							
	<b>150510 DL</b>	●							



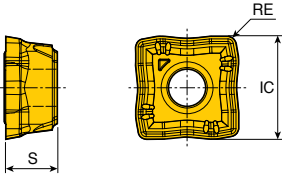
- TT9080: First choice for general purpose

●: 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>					●				

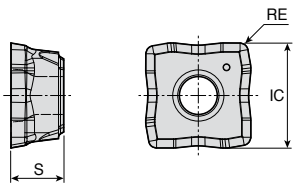


●: Standard items

# 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>								●	

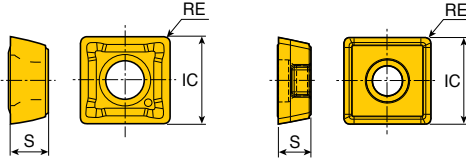


●: Standard items

# SPMG...DG



Inserts for general purpose



SPMG 120408 DG

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

Insert	Designation	Coated						Uncoated	
		TT9080	TT9030	TT8020	TT6030	TT9300	TT7400		
	<b>SPMG 050204 DG</b>		●	●		●			
	<b>060204 DG</b>		●	●		●			
	<b>07T308 DG</b>		●	●		●			
	<b>090408 DG</b>		●	●		●			
	<b>110408 DG</b>		●	●		●			
	<b>120408 DG</b>		●						
	<b>140512 DG</b>		●	●			●		



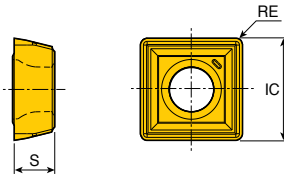
- TT9030: First choice for general purpose
- TT8020: For unstable condition
- TT7400: For high speed machining on a steel application (Peripheral **ONLY**)

●: Standard items

# SPMG...DK



Inserts for cast iron



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

Insert	Designation	Coated						Uncoated	
		TT9080	TT9030	TT8020	TT6030	TT9300	TT7400		
	<b>SPMG 050204 DK</b>				●				
	<b>060204 DK</b>				●				
	<b>07T308 DK</b>				●				
	<b>090408 DK</b>				●				
	<b>110408 DK</b>				●				
	<b>120408 DK</b>				●				
	<b>140512 DK</b>				●				

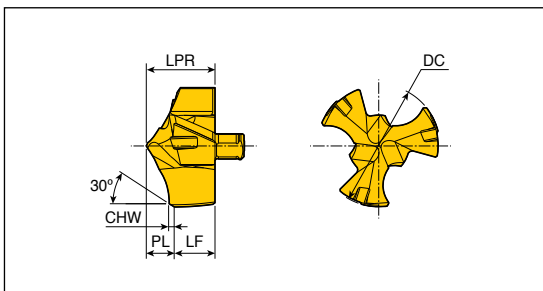


●: Standard items





## 3 flute drill heads



Designation	Dimension (mm)						Grade
	DC	LPR	PL	LF	CHW	SSC	TT5130
<b>3ED-150-P+</b>	15.0	8.40	3.31	5.09	0.50	15	●
<b>151-P+</b>	15.1	8.40	3.31	5.09	0.50	15	●
<b>152-P+</b>	15.2	8.40	3.31	5.09	0.50	15	●
<b>153-P+</b>	15.3	8.40	3.31	5.09	0.50	15	●
<b>154-P+</b>	15.4	8.40	3.31	5.09	0.50	15	●
<b>155-P+</b>	15.5	8.40	3.32	5.08	0.50	15	●
<b>156-P+</b>	15.6	8.40	3.32	5.08	0.50	15	●
<b>157-P+</b>	15.7	8.40	3.32	5.08	0.50	15	●
<b>158-P+</b>	15.8	8.40	3.32	5.08	0.50	15	●
<b>159-P+</b>	15.9	8.40	3.32	5.08	0.50	15	●
<b>160-P+</b>	16.0	9.00	3.70	5.30	0.70	16	●
<b>161-P+</b>	16.1	9.00	3.70	5.30	0.70	16	●
<b>162-P+</b>	16.2	9.00	3.70	5.30	0.70	16	●
<b>163-P+</b>	16.3	9.00	3.70	5.30	0.70	16	●
<b>164-P+</b>	16.4	9.00	3.70	5.30	0.70	16	●
<b>165-P+</b>	16.5	9.00	3.71	5.29	0.70	16	●
<b>166-P+</b>	16.6	9.00	3.71	5.29	0.70	16	●
<b>167-P+</b>	16.7	9.00	3.71	5.29	0.70	16	●
<b>168-P+</b>	16.8	9.00	3.71	5.29	0.70	16	●
<b>169-P+</b>	16.9	9.00	3.71	5.29	0.70	16	●
<b>170-P+</b>	17.0	9.50	3.88	5.62	0.70	17	●
<b>171-P+</b>	17.1	9.50	3.88	5.62	0.70	17	●
<b>172-P+</b>	17.2	9.50	3.88	5.62	0.70	17	●
<b>173-P+</b>	17.3	9.50	3.88	5.62	0.70	17	●
<b>174-P+</b>	17.4	9.50	3.88	5.62	0.70	17	●
<b>175-P+</b>	17.5	9.50	3.89	5.61	0.70	17	●
<b>176-P+</b>	17.6	9.50	3.89	5.61	0.70	17	●
<b>177-P+</b>	17.7	9.50	3.89	5.61	0.70	17	●
<b>178-P+</b>	17.8	9.50	3.89	5.61	0.70	17	●
<b>179-P+</b>	17.9	9.50	3.89	5.61	0.70	17	●

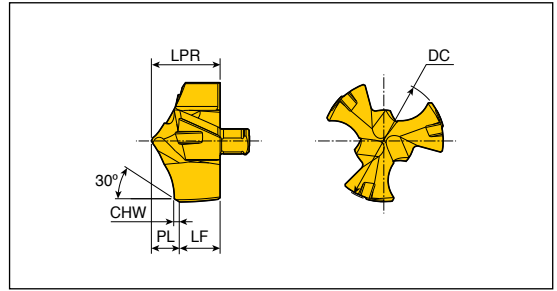


● SSC: Seat size code

●: Standard items

# 3ED...-P+

## 3 flute drill heads



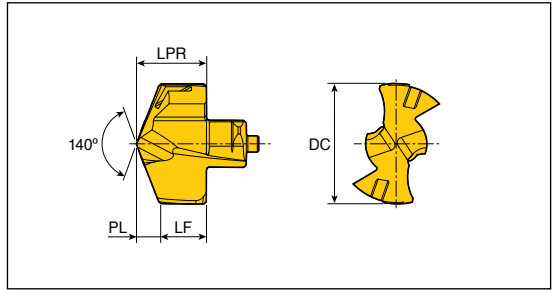
Designation	Dimension (mm)						Grade
	DC	LPR	PL	LF	CHW	SSC	TT5130
<b>3ED-180-P+</b>	18.0	10.10	4.07	6.03	0.70	18	●
<b>181-P+</b>	18.1	10.10	4.07	6.03	0.70	18	●
<b>182-P+</b>	18.2	10.10	4.07	6.03	0.70	18	●
<b>183-P+</b>	18.3	10.10	4.07	6.03	0.70	18	●
<b>184-P+</b>	18.4	10.10	4.07	6.03	0.70	18	●
<b>185-P+</b>	18.5	10.10	4.08	6.02	0.70	18	●
<b>186-P+</b>	18.6	10.10	4.08	6.02	0.70	18	●
<b>187-P+</b>	18.7	10.10	4.08	6.02	0.70	18	●
<b>188-P+</b>	18.8	10.10	4.08	6.02	0.70	18	●
<b>189-P+</b>	18.9	10.10	4.08	6.02	0.70	18	●
<b>190-P+</b>	19.0	10.70	4.26	6.44	0.70	19	●
<b>191-P+</b>	19.1	10.70	4.26	6.44	0.70	19	●
<b>192-P+</b>	19.2	10.70	4.26	6.44	0.70	19	●
<b>193-P+</b>	19.3	10.70	4.26	6.44	0.70	19	●
<b>194-P+</b>	19.4	10.70	4.26	6.44	0.70	19	●
<b>195-P+</b>	19.5	10.70	4.27	6.43	0.70	19	●
<b>196-P+</b>	19.6	10.70	4.27	6.43	0.70	19	●
<b>197-P+</b>	19.7	10.70	4.27	6.43	0.70	19	●
<b>198-P+</b>	19.8	10.70	4.27	6.43	0.70	19	●
<b>199-P+</b>	19.9	10.70	4.27	6.43	0.70	19	●
<b>200-P+</b>	20.0	11.30	4.44	6.86	0.70	20	●
<b>201-P+</b>	20.1	11.30	4.44	6.86	0.70	20	●
<b>202-P+</b>	20.2	11.30	4.44	6.86	0.70	20	●
<b>203-P+</b>	20.3	11.30	4.44	6.86	0.70	20	●
<b>204-P+</b>	20.4	11.30	4.44	6.86	0.70	20	●
<b>205-P+</b>	20.5	11.30	4.45	6.85	0.70	20	●
<b>206-P+</b>	20.6	11.30	4.45	6.85	0.70	20	●
<b>207-P+</b>	20.7	11.30	4.45	6.85	0.70	20	●
<b>208-P+</b>	20.8	11.30	4.45	6.85	0.70	20	●
<b>209-P+</b>	20.9	11.30	4.45	6.85	0.70	20	●



● SSC: Seat size code

●: Standard items

## Drill heads



Designation	Dimension (mm)					Grade
	DC	LPR	PL	LF	SSC	TT9080
<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

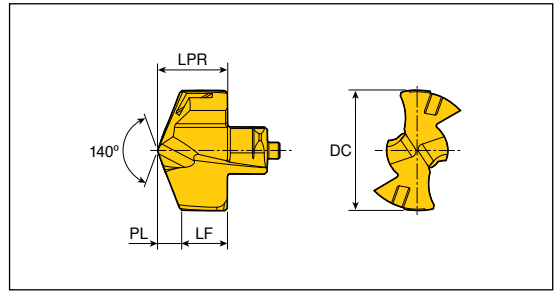


Stainless steel



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	●

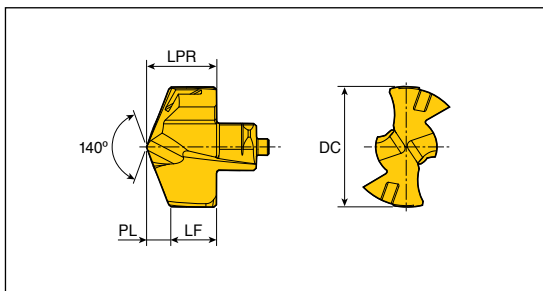


• Drill head can be ordered by an application  
 Order example) Diameter 10.0mm drill head for  
 ISO P application: TCD-100-P TT9080

• Standard items

**P** Steel **M** Stainless steel **K** Cast iron

## Drill heads



Designation	Dimension (mm)					Grade
	DC	LPR	PL	LF	SSC	
<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

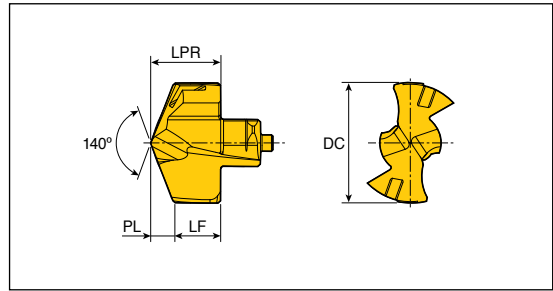


Stainless steel



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	●

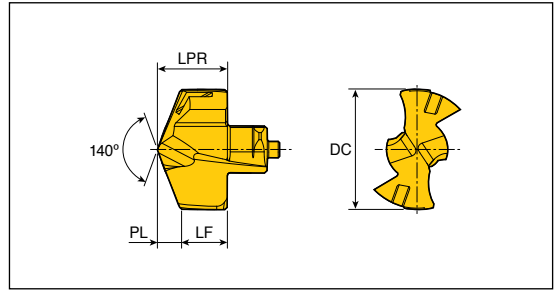


• Drill head can be ordered by an application  
 Order example) Diameter 10.0mm drill head for  
 ISO P application: TCD-100-P TT9080

• Standard items

**P** Steel **M** Stainless steel **K** 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	●

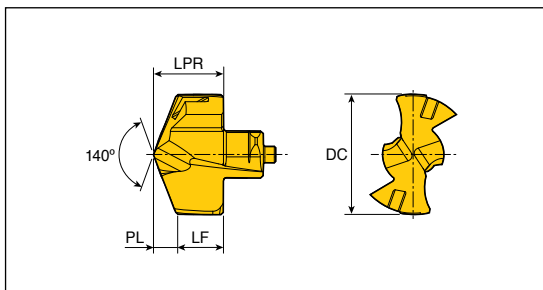


• Drill head can be ordered by an application  
 Order example) Diameter 10.0mm drill head for  
 ISO P application: TCD-100-P TT9080

●: Standard items

**P** Steel **M** Stainless steel **K** Cast iron

## Drill heads



Designation	Dimension (mm)					Grade
	DC	LPR	PL	LF	SSC	
<b>TCD - 235-P/M/K</b>	23.5	13.3	3.55	9.75	23	●
<b>236-P/M/K</b>	23.6	13.3	3.57	9.73	23	●
<b>237-P/M/K</b>	23.7	13.3	3.59	9.71	23	●
<b>238-P/M/K</b>	23.8	13.3	3.61	9.69	23	●
<b>239-P/M/K</b>	23.9	13.3	3.62	9.68	23	●
<b>240-P/M/K</b>	24.0	13.9	3.62	10.28	24	●
<b>241-P/M/K</b>	24.1	13.9	3.64	10.26	24	●
<b>242-P/M/K</b>	24.2	13.9	3.66	10.24	24	●
<b>243-P/M/K</b>	24.3	13.9	3.67	10.23	24	●
<b>244-P/M/K</b>	24.4	13.9	3.69	10.21	24	●
<b>245-P/M/K</b>	24.5	13.9	3.71	10.19	24	●
<b>246-P/M/K</b>	24.6	13.9	3.73	10.17	24	●
<b>247-P/M/K</b>	24.7	13.9	3.75	10.15	24	●
<b>248-P/M/K</b>	24.8	13.9	3.77	10.13	24	●
<b>249-P/M/K</b>	24.9	13.9	3.78	10.12	24	●
<b>250-P/M/K</b>	25.0	14.5	3.80	10.70	25	●
<b>251-P/M/K</b>	25.1	14.5	3.82	10.68	25	●
<b>252-P/M/K</b>	25.2	14.5	3.84	10.66	25	●
<b>253-P/M/K</b>	25.3	14.5	3.85	10.65	25	●
<b>254-P/M/K</b>	25.4	14.5	3.87	10.63	25	●
<b>255-P/M/K</b>	25.5	14.5	3.89	10.61	25	●
<b>256-P/M/K</b>	25.6	14.5	3.91	10.59	25	●
<b>257-P/M/K</b>	25.7	14.5	3.93	10.57	25	●
<b>258-P/M/K</b>	25.8	14.5	3.95	10.55	25	●
<b>259-P/M/K</b>	25.9	14.5	3.96	10.54	25	●



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

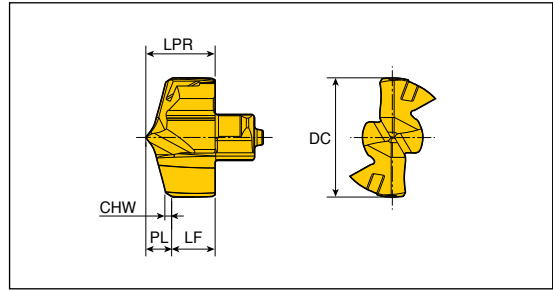
• Standard items

- P Steel
- M Stainless steel
- K Cast iron





## Self-centering drill heads



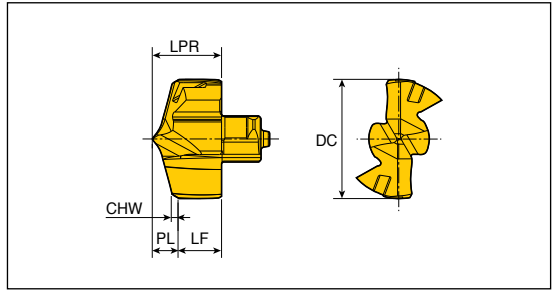
Designation	Dimension (mm)						Grade TT9080
	DC	LPR	PL	LF	CHW	SSC	
<b>TCD-060-P+</b>	6.0	4.00	1.46	2.54	0.5	6	●
<b>065-P+</b>	6.5	4.30	1.55	2.75	0.5	6.5	●
<b>068-P+</b>	6.8	4.30	1.59	2.71	0.5	6.5	●
<b>070-P+</b>	7.0	4.60	1.64	2.96	0.5	7	●
<b>072-P+</b>	7.2	4.60	1.67	2.93	0.5	7	●
<b>075-P+</b>	7.5	4.60	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	●



● SSC: Seat size code

●: Standard items

## Self-centering drill heads



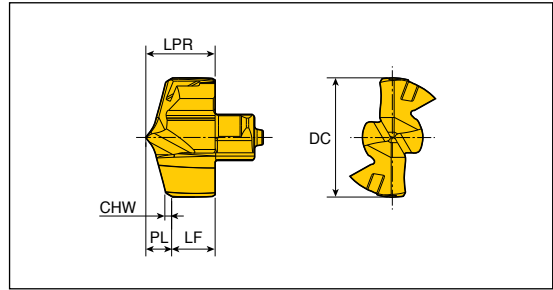
Designation	Dimension (mm)						Grade TT9080
	DC	LPR	PL	LF	CHW	SSC	
<b>TCD-114-P+</b>	11.4	6.60	2.55	4.05	0.7	11	●
<b>115-P+</b>	11.5	6.60	2.57	4.03	0.7	11	●
<b>116-P+</b>	11.6	6.60	2.58	4.02	0.7	11	●
<b>117-P+</b>	11.7	6.60	2.59	4.01	0.7	11	●
<b>118-P+</b>	11.8	6.60	2.61	3.99	0.7	11	●
<b>119-P+</b>	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

## Self-centering drill heads



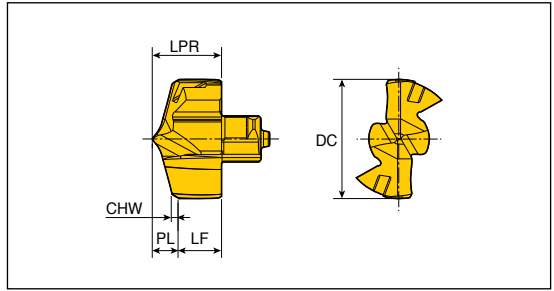
Designation	Dimension (mm)						Grade
	DC	LPR	PL	LF	CHW	SSC	TT9080
<b>TCD-151-P+</b>	15.1	8.73	3.20	5.53	0.7	15	●
<b>152-P+</b>	15.2	8.73	3.22	5.51	0.7	15	●
<b>153-P+</b>	15.3	8.73	3.23	5.50	0.7	15	●
<b>154-P+</b>	15.4	8.73	3.24	5.49	0.7	15	●
<b>155-P+</b>	15.5	8.73	3.26	5.47	0.7	15	●
<b>156-P+</b>	15.6	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	●



● SSC: Seat size code

●: Standard items

## Self-centering drill heads



Designation	Dimension (mm)						Grade TT9080
	DC	LPR	PL	LF	CHW	SSC	
<b>TCD-188-P+</b>	18.8	10.50	3.92	6.58	0.81	18	●
<b>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	●

● SSC: Seat size code

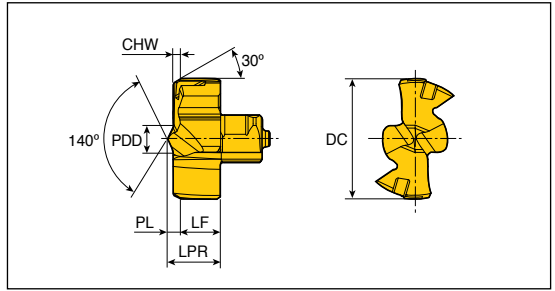
●: Standard items



D51



## 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

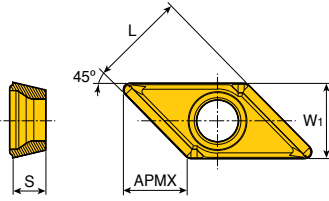
●: Standard items





# AOMT 060204-C45

Chamfering inserts for pre-thread hole



Size	Dimension (mm)			
	W1	L	S	APMX
<b>06</b>	4.5	5.66	1.96	4.0

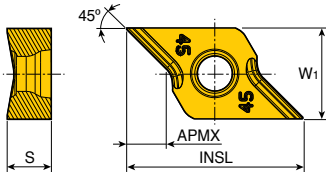
Insert	Designation	Coated						Uncoated	
		TT9080	TT9030	TT8020	TT6030	TT9300	TT7400		
	<b>AOMT 060204-C45</b>	●						K10	



●: Standard items

# CRNG 0802-45CD

Chamfering inserts for chamfering ring



Size	Dimension (mm)			
	W1	INSL	S	APMX
<b>08</b>	7.5	14.80	3.65	3.3

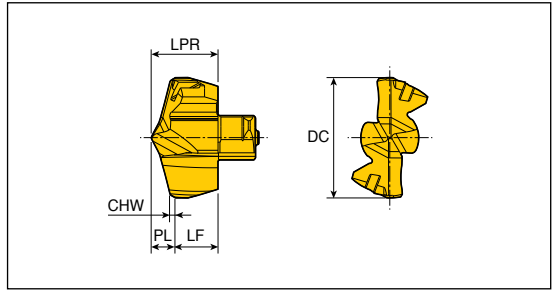
Insert	Designation	Coated						Uncoated	
		TT9080	TT9030	TT8020	TT6030	TT9300	TT7400		
	<b>CRNG 0802-45CD</b>	●						K10	



●: Standard items

# TCD...P-CO+

Self-centering 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	●

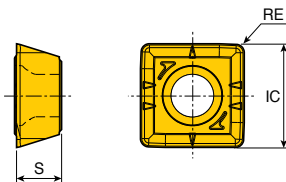


● SSC: Seat size code

● Standard items

# SPGX...DW

Inserts



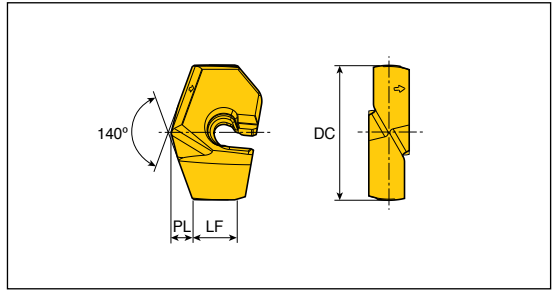
Size	Dimension (mm)			
	IC	S	RE	
<b>06</b>	6.07	2.38	0.4	
<b>07</b>	8.02	3.97	0.8	
<b>09</b>	9.91	4.30	0.8	
<b>11</b>	11.62	4.80	0.8	
<b>14</b>	14.41	5.20	1.2	

Insert	Designation	Coated						Uncoated	
		TT9080	TT8020	TT9900	TT9030	TT6080	TT7400	K10	
	<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	●

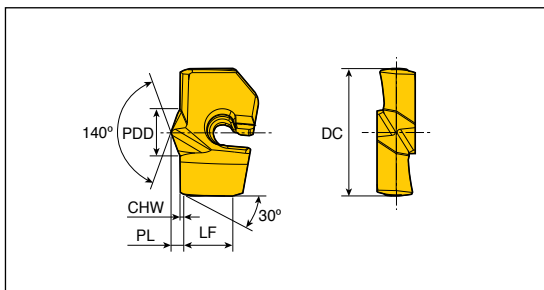


● SSC: Seat size code

●: Standard items



## 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

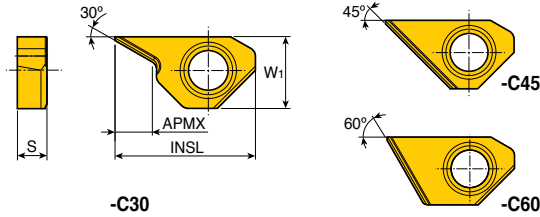
●: Standard items






# XCGT ...-C



## Chamfering inserts for T-CHAMFER holder



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

Insert	Designation	Coated						Uncoated	
		TT9080	TT9030	TT8020	TT6030	TT9300	TT7400		K10
	<b>XCGT 0603-C30</b>	•							
	<b>0903-C30</b>	•							
	<b>XCGT 0603-C45</b>	•							
	<b>0903-C45</b>	•							
	<b>XCGT 0603-C60</b>	•							
	<b>0903-C60</b>	•							

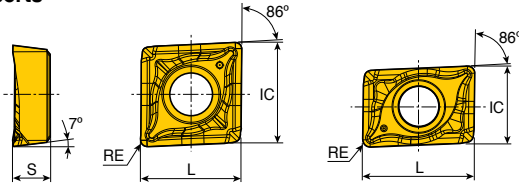
•: Standard items



# XCGT...TA



## Inserts



XCGT 0401

Size	Dimension (mm)			
	IC	L	S	RE
<b>04</b>	4.4	6.4	1.70	0.4
<b>05</b>	5.6	5.6	2.10	0.4
<b>06</b>	6.4	6.4	2.38	0.4
<b>07</b>	7.5	7.5	3.18	0.4
<b>08</b>	8.4	8.4	3.18	0.4
<b>10</b>	10.5	10.5	3.97	0.4
<b>13</b>	13.4	13.4	4.76	0.4
<b>17</b>	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	
<p>Right hand shown (XCGT 0401)</p>	<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							•	

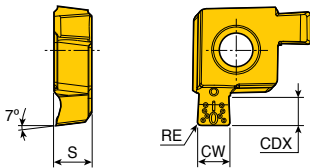


• Standard items

# XCMT...R-GV



## Inserts



Size	Dimension (mm)			
	CW	CDX	S	RE
<b>05</b>	2.0	1.8	2.27	0.2
<b>06</b>	2.0	2.0	2.62	0.2
<b>07</b>	2.5	2.0	3.42	0.2
<b>08</b>	2.5	2.5	3.50	0.2
<b>10</b>	3.0	3.0	4.37	0.3
<b>13</b>	3.5	3.5	5.24	0.3
<b>17</b>	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







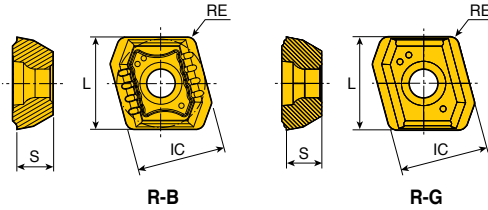





# NPMX...R-B/R-G



Inserts for TBTA...3/5/7/9



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>	●	●	●	●	●			●	●			

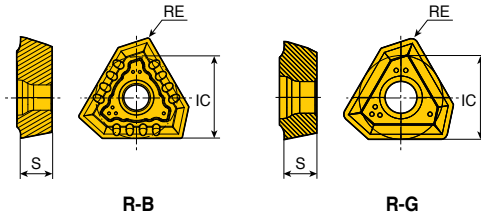


●: Standard items


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



Inserts for TBTA...3/5/7/9 & 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
	<b>TPMX 140304R-B</b>	●	●	●	●		●		●				
	<b>140308R-B</b>	●	●	●		●					●		
	<b>140308R-G</b>	●	●	●	●	●	●			●	●	●	
	<b>170404R-B</b>	●	●	●	●		●		●				
	<b>170408R-B</b>	●	●	●		●						●	
	<b>170408R-G</b>	●	●	●	●	●	●			●	●	●	
	<b>240504R-B</b>	●	●	●	●				●				
	<b>240512R-B</b>	●	●	●		●						●	
	<b>240512R-G</b>	●	●	●	●	●	●			●	●	●	
	<b>280708R-B</b>	●	●	●	●	●			●				
<b>280716R-B</b>	●	●	●		●						●		
<b>280716R-G</b>	●	●	●	●	●	●	●		●	●	●		



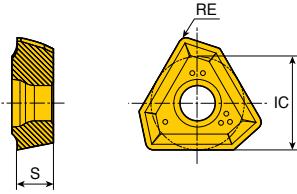
●: Standard items



# TPMX...LG



Inserts for TBTA-R



Size	Dimension (mm)		
	IC	S	RE
<b>14</b>	8.45	3.5	0.8
<b>17</b>	10.30	4.0	0.8
<b>24</b>	14.20	5.5	1.2

Insert	Designation	Pocket			Coated						Uncoated			
		Center	Inner	Outer	TT9030	TT9130	TT8125	TT7200	TT6130	TT6020	TT5100	TT5030	K10	
	<b>TPMX 140308 LG</b>			●	●						●			
	<b>170408 LG</b>			●	●	●				●	●			
	<b>240512 LG</b>			●	●	●				●	●			

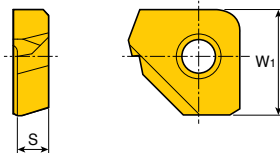


●: Standard items

# XPMT...-45



Inserts for TBTA-R



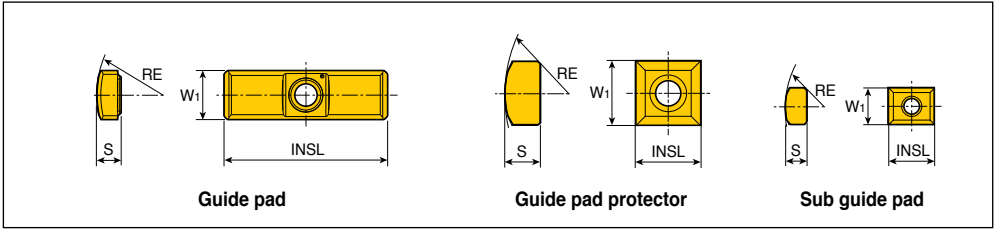
Size	Dimension (mm)	
	W1	S
<b>16</b>	9.5	2.70

Insert	Designation	Pocket			Coated						Uncoated		
		Center	Inner	Outer	TT9030	TT8125	TT7100	TT3500	TT6020	TT9300	TT7400	K10	
	<b>XPMT 16002-45</b>			●	●								



●: Standard items

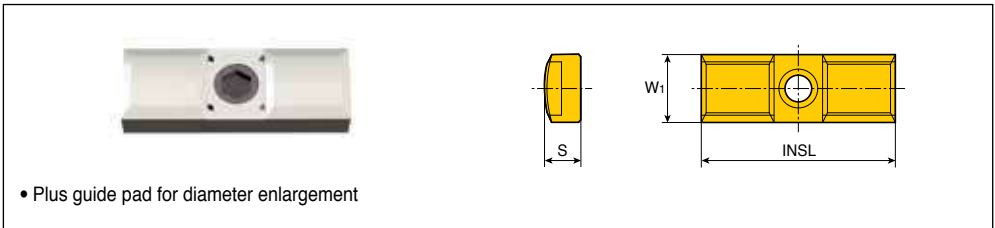
# Pad for TBTA 3.../5.../7.../9...



Designation		Dimension (mm)				Screw
		W <sub>1</sub>	S	INSL	RE	
Guide pad	<b>PAD - GP08-25-155-DC-SB</b>	8	4.5	25	15.5	CSTB3S
	<b>GP08-25-155-DC-SC</b>	8	4.5	25	15.5	CSTB3S
	<b>GP10-35-200-DC-SB</b>	10	6.0	35	20.0	CSTB4S
	<b>GP10-35-200-DC-SC</b>	10	6.0	35	20.0	CSTB4S
	<b>GP14-40-250-DC-SB/SC</b>	14	7.5	40	25.0	CSTA5S
	<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	CSTB3S
	<b>P10</b>	10	6.0	10	20.0	CSTB4S
	<b>P14</b>	14	7.5	14	25.0	CSTA5S
	<b>P18</b>	18	9.0	18	30.0	LS1206S
	<b>PAD - S08</b>	8	4.5	10	17.5	CSTB3S
Sub guide pad	<b>S10</b>	10	5.0	10	29.0	CSTB3S
	<b>S14</b>	14	7.0	20	45.0	CCSTA5S



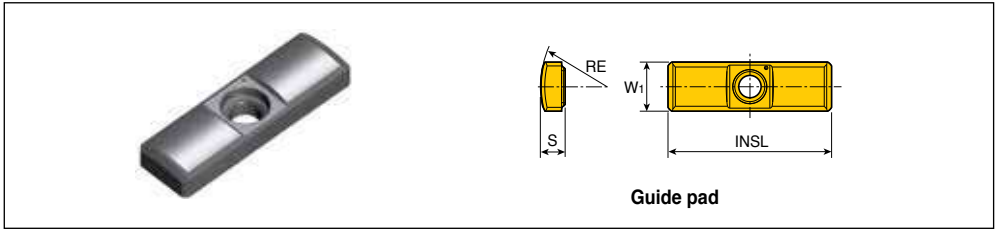
# Plus Guide Pad for TBTA 3.../5.../7.../9...



Designation										
DC	DC+1mm	S	DC+2mm	S	DC+3mm	S	DC+4mm	S	DC+5mm	S
<b>PAD-GC08</b>	<b>PAD-GC08+1</b>	5.0	<b>PAD-GC08+2</b>	5.5	<b>PAD-GC08+3</b>	6.0	-	-	-	-
<b>PAD-GC10</b>	<b>PAD-GC10+1</b>	6.5	<b>PAD-GC10+2</b>	7.0	<b>PAD-GC10+3</b>	7.5	<b>PAD-GC10+4</b>	8.0	-	-
<b>PAD-GC14</b>	<b>PAD-GC14+1</b>	8.0	<b>PAD-GC14+2</b>	8.5	<b>PAD-GC14+3</b>	9.0	<b>PAD-GC14+4</b>	9.5	<b>PAD-GC14+5</b>	10.0
<b>PAD-GC18</b>	<b>PAD-GC18+1</b>	9.5	<b>PAD-GC18+2</b>	10	<b>PAD-GC18+3</b>	10.5	<b>PAD-GC18+4</b>	11.0	<b>PAD-GC18+5</b>	11.5





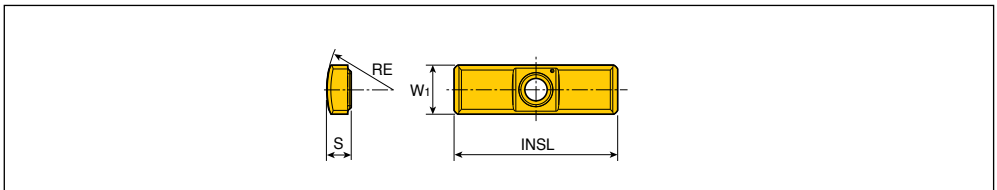


Designation	Dimension (mm)				Screw	
	W1	S	INSL	RE		
Guide pad	<b>PAD - GP06-20-120-DC-SB</b>	6	3.0	20	12.0	CSTB2.2S
	<b>GP06-20-120-DC-SC</b>	6	3.0	20	12.0	CSTB2.2S
	<b>GP07-20-120-DC-SB</b>	7	3.5	20	12.0	CSTB3S
	<b>GP07-20-120-DC-SC</b>	7	3.5	20	12.0	CSTB3S
	<b>GP08-25-155-DC-SB</b>	8	4.5	25	15.5	CSTB3S
	<b>GP08-25-155-DC-SC</b>	8	4.5	25	15.5	CSTB3S
	<b>GP10-30-200-DC-SB</b>	10	4.5	30	20.0	CSTB3.5
	<b>GP10-30-200-DC-SC</b>	10	4.5	30	20.0	CSTB3.5
	<b>GP12-35-250-DC-SB</b>	12	5.5	35	25.0	CSTB3.5
	<b>GP12-35-250-DC-SC</b>	12	5.5	35	25.0	CSTB3.5



# Pad for TBTA-TR & TRGD

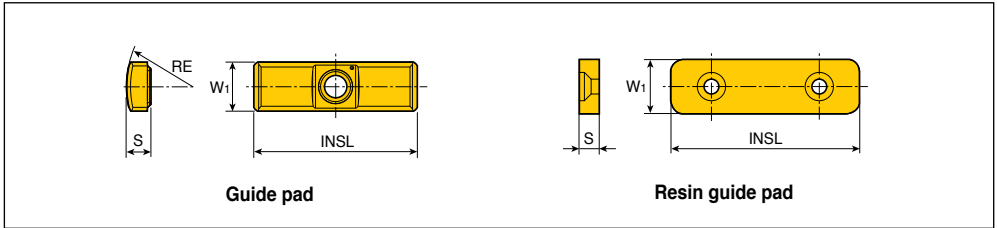
## Solid carbide guide pads



Designation	Dimension (mm)				Screw	
	W1	S	INSL	RE		
Guide pad	<b>PAD - GP05-18-060-DC-SB</b>	5	2.5	18	6.0	SR34-508
	<b>GP05-18-060-DC-SC</b>	5	2.5	18	6.0	SR34-508
	<b>GP05-18-075-DC-SB</b>	5	2.5	18	7.5	SR34-508
	<b>GP05-18-075-DC-SC</b>	5	2.5	18	7.5	SR34-508
	<b>GP06-20-085-DC-SB</b>	6	3.0	20	8.5	CSTB2.2S* / SR34-508
	<b>GP06-20-085-DC-SC</b>	6	3.0	20	8.5	CSTB2.2S* / SR34-508
	<b>GP06-20-100-DC-SB</b>	6	3.0	20	10.0	CSTB2.2S* / SR34-508
	<b>GP06-20-100-DC-SC</b>	6	3.0	20	10.0	CSTB2.2S* / SR34-508
	<b>GP06-20-120-DC-SB</b>	6	3.0	20	12.0	CSTB2.2S* / SR34-508
	<b>GP06-20-120-DC-SC</b>	6	3.0	20	12.0	CSTB2.2S* / SR34-508



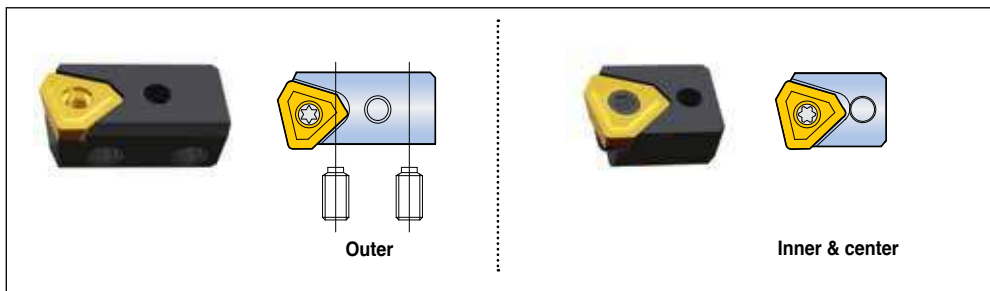
- Guide pad with "SB" is the first choice in general purpose machining.
- "SC" is an excellent toughness grade used with water-soluble coolant.



	Designation	Dimension (mm)				Screw
		W1	S	INSL	RE	
Guide pad	<b>PAD - GC08-120</b>	8	4.4	25	17.5	CSTB3S
	<b>GC08-140</b>	8	3.5	25	17.5	CSTB3S
	<b>GP08-25-155-DC-SB</b>	8	4.5	25	15.5	CSTB3S
	<b>GP08-25-155-DC-SC</b>	8	4.5	25	15.5	CSTB3S
	<b>GP10-35-200-DC-SB</b>	10	6.0	35	20.0	CSTB4S
	<b>GP10-35-200-DC-SC</b>	10	6.0	35	20.0	CSTB4S
	<b>GP14-40-250-DC-SB</b>	14	7.5	40	25.0	CSTA5S
	<b>GP14-40-250-DC-SC</b>	14	7.5	40	25.0	CSTA5S
	<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



# Cartridge for TBTA 3.../5.../7.../9



	Designation	Adjust screw	Wrench	Lock screw	Wrench	Insert
Outer	<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	L1806RH	H4	TPMX2405..
	<b>402-63</b>	AS0006-15	H3	L1806RH	H4	TPMX2807..
Inner & center	<b>CENC 05R</b>	-	-	CSTB3	T9	NPMX0803..
	<b>402-04</b>	-	-	CSTB3.5	T15	TPMX1403..
	<b>402-32</b>	-	-	CSTA5	T15	TPMX1704..
	<b>402-43</b>	-	-	LS1206	H3	TPMX2405..
	<b>402-63</b>	-	-	LS1206	H3	TPMX2807..

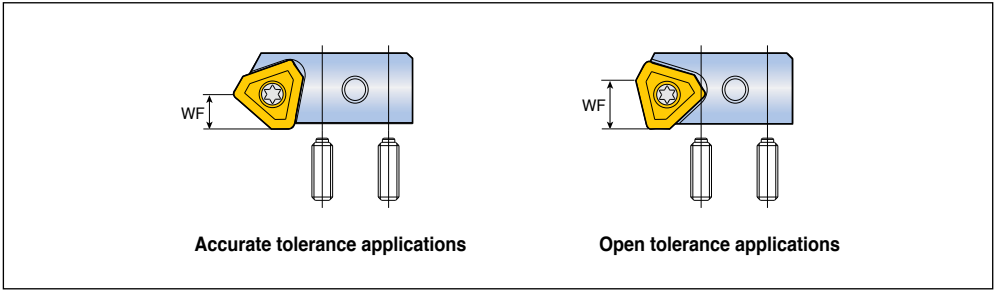


# Plus Cartridge for TBTA 3.../5.../7.../9



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>



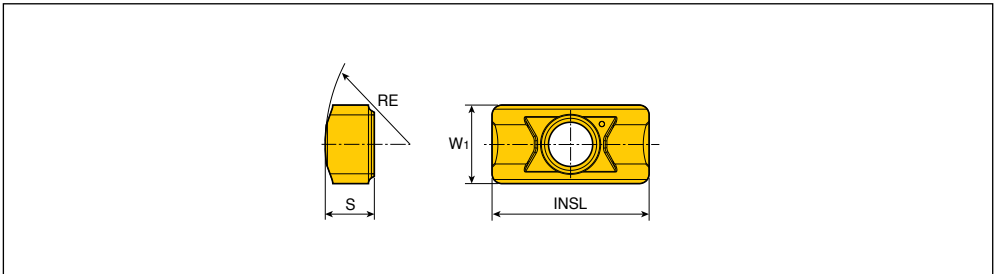


Designation		WF (mm)	Adjust screw	Wrench	Lock screw	Wrench	Insert
Accurate tolerance applications	<b>PERC P04R</b>	5	AS0004-8	H2	LS1803.5RH	H2.5	TPMX1403..LG
	<b>P32R</b>	6	AS0005-10	H2.5	LS1805RH	H3	TPMX1704..LG
	<b>P43R</b>	8	AS0005-15	H2.5	LS1806RH	H4	TPMX2405..LG
Open tolerance applications	<b>PERC 402-04</b>	8	AS0004-8	H2	LS1803.5RH	H2.5	TPMX1403..RG
	<b>402-32</b>	9	AS0005-10	H2.5	LS1805RH	H3	TPMX1704..RG
	<b>402-43</b>	13	AS0005-15	H2.5	LS1806RH	H4	TPMX2405..RG



• PERC-P and PERC 402-□□ cartridges are interchangeable in the same pocket

# Guide pad for TNDH-TP



Designation	Dimension (mm)				Screw	Grade TT9030
	W1	S	INSL	RE		
<b>PAD-G04-08</b>	4	2.5	8	9	TS 20043I/HG-P	●



• Guide pad is sold separately from drill body.

• Standard items

# Recommended Cutting Conditions

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

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	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
		>12% Si	Cured		90	24	200-350
			High temp.		130	25	200-350
	Copper alloys	>1% Pb	Free cutting		110	26	150-250
			Brass		90	27	150-250
			Electrolytic copper		100	28	150-250
	Non-metallic		Duroplastics, fiber plastics			29	150-250
			Hard rubber			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			Rm 400		36	50-80
			Alpha+beta alloys cured	Rm 1050		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 Drill length 2,3,4xD								
SOMT 04 Ø12 - Ø13.5	SOMT 05 Ø14 - Ø16	SOMT 06 Ø17 - Ø19	SOMT 07 Ø20 - Ø22	SOMT 08 Ø23 - Ø26	SOMT 09 Ø27 - Ø31	SOMT 11 Ø32 - Ø36	SOMT 13 Ø37 - Ø43	SOMT 15 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	0.08-0.16	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	0.08-0.16	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
0.06-0.09	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
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/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	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
					930	275	7	100-180
			Quenched and tempered		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
				Electrolytic copper		100	28	150-250
	Non-metallic		Duroplastics, fiber plastics			29	150-250	
			Hard rubber			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			Rm 400		36	50-80	
			Alpha+beta alloys cured	Rm 1050		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 Drill length 5xD								
SOMT 04 Ø12 - Ø13.5	SOMT 05 Ø14 - Ø16	SOMT 06 Ø17 - Ø19	SOMT 07 Ø20 - Ø22	SOMT 08 Ø23 - Ø26	SOMT 09 Ø27 - Ø31	SOMT 11 Ø32 - Ø36	SOMT 13 Ø37 - Ø43	SOMT 15 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	0.08-0.16	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/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	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
					930	275	7	100-180
			Quenched and tempered		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	
			Electrolytic copper		100	28	150-250	
	Non-metallic		Duroplastics, fiber plastics			29	150-250	
			Hard rubber			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			Rm 400		36	50-80	
			Alpha+beta alloys cured	Rm 1050		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 Drill length 2,3,4xD					
SOMT 09 Ø51 - Ø55	SOMT 11 Ø56 - Ø60	SOMT 11 Ø61 - Ø65	SOMT 11 Ø66 - Ø70	SOMT 13 Ø71 - Ø75	SOMT 13 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
0.10-0.18	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
0.05-0.10	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/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	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
					930	275	7	120-160
			Quenched and tempered		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			29	150-230	
			Hard rubber			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			Rm 400		36	30-60	
			Alpha+beta alloys cured	Rm 1050		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 Drill length 2,3,4xD					
SPMG 05 Ø12.5 - Ø15	SPMG 06 Ø16 - Ø21	SPMG 07 Ø22 - Ø27	SPMG 09 Ø28 - Ø33	SPMG 11 Ø34 - Ø41	SPMG 14 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	0.08-0.14	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/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	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
					930	275	7	120-160
			Quenched and tempered		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	
			Electrolytic copper		100	28	150-230	
	Non-metallic		Duroplastics, fiber plastics			29	150-230	
			Hard rubber			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			Rm 400		36	30-60	
		Alpha+beta alloys cured		Rm 1050		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 Drill length 5xD					
SPMG 05 Ø12.5 - Ø15	SPMG 06 Ø16 - Ø21	SPMG 07 Ø22 - Ø27	SPMG 09 Ø28 - Ø33	SPMG 11 Ø34 - Ø41	SPMG 14 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	0.08-0.12	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	0.06-0.12	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
0.05-0.09	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 DRILL-SPEED

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			29
			Hard rubber			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			Rm 400		36
			Alpha+beta alloys cured	Rm 1050		37
H	Hardened steel	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 DRILL-RUSH

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	80-140	
		>=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 and cast steel (Less than 5% of alloying elements)		Annealed		600	200	6	70-120
					930	275	7	70-110
			Quenched and tempered		1000	300	8	50-90
					1200	350	9	40-70
	High alloy steel, cast steel and tool steel		Annealed	680	200	10	50-90	
			Quenched and tempered	1100	325	11	40-80	
M	Stainless steel 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 (GG)	Ferritic		160	15	90-160		
		Pearlitic		250	16	80-140		
	Cast iron nodular (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-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
				Electrolytic copper		100	28	90-220
	Non-metallic		Duroplastics, fiber plastics				29	
			Hard rubber					30
S	High temp. alloys	Fe based	Annealed		200	31	30-60	
			Cured		280	32	20-50	
		Ni or Co based	Annealed		250	33	20-50	
			Cured		350	34	20-50	
			Cast		320	35	20-50	
	Titanium, Ti alloys			Rm 400		36	20-50	
			Alpha+beta alloys cured	Rm 1050		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 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
			Electrolytic copper		100	28	160-260
	Non-metallic		Duroplastics, fiber plastics			29	
			Hard rubber			30	
S	High temp. alloys	Fe based	Annealed		200	31	30-60
			Cured		280	32	30-80
		Ni or Co based	Annealed		250	33	30-80
			Cured		350	34	30-80
			Cast		320	35	30-80
	Titanium, Ti alloys			Rm 400		36	30-80
			Alpha+beta alloys cured	Rm 1050		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 SPADE-RUSH

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	80-140
		≥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 and cast steel (Less than 5% of alloying elements)	Quenched and tempered	600	200	6	80-120	
			930	275	7	70-110	
			1000	300	8	50-90	
			1200	350	9	40-70	
	High alloy steel, cast steel and tool steel	Annealed	680	200	10	50-90	
		Quenched and tempered	1100	325	11	40-80	
M	Stainless steel 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 (GG)	Ferritic		160	15	90-180	
		Pearlitic		250	16	80-140	
	Cast iron nodular (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-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
			Electrolytic copper		100	28	90-220
	Non-metallic		Duroplastics, fiber plastics			29	
			Hard rubber			30	
S	High temp. alloys	Fe based	Annealed		200	31	30-60
			Cured		280	32	20-50
		Ni or Co based	Annealed		250	33	20-50
			Cured		350	34	20-50
			Cast		320	35	20-50
	Titanium, Ti alloys		Rm 400		36	20-50	
		Alpha+beta alloys cured	Rm 1050		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 SOLID-3-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	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 and cast steel (Less than 5% of alloying elements)		Annealed		600	200	6	80-120
					930	275	7	70-110
			Quenched and tempered		1000	300	8	50-90
					1200	350	9	40-70
	High alloy steel, cast steel and tool steel		Annealed	680	200	10	50-90	
			Quenched and tempered	1100	325	11	40-80	
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	80-140		
		Pearlitic		250	16	70-120		
	Cast iron nodular (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-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				29	
			Hard rubber					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			Rm 400		36		
Alpha+beta alloys cured			Rm 1050		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 H-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	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	
			Quenched and tempered	1000	300	5	70-100	
	Low alloy steel and cast steel (Less than 5% of alloying elements)		Annealed		600	200	6	70-90
					930	275	7	70-90
			Quenched and tempered		1000	300	8	50-80
					1200	350	9	40-70
	High alloy steel, cast steel and tool steel		Annealed	680	200	10	50-80	
			Quenched and tempered	1100	325	11	40-70	
M	Stainless steel 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 (GG)	Ferritic		160	15	65-80		
		Pearlitic		250	16	65-80		
	Cast iron nodular (GGG)	Ferritic		180	17	85-105		
		Pearlitic		260	18	75-90		
	Malleable cast iron	Ferritic		130	19	65-80		
Pearlitic			230	20	65-80			
N	Aluminum - Wrought alloy	Not cureable		60	21	70-200		
		Cured		100	22	70-200		
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23	70-200	
			Cured		90	24	70-200	
		>12% Si	High temp.		130	25	70-150	
	Copper alloys	>1% Pb	Free cutting		110	26	70-200	
			Brass		90	27	70-200	
			Electrolitic copper		100	28	70-200	
	Non-metallic		Duroplastics, fiber plastics			29		
			Hard rubber				30	
S	High temp. alloys	Fe based	Annealed		200	31	15-40	
			Cured		280	32	15-40	
		Ni or Co based	Annealed		250	33	15-40	
			Cured		350	34	15-40	
			Cast		320	35	15-40	
	Titanium, Ti alloys			Rm 400		36		
			Alpha+beta alloys cured	Rm 1050		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
0.10-0.25	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 TOP-CAP

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, fiber plastics			29
			Hard rubber			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		Rm 400			36
			Alpha+beta alloys cured	Rm 1050		
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
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 TBTA 3/5/7/9 & TBTA-R

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	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
					930	275	7	50-100
			Quenched and tempered		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	
	Copper alloys		>1% Pb	Free cutting		110	26	60-130
				Brass		90	27	60-130
				Electrolitic copper		100	28	60-130
	Non-metallic		Duroplastics, fiber plastics			29		
			Hard rubber			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			Rm 400		36	30-100	
			Alpha+beta alloys cured	Rm 1050		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-FB

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	
	Non-metallic		Duroplastics, fiber plastics			29		
			Hard rubber				30	
S	High temp. alloys	Fe based	Annealed		200	31	20-50	
			Cured		280	32	20-50	
		Ni or Co based	Annealed		250	33	20-50	
			Cured		350	34	20-50	
			Cast		320	35	20-50	
	Titanium, Ti alloys			Rm 400		36	30-60	
			Alpha+beta alloys cured	Rm 1050		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 BTA & BTS

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	70-120
		≥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 and cast steel (Less than 5% of alloying elements)	Quenched and tempered	Annealed	600	200	6	70-100
			930	275	7	55-100	
			1000	300	8	55-100	
			1200	350	9	55-100	
	High alloy steel, cast steel and tool steel	Annealed	680	200	10	50-85	
		Quenched and tempered	1100	325	11	55-100	
M	Stainless steel 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 (GG)	Ferritic		160	15	60-100	
		Pearlitic		250	16	60-100	
	Cast iron nodular (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-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
			Electrolytic copper		100	28	65-130
	Non-metallic		Duroplastics, fiber plastics			29	
			Hard rubber			30	
S	High temp. alloys	Fe based	Annealed		200	31	10-50
			Cured		280	32	10-50
		Ni or Co based	Annealed		250	33	10-50
			Cured		350	34	10-50
			Cast		320	35	10-50
	Titanium, Ti alloys		Rm 400		36	30-50	
		Alpha+beta alloys cured	Rm 1050		37	30-50	
H	Hardened steel	Hardened		55HRC	38		
		Hardened		60HRC	39		
	Cast iron nodular	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 TRGD / 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
				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, fiber plastics			29
			Hard rubber			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		Rm 400			36
			Alpha+beta alloys cured	Rm 1050		
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 / TRGDL / TBTA-TR

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



# Reaming Tools











# TM...KEY

## Clamping keys

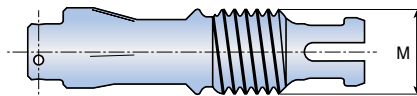


Designation	Clamping key	
	Head diameter range (mm)	SSC
<b>TM - B5-KEY</b>	11.501-13.500	B5
<b>B6-KEY</b>	13.501-16.000	B6
<b>B7-KEY</b>	16.001-20.000	B7
<b>B8-KEY</b>	20.001-25.400	B8
<b>B9-KEY</b>	25.401-32.000	B9

• SSC: Seat size code

# TM...SCR

## Clamping screws



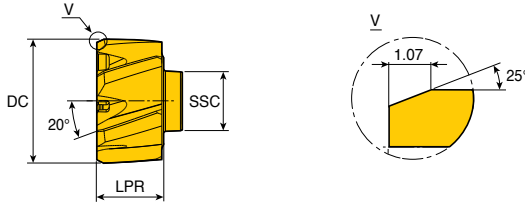
Designation	Clamping screw	
	Head diameter range (mm)	M
<b>TM - B5-SCR</b>	11.501-13.500	M5
<b>B6-SCR</b>	13.501-16.000	M6
<b>B7-SCR</b>	16.001-20.000	M7
<b>B8-SCR</b>	20.001-25.400	M8
<b>B9-SCR</b>	25.401-32.000	M9







## Head changeable reamer heads



- Left-handed flute for through hole
- For H7 hole tolerance

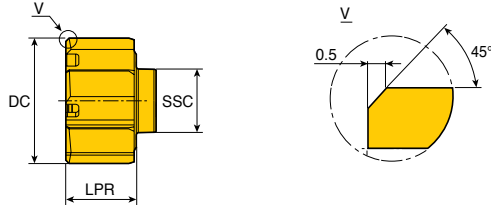
Head	Designation	Dimension (mm)		NOF	SSC	Flute type	Edge type	Grade TT9030	
		DC	LPR						
	<b>TM - 11.501-BL-B5</b>	11.501	9.5	6	B5	L	B	●	
	<b>12.000-BL-B5</b>	12.000	9.5	6	B5	L	B	●	
	<b>13.000-BL-B5</b>	13.000	9.5	6	B5	L	B	●	
	<b>13.500-BL-B5</b>	13.500	9.5	6	B5	L	B	●	
	<b>13.501-BL-B6</b>	13.501	9.5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



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

●: Standard items

## 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





# Recommended Cutting Conditions

## Machining data for TS-REAM

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	120-250
		≥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	
	Low alloy steel and cast steel (Less than 5% of alloying elements)	Quenched and tempered	Annealed	600	200	6	120-250
			930	275	7	120-250	
			1000	300	8	120-250	
			1200	350	9	120-250	
			High alloy steel, cast steel and tool steel	Annealed	680	200	10
	M	Stainless steel 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 (GG)	Ferritic		160	15	60-120	
		Pearlitic		250	16	60-120	
	Cast iron nodular (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-cast, alloyed	<=12% Si	Not cureable		75	23	250-500
			Cured		90	24	250-500
		>12% Si	High temp.		130	25	
	Copper alloys	>1% Pb	Free cutting		110	26	
		Brass			90	27	
Non-metallic	Electrolitic copper			100	28		
		Duroplastics, fiber plastics			29		
S	High temp. alloys	Fe based	Annealed		200	31	
			Cured		280	32	
		Ni or Co based	Annealed		250	33	25-50
			Cured		350	34	25-50
			Cast		320	35	
	Titanium, Ti alloys		Rm 400		36	30-80	
		Alpha+beta alloys cured	Rm 1050		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 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	
				Vc = 20 - 40		Vc = 20 - 40		
		Martensitic	13	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	Vc = 120 - 220		Vc = 80 - 200		
		Pearlitic	16	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	
				Vc = 160 - 280		Vc = 150 - 250		
		Pearlitic	18	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	
			Vc = 100 - 220		Vc = 100 - 220			
	Pearlitic	20	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

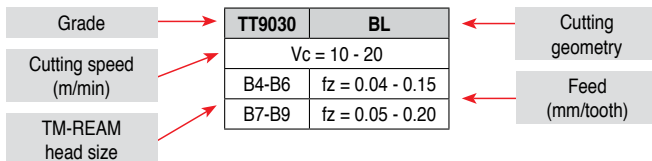
ISO	Material	Condition	Material No.	Through hole		Interrupted through Hole		
N	Aluminum - Wrought alloy	Not cureable	21	B7 - B9	BL or GS	TTAL10	BL	
		Cured	22	Vc = 150 - 400		Vc = 150 - 400		
	Aluminum-cast, alloyed	<=12% Si	Not cureable	23	B4 - B6	fz = 0.08 - 0.16	B4 - B6	fz = 0.08 - 0.16
		Cured	24					
	Copper alloys	>12% Si	High temp.	25	B7 - B9	fz = 0.10 - 0.20	B7 - B9	fz = 0.10 - 0.20
			Free cutting	26	TT9030	BL	TT9030	BL
		>1% Pb	Free cutting	26	Vc = 50 - 200		Vc = 50 - 200	
	Non-metallic	Brass	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
		Duroplastics, fiber plastics	Duroplastics, fiber plastics	29	TT9030	AS	TT9030	AS
Hard rubber			30	Vc = 25 - 80		Vc = 25 - 80		
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	B4 - B6	fz = 0.04 - 0.10	B4 - B6	fz = 0.03 - 0.08
	Cured	34						
	Cast	35						
	Titanium, Ti alloys	Alpha+beta alloys cured	Alpha+beta alloys cured	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:



# 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				
	Low alloy steel and cast steel (Less than 5% of alloying elements)	Quenched and tempered		5	B7 - B9	fz = 0.08 - 0.20	B7 - B9	fz = 0.07 - 0.16
		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	
		Austenitic		14	B4 - B6	fz = 0.04 - 0.10	B4 - B6	fz = 0.03 - 0.08
	K	Gray cast iron (GG)	Ferritic		15	B7 - B9	fz = 0.05 - 0.13	B7 - B9
Pearlitic			16	TT9030	AS	TT9030	AS	
Cast iron nodular (GGG)		Ferritic		17	Vc = 80 - 200		Vc = 60 - 120	
		Pearlitic		18	B4 - B6	fz = 0.06 - 0.18	B4 - B6	fz = 0.05 - 0.13
Malleable cast iron		Ferritic		19	B7 - B9	fz = 0.08 - 0.23	B7 - B9	fz = 0.08 - 0.18
		Pearlitic		20	TT9030	AS	TT9030	AS
		Pearlitic		19	Vc = 160 - 280		Vc = 160 - 240	
				18	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		
			19	TT9030	AS	TT9030	AS	
			20	Vc = 100 - 220		Vc = 100 - 220		
			20	B4 - B6	fz = 0.06 - 0.18	B4 - B6	fz = 0.05 - 0.15	
			20	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

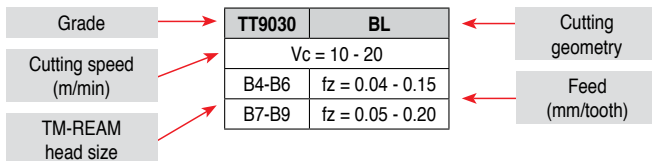
ISO	Material	Condition	Material No.	Blind hole		Interrupted blind hole		
N	Aluminum - Wrought alloy	Not cureable	21	TTAL10	GS or AS	TTAL10	GS or AS	
		Cured	22	Vc = 150 - 400		Vc = 150 - 300		
	Aluminum-cast, alloyed	<=12% Si	Not cureable	23	B4 - B6	fz = 0.08 - 0.16	B4 - B6	fz = 0.07 - 0.15
			Cured	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	
	Non-metallic		Electrolitic copper	28	B7 - B9	fz = 0.10 - 0.20	B7 - B9	fz = 0.10 - 0.20
			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	B4 - B6	fz = 0.03 - 0.08	B4 - B6	fz = 0.03 - 0.08
			Cured	34				
			Cast	35				
	Titanium, Ti alloys	Alpha+beta alloys cured	36	B7 - B9	fz = 0.04 - 0.11	B7 - B9	fz = 0.04 - 0.11	
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:



# Recommended Cutting Conditions



## Machining data for TB-REAM

			Lead A (15°/3°) (Reaming allowance: 0.1~0.3)						
			Feed (mm/rev)	Rake (°)	Cutting speed 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°) (Reaming allowance: 0.2~0.4)						
			Feed (mm/rev)	Rake (°)	Cutting speed 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							
K	Grey cast iron (GG)	15 - 16							Please ask
	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°) (Reaming allowance: 0.1 ~ 0.3)						
			Feed (mm/rev)	Rake (°)	Cutting speed Vc (m/min)				PCD
ISO	Material	Material No.			Carbide	Coated carbide	Cermet		
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°) (Reaming allowance: 0.1 ~ 0.2)						
			Feed (mm/rev)	Rake (°)	Cutting speed Vc (m/min)				PCD
ISO	Material	Material No.			Carbide	Coated carbide	Cermet		
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							

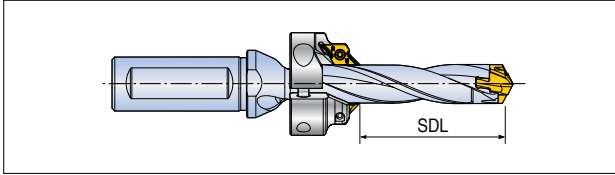
• The cutting conditions in the table below should be used to start a new application. Optimal conditions for a specific application should be evaluated by examining the results and changing the machining conditions accordingly.

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

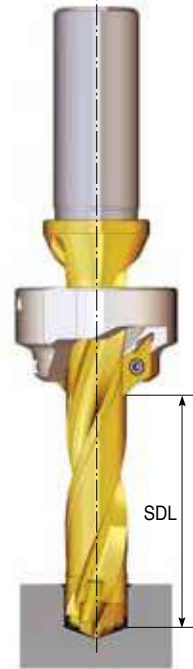
■ Steel   
 ■ Stainless steel   
 ■ Cast iron   
 ■ Nonferrous



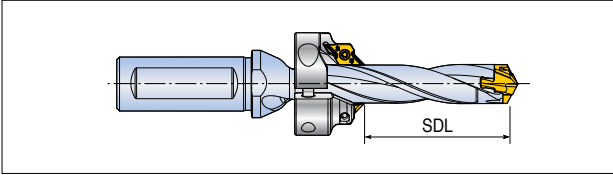
## ► Chamfering ring designation - DRILL-RUSH



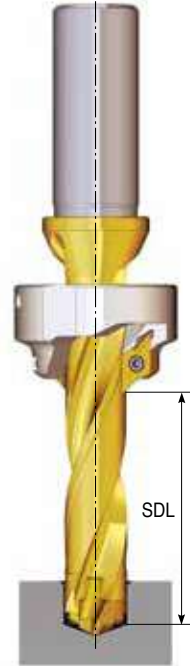
	Designation	CFR designation	SDL	
			min	max
3D	TCD 130-134-16T3/S0-3D	CFR D130-A45	19	19
	135-139-16T3/S0-3D	CFR D135-A45	19	20
	140-144-16T3/S0-3D	CFR D140-A45	21	22
	145-149-16T3/S0-3D	CFR D145-A45	22	23
	150-159-20T3/S0-3D	CFR D150-A45	23	23
	160-169-20T3/S0-3D	CFR D160-A45	24	25
	170-179-20T3/S0-3D	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
5D	240-249-32T2/S0-3D	CFR D240-A45	36	48
	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 designation - 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





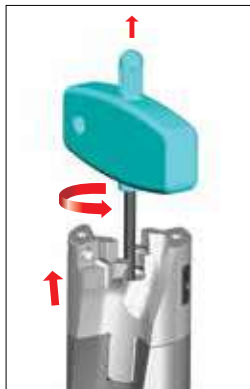


## ► Modular head replacement instructions

1. Remove both outer inserts, then remove the center drill head.  
(When clamping, go in the reverse order)



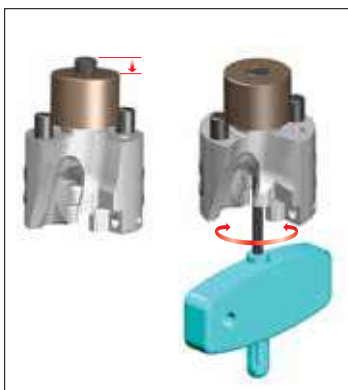
2. Use a wrench to turn the screw counter-clock-wise to remove the modular head.



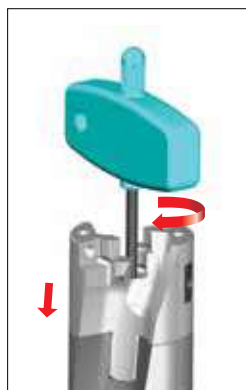
3. Insert the setting gauge into the bottom of the disconnected modular head.



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



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

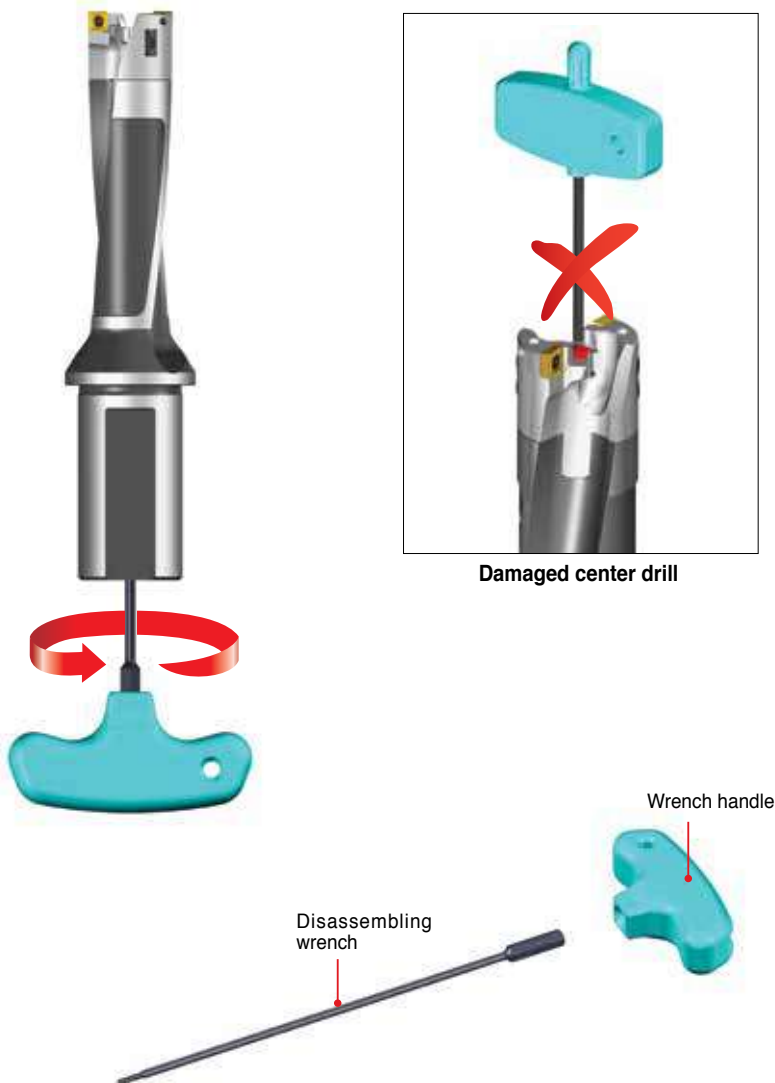


Setting gauge

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

## ► 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.



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

# Technical Data

## ► Hole tolerance

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

# Technical Data

## ► Hole tolerance

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



## ► 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 \_\_\_\_\_

S \_\_\_\_\_

•Hole tolerance \_\_\_\_\_

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 \_\_\_\_\_

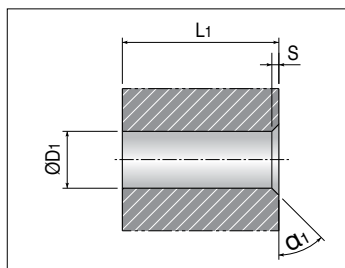
### Workpiece

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

### Shank type

- Cylindrical shank (ISO 9766)
- Whistle notch shank
- Cylindrical with flat type
- Weldon shank

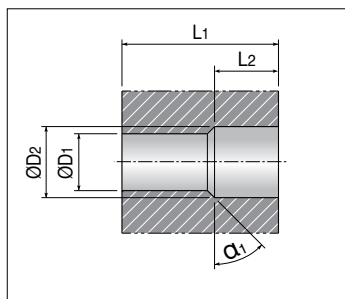
## ► Specific dimensions



Through  Blind   
 ØD1 \_\_\_\_\_ L1 \_\_\_\_\_  
 α1 \_\_\_\_\_ S \_\_\_\_\_  
 •Hole tolerance \_\_\_\_\_

### Technical data

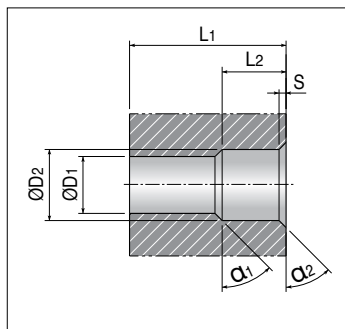
•Machine type  
 MCT  Lathe   
 Vertical  Horizontal   
 Machine name \_\_\_\_\_  
 Power \_\_\_\_\_ kW  
 •Coolant supply  
 Internal  External   
 Coolant pressure \_\_\_\_\_ bar  
 Coolant type \_\_\_\_\_



Through  Blind   
 ØD1 \_\_\_\_\_ ØD2 \_\_\_\_\_  
 L1 \_\_\_\_\_ L2 \_\_\_\_\_  
 α1 \_\_\_\_\_  
 •Hole tolerance \_\_\_\_\_

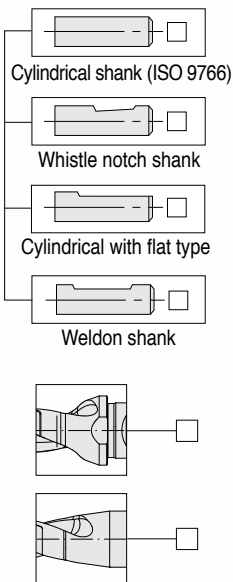
### Workpiece

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



Through  Blind   
 ØD1 \_\_\_\_\_ ØD2 \_\_\_\_\_  
 L1 \_\_\_\_\_ L2 \_\_\_\_\_  
 α1 \_\_\_\_\_ α2 \_\_\_\_\_  
 S \_\_\_\_\_  
 •Hole tolerance \_\_\_\_\_

### Shank type



•Shank dia: \_\_\_\_\_  
 •Shank length: \_\_\_\_\_

Comment

## ► 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

- TiAIN
- 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 (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)

## ► Deep hole drilling order form

\*: Mandatory data field

Tool (Drill head)	
Drill diameter( $\phi$ )	(mm)
Thread	<input type="checkbox"/> Inner <input type="checkbox"/> Outer
Brazed	<input type="checkbox"/>
Indexable	<input type="checkbox"/> Adjustable <input type="checkbox"/> Direct mount <input type="checkbox"/>
Coating	<input type="checkbox"/> Coated <input type="checkbox"/> Uncoated
Coating type	<input type="checkbox"/> TiN <input type="checkbox"/> TiAlN <input type="checkbox"/> Other
• Solid drilling	<input type="checkbox"/>
• Counterboring	<input type="checkbox"/>
Cutting angle *	<input type="checkbox"/> 20° <input type="checkbox"/> 45°
Brazed indexable	<input type="checkbox"/> Nomal angle <input type="checkbox"/> Close angle
Pre-bored size(per side)	(mm)
Bottom finishing *	<input type="checkbox"/> Fullball R <input type="checkbox"/> Flatbottom R <input type="checkbox"/> Corner R
	<input type="checkbox"/> Compound R
• Trepanning	<input type="checkbox"/>
Core size( $\phi$ )	(mm) <input type="checkbox"/>
Tube inner dia( $\phi$ )	(mm)
Tube outer dia( $\phi$ )	(mm)
Tube	
Outside dia( $\phi$ )	(mm)
Total length(L)	(mm)
Internal thread	<input type="checkbox"/>
External thread	<input type="checkbox"/> 4 Starts <input type="checkbox"/> 2 Starts <input type="checkbox"/> 1 Starts
Tube thread	<input type="checkbox"/> 1 end <input type="checkbox"/> Both ends
Inner tube length	(mm)
Inner tube slit	<input type="checkbox"/> 1 end <input type="checkbox"/> Both ends
Drilling system	
Single tube system	<input type="checkbox"/> STS
Double tube system	<input type="checkbox"/> DTS
Boring conditions	
Through hole drilling	<input type="checkbox"/>
Blind hole drilling	<input type="checkbox"/>
Cross hole drilling *	<input type="checkbox"/>

### \* Please sketch your drilling application

General information		Production	
Quantity per year:			
Present performance status:			
grade, tool life, etc:			
Cutting data:	Vc=	m/min,	N=
	f=	mm/rev,	F=
			rpm
			mm/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 DIN1835A DIN6535HA		20x50	10
		25x56	11
		32x60	12
		40x70	13
		.75x2.03"	95
		1.00x2.28"	96
		1.25x2.28"	97
Weldon DIN1835B DIN6535HB		20x50	22
		25x56	23
		32x60	24
		40x70	25
		.75x2.03"	99
		1.00x2.28"	100
Whistle notch 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"/>
	horizontal <input type="checkbox"/>
	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"/> 	
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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Slotting Inserts	E32
Tailor-made Inserts	E33

### Grades

E34

















### Milling Cutters

Face Mills	E38
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MAXI-SLOT	E205




# Tool Selection Guide

## Face mills

Series		TANGSFEEED	MILLRUSH	MILL2RUSH	MILL2RUSH	CHASEMILL
		4T-TF90	3P TF90	6N TF90	SCRM90TN	TFM90AX 2S-TFM90AP TFM90AP
						
<b>Pages</b>		E38	E39-E41	E42-E44	E45-E46	E47-E50
<b>Approach angle</b>		90°	90°	90°	90°	90°
<b>Max. depth of cut(mm)</b>		8.3-12.5	4.7-15	4.1-9.2	13-15	5.5-17.9
<b>Diameter range(mm)</b>		Ø40-Ø200	Ø32-Ø250	Ø40-Ø250	Ø50-Ø250	Ø32-Ø200
<b>Insert</b>		LPK(H)U 0904 LPKU 1407	3PK(H)T 0603 3PK(H)T 1004 3PK(H)T 1505 3PK(H)T 1906	6NKG 0403 6NGU 0604 6NGU 0905	TNMX 1806 TNM(G)X 2207	AXM(C)T 0602 APK(C)T 09T3 APK(C)T 1204 APK(C)T 1705 APKT1907
<b>Application</b>	Facing		●	●	●	●
	High feed milling					○
	Shouldering		●	●	●	●
	Slotting		●	●	●	●
	Straight ramping		●	●		●
	Helical ramping		●	●		●
	Slanted shoulder & chamfer					
	Side slotting					
	Profiling					○
	Step down					
Counter boring						

# Tool Selection Guide

## Face mills

<i>CHASE2MILL</i>	<i>CHASE4MILL</i>	<i>CHASE8MILL</i>	<i>CHASE4ALU</i>	<i>CHASE4FINISH</i>	<i>CHASE2QUAD</i>
<b>TFM90AN</b>	<b>4N TF90</b>	<b>8D-TF90</b>	<b>TFM90XEV</b>	<b>For Finishing</b> <b>4W-TF90</b>	<b>For Finishing</b> <b>TFM90SNS</b>
					
E51-E52	E53-E54	E55-E56	E57	E58	E59
90°	90°	90°	90°	-	90°
11-15	3.5-13.8	5.0-8.0	16-21	0.5	1.0
Ø40-Ø200	Ø32-Ø100	Ø32-Ø160	Ø40-Ø200	Ø50-Ø160	Ø50-Ø250
ANM(H)X 1106 ANM(H)X 1607	4NKT 0402 4NK(H)T 0603 4NK(H)T 0904 4NKT 1106 4NKT 1407	SQKU 0703 SQK(H)U 1206	XEVT 1605 XEVT 2206	4WHU 1207	SNEX 1204 SNET 1205
●	●	●	●	●	●
	○				
●	●	●	●		
●	●	●	●		
●	●		●		
●	●		●		
	○				
	●		●		

● Recommended, ○ Suitable

# Tool Selection Guide

## Face mills

Series		CHASE2QUAD	LIONMILL	LIONMILL	CHASE2QUAD	CHASE2QUAD
		For Finishing				
		TQ90SNS	LM90TP	LM90SE	TFM90SN TFM88SN	TFM75SN
Pages		E60	E61	E62	E63-E64	E65
Approach angle		90°	90°	90°	90°, 88°	75°
Max. depth of cut(mm)		1.0	17.6	17.0	12.0	9.5
Diameter range(mm)		Ø250-Ø400	Ø80-Ø315	Ø125-Ø315	Ø50-Ø200	Ø50-Ø250
Insert		SNEX 1204 SNET 1205	TPKN 2204	SEKX 2107	SNGX 1306 SNGX 1306 ZN	SNM(G)X 1306 EN SNMX 1306 XTN
Application	Facing		●	●	●	●
	High feed milling					
	Shouldering			●	●	●
	Slotting					
	Straight ramping					
	Helical ramping					
	Slanted shoulder & chamfer					●
	Side slotting					
	Profiling					
	Step down					
Counter boring						

# Tool Selection Guide

## Face mills

















LIONMILL	CHASEMILL	CHASE10MILL	LIONMILL	CHASE12MILL	CHASE2HEPTA
<b>LM75SP</b>	<b>TFM75AP</b>	<b>TFM65PT</b>	<b>LM60SC</b>	<b>12D-TF45</b>	<b>14D-F45XN</b>
					
E66	E67	E68	E69-E70	E71-E72	E73-E74
75°	75°	65°	60°	45°	45°
9.5-12.5	3.9	3.3-6.5	13.0-18.0	3.0-5.0	3.5-5.0
Ø80-Ø315	Ø80-Ø125	Ø40-Ø125	Ø125-Ø315	Ø50-Ø250	Ø50-Ø250
SPKN 1203 SPKN 1504	APKT 1705 PER-M APKT 1705 PER-EM	PTKU 0503 PTKU 1006	SCKN 2107 SCKN 2708	HXK(H)U 0605 HXK(H)U 1007	XNM(H)U 0605 XNM(H)U 0906
●	●	●	●	●	●
●		●	●	●	●

● Recommended, ○ Suitable



# Tool Selection Guide

## Face mills

Series		CHASE <sup>2</sup> HEPTA	CHASE <sup>2</sup> HEPTA	CHASE <sup>HE</sup> PTA	CHASE <sup>2</sup> QUAD	CHASE <sup>2</sup> QUAD	
		14D-F45XNH	14D-F45XNW	7S-F45	TFM45SN	TFM45SNS	
							
<b>Pages</b>		E75	E76	E77	E78	E79	
<b>Approach angle</b>		45°	45°	45°	45°	45°	
<b>Max. depth of cut(mm)</b>		3.5-5.0	5.0	3.2	7.0	8.8	
<b>Diameter range(mm)</b>		Ø63-Ø125	Ø80-Ø315	Ø32-Ø125	Ø40-Ø250	Ø63-Ø250	
<b>Insert</b>		XNM(H)U 0605 XNM(H)U 0906	XNHU 0906	7EMT 0604	SNM(G)X 1306 AN SNMX 1306 XTN	SNMX 1607 SNHX 1606	
<b>Application</b>	Facing		●	●	●	●	●
	High feed milling						
	Shouldering						
	Slotting						
	Straight ramping				●		
	Helical ramping				●		
	Slanted shoulder & chamfer		●	●	●	●	●
	Side slotting						
	Profiling						
	Step down						
Counter boring							

# Tool Selection Guide

















## Face mills

CHASE2QUAD	CHASE2QUAD	CHASE2MILL	LIONMILL	LIONMILL	CHASE2MOLD
<b>TFM45SNS-CA</b>	<b>TFM45SNW TQ45SNW</b>	<b>TFM45AN</b>	<b>LM45SD</b>	<b>LM45SE</b>	<b>TFMRNS</b>
					
E80	E81	E82	E83	E84	E85-E86
45°	45°	45°	45°	45°	-
8.8	8.8	8.4	6.5-8.7	6.5-8.7	5.0-8.0
Ø125-Ø315	Ø80-Ø355	Ø50-Ø160	Ø80-Ø315	Ø80-Ø250	Ø32-Ø200
SNMX 1607 SNHX 1606	SNHX 1606	ANHX 1607 ANR-M	SDKN 1203 SDKN 1504	SEKN 1203 SEKN 1504	RNMU 1004 RNMU 1205 RNMU 1606
●	●	●	●	●	●
					●
					●
●	●		●	●	
					●

● Recommended, ○ Suitable





# Tool Selection Guide

## Face mills

Series		CHASEMOLD	CHASESPEED	CHASESPEED	CERAMICSPEED	CERAMICSPEED
		TFMRY	TFMRN	TFMRP	TFMBN-09CH	TFMBN-12
						
<b>Pages</b>		E87-E89	E90	E91	E92	E93
<b>Approach angle</b>		-	-	-	-	-
<b>Max. depth of cut(mm)</b>		4.0-10.0	6.3	6.3	1.5	2.5
<b>Diameter range(mm)</b>		Ø32-Ø250	Ø50-Ø80	Ø50	Ø40-Ø50	Ø50-Ø80
<b>Insert</b>		RYM(H)X 0803 RYM(H)X 1004 RYM(H)X 1205 RYM(H)X 1606 RYMX 2007	RNGN 1207 FL	RPGN 1204 FL	BNGX 0904	BNGX 1207
<b>Application</b>	Facing		●	●	●	●
	High feed milling				●	●
	Shouldering					
	Slotting					
	Straight ramping		●	●	●	●
	Helical ramping		●	●	●	●
	Slanted shoulder & chamfer					
	Side slotting					
	Profiling		●	●	●	●
	Step down					
Counter boring						

# Tool Selection Guide

















## Face mills

<i>CHASE10MILL</i>	<i>CHASE4FEED</i>	<i>CHASE2FEED</i>	<i>CHASEFEED</i>		
<b>TFMPT</b>	<b>TFMBL</b>	<b>TFMBL-13</b>	<b>TFMSB</b>		
					
E94	E95-E96	E97-E98	E99-E100		
25°	-	-	-		
1.5-3.0	1.0-2.0	2.0	1.0-2.0		
Ø40-Ø200	Ø32-Ø200	Ø40-Ø250	Ø32-Ø250		
PTKU 0503 PTKU 1006	BLMP 0603 BLMP 0904 BLMP 1105	BLMP 1306	SBMT 0603 SBMT 0904 SBMT 1306		
●	●	●	●		
●	●	●	●		
●	●	●	●		
●	●	●	●		
●	●	●	●		

● Recommended, ○ Suitable

# Tool Selection Guide

## End mills & modular heads

		<i>MILLSPEED</i>	<i>TANGSPEED</i>	<i>MILLRUSH</i>	<i>MILL2RUSH</i>	<i>MILL2RUSH</i>
<b>Series</b>		<b>2S-TE90CV</b> 	<b>4T-TE90</b> 	<b>3P-TE90</b> 	<b>6N TE90</b> 	<b>SCRM90TN</b> 
<b>Pages</b>		E101-E102	E103-E104	E105-E110	E111-E112	E113
<b>Approach angle</b>		90°	90°	90°	90°	90°
<b>Max. depth of cut(mm)</b>		5.0	4.6-8.3	3.5-15.0	4.1-9.2	13.0
<b>Diameter range(mm)</b>		Ø6-Ø20	Ø10-Ø40	Ø8-Ø50	Ø20-Ø40	Ø35-Ø40
<b>Insert</b>		CVK(H)T 0502	LPK(H)U 0502 LPK(H)U 0904	3PKT 0402 3PK(H)T 0603 3PK(H)T 1004 3PK(H)T 1505 3PK(H)T 1906	6NKU 0403 6NGU 0604 6NGU 0905	TNMX 1806
<b>Application</b>	Facing 	●	●	●	●	●
	High feed milling 	○				
	Shouldering 	●	●	●	●	●
	Slotting 	●	●	●	●	●
	Straight ramping 	●	●	●		
	Helical ramping 	●	●	●		
	Slanted shoulder & chamfer 					
	Profiling 	○				
	Plunging 					
	Step down 					
	Counter boring 					

# Tool Selection Guide

## End mills & modular heads

<i>CHASEMILL</i>	<i>CHASEMILL</i>	<i>CHASE2MILL</i>	<i>CHASE4MILL</i>	<i>CHASE8MILL</i>	<i>CHASEALU</i>
<b>MTE90AX-06-L</b>	<b>TE90AX 2S-TE90AP TE90AP</b>	<b>TE90AN</b>	<b>4N TE90</b>	<b>8D-TE90</b>	<b>TE90XEV-HSK63A</b>
					
E114	E115-E123	E124-E125	E126-E131	E132-E133	E134
90°	90°	90°	90°	90°	90°
5.5	5.5-17.9	11.0-15.0	3.5-13.8	5.0	16
Ø8-Ø30	Ø8-Ø42	Ø25-Ø50	Ø8-Ø40	Ø16-Ø40	Ø25-Ø50
AXCT 06-L	AXM(C)T 0602 APK(C)T 09T3 APK(C)T 1204 APK(C)T 1705 APKT 1907	ANM(H)X 1106 ANM(H)X 1607	4NKT 0402 4NK(H)T 0603 4NK(H)T 0904 4NKT 1106 4NKT 1407	SQKU 0703	XEVT 1605
●	●	●	●	●	●
	○		○		
●	●	●	●	●	●
●	●	●	●	●	●
	●	●	●		●
	●	●	●		●
	○		○		
			●		●

● Recommended, ○ Suitable

# Tool Selection Guide

## End mills & modular heads

Series		CHASE <sup>ALU</sup>	MILL <sup>RUSH</sup>	CHASE <sup>QUAD</sup>	CHASE <sup>QUAD</sup>	CHASE <sup>QUAD</sup>	
		TE90XEV	3P-TCF	TSF	TDM	TCF	
							
<b>Pages</b>		E135	E136-E137	E138	E139	E140	
<b>Approach angle</b>		90°	30°-60°	90°	90°	45°-75°	
<b>Max. depth of cut(mm)</b>		16-21	-	5.6-13.4	12-40	-	
<b>Diameter range(mm)</b>		Ø25-Ø40	Ø3.3-Ø31	Ø12-Ø50	Ø12-Ø50	Ø8.3-Ø38.9	
<b>Insert</b>		XEVT 1605 XEVT 2206	3PKT 0402 3PK(H)T 0603 3PK(H)T 1004	XOMT 0602 SPMG(T) 0904 SPMG(T) 1104 SPMG(T) 1405	XOMT 0602 SPMG(T) 0904 SPMG(T) 1104 SPMG(T) 1405	SPMG(T) 1104	
<b>Application</b>	Facing		●		●	●	
	High feed milling						
	Shouldering		●		●	●	
	Slotting		●		●	●	
	Straight ramping		●			●	
	Helical ramping		●			●	
	Slanted shoulder & chamfer			●			●
	Profiling						
	Plunging				●	●	
	Step down		●			●	
	Counter boring				●	●	
Drill mill					●		

# Tool Selection Guide

## End mills & modular heads













<i>CHASE</i> HEPTA	<i>CHASE</i> 2MOLD	<i>CHASE</i> MOLD	<i>FINE</i> BALL	<i>FINE</i> BALL	<i>CHASE</i> SPEED
<b>7S-E45</b>	<b>TERNS</b>	<b>TERY</b>	<b>TNF</b>	<b>TNFR</b>	<b>TERP</b>
					
E141	E142-E143	E144-E146	E147-E149	E150-E152	E153-E154
45°	-	-	-	-	-
3.2	5.0-8.0	4.0-10.0	-	-	4.7-6.3
Ø32-Ø50	Ø25-Ø50	Ø16-Ø50	Ø6-Ø32	Ø6-Ø32	Ø20-Ø40
7EMT 0604	RNMU 1004 RNMU 1205 RNMU 1606	RYM(H)X 0803 RYM(H)X 1004 RYM(H)X 1205 RYM(H)X 1606 RYM(H)X 2007	NFB (NFR)	NFR	RPGN 0903 FL RPGN 1204 FL
●	●	●		●	●
				●	
				●	
●	●	●	●	●	●
●	●	●	●	●	●
●					
	●	●	●	○	●
			(○)	●	
				●	
				●	
				●	

● Recommended, ○ Suitable



# Tool Selection Guide

## End mills & modular heads

Series		<i>DUETBALL</i>	<i>TRIOBALL</i>	<i>CHASE2BALL</i>	<i>CHASE2BALL</i>	
		2F	3F	TDB50X	TDB50X-WT	
Pages		E155-E156	E157	E158	E159	
Approach angle		-	-	-	-	
Max. depth of cut(mm)		11.8-55.3	39-94	59-69	59-69	
Diameter range(mm)		Ø16-Ø32	Ø32-Ø50	Ø50	Ø50	
Insert		2FB APKT 09T3 APKT 1204	3FB CNHX 1311 CNHX 1606	6RBE 50-M	6RBE 50-M	
Application	Facing					
	High feed milling					
	Shouldering					
	Slotting					
	Straight ramping		●	●	●	●
	Helical ramping		●	●	●	●
	Slanted shoulder & chamfer					
	Profiling		●	●	●	●
	Plunging					
	Step down					
	Counter boring					
	Drill mill					

# Tool Selection Guide


















## High feed end mills & modular heads

<i>NANRUSH</i>	<i>CERAMICSPEED</i>	<i>CHASE10MILL</i>	<i>CHASE4FEED</i>	<i>CHASE2FEED</i>	<i>CHASEFEED</i>
<b>THFN</b>	<b>TEBN-09CH</b>	<b>TEPT</b>	<b>TEBL</b>	<b>TEBL-13</b>	<b>TESB</b>
					
E160-E161	E162	E163	E164-E171	E172	E173-E175
20°	-	25 °	-	-	-
0.3-0.5	1.5	1.5-3.0	0.5-2.0	2.0	1.0-2.0
Ø6-Ø8	Ø25-Ø40	Ø20-Ø40	Ø8-Ø42	Ø32-Ø42	Ø16-Ø42
HFN 060 HFN 080	BNGX 0904	PTKU 0503 PTKU 1006	BLMP 0402 BLMP 0603 BLMP 0904 BLMP 1105	BLMP 1306	SBMT 0603 SBMT 0904 SBMT 1306
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●

● Recommended, ○ Suitable

# Tool Selection Guide

## Extended flute cutters

Series		TANGSPEED	TANGSPEED	CHASEVQUAD	MILLRUSH	MILL2RUSH
		4T-TEF	4T-TES	4S-TEF 4S-TES	3P TEF 3P TES	TEF-TN TES-TN
						
<b>Pages</b>		E176	E177	E178-E179	E180-E181	E182-E183
<b>Approach angle</b>		90°	90°	90°	90°	90°
<b>Max. depth of cut(mm)</b>		15-51	34-56	52-77.9	20-83	48-71
<b>Diameter range(mm)</b>		Ø16-Ø40	Ø50-Ø100	Ø32-Ø80	Ø20-Ø100	Ø50-Ø100
<b>Insert</b>		LPK(H)U 0502 LPK(H)U 0904	LPKU 1407	SVK(H)T 1145	3PK(H)T 0603 3PK(H)T 1004 3PK(H)T 1505 3PK(H)T 1906	TNMX 1806
<b>Application</b>	Facing					
	High feed milling					
	Shouldering		●	●	●	●
	Slotting		●	●	●	●
	Trochoidal milling		●	●	●	
	Straight ramping					
	Helical ramping					
	Slanted shoulder & chamfer					
	Profiling					
	Plunging					
	Step down					
Counter boring						








# Tool Selection Guide

## Slotting cutters

		TOPSLOT	TOPSLOT	TOPSLOT	TOPSLOT	TOPSLOT	
Series		TSM-TS16	TSM-SL	TSM-FD-Z	TSM-FD-ZN	TSM-FD-S/W-ZN	
							
Pages		E189-E190	E191-E192	E193-E194	E195	E196-E198	
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 ZNHU 110	ZNHU 080 ZNHU 110 ZNHU 140	
Application	Facing		●				
	Shouldering						
	Slotting						
	T slotting		●	●			
	Side slotting		●	●	●	●	
	Internal groove milling		●	●			
	Bottom shouldering		●	●	●	●	
	Slitting				●	●	●
	External threading						
	Internal threading						

# Tool Selection Guide













## Slotting cutters

TOP SLOT	TOP SLOT	TOP SLOT	TSC Slotting Cutter	MAXI SLOT	MAXI SLOT
<b>TSM-FF-Z</b>	<b>TSM-FF-ZN</b>	<b>TSM-FF-S/W-ZN</b>	<b>TSC</b>	<b>TR-S</b>	<b>TR-F</b>
					
E199	E200	E201-E203	E204	E205	E206
-	-	-	-	-	-
3-10	10-20	10-26	1.6-4.52	3-10	8-10
Ø80-Ø160	Ø63-Ø125	Ø100-Ø315	Ø75-Ø160	Ø24.7-Ø39.7	Ø24.25-Ø39.25
ZNHT	ZNHU 080 ZNHU 110	ZNHU 080 ZNHU 110 ZNHU 140	TIMC TIMJ TIPV	-	-
					●
					●
●	●	●		●	
●	●	●	●	●	
●	●	●		●	●
			●		

● Recommended, ○ Suitable

















# Tool Selection Guide

## Slotting cutters

Series						
	<b>TR-T-W55</b> <b>TR-T-M60</b>					
						
Pages	E207					
Approach angle	-					
Max. width of cut(mm)	7.7-9.5					
Diameter range(mm)	Ø24.7-Ø39.7					
Insert	-					
Application	Facing					
	Shouldering					
	Slotting					
	T slotting					
	Side slotting					
	Internal groove milling					
	Bottom shouldering					
	Slitting					
	External threading		●			
	Internal threading		●			

# Tool Selection Guide

## Milling inserts




		<i>MILLSPEED</i>	<i>TANGSPEED</i>	<i>MILLRUSH</i>	<i>MILL2RUSH</i>	<i>MILL2RUSH</i>
Series		CVK(H)T 0502 	LPK(H)U 0502 LPK(H)U 0904 LPKU 1407 	3PKT 0402 3PK(H)T 0603 3PK(H)T 1004 3PK(H)T 1505 3PK(H)T 1906 	6NKU 0403 6NGU 0604 6NGU 0905 	TNMX 1806 TNM(G)X 2207 
Material		P M K S H	P M K S H	P M K N S H	P M K N S H	P M K S H
Pages		E235	E238	E216-E217	E221-E222	E261
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	13-15
Application	Facing	 ●	●	●	●	●
	High feed milling	 ○	○			
	Shouldering	 ●	●	●	●	●
	Slotting	 ●	●	●	●	●
	Straight ramping	 ●	●	●	●	
	Helical ramping	 ●	●	●	●	
	Slanted shoulder & chamfer	 ●				
	Profiling	 ○	○			
	Plunging					
	Step down					
	Counter boring					

● Recommended, ○ Suitable



# Tool Selection Guide

## Milling inserts

		CHASEMILL	CHASEMILL	CHASEMILL	CHASE2MILL	CHASE4MILL	
Series		AXCT 0602-L	AXM(C)T 0602 APK(C)T 09T3 APK(C)T 1204 APK(C)T 1705 APKT 1907	APCT 12-PCD35	ANM(H)X 1106 ANM(H)X 1607	4NKT 0402 4NK(H)T 0603 4NK(H)T 0904 4NKT 1106 4NKT 1407	
							
Material		P M S	P M K N S H	N	P M K N S H	P M K N S H	
Pages		E230	E225-E231	E226	E224	E218-E219	
Approach angle		90°	90°	90°	90°	90°	
Max. depth of cut(mm)		5.5	0.5-17.9	3.5	11-15	0.5-13.8	
Application	Facing		●	●	●	●	●
	High feed milling			○			○
	Shouldering		●	●	●	●	●
	Slotting		●	●	●	●	●
	Straight ramping			●		●	●
	Helical ramping			●		●	●
	Slanted shoulder & chamfer						
	Profiling			○			○
	Plunging						
	Step down						●
	Counter boring						

# Tool Selection Guide

















## Milling inserts

CHASE 3 MILL	CHASE ALU	CHASE 4 FINISH	CHASE 2 QUAD	LION MILL	LION MILL
SQKU 0703 SQK(H)U 1206	XEVT 1605 XEVT 2206	4WHU 1207	SNEX 1204 SNET 1205	TPKN 2204	SEKX 2107
					
P M K	N	P M K N S H P	K	P M K	P K
E257	E264	E220	E251	E262	E249
90°	90°	90°	90°	90°	90°
5.0-8.0	14-21	0.5	1.0	17.6	17
●	●	●	●	●	●
●	●			●	●
●	●			●	
	●				
	●				
	●				

● Recommended, ○ Suitable

# Tool Selection Guide

## Milling inserts

		CHASE VQUAD	CHASE 2QUAD	CHASE 2QUAD	LION MILL	CHASE MILL
Series		<u>SVK(H)T 1145</u>	<u>SNGX 1306... SNGX 1306 ZN</u>	<u>SNM(G)X 1306 EN... SNMX 1306 XTN</u>	<u>SPKN 1203 SPKN 1504</u>	<u>APKT 1705</u>
						
Material		P M K S H	P M K	P M K	P M K	P M K N S H
Pages		E258	E253	E252	E256	E228
Approach angle		90°	90°, 88°	75°	75°	75°
Max. depth of cut(mm)		9-10	10-12	9.5	9.5-12.5	3.9
Application	Facing 		●	●	●	●
	High feed milling 					
	Shouldering 	●	●			
	Slotting 	●				
	Straight ramping 					
	Helical ramping 					
	Slanted shoulder & chamfer 				●	●
	Profiling 					
	Plunging 					
	Step down 					
	Counter boring 					

# Tool Selection Guide

















## Milling inserts

CHASE10MILL	LIONMILL	CHASE12MILL	CHASE2HEPTA	CHASEHEPTA	CHASE2QUAD
PTKU 0503 PTKU 1006	SCKN 2107 SCKN 2708	HXK(H)U 0605 HXK(H)U 1007	XNM(H)U 0605 XNM(H)U 0906	7EMT 0604	SNM(G)X 1306 AN... SNMX 1306 XTN
					
<b>P</b> <b>M</b> <b>K</b>	<b>P</b> <b>K</b>	<b>P</b> <b>K</b>	<b>P</b> <b>M</b> <b>K</b>	<b>P</b> <b>M</b> <b>K</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b>
E242	E248	E237	E265-E266	E223	E252
65°	60°	45°	45°	45°	45°
3.3-6.5	13-18	3.0-5.0	1.0-5.0	3.2	6-7
●	●	●	●	●	●
				●	
				●	
●	●	●	●	●	●

● Recommended, ○ Suitable







# Tool Selection Guide

## Milling inserts

		CHASE <sup>2</sup> QUAD	CHASE <sup>2</sup> MILL	LIONMILL	CHASE <sup>2</sup> MOLD	CHASEMOLD	
Series		SNMX 1607 SNHX 1606	ANHX 1607	SDKN 1203 SDKN 1504 SEKN 1203 SEKN 1504	RNMU 1004 RNMU 1205 RNMU 1606	RYM(H)X 0803 RYM(H)X 1004 RYM(H)X 1205 RYM(H)X 1606 RYMX 2007	
							
Material		P M K	P M K N S	P	P M K S H	P M K S H	
Pages		E254	E223	E248-E249	E244	E245-E246	
Approach angle		45°	45°	45°	-	-	
Max. depth of cut(mm)		8.8	8.4	6.5-8.7	5-8	4-10	
Application	Facing		●	●	●	●	●
	High feed milling						
	Shouldering						
	Slotting						
	Straight ramping					●	●
	Helical ramping					●	●
	Slanted shoulder & chamfer		●		●		
	Profiling					●	●
	Plunging						
	Step down						
	Counter boring						

# Tool Selection Guide

















## Milling inserts

CHASE SPEED	CERAMIC SPEED	CERAMIC SPEED	CHASE 10 MILL	CHASE 4 FEED	CHASE 2 FEED
RNGN 1207 FL RPGN 0903 FL RPGN 1204 FL	BNGX 0904	BNGX 1207	PTKU 0503 PTKU 1006	BLMP 0402 BLMP 0603 BLMP 0904 BLMP 1105	BLMP 1306
					
S	S	S	P M K	P M K S H	P M K S H
E243	E234	E234	E242	E232	E233
-	-	-	25°	-	-
4.7-6.3	1.5	2.5	1.5-3.0	0.5-2.0	2.0
●	●	●	●	●	●
	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●

● Recommended, ○ Suitable





# Tool Selection Guide

## Milling inserts

		<i>CHASEFEED</i>	<i>MILLRUSH</i>	<i>CHASEQUAD</i>	<i>NANRUSH</i>	<i>FINEBALL</i>
Series		SBMT 0603 SBMT 0904 SBMT 1306	3PKT 0402 3PK(H)T 0603 3PK(H)T 1004	SPMG(T) 0904 SPMG(T) 1104 SPMG(T) 1405 XOMT 0602	HFN 060 HFN 080	NFB
						
Material		P M K S H	P M K N S H	P M K	P M K S H	P M K S H
Pages		E247	E216	E255	E236	E239
Approach angle		-	30°-60°	15°-45°, 90°	20°	-
Max. depth of cut(mm)		1.0-2.0	-	-	0.3-0.5	-
Application	Facing		•	•	•	•
	High feed milling		•		•	
	Shouldering				•	
	Slotting				•	
	Straight ramping		•		•	•
	Helical ramping		•		•	•
	Slanted shoulder & chamfer			•	•	
	Profiling		•			•
	Plunging				•	
	Step down				•	
	Counter boring				•	
	Drill mill				•	

# Tool Selection Guide

## Milling inserts


















<i>FINEBALL</i>	<i>DUETBALL</i>	<i>TRIOBALL</i>	<i>CHASE2BALL</i>		
NFR	2FB	3FB	6RBE		
					
<b>P</b> <b>M</b> <b>K</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>S</b> <b>H</b>		
E240-E241	E214	E215	E222		
-	-	-	-		
-	11.8-44.7	39-94	59-69		
●					
●					
●					
●	●	●	●		
●	●	●	●		
○	●	●	●		
●					
●					
●					
●					

● Recommended, ○ Suitable



# Tool Selection Guide


## Slotting inserts

Series	TOP SLOT	TOP SLOT	TOP SLOT	TOP SLOT	TSC slotting cutter
	TS16	SLOT	ZNHT	ZNHU	TIMC TIMJ TIPV
					
<b>Material</b>	P M K S H	P M K	P M K N	P M K	P M K N
<b>Pages</b>	E263	E250	E267	E268	E259-E260
<b>Approach angle</b>	-	-	-	-	-
<b>Max. depth of cut(mm)</b>	4.8	*	*	*	
<b>Application</b>	Facing 	●			
	Shouldering 				
	Slotting 				
	Straight ramping 				
	Helical ramping 				
	Side slotting 	●	●	●	●
	Profiling 				
	Plunging 				
	Step down 				
	Counter boring 				
	Drill mill 				
	Slitting 			●	●

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

# Tool Selection Guide

## Tailor-made inserts

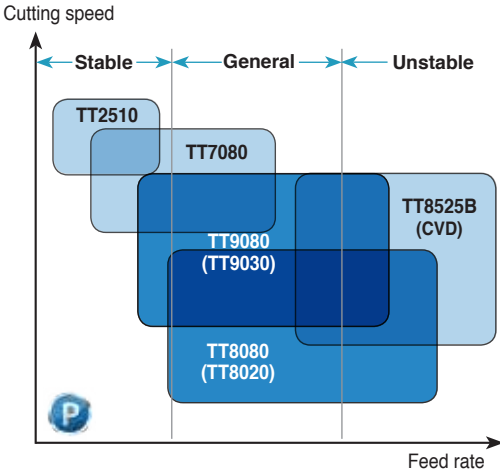
Tailor-made Insert					
LNC PMIN SNA SNB 					
P M K N S H E269-E270					
-					
●					
●					
●					
●					

● Recommended, ○ Suitable

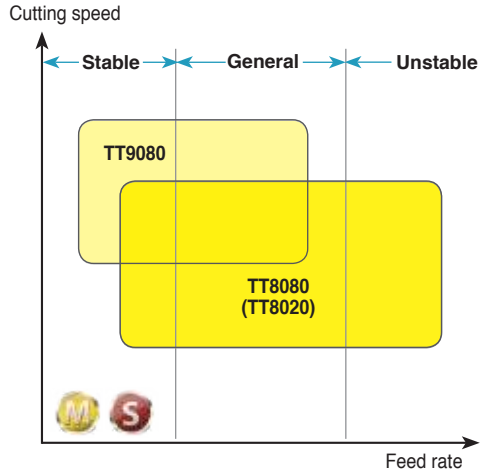
# Grades

## Selection guide for milling grades

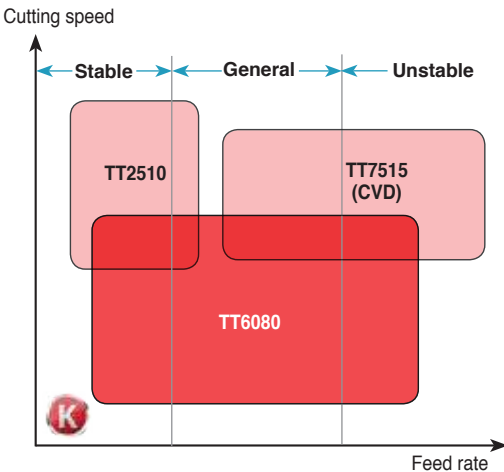
### For steel



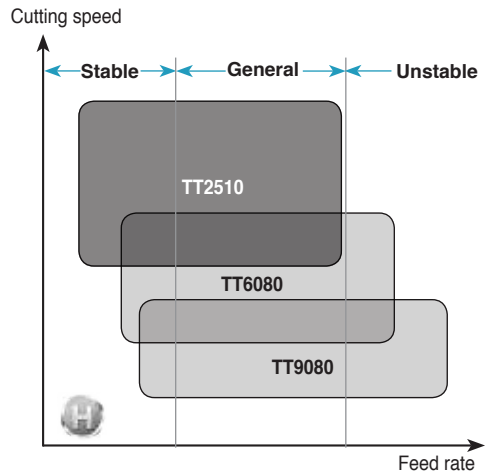
### For stainless steel & super alloy



### For cast iron



### For hardened material



# Grades

## Carbide grades

Grades	ISO	Charactristics & applications
<b>K10</b> Carbide	<b>K05 – K15</b> <b>N05 – N15</b> <b>S05 – S15</b>	• General machining of cast iron, aluminum alloys and non-ferrous materials
<b>TT2510</b> PVD coated	<b>P05 – P25</b> <b>H05 – H25</b>	• High speed milling of pre-hardened steel and hardened steel
<b>TT6080</b> PVD coated	<b>K05 – K25</b> <b>H05 – H25</b>	• General machining for gray and ductile cast iron • Finish and medium machining of hardened steel
<b>TT7080</b> PVD coated	<b>P05 – P25</b> <b>K05 – K25</b>	• General milling of steel • Heavy interrupted cutting of cast iron
<b>TT9080</b> PVD coated	<b>P20 – P40</b> <b>M20 – M40</b> <b>S20 – S40</b>	• General machining of steel, stainless steel and heat-resistant alloy
<b>TT9030</b> PVD coated	<b>P20 – P40</b> <b>M20 – M40</b> <b>S20 – S40</b>	• General machining of steel, stainless steel and heat-resistant alloy
<b>TT8080</b> PVD coated	<b>P30 – P50</b> <b>M30 – M50</b> <b>S30 – S50</b>	• Interrupted and rough machining of steel and stainless steel • Low speed and interrupted machining of heat-resistant alloy
<b>TT8020</b> PVD coated	<b>P30 – P50</b> <b>M30 – M50</b> <b>S30 – S50</b>	• Interrupted and rough machining of steel and stainless steel • Low speed and interrupted machining of heat-resistant alloy
<b>TT5515</b> PVD coated	<b>P10 – P30</b> <b>M10 – M30</b> <b>K10 – K30</b> <b>S10 – S30</b> <b>H10 – H30</b>	• High speed milling of steel and hardened steel • General milling of stainless steel, cast iron and heat-resistant alloy
<b>TT5525</b> PVD coated	<b>P20 – P40</b> <b>M20 – M40</b> <b>S20 – S40</b>	• General machining of steel, stainless steel and heat-resistant alloy
<b>TT7515</b> CVD coated	<b>K05 – K25</b> <b>H05 – H25</b>	• General machining for gray and ductile cast iron • Finish and medium machining of hardened steel
<b>TT8525B</b> CVD coated	<b>P30 – P45</b> <b>M30 – M45</b>	• Rough milling & high speed drilling of carbon & alloy steel • Medium speed milling of stainless steel

# Grades

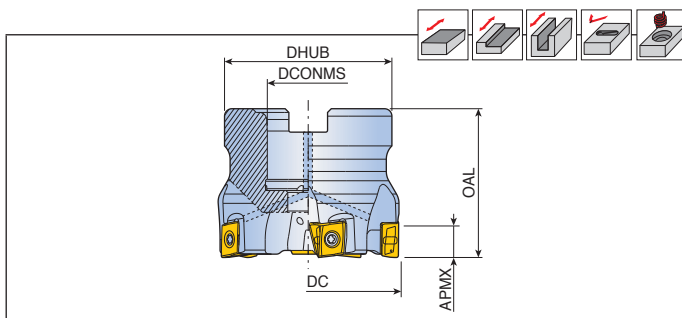
## Cermet, ceramic and CBN grades

Grades	ISO	Characteristics & applications
<b>CT7000</b> cermet	<div style="display: flex; flex-wrap: wrap; gap: 2px;"> <div style="background-color: #0070C0; color: white; padding: 2px;">P15</div> <div style="background-color: #0070C0; color: white; padding: 2px;">P25</div> <div style="background-color: #FFD700; color: black; padding: 2px;">M15</div> <div style="background-color: #FFD700; color: black; padding: 2px;">M25</div> </div>	<ul style="list-style-type: none"> <li>• Finish milling of steel and stainless steel</li> </ul>
<b>AS10</b> Ceramic	<div style="background-color: #C00000; color: white; padding: 2px;">K20</div> <div style="background-color: #C00000; color: white; padding: 2px;">K30</div>	<ul style="list-style-type: none"> <li>• General milling of cast iron</li> </ul>
<b>TC3030</b> Ceramic	<div style="background-color: #800000; color: white; padding: 2px;">S25</div> <div style="background-color: #800000; color: white; padding: 2px;">S35</div>	<ul style="list-style-type: none"> <li>• High feed milling of super alloy</li> <li>• SiAlON ceramic grade</li> </ul>
<b>TB7015</b> CBN	<div style="background-color: #808080; color: white; padding: 2px;">H25</div> <div style="background-color: #808080; color: white; padding: 2px;">H35</div> <div style="background-color: #C00000; color: white; padding: 2px;">K10</div> <div style="background-color: #C00000; color: white; padding: 2px;">K20</div>	<ul style="list-style-type: none"> <li>• Machining of hardened steel</li> <li>• High speed machining of cast iron</li> </ul>

# Milling Cutters



## Face mills



Designation		Dimension (mm)					Coolant hole	Arbor style		Mounting bolt	Insert
		DC	DCONMS	DHUB	OAL	APMX					
<b>4T-TF90-640-16R-09</b>	6	40	16	38	40	8.3	●	A	0.3	SH M8x30	LPK(H)U 0904... 
<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 1407... 
<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

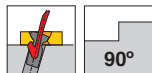
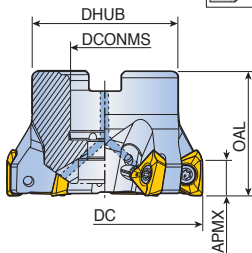
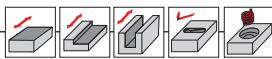
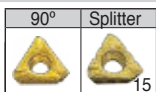
Designation	Screw	Wrench	Wrench handle	
<b>4T-TF90-09</b>	TS 30D082-P	TBLD T08P-W4	THND 4W	-
<b>4T-TF90-14</b>	TS 40G110I	TBLD T15-W6	-	SW6-T

 E271-E273	 E274-E275	 E288-E289
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# 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...
<b>732-16R-06</b>	7	32	16	30	32	4.7	●	A	0.1	SH M8x30	E216
<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...
<b>640-16R-10</b>	6	40	16	38	40	7	●	A	0.3	SH M8x30	E216
<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	45	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	
<b>3P TF90- 450-22R-15</b>	4	50	22	45	40	11	●	A	0.3	SH M10x30	3PK(H)T 1505...
<b>550-22R-15</b>	5	50	22	45	40	11	●	A	0.3	SH M10x30	E216-217
<b>463-22R-15-B</b>	4	63	22	47	40	11	●	A	0.5	SH M10x30	
<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>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>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	-	

Cutting Condition  
E271-E273

Arbor Style  
E274-E275

Ramping Data  
E291-E292

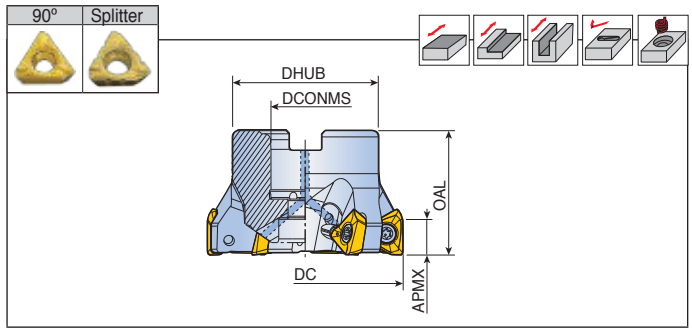




# 3P TF90-15/19



## Face mills (Inch bore)



Designation		Dimension (mm)					Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCONMS	DHUB	OAL	APMX					
<b>3P TF90-780-25.4R-15</b>	7	80	25.4	70	50	11	●	A	1.0	SH M12x35	3PK(H)T 1505...
<b>880-25.4R-15</b>	8	80	25.4	70	50	11	●	A	1.0	SH M12x35	E216-217
<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>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>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...
<b>780-25.4R-19</b>	7	80	25.4	70	50	15	●	A	1.0	SH M12x35	E216-217
<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>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

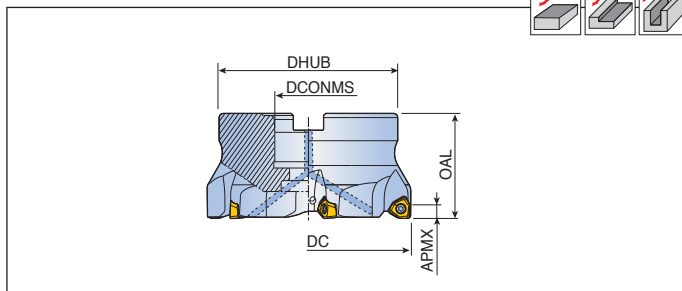
Designation	Screw	Wrench			
<b>3P TF90-06</b>	TS 200431/HG-P	TD 6P	-		
<b>3P TF90-10</b>	TS 25C065I/HG	TD 8	-		
<b>3P TF90-15</b>	TS 40B100I	TD 15	-		
<b>3P TF90-19</b>	TS 45120I	-	T-T20		





# 6N TF90-06/09

## Face mills



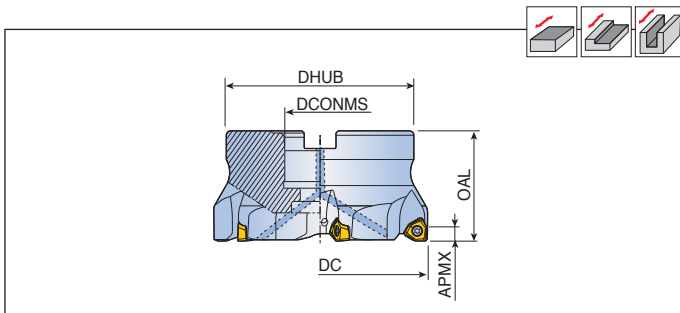
Designation	Z	Dimension (mm)					Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCONMS	DHUB	OAL	APMX					
<b>6N TF90-440-16R-06</b>	4	40	16	38	40	6.2	●	A	0.3	SH M8x30	6NGU 0604... E221
<b>450-22R-06</b>	4	50	22	45	40	6.2	●	A	0.4	LH M10x25	
<b>650-22R-06</b>	6	50	22	45	40	6.2	●	A	0.4	LH M10x25	
<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>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	
<b>14125-40R-06</b>	14	125	40	85	63	6.2	●	A	3.2	SH M20x40	
<b>6N TF90-450-22R-09</b>	4	50	22	45	40	9.2	●	A	0.3	LH M10x25	6NGU 0905... E221
<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>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>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	-	



# 6N TF90-06/09



Face mills (Inch bore)



Designation		Dimension (mm)					Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCONMS	DHUB	OAL	APMX					
<b>6N TF90-580-25.4R-06</b>	5	80	25.4	70	50	6.2	●	A	1.0	SH M12x35	6NGU 0604...
<b>780-25.4R-06</b>	7	80	25.4	70	50	6.2	●	A	1.0	SH M12x35	E221
<b>980-25.4R-06</b>	9	80	25.4	70	50	6.2	●	A	1.0	SH M12x35	
<b>6100-31.75R-06</b>	6	100	31.75	80	50	6.2	x	B	1.9	-	
<b>8100-31.75R-06</b>	8	100	31.75	80	50	6.2	x	B	1.9	-	
<b>11100-31.75R-06</b>	11	100	31.75	80	50	6.2	x	B	1.9	-	
<b>7125-38.1R-06</b>	7	125	38.1	80	63	6.2	x	B	3.2	-	
<b>6N TF90-580-25.4R-09</b>	5	80	25.4	58	50	9.2	●	A	1.0	SH M12x35	6NGU 0905...
<b>780-25.4R-09</b>	7	80	25.4	58	50	9.2	●	A	1.1	SH M12x35	E221
<b>980-25.4R-09</b>	9	80	25.4	58	50	9.2	●	A	1.1	SH M12x35	
<b>6100-31.75R-09</b>	6	100	31.75	80	50	9.2	x	B	1.9	-	
<b>8100-31.75R-09</b>	8	100	31.75	80	50	9.2	x	B	1.8	-	
<b>11100-31.75R-09</b>	11	100	31.75	80	50	9.2	x	B	1.9	-	
<b>7125-38.1R-09</b>	7	125	38.1	80	63	9.2	x	B	3.1	-	
<b>11125-38.1R-09</b>	11	125	38.1	80	63	9.2	x	B	3.1	-	
<b>14125-38.1R-09</b>	14	125	38.1	80	63	9.2	x	B	3.2	-	
<b>12160-50.8R-09</b>	12	160	50.8	100	63	9.2	x	B	4.3	-	
<b>16160-50.8R-09</b>	16	160	50.8	100	63	9.2	x	B	4.3	-	

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

## Spare parts

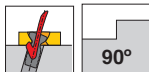
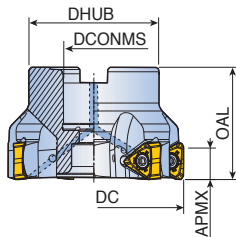
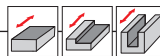
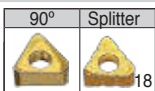
Designation	Screw	Wrench			
<b>6N TF90-06</b>	TS 300851/HG	TD 9	-		
<b>6N TF90-09</b>	TS 40B1001	-	T-T15		





# SCRM90TN

Face mills (Inch bore)



Designation		Dimension (mm)					Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCONMS	DHUB	OAL	APMX					
<b>SCRM90TN 580-25.4R-18</b>	5	80	25.4	70	50	13	●	A	1.1 SH M12x35	TNMX 1806...	
<b>780-25.4R-18</b>	7	80	25.4	70	50	13	●	A	1.1 SH M12x35	E261	
<b>6100-31.75R-18-B</b>	6	100	31.75	80	50	13	x	B	2.0 -		
<b>8100-31.75R-18</b>	8	100	31.75	80	50	13	x	B	2.0 -		
<b>7125-38.1R-18-B</b>	7	125	38.1	80	63	13	x	B	3.4 -		
<b>10125-38.1R-18</b>	10	125	38.1	80	63	13	x	B	3.3 -		
<b>10160-50.8R-18</b>	10	160	50.8	100	63	13	x	B	4.5 -		
<b>14160-50.8R-18</b>	14	160	50.8	100	63	13	x	B	4.5 -		
<b>16200-47.625R-18</b>	16	200	47.625	130	63	13	x	C	6.2 -		
<b>SCRM90TN 580-25.4R-22</b>	5	80	25.4	70	50	15	●	A	0.9 SH M12x35	TNM(G)X 2207...	
<b>6100-31.75R-22</b>	6	100	31.75	80	50	15	x	B	1.8 -	E261	
<b>8125-38.1R-22</b>	8	125	38.1	80	63	15	x	B	3.0 -		

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

## Spare parts

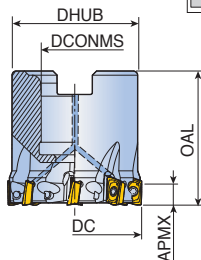
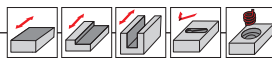
Designation	Screw	Wrench			
<b>SCRM90TN-18</b>	TS 40B100I	T-T15			
<b>SCRM90TN-22</b>	TS 45I20I	T-T20			



# TFM90AX-06/2S-TFM90AP-09



Face mills



Designation	⌀	Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCONMS	DHUB	OAL	APMX						
<b>TFM90AX</b>	<b>832-16R-06</b>	8	32	16	30	32	5.5	●	A	0.1	SH M8x25	AXM(C)T 0602...
	<b>1040-16R-06</b>	10	40	16	38	40	5.5	●	A	0.2	SH M8x25	E230-E231
	<b>1040-22R-06</b>	10	40	22	38	40	5.5	●	A	0.2	SH M10x30	
<b>2S-TFM90AP</b>	<b>540-16R-09</b>	5	40	16	38	40	8.8	●	A	0.3	SH M8x30	APK(C)T 09T3...
	<b>640-16R-09</b>	6	40	16	38	40	8.8	●	A	0.2	SH M8x30	E225, E230
	<b>550-22R-09-B</b>	5	50	22	45	40	8.8	●	A	0.3	SH M10x30	
	<b>650-22R-09</b>	6	50	22	45	40	8.8	●	A	0.3	SH M10x30	
	<b>750-22R-09</b>	7	50	22	45	40	8.8	●	A	0.3	SH M10x30	
	<b>863-22R-09</b>	8	63	22	47	40	8.8	●	A	0.5	SH M10x30	
	<b>1080-27R-09</b>	10	80	27	58	50	8.8	●	A	1.1	SH M12x35	

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

## Spare parts

Designation	Screw	Wrench			
<b>TFM90AX</b>	TS 18041/HG	TD 6P			
<b>2S-TFM90AP</b>	TS 25075/HG	TD 8			







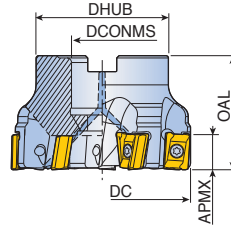
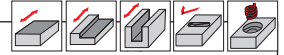




# TFM90AN-11/16



## Face mills

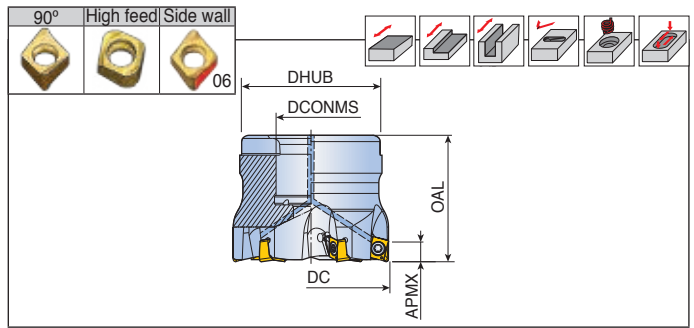


Designation		Dimension (mm)					Coolant hole	Arbor style	Kg	Mounting bolt	Insert	
		DC	DCONMS	DHUB	OAL	APMX						
<b>TFM90AN 440-16R-11</b>	4	40	16	38	40	11	●	A	0.2	SH M8x30	ANM(H)X 1106... E224	
<b>450-22R-11</b>	4	50	22	45	40	11	●	A	0.3	SH M10x30		
<b>650-22R-11</b>	6	50	22	45	40	11	●	A	0.3	SH M10x30		
<b>563-22R-11</b>	5	63	22	47	40	11	●	A	0.6	SH M10x30		
<b>763-22R-11</b>	7	63	22	47	40	11	●	A	0.6	SH M10x30		
<b>880-27R-11</b>	8	80	27	58	50	11	●	A	1.1	SH M12x35		
<b>1080-27R-11</b>	10	80	27	58	50	11	●	A	1.1	SH M12x35		
<b>9100-32R-11</b>	9	100	32	85	50	11	●	A	2.0	SH M16x35		
<b>12100-32R-11</b>	12	100	32	85	50	11	●	A	2.0	SH M16x35		
<b>10125-40R-11</b>	10	125	40	85	63	11	●	A	3.3	SH M20x40		
<b>14125-40R-11</b>	14	125	40	85	63	11	●	A	3.4	SH M20x40		
<b>TFM90AN 350-22R-16</b>	3	50	22	45	40	15	●	A	0.4	SH M10x30		ANM(H)X 1607... E224
<b>450-22R-16</b>	4	50	22	45	40	15	●	A	0.4	SH M10x30		
<b>463-22R-16</b>	4	63	22	47	40	15	●	A	0.5	SH M10x30		
<b>663-22R-16</b>	6	63	22	47	40	15	●	A	0.5	SH M10x30		
<b>580-27R-16</b>	5	80	27	58	50	15	●	A	0.8	SH M12x35		
<b>780-27R-16</b>	7	80	27	58	50	15	●	A	0.9	SH M12x35		
<b>5100-32R-16</b>	5	100	32	85	50	15	●	A	1.3	SH M16x35		
<b>8100-32R-16</b>	8	100	32	85	50	15	●	A	1.5	SH M16x35		
<b>7125-40R-16</b>	7	125	40	85	63	15	●	A	3.9	SH M20x40		
<b>10125-40R-16</b>	10	125	40	85	63	15	●	A	3.7	SH M20x40		
<b>8160-40R-16</b>	8	160	40	110	63	15	x	C	5.0	-		
<b>12160-40R-16</b>	12	160	40	110	63	15	x	C	5.3	-		
<b>14200-60R-16</b>	14	200	60	130	63	15	x	C	7.0	-		

Cutting Condition E271-E273	Arbor Style E274-E275	Ramping Data E321
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## 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	4NKT 0402....
<b>1040-16R-04</b>	10	40	16	38	40	3.5	●	A	0.2	SH M8x25	E218-E219
<b>4N TF90-432-16R-06</b>	4	32	16	30	32	6.0	●	A	0.1	SH M8x25	4NK(H)T 0603....
<b>532-16R-06</b>	5	32	16	30	32	6.0	●	A	0.1	SH M8x25	E218-E219
<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>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>4N TF90-540-16R-09</b>	5	40	16	38	40	8.0	●	A	0.3	SH M8x25	4NK(H)T 0904....
<b>650-22R-09</b>	6	50	22	45	40	8.0	●	A	0.3	LH M10x25	E218-E219
<b>763-22R-09</b>	7	63	22	47	40	8.0	●	A	0.5	LH M10x25	
<b>980-27R-09</b>	9	80	27	58	50	8.0	●	A	1.1	SH M12x35	

- 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

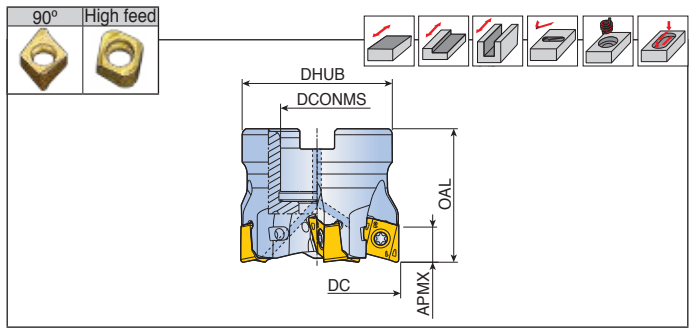
Designation	Screw	Wrench		Wrench handle
<b>4N TF90-04</b>	TS 18041/HG	TD 6P	-	-
<b>4N TF90-06</b>	TS 30B068I/HG	TD 8	-	-
<b>4N TF90-09</b>	TS 35A088I/HG	-	TBLD T10P-W6	THND 6W

 E271-E273	 E274-E275	 E293-E313
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# 4N TF90-11/14



## Face mills



Designation	Z	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... E218-E219
<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>4N TF90- 450-22R-14</b>	4	50	22	45	45	13.8	●	A	0.4	SH M10x25	4NKT 1407... E218-E219
<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	

- 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		

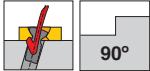
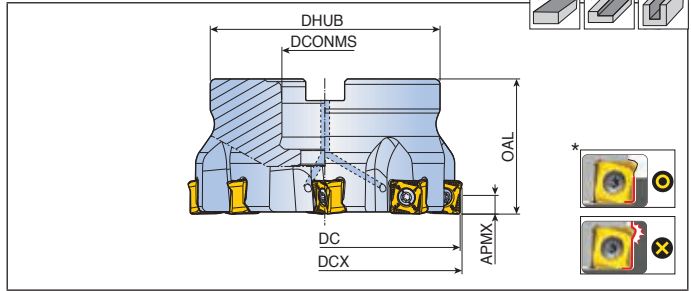
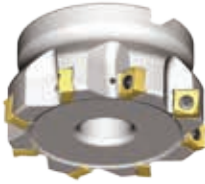
 E271-E273	 E274-E275	 E293-E313
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# 8D-TF90-12

## Face mills



Designation		Dimension (mm)						Coolant hole	Arbor style		Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>8D-TF90-340-16R-12</b>	3	40	41.3	16	38	40	8.5**	●	E	0.3	KTB 32B	SQK(H)U 1206... E257
<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>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>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>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>22160-40R-12</b>	22	160	161.3	40	110	63	8.5**	x	C	4.9	-	

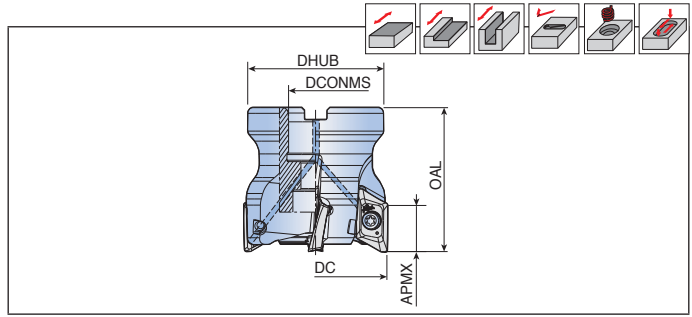
- DC: Cutting diameter      • DCX: Cutting diameter maximum
- Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- \* Multi-Step milling is not recommended over the APMX      • \*\* When applying SQHU insert, APMX is 8.0mm.

## 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 hole	Arbor style	Max RPM	Kg	Mounting 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	XEVT 1605... 
<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>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>10200-60R-16</b>	10	200	60	130	63	16	x	C	18,300	5.3	-	
<b>TFM90XEV 350-22R-22</b>	3	50	22	45	55	21	●	A	31,400	0.4	SH M10x30-C	XEVT 2206... 
<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	
<b>10200-60R-22</b>	10	200	60	124	63	21	x	C	15,700	5.9	-	

• Cutter body for inserts with corner radii more than 3.2mm (XEVT 16) and 3.0mm (XEVT 22) should be modified as follows: body "RE"=insert "RE"-0.3mm

## Spare parts

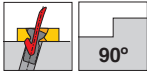
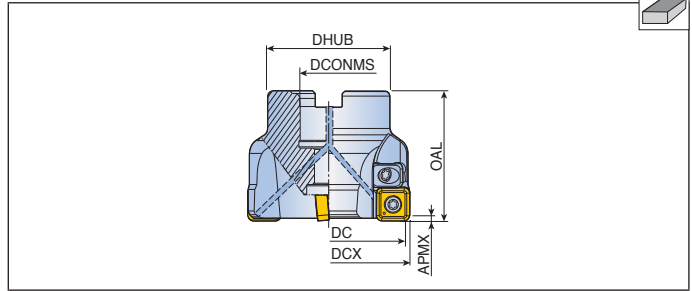
Designation	Screw	Wrench			
<b>TFM90XEV-16</b>	TS 400931/HG	T-T15			
<b>TFM90XEV-22</b>	TS 501151	T-T20			





# TFM90SNS-12

Face mills for finishing



Designation	Z	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 1204... SNET 1205... E251
<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	

E271-E273

E274-E275

E279-E280

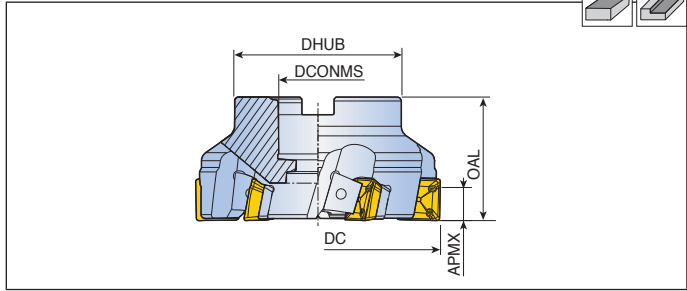




# LM90SE-21



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...
<b>8160-40R-21</b>	8	160	40	110	63	17.0	C	5.3	-	E249
<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</b>	TSSE 21N-ST	TS 50C130//HG	WPA 8-SE16	TS 80160W TS 80200W	T-W 4	T-T20 <sup>(1)</sup>

- The shim screw wrench<sup>(1)</sup> shall be ordered separately
- Wedge screw TS 80160W : Diameter 125 – 200 mm  
TS 80200W : Diameter 250 – 315 mm

Cutting Condition  
 E271-E273

Arbor Style  
 E274-E275

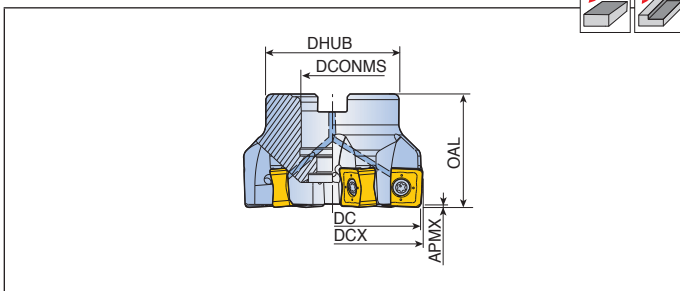
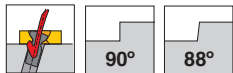




# TFM90SN/TFM88SN-13



Face mills (Inch bore)



Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>TFM90SN 780-25.4R-13</b>	7	80	80.7	25.4	70	50	12.0	●	A	1.2	SH M12x35	SNGX
<b>8100-31.75R-13</b>	8	100	100.8	31.75	80	50	12.0	x	B	1.9	-	1306 ...
<b>10125-38.1R-13</b>	10	125	125.8	38.1	80	63	12.0	x	B	2.8	-	E253
<b>TFM88SN 780-25.4R-13</b>	7	80	81.2	25.4	70	50	12.0	●	A	1.2	SH M12x35	SNGX
<b>980-25.4R-13*</b>	9	80	81.2	25.4	70	50	12.0	●	A	1.2	SH M12x35	1306 ZN...
<b>8100-31.75R-13</b>	8	100	101.2	31.75	80	50	12.0	x	B	1.9	-	E253
<b>11100-31.75R-13*</b>	11	100	101.2	31.75	80	50	12.0	x	B	1.9	-	
<b>10125-38.1R-13</b>	10	125	126.1	38.1	80	63	12.0	x	B	2.8	-	
<b>12160-50.8R-13</b>	12	160	161.1	50.8	100	63	12.0	x	B	4.2	-	

- \*: Fine pitch cutter for cast iron
- Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

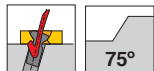
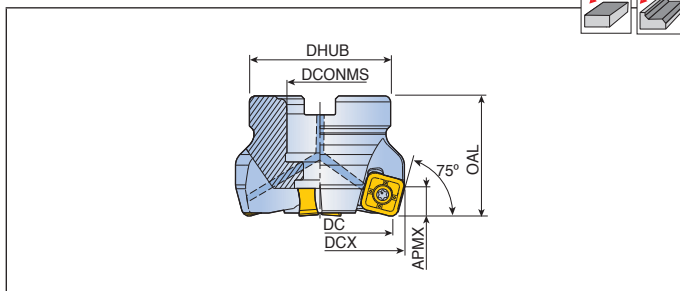
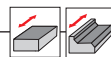
## Spare parts

Designation	Screw	Wrench			
<b>TFM90SN</b>	TS 40B100I	T-T15			
<b>TFM88SN</b>	TS 40B100I	T-T15			



# 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... E252	
<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	3.2	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

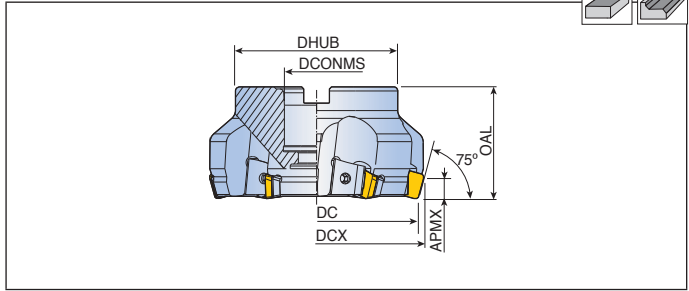
Designation	Screw	Wrench			
	<b>TFM75SN</b>	TS 40B100I	T-T15		



# LM75SP-12/15



## Face mills



Designation		Dimension (mm)						Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX				
<b>LM75SP580-25.4 R-12</b>	5	80	85.4	25.4	70	50	9.5	A	1.5	SH M12x35	SPKN 1203...
<b>6100-31.75R-12</b>	6	100	105.4	31.75	80	55	9.5	A	2.4	LH M16x35	E256
<b>8125-38.1R-12</b>	8	125	130.4	38.1	80	63	9.5	B	3.2	-	-
<b>10160-50.8R-12</b>	10	160	165.4	50.8	100	63	9.5	B	5.0	-	-
<b>12200-47.625R-12</b>	12	200	205.4	47.625	130	63	9.5	C	7.4	-	-
<b>16250-47.625R-12</b>	16	250	255.4	47.625	160	63	9.5	C	10.8	-	-
<b>LM75SP580-25.4R-15</b>	5	80	86.97	25.4	70	55	12.5	A	1.5	SH M12x35	SPKN 1504...
<b>5100-31.75R-15</b>	5	100	106.96	31.75	80	55	12.5	A	2.4	LH M16x35	E256
<b>8125-38.1R-15</b>	8	125	131.95	38.1	80	63	12.5	B	3.1	-	-
<b>10160-50.8R-15</b>	10	160	166.94	50.8	100	63	12.5	B	5.0	-	-
<b>12200-47.625R-15</b>	12	200	206.94	47.625	130	63	12.5	C	6.9	-	-
<b>16250-47.625R-15</b>	16	250	256.93	47.625	160	63	12.5	C	10.8	-	-
<b>20315-47.625R-15</b>	20	315	321.93	47.625	220	63	12.5	D	17.4	-	-

• Metric bore cutter is available upon request

## Spare parts

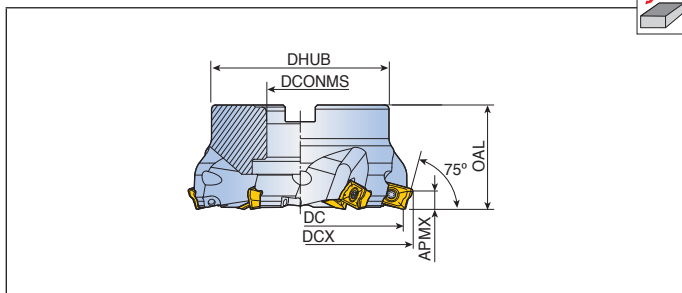
Designation	Carbide shim	Wedge	Shim screw	Wedge screw	Wrench	
<b>LM75SP-12</b>	TSSP 12N	WPA 8	TS 40B100I	TS 80200W	T-W 4	T-T15
<b>LM75SP-15</b>	TSSP 15N	WPA 8	TS 40B100I	TS 80160W <sup>(1)</sup>	T-W 4	T-T15

Cutting Condition  
 Arbor Style  
 E271-E273    E274-E275

• <sup>(1)</sup> TS 80160W is for D80 cutter  
 • The shim screw wrench T-T15<sup>(2)</sup> shall be ordered separately

# TFM75AP-17

## Face mills



Designation		Dimension (mm)						Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX				
<b>TFM75AP 580-27R-17</b>	5	80	87.82	27	58	50	3.9	A	0.8	SH M12x35	APKT 1705
<b>6100-32R-17</b>	6	100	107.82	32	85	50	3.9	B	1.3	-	PER-M
<b>7125-40R-17</b>	7	125	132.82	40	85	63	3.9	B	3.5	-	APKT 1705
<b>TFM75AP 580-25.4R-17</b>	5	80	87.82	25.4	70	50	3.9	A	0.8	SH M12x35	PER-EM
<b>6100-31.75R-17</b>	6	100	107.82	31.75	80	50	3.9	B	1.3	-	E228
<b>7125-38.1R-17</b>	7	125	132.82	38.1	80	63	3.9	B	3.5	-	

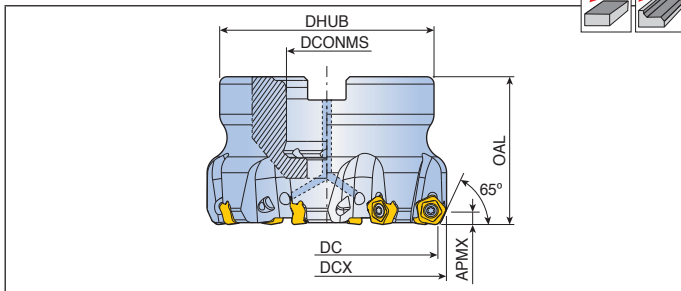
• Cutter for the other corner of APKT inserts

## Spare parts

Designation	Screw	Wrench			
<b>TFM75AP-17</b>	TS 40120I/HG	T-T15			



## Face mills



Designation		Dimension (mm)						Coolant hole	Arbor style	kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>TFM65PT 640-16R-05</b>	6	40	43.7	16	38	40	3.3	•	A	0.3	SH M8x25	PTKU 0503...
<b>750-22R-05</b>	7	50	53.7	22	45	40	3.3	•	A	0.4	SH M10x30	E242
<b>863-22R-05</b>	8	63	66.7	22	58	40	3.3	•	A	0.7	SH M10x30	
<b>TFM65PT 680-27R-10</b>	6	80	87.4	27	70	50	6.5	•	A	1.2	LH M12x30	PTKU 1006...
<b>8100-32R-10</b>	8	100	107.4	32	85	50	6.5	•	A	1.9	LH M16x35	E242
<b>9125-40R-10</b>	9	125	132.4	40	85	63	6.5	•	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		Wrench handle	
<b>TFM65PT-05</b>	TS 25D060/HG-P	TD 7P	-	SW6-T	
<b>TFM65PT-10</b>	TS 50D130/HG-P	-	TBLD T20P-W6	SW6-T	

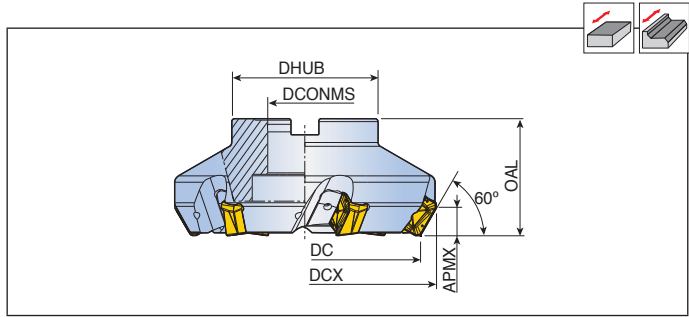
Cutting Condition  
E271-E273

Arbor Style  
E274-E275

# 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... E248	
<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



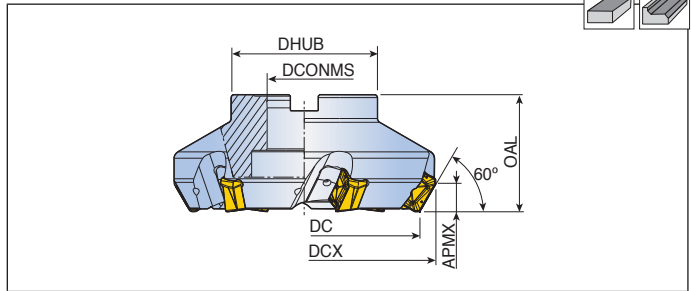
E271-E273

E274-E275

# LM60SC-27



Face mills



Designation		Dimension (mm)							Arbor style	Kg	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX				
<b>LM60SC 5125-40R-27</b>	5	125	146	40	85	63	18.0	B	4.6	SCKN 2708... E248	
<b>6160-40R-27</b>	6	160	181	40	110	80	18.0	C	8.7		
<b>8160-40R-27</b>	8	160	181	40	110	80	18.0	C	8.4		
<b>8200-60R-27</b>	8	200	220.9	60	130	80	18.0	C	12.4		
<b>10200-60R-27</b>	10	200	220.9	60	130	80	18.0	C	12.3		
<b>10250-60R-27</b>	10	250	270.8	60	160	80	18.0	C	19.9		
<b>12250-60R-27</b>	12	250	270.8	60	160	80	18.0	C	19.8		
<b>12315-60R-27</b>	12	315	335.8	60	220	80	18.0	D	26.0		
<b>15315-60R-27</b>	15	315	335.8	60	220	80	18.0	D	25.9		
<b>LM60SC 12250-47.625R-27</b>	12	250	270.8	47.625	160	80	18.0	C	19.8		
<b>12315-47.625R-27</b>	12	315	335.8	47.625	220	80	18.0	D	26.0		

## Spare parts

Designation	Shim	Shim screw	Wedge	Wedge screw	Wrench		Wrench handle
<b>LM60SC-27</b>	TSSC 27R-TS	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

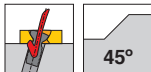
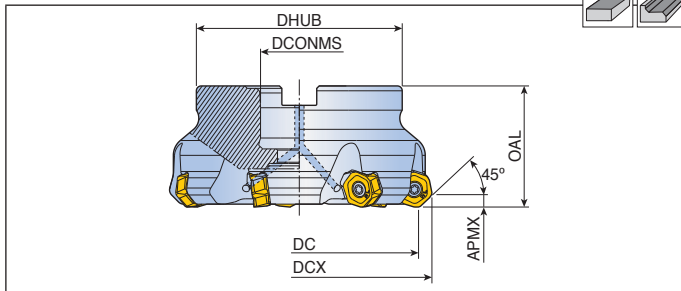


E271-E273 E274-E275



# 12D-TF45-06

## Face mills



Designation	Z	Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>12D-TF45-450-22R-06</b>	4	50	60.8	22	45	40	3.0	●	A	0.5	LH M10x25	HXK(H)U
<b>650-22R-06</b>	6	50	60.8	22	45	40	3.0	●	A	0.5	LH M10x25	0605...
<b>563-22R-06</b>	5	63	73.8	22	47	40	3.0	●	A	0.7	LH M10x25	E237
<b>763-22R-06</b>	7	63	73.8	22	47	40	3.0	●	A	0.7	LH M10x25	
<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>7100-32R-06</b>	7	100	110.8	32	85	50	3.0	●	A	2.2	SH M16x35	
<b>12100-32R-06</b>	12	100	110.8	32	85	50	3.0	●	A	2.2	SH M16x35	
<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>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)

## Spare parts

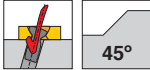
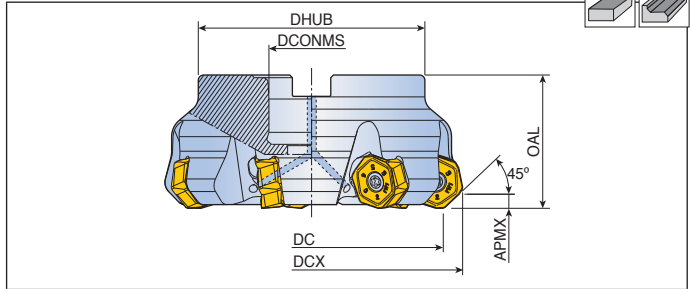
Designation	Screw	Wrench	Wrench handle		
<b>12D-TF45-06</b>	TS 40B100I	TBLD T15-W6	SW6-T		





# 12D-TF45-10

## Face mills



Designation	⊕	Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>12D-TF45-563-22R-10</b>	5	63	77.5	22	47	50	5.0	●	A	0.9	SH M10x30	HXK(H)U 1007...
<b>763-22R-10</b>	7	63	77.5	22	47	50	5.0	●	A	0.9	SH M10x30	
<b>680-27R-10</b>	6	80	94.5	27	70	50	5.0	●	A	1.6	SH M12x35	E237
<b>980-27R-10</b>	9	80	94.5	27	70	50	5.0	●	A	1.6	SH M12x35	
<b>7100-32R-10</b>	7	100	114.5	32	85	50	5.0	●	A	2.4	LH M16x35	
<b>11100-32R-10</b>	11	100	114.5	32	85	50	5.0	●	A	2.4	LH M16x35	
<b>8125-40R-10</b>	8	125	139.5	40	85	63	5.0	●	A	4.1	SH M20x40	
<b>10125-40R-10</b>	10	125	139.5	40	85	63	5.0	●	A	4.0	SH M20x40	
<b>14125-40R-10</b>	14	125	139.5	40	85	63	5.0	●	A	4.0	SH M20x40	
<b>10160-40R-10</b>	10	160	174.5	40	110	63	5.0	x	C	5.6	-	
<b>16160-40R-10</b>	16	160	174.5	40	110	63	5.0	x	C	5.6	-	
<b>14200-60R-10</b>	14	200	214.5	60	130	63	5.0	x	C	7.9	-	
<b>21200-60R-10</b>	21	200	214.5	60	130	63	5.0	x	C	7.9	-	
<b>16250-60R-10</b>	16	250	264.5	60	160	63	5.0	x	C	12.4	-	
<b>26250-60R-10</b>	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)

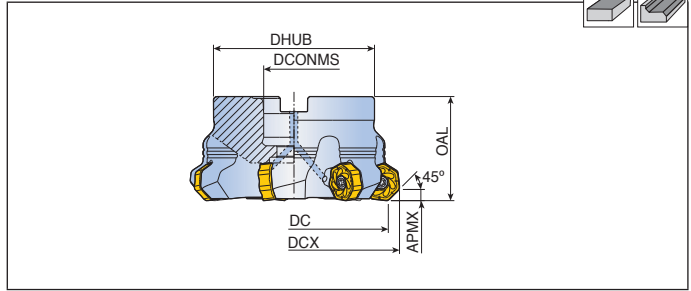
## Spare parts

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)						Coolant hole	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 0605... E265
<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	-	

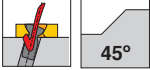
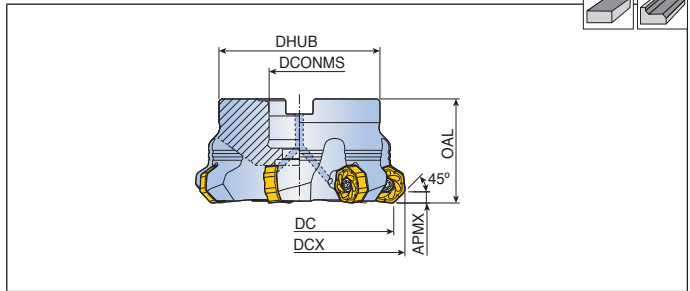
• Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

Designation	Screw	Wrench			
	<b>14D-F45XN-06</b>	TS 40B100I	T-T15		



## Face mills



Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	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	XNM(H)U 0906... E266
<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)

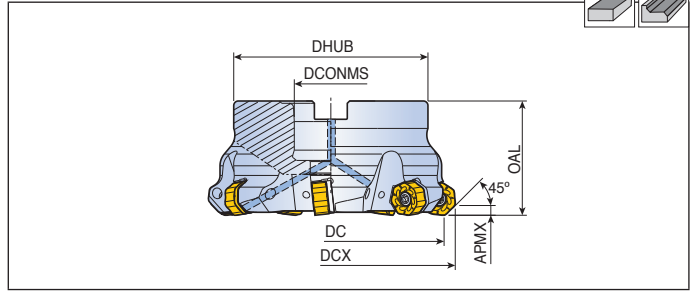
## Spare parts

Designation	Screw	Wrench			
	<b>14D-F45XN-09</b>	TS 50C130/HG	T-T20		



# 14D-F45XNH-06/09

## Shim type face mills



Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>14D-F45XNH 763-22R-06</b>	7	63	72.2	22	47	40	3.5	●	A	0.7	SH M10x25	XNM(H)U 0605... E265
<b>780-27R-06</b>	7	80	89.2	27	70	50	3.5	●	A	1.5	SH M12x35	
<b>880-27R-06</b>	8	80	89.2	27	70	50	3.5	●	A	1.5	SH M12x35	
<b>7100-32R-06</b>	7	100	109.2	32	85	50	3.5	●	A	2.2	SH M16x35	
<b>8100-32R-06</b>	8	100	109.2	32	85	50	3.5	●	A	2.2	SH M16x35	
<b>11125-40R-06</b>	11	125	134.2	40	85	63	3.5	●	A	3.5	SH M20x40	
<b>14D-F45XNH 563-22R-09</b>	5	63	75.1	22	47	40	5.0	●	A	0.6	SH M10x35	XNM(H)U 0906... E266
<b>680-27R-09</b>	6	80	92.1	27	70	50	5.0	●	A	1.5	SH M12x35	
<b>7100-32R-09</b>	7	100	112.1	32	85	50	5.0	●	A	2.2	SH M16x35	
<b>9125-40R-09</b>	9	125	137.0	40	85	63	5.0	●	A	3.6	SH M20x40	

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

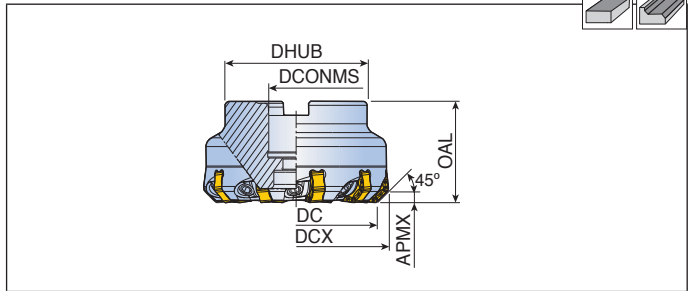
## Spare parts

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 8050088S	TBLD T20-W6	SW6-T



# 14D-F45XNW-09

Face mill



Designation		Dimension (mm)						Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX				
<b>14D-F45XNW 1080-27R-09</b>	10	80	91.9	27	70	50	5.0	A	1.5	SH M12x35	XNHU 0906... E266
<b>14100-32R-09</b>	14	100	112	32	85	55	5.0	A	2.9	SH M16x35	
<b>18125-40R-09</b>	18	125	137	40	85	63	5.0	B	3.8	-	
<b>18160-40R-09</b>	18	160	172	40	110	63	5.0	C	5.6	-	
<b>22160-40R-09</b>	22	160	172	40	110	63	5.0	C	5.6	-	
<b>28200-60R-09</b>	28	200	212	60	130	63	5.0	C	7.9	-	
<b>36250-60R-09</b>	36	250	262	60	160	63	5.0	C	12.7	-	
<b>44315-60R-09</b>	44	315	327	60	220	63	5.0	D	19.9	-	

• Recommend to very stable machining condition at cast iron & steel

## Spare parts

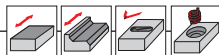
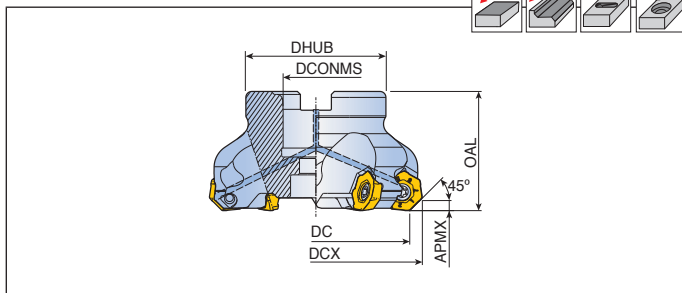
Designation	Wedge	Wedge screw	Wrench		
<b>14D-F45XNW-09</b>	WFZ 8H	WS 8	T-W 4		

Cutting Condition  
E271-E273

Arbor Style  
E274-E275

# 7S-F45-06

## Face mills



Designation	⊕	Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>7S-F45 332-16R-06</b>	3	32	40.4	16	38	40	3.2	●	E	0.2	KTB 32B	7EMT 0604... E223
<b>440-16R-06</b>	4	40	48.5	16	38	40	3.2	●	A	0.3	SH M8x30	
<b>550-22R-06</b>	5	50	58.5	22	45	40	3.2	●	A	0.4	LH M10x25	
<b>663-22R-06</b>	6	63	71.5	22	47	40	3.2	●	A	0.5	LH M10x25	
<b>780-27R-06</b>	7	80	88.5	27	70	50	3.2	●	A	1.3	LH M12x30	
<b>8100-32R-06</b>	8	100	108.5	32	85	50	3.2	●	A	1.9	LH M16x35	
<b>9125-40R-06</b>	9	125	133.5	40	85	63	3.2	●	A	3.3	SH M20x40	
<b>7S-F45 780-25.4R-06</b>	7	80	88.5	25.4	70	50	3.2	●	A	1.3	LH M12x30	
<b>8100-31.75R-06</b>	8	100	108.5	31.75	80	50	3.2	●	A	1.8	LH M16x35	
<b>9125-38.1R-06</b>	9	125	133.5	38.1	80	63	3.2	x	B	2.8	-	

• Mounting bolt with coolant through hole is available on request (ordering example: SH M8x1.25x30-C)

## Spare parts

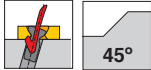
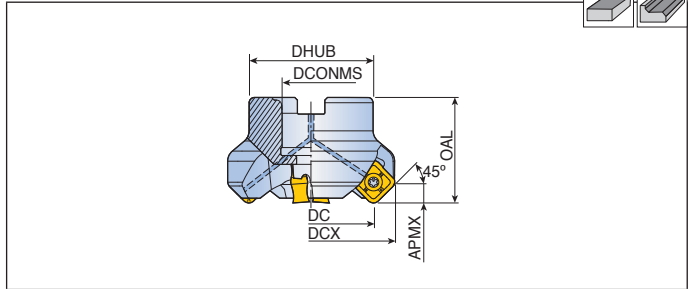
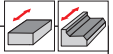
Designation	Screw	Wrench			
<b>7S-F45-06</b>	TS 40093I/HG	T-T15			

 E271-E273	 E274-E275	 E327
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# TFM45SN-13



## Face mills



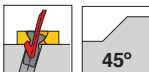
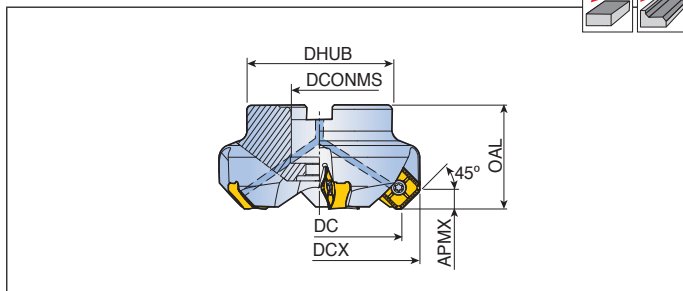
Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>TFM45SN 440-16R-13</b>	4	40	54.7	16	38	40	7.0	●	A	0.3	LH M10x25	SNM(G)X 1306 AN... SNMX 1306 XTN E252
<b>450-22R-13</b>	4	50	64.7	22	45	40	7.0	●	A	0.5	LH M10x25	
<b>650-22R-13</b>	6	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)



# TFM45SNS-16

## Face mills



Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>TFM45SNS 463-22R-16</b>	4	63	81.1	22	47	50	8.8	●	A	1.0	LH M10x25	SNMX 1607... SNHX 1606... E254
<b>580-27R-16</b>	5	80	98.2	27	70	50	8.8	●	A	1.5	LH M12x30	
<b>7100-32R-16</b>	7	100	118.2	32	85	50	8.8	●	A	2.3	LH M16x35	
<b>8125-40R-16</b>	8	125	143.2	40	85	63	8.8	●	A	4.0	SH M20x40	
<b>10125-40R-16</b>	10	125	143.2	40	85	63	8.8	●	A	4.0	SH M20x40	
<b>10160-40R-16</b>	10	160	178.2	40	110	63	8.8	x	C	5.4	-	
<b>12160-40R-16</b>	12	160	178.2	40	110	63	8.8	x	C	5.4	-	
<b>12200-60R-16</b>	12	200	218.2	60	130	63	8.8	x	C	7.5	-	
<b>14250-60R-16</b>	14	250	268.2	60	160	63	8.8	x	C	13	-	
<b>TFM45SNS 580-25.4R-16</b>	5	80	98.2	25.4	70	50	8.8	●	A	1.5	LH M12x30	
<b>7100-31.75R-16</b>	7	100	118.2	31.75	80	50	8.8	x	B	2.3	-	
<b>8125-38.1R-16</b>	8	125	143.2	38.1	80	63	8.8	x	B	4.0	-	
<b>10160-50.8R-16</b>	10	160	178.2	50.8	100	63	8.8	x	B	5.4	-	
<b>12200-47.625R-16</b>	12	200	218.2	47.625	130	63	8.8	x	C	7.5	-	

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

## Spare parts

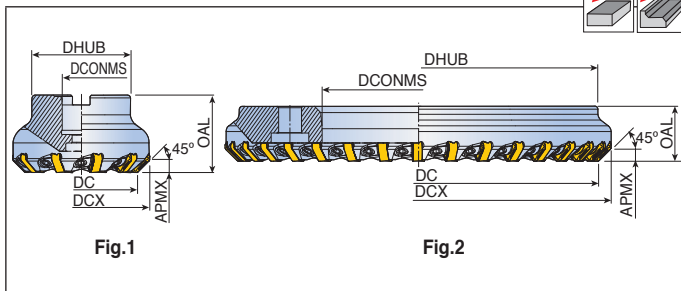
Designation	Screw	Wrench			
<b>TFM45SN-13</b>	TS 40B100I	T-T15			
<b>TFM45SNS-16</b>	TS 45120I	T-T20			







## 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...
<b>14100-32R-16</b>	14	100	118.2	32	85	63	8.8	1	A	3.2	SH M16x35	E254
<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...
<b>34250R-16</b>	34	250	268.2	133.35	248	38	8.8	2	7.9	QA 10 K/M	E254
<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	-

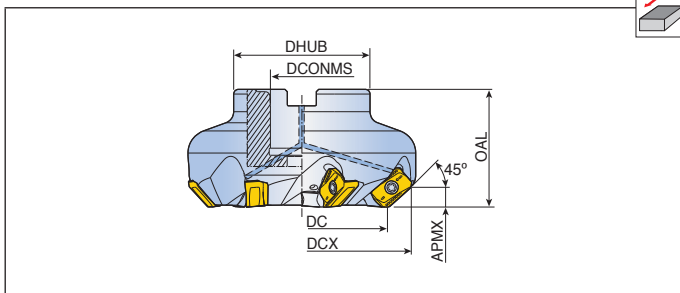
• Recommend to very stable machining condition at cast iron & steel

## 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		



## Face mills



Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DC	DCX	DCONMS	DHUB	OAL	APMX					
<b>TFM45AN 450-22R-16</b>	4	50	67.8	22	45	40	8.4	●	A	0.6	LH M10x25	ANHX 1607 ANR-M E223
<b>663-22R-16</b>	6	63	80.6	22	47	40	8.4	●	A	0.9	LH M10x25	
<b>780-27R-16</b>	7	80	97.5	27	58	50	8.4	●	A	1.6	SH M12x35	
<b>8100-32R-16</b>	8	100	117.5	32	85	50	8.4	●	A	2.5	LH M16x35	
<b>9125-40R-16</b>	9	125	142.6	40	85	63	8.4	●	A	4.3	SH M20x40	
<b>10160-40R-16</b>	10	160	177.7	40	110	63	8.4	x	C	5.8	-	

- 90° Inserts can not be mounted
- Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

Designation	Screw	Wrench			
	<b>TFM45AN</b>	TS 401201	T-T15		

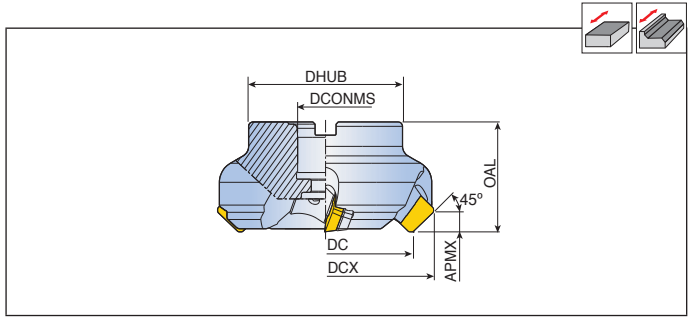




# LM45SE-12/15



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...
<b>5100-31.75R-12</b>	5	100	113.6	31.75	80	60	6.5	A	2.8	LH M16x35	E249
<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	-	-
<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...
<b>5100-31.75R-15</b>	5	100	118	31.75	80	60	8.7	A	2.8	LH M16x35	E249
<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	
				(1)		(2)
<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



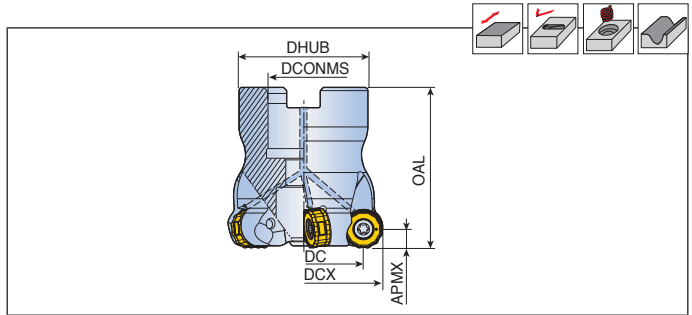
• (1) TS 80160W is for D80 cutter  
 • The shim screw wrench T-T15<sup>(2)</sup> shall be ordered separately



# TFMRNS-16



## 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... E244
<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	-	

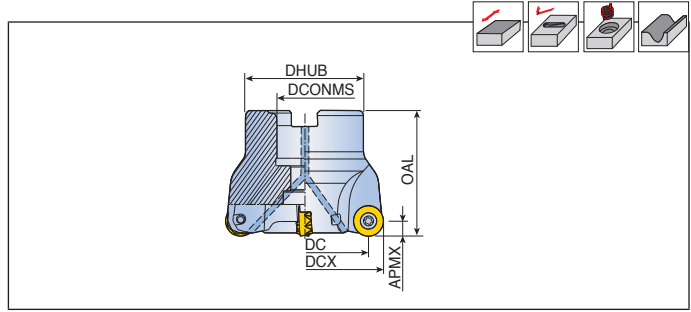
• Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

Designation	Screw	Wrench			
<b>TFMRNS-10</b>	TS 35085I/HG	T-T15			
<b>TFMRNS-12</b>	TS 40G110I	T-T15			
<b>TFMRNS-16</b>	TS 50A121I/HG	T-T20			

 E271-E273	 E274-E275	 E340
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## Face mills

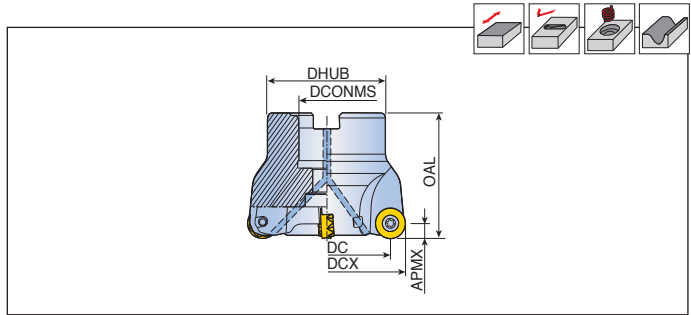


Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DCX	DC	DCONMS	DHUB	OAL	APMX					
<b>TFMRY 532-16R-08</b>	5	32	24	16	30	40	4.0	●	A	0.12	SH M8x30	RYM(H)X 0803... 
<b>640-16R-08</b>	6	40	32	16	38	40	4.0	●	A	0.22	SH M8x30	
<b>TFMRY 432-16R-10</b>	4	32	22	16	30	40	5.0	●	A	0.12	SH M8x30	RYM(H)X 1004... 
<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	RYM(H)X 1205... 
<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	
<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	





## 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 1606...  E245-E246
<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

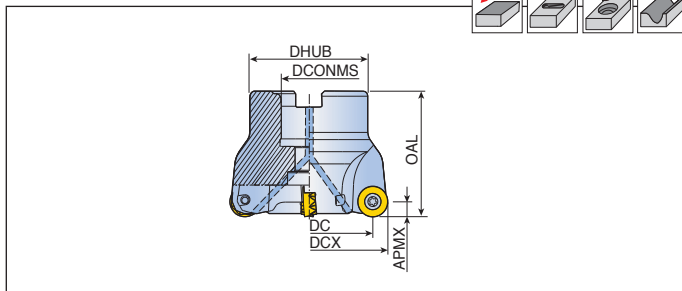
Designation	Shim	Shim screw	Screw	Wrench	
<b>TFMRY-08</b>	-	-	TS 30A60I/HG	TD 9	-
<b>TFMRY-10</b>	-	-	TS 35085/HG	-	T-T15
<b>TFMRY-12</b>	-	-	TS 40093I	-	T-T15
<b>TFMRY-16</b>	-	-	TS 50115I	-	T-T20
<b>TFMRY...H-16</b>	TSRY 16NS	TS 8050088S	TS 50A140I	-	T-T20

 E271-E273	 E274-E275	 E343
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# TFMRY-20



## Face mills



Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DCX	DC	DCONMS	DHUB	OAL	APMX					
<b>TFMRY 463-22R-20</b>	4	63	43	22	47	50	10.0	●	A	0.5	SH M10x30	RYMX 2007...
<b>580-27R-20</b>	5	80	60	27	58	50	10.0	●	A	0.8	LH M12x30	
<b>5100H-32R-20*</b>	5	100	80	32	66	50	10.0	●	A	1.1	LH M16x35	E245-E246
<b>6100-32R-20</b>	6	100	80	32	66	50	10.0	●	A	1.2	LH M16x35	
<b>5125H-40R-20*</b>	5	125	105	40	85	63	10.0	●	A	2.7	SH M20x40	
<b>7125-40R-20</b>	7	125	105	40	85	63	10.0	●	A	2.5	SH M20x40	
<b>6160H-40R-20*</b>	6	160	140	40	110	63	10.0	x	C	2.7	-	
<b>8160-40R-20</b>	8	160	140	40	110	63	10.0	x	C	3.8	-	
<b>8200H-60R-20*</b>	8	200	180	60	130	63	10.0	x	C	5.3	-	
<b>9250H-60R-20*</b>	9	250	230	60	160	63	10.0	x	C	9.3	-	

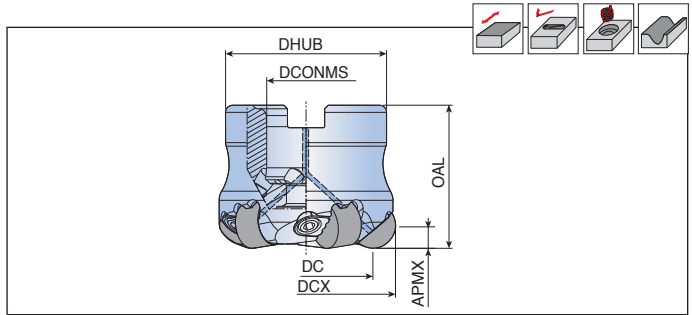
- \*: Carbide shim type
- Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## Spare parts

Designation	Shim 	Shim screw 	Screw 	Wrench 	Wrench handle 
<b>TFMRY-20</b>	-	-	TS 60A130I	BLD T25/M7	SW6-T
<b>TFMRY...H-20</b>	TSRY 20NS	TS 9060011S	TS 60A165I	BLD T25/M7	SW6-T

 E271-E273	 E274-E275	 E343
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## Face mills



Designation		Dimension (mm)						Air hole <sup>(1)</sup>	Arbor style	Kg	Mounting bolt	Insert
		DCX	DC	DCONMS	DHUB	OAL	APMX					
<b>TFMRN 450-22R-1207</b>	4	50	37.3	22	45	40	6.3	●	A	0.4	SH M10x30	RNGN 1207
<b>550-22R-1207</b>	5	50	37.3	22	45	40	6.3	●	A	0.4	SH M10x30	FL...
<b>463-22R-1207</b>	4	63	50.3	22	47	40	6.3	●	A	0.6	SH M10x30	E243
<b>663-22R-1207</b>	6	63	50.3	22	47	40	6.3	●	A	0.6	SH M10x30	
<b>763-22R-1207</b>	7	63	50.3	22	47	40	6.3	●	A	0.6	SH M10x30	
<b>580-27R-1207</b>	5	80	67.3	27	58	50	6.3	●	A	1.1	SH M12x35	
<b>780-27R-1207</b>	7	80	67.3	27	58	50	6.3	●	A	1.1	SH M12x35	
<b>880-27R-1207</b>	8	80	67.3	27	58	50	6.3	●	A	1.1	SH M12x35	

- Mounting bolt with coolant 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		

Cutting Condition  
E271-E273

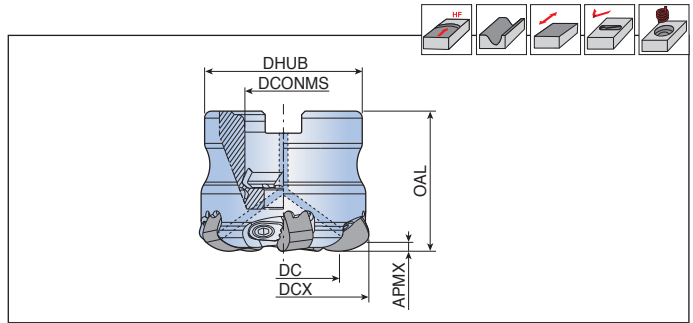
Arbor Style  
E274-E275





# TFMBN-12

## High feed face mills



Designation		Dimension (mm)						Air hole <sup>(1)</sup>	Arbor style	Kg	Mounting bolt	Insert
		DCX	DC	DCONMS	DHUB	OAL	APMX					
<b>TFMBN 450-22R-12</b>	4	50	32.8	22	45	40	2.5	●	A	0.3	SH M10x30	BNGX 1207... E234
<b>550-22R-12</b>	5	50	32.8	22	45	40	2.5	●	A	0.3	SH M10x30	
<b>663-22R-12</b>	6	63	45.7	22	47	40	2.5	●	A	0.4	SH M10x30	
<b>763-22R-12</b>	7	63	45.7	22	47	40	2.5	●	A	0.4	SH M10x30	
<b>780-27R-12</b>	7	80	62.6	27	70	50	2.5	●	A	1.2	SH M12x35	
<b>880-27R-12</b>	8	80	62.6	27	70	50	2.5	●	A	1.2	SH M12x35	

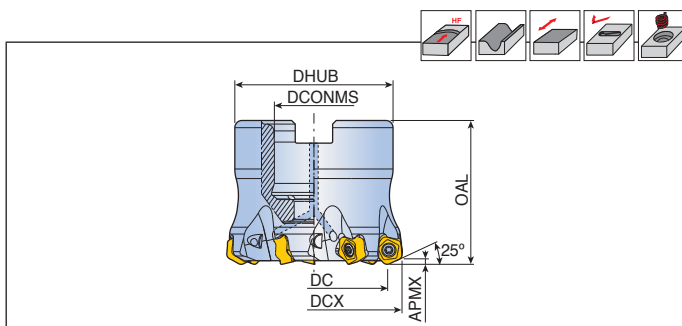
- Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)
- <sup>(1)</sup> Use only air (Coolant is prohibited)

## Spare parts

Designation	Wedge	Screw	Wrench		
<b>TFMBN-12</b>	WFZ 6-C	WS 6	T-W 3		

 E271-E273	 E274-E275	 E345
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## High feed face mills



Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DCX	DC	DCONMS	DHUB	OAL	APMX					
<b>TFMPT 640-16R-05</b>	6	40	31.8	16	38	40	1.5	●	A	0.3	SH M8x25	PTKU 0503...
<b>750-22R-05</b>	7	50	41.8	22	45	40	1.5	●	A	0.4	LH M10x25	E242
<b>752-22R-05</b>	7	52	43.8	22	45	40	1.5	●	A	0.3	LH M10x25	
<b>863-22R-05</b>	8	63	54.8	22	58	50	1.5	●	A	0.8	SH M10x30	
<b>866-27R-05</b>	8	66	57.8	27	58	50	1.5	●	A	0.7	SH M12x35	
<b>TFMPT 450-22R-10</b>	4	50	33.4	22	45	40	3.0	●	E	0.3	TCS10-40	PTKU 1006...
<b>563-22R-10</b>	5	63	46.4	22	58	50	3.0	●	A	0.8	SH M10x30	E242
<b>566-22R-10</b>	5	66	49.4	22	58	50	3.0	●	A	0.8	SH M10x30	
<b>680-27R-10</b>	6	80	63.4	27	70	60	3.0	●	A	1.4	SH M12x30	
<b>8100-32R-10</b>	8	100	83.4	32	85	60	3.0	●	A	2.3	SH M16x35	
<b>9125-32R-10</b>	9	125	108.4	32	85	60	3.0	●	A	3.1	SH M16x35	
<b>10160-40R-10</b>	10	160	143.4	40	110	60	3.0	x	C	4.1	-	
<b>12200-60R-10</b>	12	200	183.4	60	130	60	3.0	x	C	5.7	-	
<b>TFMPT 680-25.4R-10</b>	6	80	63.4	25.4	70	60	3.0	●	A	1.5	SH M12x35	
<b>8100-31.75R-10</b>	8	100	83.4	31.75	80	60	3.0	x	B	2.0	-	
<b>9125-38.1R-10</b>	9	125	108.4	38.1	80	60	3.0	x	B	2.6	-	
<b>10160-50.8R-10</b>	10	160	143.4	50.8	100	60	3.0	x	B	4.2	-	

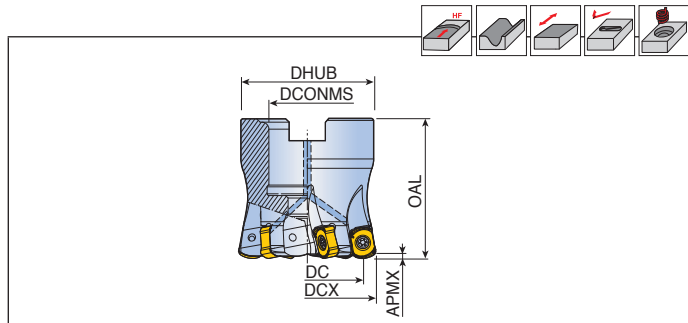
• Mounting bolt with coolant through hole is available on request (ordering example: SH M10x1.5x30-C)

## 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	

 E271-E273	 E274-E275	 E328-E329
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## High feed face mills

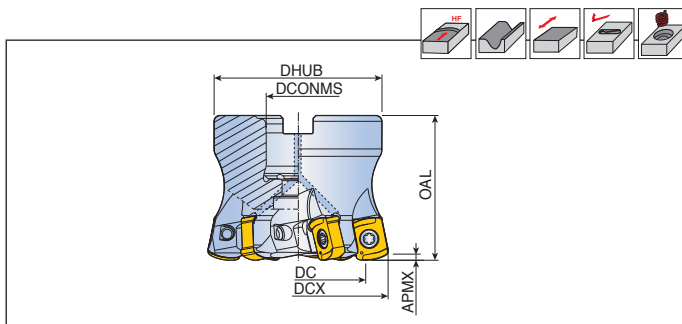


Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting bolt	Insert
		DCX	DC	DCONMS	DHUB	OAL	APMX					
<b>TFMBL 432-16R-06</b>	4	32	24.3	16	30	40	1.0	●	A	0.1	SH M8x25	BLMP 0603... E232
<b>532-16R-06</b>	5	32	24.3	16	30	40	1.0	●	A	0.1	SH M8x25	
<b>640-16R-06</b>	6	40	32.2	16	38	40	1.0	●	A	0.2	SH M8x25	
<b>640-22R-06</b>	6	40	32.2	22	38	40	1.0	●	A	0.2	SH M10x30	
<b>650-22R-06</b>	6	50	42.2	22	45	50	1.0	●	A	0.4	SH M10x30	
<b>750-22R-06</b>	7	50	42.2	22	45	50	1.0	●	A	0.4	SH M10x30	
<b>850-22R-06</b>	8	50	42.2	22	45	50	1.0	●	A	0.4	SH M10x30	
<b>752-22R-06</b>	7	52	44.2	22	45	40	1.0	●	A	0.4	SH M10x30	
<b>852-22R-06</b>	8	52	44.2	22	45	40	1.0	●	A	0.4	SH M10x30	
<b>763-22R-06</b>	7	63	55.5	22	47	50	1.0	●	A	0.6	SH M10x30	
<b>863-22R-06</b>	8	63	55.5	22	47	50	1.0	●	A	0.6	SH M10x30	
<b>963-22R-06</b>	9	63	55.5	22	47	50	1.0	●	A	0.6	SH M10x30	
<b>966-27R-06</b>	9	66	58.5	27	58	50	1.0	●	A	0.7	SH M12x35	
<b>TFMBL 432-16R-09</b>	4	32	21.6	16	30	40	1.5	●	E	0.1	KTB 32B	BLMP 0904... E232
<b>440-16R-09</b>	4	40	29.6	16	38	40	1.5	●	A	0.2	SH M8x25	
<b>540-16R-09</b>	5	40	29.6	16	38	40	1.5	●	A	0.2	SH M8x25	
<b>550-22R-09</b>	5	50	39.6	22	45	50	1.5	●	A	0.4	SH M10x30	
<b>650-22R-09</b>	6	50	39.6	22	45	50	1.5	●	A	0.4	SH M10x30	
<b>750-22R-09</b>	7	50	39.6	22	45	50	1.5	●	A	0.4	SH M10x30	
<b>652-22R-09</b>	6	52	41.6	22	45	40	1.5	●	A	0.4	SH M10x30	
<b>752-22R-09</b>	7	52	41.6	22	45	40	1.5	●	A	0.4	SH M10x30	
<b>663-22R-09</b>	6	63	52.6	22	47	50	1.5	●	A	0.6	SH M10x30	
<b>763-22R-09</b>	7	63	52.6	22	47	50	1.5	●	A	0.6	SH M10x30	
<b>863-22R-09</b>	8	63	52.6	22	47	50	1.5	●	A	0.6	SH M10x30	
<b>766-27R-09</b>	7	66	55.6	27	58	50	1.5	●	A	0.7	SH M12x35	
<b>866-27R-09</b>	8	66	55.6	27	58	50	1.5	●	A	0.8	SH M12x35	
<b>780-27R-09</b>	7	80	69.6	27	70	50	1.5	●	A	1.2	SH M12x35	
<b>880-27R-09</b>	8	80	69.6	27	70	50	1.5	●	A	1.2	SH M12x35	
<b>980-27R-09</b>	9	80	69.6	27	70	50	1.5	●	A	1.2	SH M12x35	
<b>1080-27R-09</b>	10	80	69.6	27	70	50	1.5	●	A	1.2	SH M12x35	
<b>8100-32R-09</b>	8	100	89.6	32	85	60	1.5	●	A	2.3	SH M16x35	
<b>9100-32R-09</b>	9	100	89.6	32	85	60	1.5	●	A	2.3	SH M16x35	
<b>10100-32R-09</b>	10	100	89.6	32	85	60	1.5	●	A	2.3	SH M16x35	
<b>11100-32R-09</b>	11	100	89.6	32	85	60	1.5	●	A	2.3	SH M16x35	
<b>12100-32R-09</b>	12	100	89.6	32	85	60	1.5	●	A	2.3	SH M16x35	
<b>12125-40R-09</b>	12	125	114.6	40	85	60	1.5	●	A	2.7	SH M20x40	
<b>14125-40R-09</b>	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... E232
<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

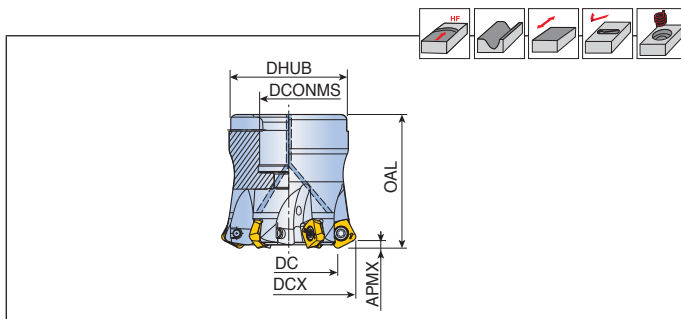
Designation	Screw	Wrench		Wrench handle	
<b>TFMBL-06</b>	TS 250641/HG-P	TD 8P	-	-	
<b>TFMBL-09</b>	TS 35A0881/HG	TD 10P	-	-	
<b>TFMBL-11</b>	TS 50A1211/HG	-	TBLD T20-W6	SW6-T	

 E271-E273	 E274-E275	 E334
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## High feed face mills



Designation		Dimension (mm)						Coolant hole	Arbor style	Kg	Mounting 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... E247
<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... E247
<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

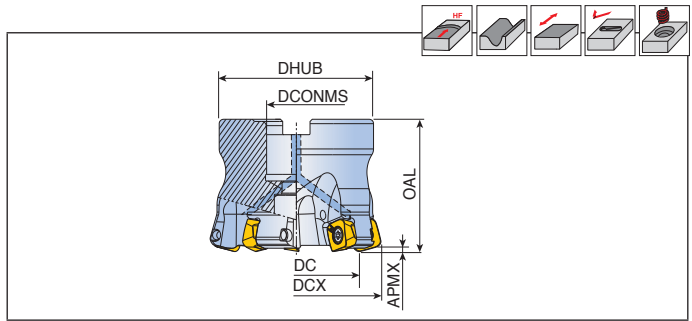
Designation	Screw	Wrench			
<b>TFMSB-06</b>	TS 25064I/HG-P	TD 8P			
<b>TFMSB-09</b>	TS 35A088I/HG	TD 10P			
<b>TFMSB 750-22R-09</b>	TS 35A070I/HG	TD 10P			
<b>TFMSB 752-22R-09</b>	TS 35A070I/HG	TD 10P			



# 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... E247
<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 501151	T-T20		

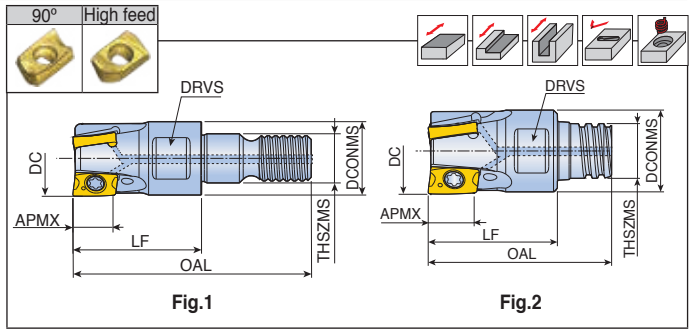
Cutting Condition E271-E273	Arbor Style E274-E275	Ramping Data E338
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# 2S-TE90CV-M(S)-05



## Modular heads



Designation	Hex	Dimension (mm)							Coolant hole	Fig.	Insert
		DC	DCONMS	LF	OAL	THSZMS	APMX	DRVS			
<b>2S-TE90CV- 208-M04-05</b>	2	8	7.8	10	21.5	M04	5.0	6	●	1	CVK(H)T 0502... E235
<b>310-M06-05</b>	3	10	9.7	17	31.5	M06	5.0	8	●	1	
<b>412-M06-05</b>	4	12	11	17	31.5	M06	5.0	8	●	1	
<b>516-M08-05</b>	5	16	13	23	40.5	M08	5.0	10	●	1	
<b>620-M10-05</b>	6	20	18	23	43.0	M10	5.0	15	●	1	
<b>720-M10-05</b>	7	20	18	23	43.0	M10	5.0	15	●	1	
<b>2S-TE90CV- 208-S05-05</b>	2	8	7.6	10	16.7	S05	5.0	5.5	●	2	
<b>310-S06-05</b>	3	10	9.6	15	21.3	S06	5.0	8	●	2	
<b>412-S08-05</b>	4	12	11.5	16	23.5	S08	5.0	10	●	2	

- 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)

## Spare parts

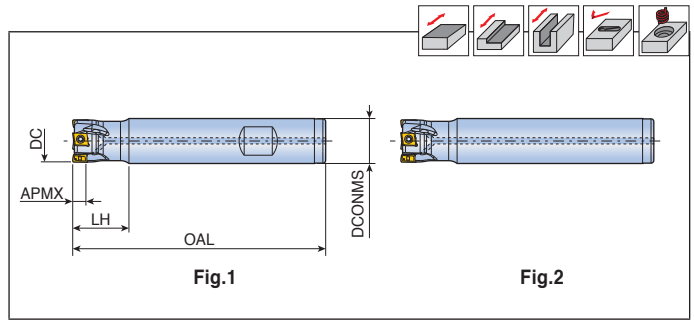
Designation	Screw	Wrench			
	<b>2S-TE90CV-05</b>	TS 18033/HG-P	TD 6P		

Cutting Condition  
E271-E273

Ramping Data  
E286-E287

# 4T-TE90-05/09

## End mills



Designation	Flutes	Dimension (mm)					Coolant hole	Fig.	Insert
		DC	DCONMS	OAL	LH	APMX			
<b>4T-TE90-210-10-05</b>	2	10	10	80	15	4.6	●	2	LPK(H)U 0502... E238
<b>211-10-05</b>	2	11	10	80	15	4.6	●	2	
<b>212-12-05</b>	2	12	12	80	15	4.6	●	2	
<b>312-12-05</b>	3	12	12	80	15	4.6	●	2	
<b>313-12-05</b>	3	13	12	80	15	4.6	●	2	
<b>316-W16-05</b>	3	16	16	90	20	4.6	●	1	
<b>416-W16-05</b>	4	16	16	90	20	4.6	●	1	
<b>420-W20-05</b>	4	20	20	100	25	4.6	●	1	
<b>520-W20-05</b>	5	20	20	100	25	4.6	●	1	
<b>625-W25-05</b>	6	25	25	110	30	4.6	●	1	
<b>832-W25-05</b>	8	32	25	110	20	4.6	●	1	
<b>4T-TE90-220-W20-09</b>	2	20	20	100	30	8.3	●	1	LPK(H)U 0904... E238
<b>220-20-09-L170</b>	2	20	20	170	30	8.3	●	2	
<b>320-W20-09</b>	3	20	20	100	30	8.3	●	1	
<b>325-W25-09</b>	3	25	25	100	30	8.3	●	1	
<b>325-25-09-L200</b>	3	25	25	200	30	8.3	●	2	
<b>425-W25-09</b>	4	25	25	100	30	8.3	●	1	
<b>425-25-09-L120</b>	4	25	25	120	30	8.3	●	2	
<b>332-W32-09</b>	3	32	32	110	35	8.3	●	1	
<b>332-32-09-L210</b>	3	32	32	210	35	8.3	●	2	
<b>532-W32-09</b>	5	32	32	110	35	8.3	●	1	
<b>532-32-09-L130</b>	5	32	32	130	35	8.3	●	2	
<b>440-W32-09</b>	4	40	32	115	30	8.3	●	1	
<b>440-32-09-L150</b>	4	40	32	150	30	8.3	●	2	
<b>640-W32-09</b>	6	40	32	115	30	8.3	●	1	

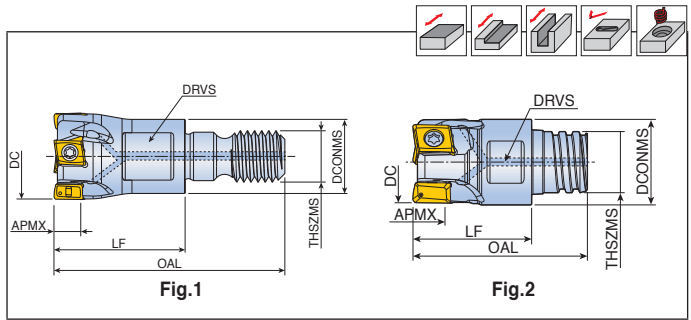




# 4T-TE90-M(S)-05/09



## Modular heads



Designation	♻️	Dimension (mm)							Coolant hole	Fig.	Insert
		DC	DCONMS	LF	OAL	THSZMS	APMX	DRVS			
<b>4T-TE90-210-M06-05</b>	2	10	9.7	17	31.5	M06	4.6	8	●	1	LPK(H)U 0502... E238
<b>312-M06-05</b>	3	12	11	17	31.5	M06	4.6	8	●	1	
<b>416-M08-05</b>	4	16	13	23	40.5	M08	4.6	10	●	1	
<b>520-M10-05</b>	5	20	18	23	43	M10	4.6	15	●	1	
<b>625-M12-05</b>	6	25	21	27	49	M12	4.6	17	●	1	
<b>832-M16-05</b>	8	32	29	27	52	M16	4.6	25	●	1	
<b>4T-TE90-210-S06-05</b>	2	10	9.6	15	21.3	S06	4.6	8	●	2	LPK(H)U 0904... E238
<b>312-S08-05</b>	3	12	11.5	16	23.5	S08	4.6	10	●	2	
<b>416-S10-05</b>	4	16	15.2	20	31.3	S10	4.6	13	●	2	
<b>4T-TE90-220-M10-09</b>	2	20	18	30	50	M10	8.3	15	●	1	LPK(H)U 0904... E238
<b>320-M10-09</b>	3	20	18	30	50	M10	8.3	15	●	1	
<b>425-M12-09</b>	4	25	21	35	57	M12	8.3	17	●	1	
<b>532-M16-09</b>	5	32	29	43	68	M16	8.3	25	●	1	
<b>640-M16-09</b>	6	40	29	43	68	M16	8.3	25	●	1	

• Matched with T-FLEXTEC holder(Fig.1) & MAXI-RUSH holder(Fig.2)

## Spare parts

Designation	Screw	Wrench		Wrench handle	
<b>4T-TE90-05 (Ø10,Ø11)</b>	TS 18041I/SG-P	TD 6P	-	-	
<b>4T-TE90-05 (Ø12-Ø40)</b>	TS 18049/HG-P	TD 6P	-	-	
<b>4T-TE90-09</b>	TS 30D082-P	-	TBLD T08P-W4	THND 4W	









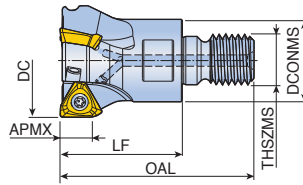
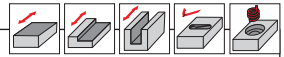
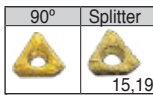




# 3P TE90-M-06/10/15/19



## Modular heads



Designation	S	Dimension (mm)						Coolant hole	Insert
		DC	DCONMS	LF	OAL	THSZMS	APMX		
<b>3P TE90-216-M08-06</b>	2	16	13	23	40.5	M08	4.7	●	3PK(H)T 0603...
<b>320-M10-06</b>	3	20	18	35	55	M10	4.7	●	E216
<b>420-M10-06</b>	4	20	18	35	55	M10	4.7	●	
<b>425-M12-06</b>	4	25	21	35	57	M12	4.7	●	
<b>525-M12-06</b>	5	25	21	35	57	M12	4.7	●	
<b>632-M16-06</b>	6	32	29	43	68	M16	4.7	●	
<b>732-M16-06</b>	7	32	29	43	68	M16	4.7	●	
<b>735-M16-06</b>	7	35	29	43	68	M16	4.7	●	
<b>3P TE90-220-M10-10</b>	2	20	18	35	55	M10	7.0	●	3PK(H)T 1004...
<b>325-M12-10</b>	3	25	21	35	57	M12	7.0	●	E216
<b>326-M12-10</b>	3	26	21	35	57	M12	7.0	●	
<b>432-M16-10</b>	4	32	29	43	68	M16	7.0	●	
<b>532-M16-10</b>	5	32	29	43	68	M16	7.0	●	
<b>535-M16-10</b>	5	35	29	43	68	M16	7.0	●	
<b>540-M16-10</b>	5	40	29	43	68	M16	7.0	●	
<b>640-M16-10</b>	6	40	29	43	68	M16	7.0	●	
<b>642-M16-10</b>	6	42	29	43	68	M16	7.0	●	
<b>3P TE90-232-M16-15</b>	2	32	29	43	68	M16	11.0	●	3PK(H)T 1505...
<b>332-M16-15</b>	3	32	29	43	68	M16	11.0	●	E216-E217
<b>340-M16-15</b>	3	40	29	43	68	M16	11.0	●	
<b>440-M16-15</b>	4	40	29	43	68	M16	11.0	●	
<b>3P TE90-340-M16-19</b>	3	40	29	43	68	M16	15.0	●	3PK(H)T 1906...
									E216-E217

• Matched with T-FLEXTEC holder

## Spare parts

Designation	Screw	Wrench			
<b>3P TE90-06</b>	TS 20043I/HG-P	TD 6P	-		
<b>3P TE90-10</b>	TS 25C065I/HG	TD 8	-		
<b>3P TE90-15</b>	TS 40B100I	TD 15	-		
<b>3P TE90-19</b>	TS 45120I	-	T-T20		



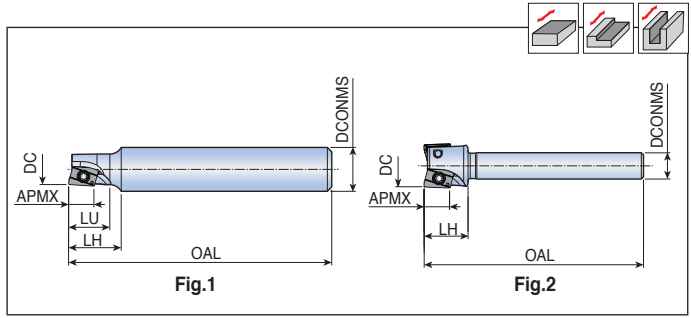








## End mills



Designation	Flutes	Dimension (mm)						Fig.	Insert
		DC	DCONMS	OAL	LU	LH	APMX		
<b>MTE90AX 108-10-06-L60</b>	1	8	10	60	9	12	5.5	1	AXCT 06-L... E230
<b>210-05-06-L40</b>	2	10	5	40	-	10	5.5	2	
<b>210-06-06-L50</b>	2	10	6	50	-	10	5.5	2	
<b>210-07-06-L50</b>	2	10	7	50	-	10	5.5	2	
<b>210-10-06-L50</b>	2	10	10	50	10	12	5.5	1	
<b>212-10-06-L50</b>	2	12	10	50	-	10	5.5	2	
<b>214-10-06-L50</b>	2	14	10	50	-	10	5.5	2	
<b>315-05-06-L40</b>	3	15	5	40	-	10	5.5	2	
<b>316-07-06-L50</b>	3	16	7	50	-	10	5.5	2	
<b>316-10-06-L50</b>	3	16	10	50	-	10	5.5	2	
<b>320-07-06-L50</b>	3	20	7	50	-	10	5.5	2	
<b>320-10-06-L50</b>	3	20	10	50	-	10	5.5	2	
<b>530-10-06-L50</b>	5	30	10	50	-	10	5.5	2	

## Spare parts

Designation	Screw	Wrench			
<b>MTE90AX-06-L</b>	TS 18041/HG	TD 6P			





# TE90AX-M(S)-06



## Modular heads

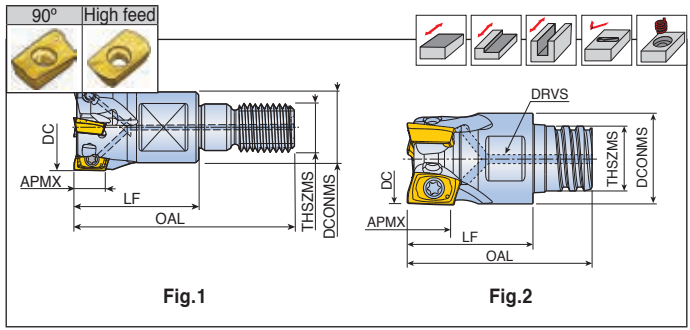


Fig.1

Fig.2

Designation		Dimension (mm)							Coolant hole	Fig.	Insert
		DC	DCONMS	LF	OAL	THSZMS	APMX	DRVS			
<b>TE90AX 210-M06-06</b>	2	10	9.7	17	31.5	M06	5.5	8	●	1	AXM(C)T 0602... E230-E231
<b>312-M06-06</b>	3	12	11	17	31.5	M06	5.5	8	●	1	
<b>416-M08-06</b>	4	16	13	23	40.5	M08	5.5	10	●	1	
<b>520-M10-06</b>	5	20	18	23	43	M10	5.5	15	●	1	
<b>725-M12-06</b>	7	25	21	27	49	M12	5.5	17	●	1	
<b>832-M16-06</b>	8	32	29	27	52	M16	5.5	25	●	1	
<b>1040-M16-06</b>	10	40	29	27	52	M16	5.5	25	●	1	
<b>TE90AX 210-S06-06</b>	2	10	9.6	15	21.3	S06	5.5	8	●	2	
<b>312-S08-06</b>	3	12	11.5	16	23.5	S08	5.5	10	●	2	
<b>416-S10-06</b>	4	16	15.2	20	31.3	S10	5.5	13	●	2	

- Matched with T-FLEXTEC holder(Fig.1) & MAXI-RUSH holder(Fig.2)
- Cutter body for 'AXMT 06' insert with corner radius more than 1.0mm should be modified accordingly  
body "RE"=Insert "RE"-0.1mm

## Spare parts

Designation	Screw	Wrench			
<b>TE90AX-06</b>	TS 18041I/HG	TD 6P			

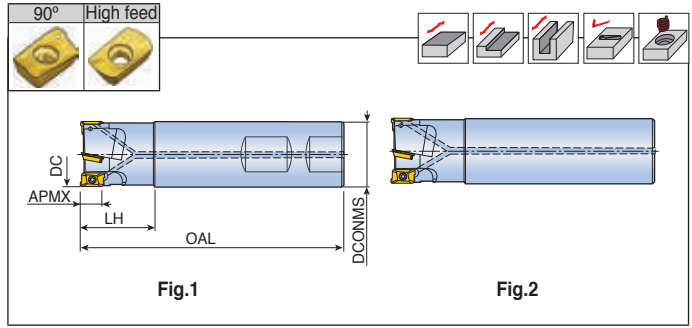
Cutting Condition  
E271-E273

Ramping Data  
E314,E318

# 2S-TE90AP-09



End mills



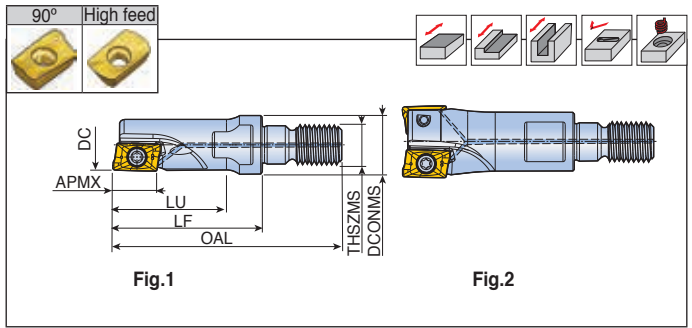
Designation	⊕	Dimension (mm)					Coolant hole	Fig.	Insert
		DC	DCONMS	OAL	LH	APMX			
<b>2S-TE90AP 110-W10-09-C</b>	1	10	10	80	25	8.8	●	1	APK(C)T 09T3... E225, E230
<b>112-W12-09</b>	1	12	12	80	25	8.8	x	1	
<b>112-W16-09-C</b>	1	12	16	80	26	8.8	●	1	
<b>114-W12-09</b>	1	14	12	80	25	8.8	x	1	
<b>216-15-09-L</b>	2	16	15	170	30	8.8	x	2	
<b>216-W16-09-C</b>	2	16	16	90	25	8.8	●	1	
<b>216-16-09-L</b>	2	16	16	145	30	8.8	x	2	
<b>217-16-09-L</b>	2	17	16	180	25	8.8	x	2	
<b>218-W16-09-C</b>	2	18	16	90	25	8.8	●	1	
<b>220-19-09-L</b>	2	20	19	170	25	8.8	x	2	
<b>220-20-09-L</b>	2	20	20	170	40	8.8	x	2	
<b>320-W20-09-C</b>	3	20	20	110	30	8.8	●	1	
<b>221-20-09-L</b>	2	21	20	200	25	8.8	x	2	
<b>322-W20-09-C</b>	3	22	20	110	30	8.8	●	1	
<b>225-24-09-L</b>	2	25	24	210	28	8.8	x	2	
<b>225-25-09-L</b>	2	25	25	210	40	8.8	x	2	
<b>325-W20-09-C</b>	3	25	20	110	30	8.8	●	1	
<b>325-W25-09</b>	3	25	25	110	30	8.8	x	1	
<b>425-W20-09-C</b>	4	25	20	110	30	8.8	●	1	
<b>226-25-09-L</b>	2	26	25	250	40	8.8	x	2	
<b>430-W25-09-C</b>	4	30	25	130	32	8.8	●	1	
<b>232-32-09-L</b>	2	32	32	250	65	8.8	x	2	
<b>432-W25-09-C</b>	4	32	25	130	32	8.8	●	1	
<b>532-W25-09-C</b>	5	32	25	130	32	8.8	●	1	
<b>333-32-09-L</b>	3	33	32	250	40	8.8	x	2	
<b>240-32-09-L</b>	2	40	32	250	32	8.8	x	2	
<b>540-W32-09-C</b>	5	40	32	130	32	8.8	●	1	
<b>640-W32-09</b>	6	40	32	130	32	8.8	x	1	



# 2S-TE90AP-M-09



## Modular heads



Designation	⌀	Dimension (mm)							Coolant hole	Fig.	Insert
		DC	DCONMS	LF	OAL	LU	THSZMS	APMX			
<b>2S-TE90AP 110-M06-09</b>	1	10	9.7	33	47.5	19	M06	8.8	●	1	APK(C)T 09T3... E225, E230
<b>112-M08-09</b>	1	12	13	33	50.5	25	M08	8.8	●	1	
<b>216-M08-09</b>	2	16	13	38	50.5	-	M08	8.8	●	2	
<b>320-M10-09</b>	3	20	18	38	58	-	M10	8.8	●	2	
<b>325-M12-09</b>	3	25	21	38	60	-	M12	8.8	●	2	
<b>425-M12-09</b>	4	25	21	38	60	-	M12	8.8	●	2	
<b>432-M16-09</b>	4	32	29	38	63	-	M16	8.8	●	2	
<b>532-M16-09</b>	5	32	29	38	63	-	M16	8.8	●	2	
<b>540-M16-09</b>	5	40	29	43	68	-	M16	8.8	●	2	
<b>640-M16-09</b>	6	40	29	43	68	-	M16	8.8	●	2	

- Matched with T-FLEXTEC holder
- Cutter body for 'APKT09' insert with corner radius more than 2.4mm should be modified accordingly  
body "RE"=Insert "RE"-0.2mm

## Spare parts

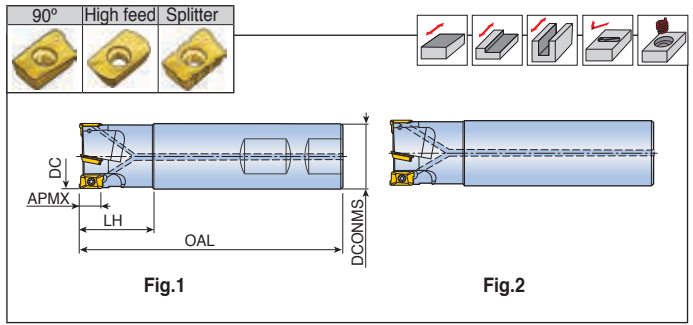
Designation	Screw	Wrench			
<b>2S-TE90AP-09</b>	TS 25055/HG	TD 8			



# TE90AP-12



End mills



Designation	Flutes	Dimension (mm)					Coolant hole	Fig.	Insert
		DC	DCONMS	OAL	LH	APMX			
<b>TE90AP 116-W16-12-C</b>	1	16	16	85	26	12.0	●	1	APK(C)T 1204.... E226,E230
<b>218-W20-12-C</b>	2	18	20	85	26	12.0	●	1	
<b>220-19-12-L</b>	2	20	19	170	30	12.0	●	2	
<b>220-W20-12-C</b>	2	20	20	90	30	12.0	●	1	
<b>220-W20-12-L-C</b>	2	20	20	125	30	12.0	●	1	
<b>220-20-12-L</b>	2	20	20	170	30	12.0	●	2	
<b>220-20-12-L200</b>	2	20	20	200	30	12.0	●	2	
<b>221-20-12-L200</b>	2	21	20	200	30	12.0	●	2	
<b>221-20-12-L250</b>	2	21	20	250	30	12.0	●	2	
<b>225-24-12-L</b>	2	25	24	200	40	12.0	●	2	
<b>225-W25-12-L-C</b>	2	25	25	145	40	12.0	●	1	
<b>225-25-12-L</b>	2	25	25	210	40	12.0	●	2	
<b>225-25-12-L200</b>	2	25	25	200	40	12.0	●	2	
<b>325-W25-12-C</b>	3	25	25	100	40	12.0	●	1	
<b>226-25-12-L200</b>	2	26	25	200	40	12.0	●	2	
<b>226-25-12-L250</b>	2	26	25	250	40	12.0	●	2	
<b>232-25-12-L</b>	2	32	25	250	40	12.0	●	2	
<b>332-W25-12-L-C</b>	3	32	25	155	35	12.0	●	1	
<b>332-W32-12-C</b>	3	32	32	110	40	12.0	●	1	
<b>332-32-12-L</b>	3	32	32	250	40	12.0	●	2	
<b>332-32-12-L150</b>	3	32	32	150	40	12.0	●	2	
<b>432-W25-12-C</b>	4	32	25	100	40	12.0	●	1	
<b>233-32-12-L200</b>	2	33	32	200	40	12.0	●	2	
<b>233-32-12-L250</b>	2	33	32	250	40	12.0	●	2	
<b>333-32-12-L200</b>	3	33	32	200	40	12.0	●	2	
<b>333-32-12-L250</b>	3	33	32	250	40	12.0	●	2	
<b>435-W25-12</b>	4	35	25	100	40	12.0	●	1	
<b>440-W32-12-C</b>	4	40	32	115	45	12.0	●	1	
<b>440-32-12-L</b>	4	40	32	250	40	12.0	●	2	
<b>540-W32-12-C</b>	5	40	32	115	45	12.0	●	1	



















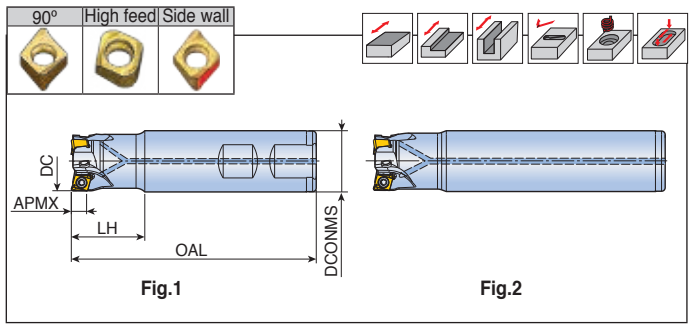




# 4N TE90-06



## End mills



Designation	Flutes	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.....
<b>216-W16-06</b>	2	16	16	90	25	6.0	●	1	E218-E219
<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	

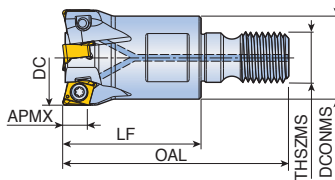
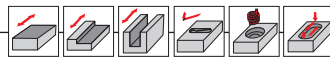
• Cutter body for '4NKT 060320R-HF' and '4NHT 060320R-F' inserts should be modified with body corner radius 2.0 mm



# 4N TE90-M-06



## Modular heads



Designation		Dimension (mm)						Coolant hole	Insert
		DC	DCONMS	LF	OAL	THSZMS	APMX		
<b>4N TE90-216-M08-06</b>	2	16	13	23	40.5	M08	6.0	●	4NK(H)T 0603... E218-E219
<b>217-M08-06</b>	2	17	13	23	40.5	M08	6.0	●	
<b>220-M10-06</b>	2	20	18	35	55	M10	6.0	●	
<b>320-M10-06</b>	3	20	18	35	55	M10	6.0	●	
<b>321-M10-06</b>	3	21	18	35	55	M10	6.0	●	
<b>325-M12-06</b>	3	25	21	35	57	M12	6.0	●	
<b>425-M12-06</b>	4	25	21	35	57	M12	6.0	●	
<b>426-M12-06</b>	4	26	21	35	57	M12	6.0	●	
<b>432-M16-06</b>	4	32	29	43	68	M16	6.0	●	
<b>532-M16-06</b>	5	32	29	43	68	M16	6.0	●	
<b>533-M16-06</b>	5	33	29	43	68	M16	6.0	●	
<b>535-M16-06</b>	5	35	29	43	68	M16	6.0	●	
<b>540-M16-06</b>	5	40	29	43	68	M16	6.0	●	
<b>640-M16-06</b>	6	40	29	43	68	M16	6.0	●	

- 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

## Spare parts

Designation	Screw	Wrench			
	<b>4N TE90-06</b>	TS 30B068/HG	TD 8		



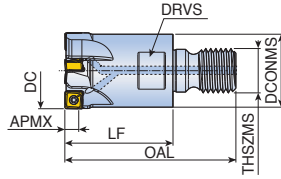
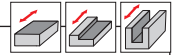






# 8D-TE90-M-07

## Modular heads



Designation		Dimension (mm)							Coolant hole	Insert
		DC	DCONMS	LF	OAL	THSZMS	APMX	DRVS		
<b>8D-TE90-216-M08-07</b>	2	16	14	23	40.5	M08	5.0	10	●	SQKU 0703...
<b>320-M10-07</b>	3	20	18	30	50	M10	5.0	15	●	E257
<b>325-M12-07</b>	3	25	22	35	57	M12	5.0	17	●	
<b>432-M16-07</b>	4	32	29	43	68	M16	5.0	25	●	
<b>540-M16-07</b>	5	40	29	43	68	M16	5.0	25	●	

• Matched with T-FLEXTEC holder

## Spare parts

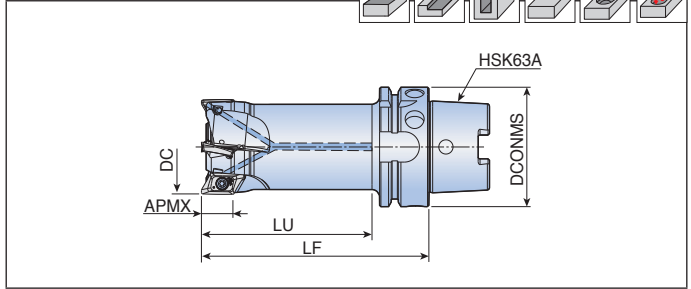
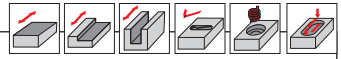
Designation	Screw	Wrench			
<b>8D-TE90-07</b>	TS 25D060/HG-P	TD 7P			



# TE90XEV-HSK63A-16



End mills for HSK toolholder



Designation		Dimension (mm)						Coolant hole	Max RPM	Insert
		DC	DCONMS	LF	LU	APMX				
<b>TE90XEV 225-100-HSK63A-16</b>	2	25	63	100	70	16	●	52,000	XEVT 1605... E264	
<b>232-125-HSK63A-16</b>	2	32	63	125	95	16	●	46,000		
<b>332-90-HSK63A-16</b>	3	32	63	90	60	16	●	46,000		
<b>340-105-HSK63A-16</b>	3	40	63	105	75	16	●	41,200		
<b>450-105-HSK63A-16</b>	4	50	63	105	75	16	●	36,800		
<b>450-120-HSK63A-16</b>	4	50	63	120	90	16	●	36,800		

• Cutter body for inserts with corner radii more than 3.2mm (XEVT 16) should be modified as follows:  
body "RE"=insert "RE"-0.3mm

## Spare parts

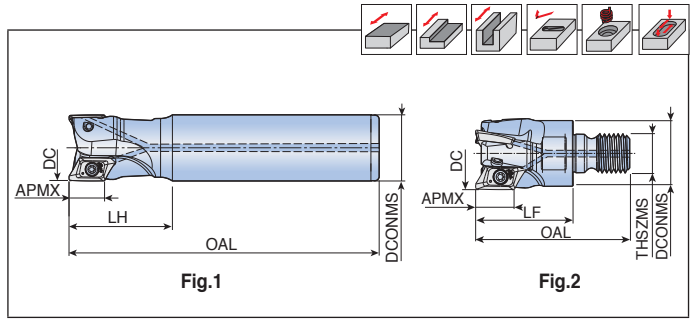
Designation	Screw	Wrench			
<b>TE90XEV-16 (-Ø25)</b>	TS 40085I/HG	T-T15			
<b>TE90XEV-16 (Ø32-)</b>	TS 40093I/HG	T-T15			



# 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 225-25-16</b>	2	25	25	125	-	-	55	16	●	1	52,000	XEVT 1605... E264
<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 225-M12-16</b>	2	25	21	65	M12	43	-	16	●	2	52,000	XEVT 2206... E264
<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 232-32-22</b>	2	32	32	160	-	-	100	21	●	1	37,500	
<b>340-40-22</b>	3	40	40	160	-	-	80	21	●	1	35,100	

- Matched with T-FLEXTEC holder
- Cutter body for inserts with corner radii more than 3.2mm (XEVT 16) and 3.0mm (XEVT 22) should be modified as follows:  
body "RE"=insert "RE"-0.3mm

## 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			



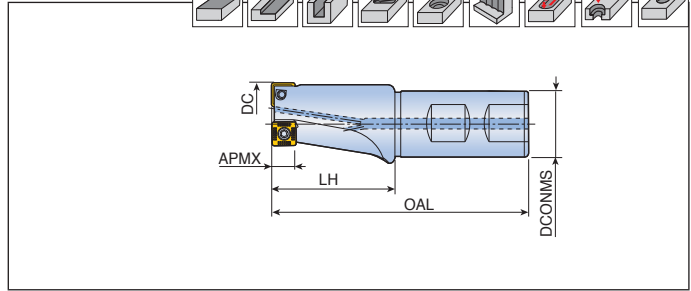
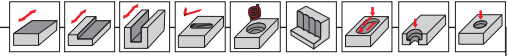








## End mills



Designation	Flutes	Dimension (mm)					Coolant hole	Max. drilling depth (mm)	Insert
		DC	DCONMS	OAL	LH	APMX			
<b>TDM 112 W16-06</b>	1	12	16	80	20	5.6	●	12	XOMT 0602...
<b>216 W20-06</b>	2	16	20	90	25	5.6	●	16	E255
<b>218 W20-06</b>	2	18	20	90	25	5.6	●	16	
<b>220 W25-06</b>	2	20	25	100	40	5.6	●	20	
<b>222 W25-06</b>	2	22	25	110	47	5.6	●	25	
<b>TDM 225 W25-09</b>	2	25	25	110	50	9.0	●	30	SPMG(T) 0904...-EM
<b>228 W32-09</b>	2	28	32	125	60	9.0	●	38	E255
<b>TDM 232 W32-11</b>	2	32	32	125	60	10.7	●	38	SPMG(T) 1104...-EM
<b>240 W32-11</b>	2	40	32	125	60	10.7	●	38	E255
<b>TDM 245 W32-14</b>	2	45	32	130	66	13.4	●	40	SPMG(T) 1405...-EM
<b>250 W32-14</b>	2	50	32	150	66	13.4	●	40	E255

## Spare parts

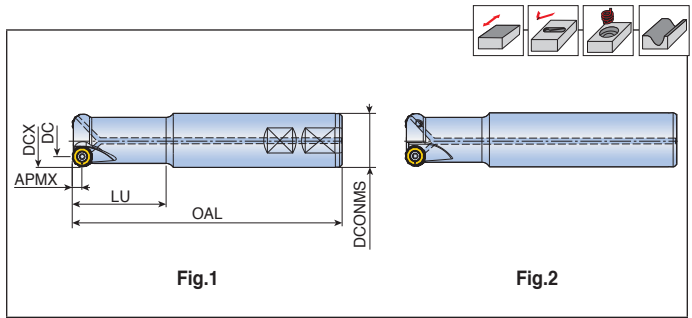
Designation	Screw	Wrench			
<b>TDM (Ø12)</b>	TS 22046I	TD 7			
<b>TDM (Ø16-Ø22)</b>	TS 22052I/HG	TD 7			
<b>TDM (Ø25-Ø28)</b>	TS 35088I	TD 10			
<b>TDM (Ø32-Ø40)</b>	TS 40093I	TD 15			
<b>TDM (Ø45-Ø50)</b>	TS 50A121I/HG	TD 20			







## End mills

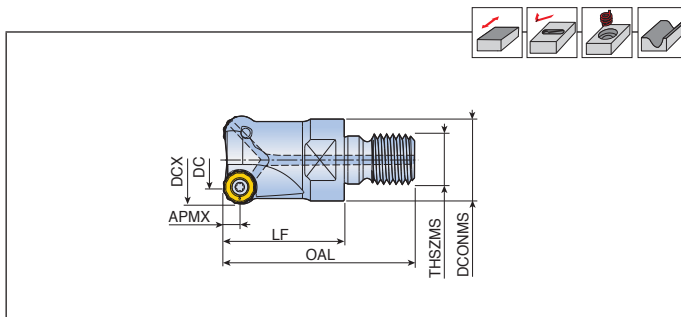


Designation		Dimension (mm)							Coolant hole	Fig.	Insert
		DCX	DC	DCONMS	OAL	LU	APMX				
<b>TERNS 225-25-10-L160</b>	2	25	15	25	160	60	5.0	●	2	RNMU 1004... 	
<b>225-32-10-L250</b>	2	25	15	32	250	40	5.0	●	2		
<b>325-25-10-L160</b>	3	25	15	25	160	60	5.0	●	2		
<b>226-25-10-L200</b>	2	26	16	25	200	80	5.0	●	2		
<b>332-32-10-L180</b>	3	32	22	32	180	70	5.0	●	2		
<b>332-32-10-L250</b>	3	32	22	32	250	100	5.0	●	2		
<b>432-32-10-L180</b>	4	32	22	32	180	70	5.0	●	2		
<b>432-32-10-L250</b>	4	32	22	32	250	100	5.0	●	2		
<b>433-32-10-L200</b>	4	33	23	32	200	80	5.0	●	2		
<b>433-32-10-L250</b>	4	33	23	32	250	100	5.0	●	2		
<b>TERNS 232-32-12-L150</b>	2	32	20	32	150	50	6.0	●	2	RNMU 1205... 	
<b>232-32-12-L200</b>	2	32	20	32	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	60	6.0	●	1		
<b>332-32-12-L200</b>	3	32	20	32	200	70	6.0	●	2		
<b>332-32-12-L250</b>	3	32	20	32	250	60	6.0	●	2		
<b>233-32-12-L200</b>	2	33	21	32	200	50	6.0	●	2		
<b>233-32-12-L250</b>	2	33	21	32	250	50	6.0	●	2		
<b>333-32-12-L200</b>	3	33	21	32	200	70	6.0	●	2		
<b>333-32-12-L250</b>	3	33	21	32	250	60	6.0	●	2		
<b>340-W32-12</b>	3	40	28	32	160	50	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	160	50	6.0	●	1		
<b>440-32-12-L250</b>	4	40	28	32	250	60	6.0	●	2		
<b>450-32-12-L200</b>	4	50	38	32	200	70	6.0	●	2		
<b>550-32-12-L250</b>	5	50	38	32	250	60	6.0	●	2		
<b>TERNS 240-W32-16-L160</b>	2	40	24	32	160	50	6.0	●	1	RNMU 1606... 	
<b>240-32-16-L180</b>	2	40	24	32	180	70	8.0	●	2		
<b>240-32-16-L250</b>	2	40	24	32	250	100	8.0	●	2		
<b>340-32-16-L180</b>	3	40	24	32	180	70	8.0	●	2		
<b>340-32-16-L250</b>	3	40	24	32	250	100	8.0	●	2		



# TERNS-M

## Modular heads



Designation		Dimension (mm)							Coolant hole	Insert
		DCX	DC	DCONMS	LF	OAL	THSZMS	APMX		
<b>TERNS 225-M12-10</b>	2	25	15	21	35	57	M12	5.0	●	RNMU 1004...
<b>325-M12-10</b>	3	25	15	21	35	57	M12	5.0	●	E244
<b>432-M16-10</b>	4	32	22	29	43	68	M16	5.0	●	
<b>542-M16-10</b>	5	42	32	29	43	68	M16	5.0	●	
<b>TERNS 232-M16-12</b>	2	32	20	29	43	68	M16	6.0	●	RNMU 1205...
<b>332-M16-12</b>	3	32	20	29	43	68	M16	6.0	●	E244
<b>233-M16-12</b>	2	33	21	29	43	68	M16	6.0	●	
<b>333-M16-12</b>	3	33	21	29	43	68	M16	6.0	●	
<b>340-M16-12</b>	3	40	28	29	43	68	M16	6.0	●	
<b>440-M16-12</b>	4	40	28	29	43	68	M16	6.0	●	
<b>TERNS 240-M16-16</b>	2	40	24	29	43	68	M16	8.0	●	RNMU 1606...
<b>340-M16-16</b>	3	40	24	29	43	68	M16	8.0	●	E244

• Matched with T-FLEXTEC holder

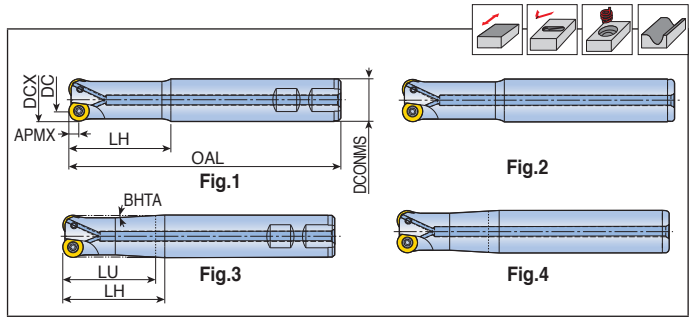
## Spare parts

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	-		





## End mills

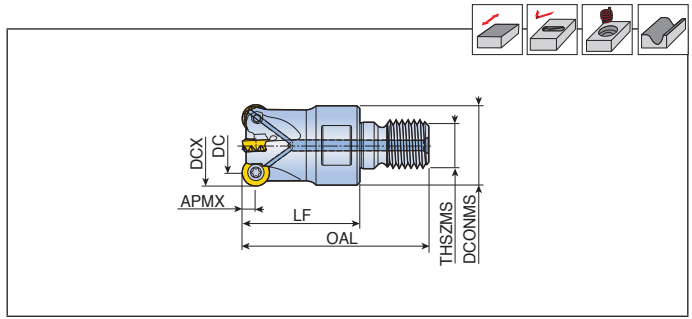


Designation		Dimension (mm)								Coolant hole	Fig.	Insert
		DCX	DC	DCONMS	OAL	LU	LH	BHTA	APMX			
<b>TERY 216-W20-08-L</b>	2	16	8	20	110	45	55	4.1	4.0	●	3	RYM(H)X 0803... E245-E246
<b>217-16-08-L130</b>	2	17	9	16	130	-	30	-	4.0	●	2	
<b>218-16-08-L150</b>	2	18	10	16	150	-	30	-	4.0	●	2	
<b>320-W20-08</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	
<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	
<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	RYM(H)X 1205... E245-E246
<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	
<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>TERY 240-W32-16</b>	2	40	24	32	160	-	50	-	8.0	●	1	RYM(H)X 1606... E245-E246
<b>340-32-16-L250</b>	3	40	24	32	250	-	50	-	8.0	●	2	
<b>TERY 350-32-20</b>	3	50	30	32	160	-	50	-	10.0	●	2	RYM(H)X 2007... E245-E246
<b>350-40-20</b>	3	50	30	40	200	-	60	-	10.0	●	2	





## Modular heads



Designation	⌀	Dimension (mm)							Coolant hole	Insert
		DCX	DC	DCONMS	LF	OAL	THSZMS	APMX		
<b>TERY 225-M12-12</b>	2	25	13	21	35	57	M12	6.0	●	RYM(H)X 1205... E245-E246
<b>232-M16-12</b>	2	32	20	29	43	68	M16	6.0	●	
<b>332-M16-12</b>	3	32	20	29	43	68	M16	6.0	●	
<b>335-M16-12</b>	3	35	23	29	43	68	M16	6.0	●	
<b>340-M16-12</b>	3	40	28	29	43	68	M16	6.0	●	
<b>440-M16-12</b>	4	40	28	29	43	68	M16	6.0	●	
<b>442-M16-12</b>	4	42	30	29	43	68	M16	6.0	●	
<b>TERY 232-M16-16</b>	2	32	16	29	43	68	M16	8.0	●	RYM(H)X 1606... E245-E246
<b>240-M16-16</b>	2	40	24	29	43	68	M16	8.0	●	
<b>342-M16-16</b>	3	42	26	29	43	68	M16	8.0	●	

• Matched with T-FLEXTEC holder

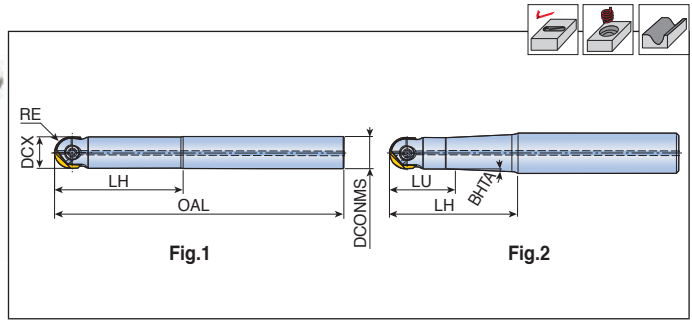
## Spare parts

Designation	Screw	Wrench		Wrench handle
<b>TERY-08</b>	TS 30A060I/HG	TD 9	-	
<b>TERY-10</b>	TS 35070I/HG(UnderD21), TS 35085I/HG	TD 15	-	
<b>TERY-12</b>	TS 40093I	TD 15	-	
<b>TERY-16</b>	TS 50115I	TD 20	-	
<b>TERY-20</b>	TS 60A130I	-	BLD T25/M7	SW6-T

Cutting Condition  
E271-E273

Ramping Data  
E342-E343

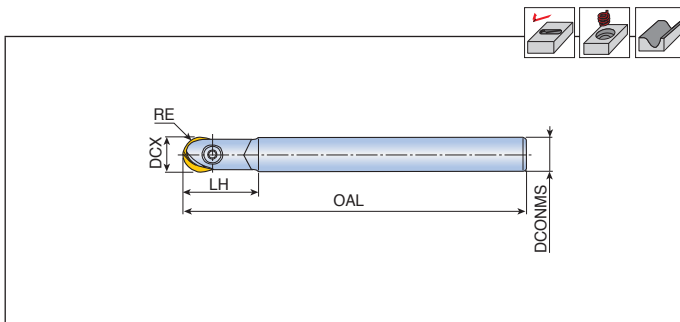
## End mills



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... NFR 060A...
<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	
<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	NFB 120...
<b>120-12M</b>	12	6	12	180	60	-	-	●	1	NFR 120A...
<b>120-16M</b>	12	6	16	140	60	25	2.4°	●	2	NFR 130A...
<b>120-20L</b>	12	6	20	180	80	40	5°	●	2	
<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	
<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	
<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	
<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	
<b>320-32L</b>	32	16	32	250	60	-	-	●	1	NFB 320... NFR 320A...
										E239-E241

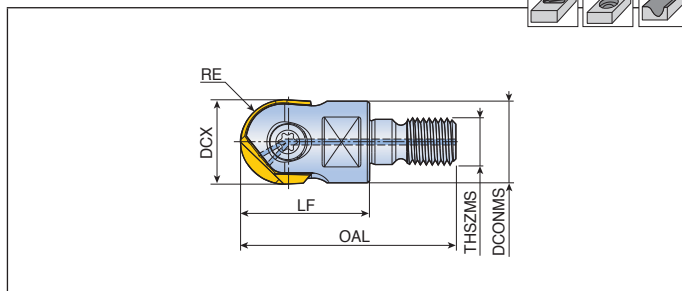
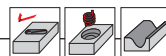


## End mills-carbide shank



Designation	Dimension (mm)					Insert
	DCX	RE	DCONMS	OAL	LH	
<b>TNF 060-06-CT-L60</b>	6	3	6	60	15	NFB 060... NFR 060A...
<b>060-06-CT-L80</b>	6	3	6	80	20	
<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... NFR 080A...
<b>080-10-CT-L140</b>	8	4	10	140	75	
<b>080-08-CT-L160</b>	8	4	8	160	80	
<b>100-10-CT-L100</b>	10	5	10	100	35	NFB 100... NFR 100A... NFR 110A...
<b>100-10-CT-L140</b>	10	5	10	140	75	
<b>100-10-CT-L200</b>	10	5	10	200	70	
<b>100-10-CT-L220</b>	10	5	10	220	140	
<b>120-12-CT-L120</b>	12	6	12	120	50	NFB 120... NFR 120A... NFR 130A...
<b>120-12-CT-L160-S</b>	12	6	12	160	30	
<b>120-12-CT-L160</b>	12	6	12	160	90	
<b>120-12-CT-L200</b>	12	6	12	200	70	
<b>120-12-CT-L220</b>	12	6	12	220	150	
<b>160-16-CT-L120</b>	16	8	16	120	60	NFB 160... NFR 160A... NFR 170A...
<b>160-16-CT-L160-S</b>	16	8	16	160	70	
<b>160-16-CT-L160</b>	16	8	16	160	80	
<b>160-16-CT-L200</b>	16	8	16	200	70	
<b>160-16-CT-L220</b>	16	8	16	220	150	
<b>200-20-CT-L200</b>	20	10	20	200	70	NFB 200... NFR 200A... NFR 210A...
<b>200-20-CT-L110</b>	20	10	20	110	40	
<b>200-20-CT-L220</b>	20	10	20	220	120	
<b>200-20-CT-L300</b>	20	10	20	300	220	
<b>250-25-CT-L200</b>	25	12.5	25	200	70	NFB 250... NFR 250A... NFR 260A...
<b>250-25-CT-L220-S</b>	25	12.5	25	220	80	
<b>250-25-CT-L220</b>	25	12.5	25	220	120	
<b>250-25-CT-L300</b>	25	12.5	25	300	220	
<b>300-32-CT-L200</b>	30	15	32	200	70	NFB 300... NFB 320... NFR 300A... NFR 320A...
<b>300-32-CT-L250-S</b>	30	15	32	250	80	
<b>300-32-CT-L250</b>	30	15	32	250	150	
<b>300-32-CT-L350-S</b>	30	15	32	350	80	E239-E241
<b>300-32-CT-L350</b>	30	15	32	350	230	
<b>320-32-CT-L300</b>	32	16	32	300	220	NFB 320... NFR 320A...

## Modular heads



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... NFR 100A... NFR 110A...
<b>120-M06</b>	12	6	11.5	37.5	23	M06	●	NFB 120...
<b>120-M08</b>	12	6	13	40.5	23	M08	●	NFR 120A... NFR 130A...
<b>160-M08</b>	16	8	13	47.5	30	M08	●	NFB 160... NFR 160A... NFR 170A...
<b>200-M10</b>	20	10	19	50	30	M10	●	NFB 200... NFR 200A... NFR 210A...
<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... NFR 260A...
<b>300-M16</b>	30	15	29	68	43	M16	●	NFB 300... NFB 320... NFR 300A... NFR 320A...
<b>320-M16</b>	32	16	29.5	68	43	M16	●	NFB 320... 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	-	-





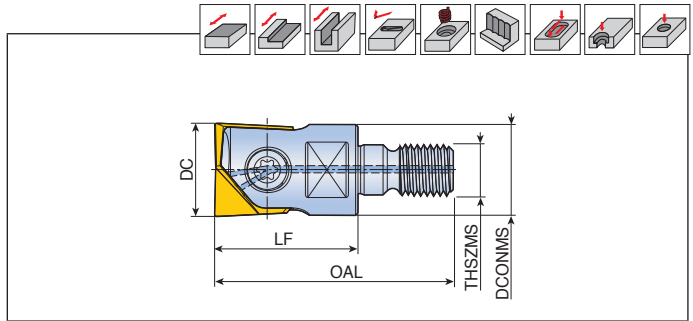




# TNFR-M



## Modular heads



Designation	Dimension (mm)					Coolant hole	Insert
	DC	DCONMS	LF	OAL	THSZMS		
<b>TNFR 100-M06</b>	10	9.7	20	34.5	M06	●	NFR 100A... NFR 110A...
<b>120-M06</b>	12	11.5	23	37.5	M06	●	NFR 120A...
<b>120-M08</b>	12	13	23	40.5	M08	●	NFR 130A...
<b>160-M08</b>	16	13	30	47.5	M08	●	NFR 160A... NFR 170A...
<b>200-M10</b>	20	19	30	50	M10	●	NFR 200A... NFR 210A...
<b>250-M12</b>	25	24	35	57	M12	●	NFR 250A... NFR 260A...
<b>300-M16</b>	30	29	43	68	M16	●	NFR 300A NFR 320A
<b>320-M16</b>	32	29.5	43	68	M16	●	NFR 320A E240-E241

• Matched with T-FLEXTEC holder

## Spare parts

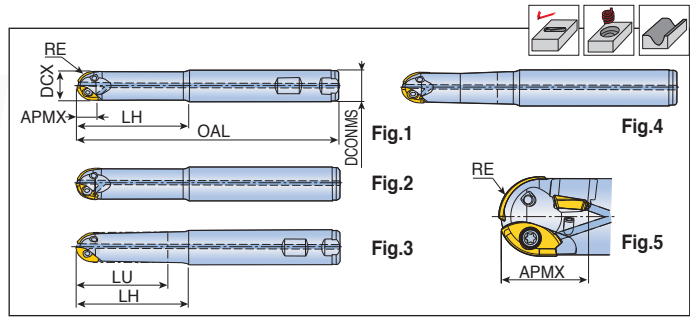
Designation	Screw	Wrench			Wrench handle	
<b>TNFR 060</b>	TS 20F060A	TD 6	-	-	-	
<b>TNFR 080</b>	TS 25F080A	TD 8	-	-	-	
<b>TNFR 100</b>	TS 30F100A	TD 10	-	-	-	
<b>TNFR 120</b>	TS 40F120A	TD 15	-	-	-	
<b>TNFR 160</b>	TS 50F160A	-	T-T20	-	-	
<b>TNFR 200</b>	TS 60F200A	-	-	BLD T25/M7	SW6-T	
<b>TNFR 250</b>	TS 70F250A	-	-	BLD T25/M7	SW6-T	
<b>TNFR 300, TNFR 320</b>	TS 80F300A	-	T-T30	-	-	







## End mills



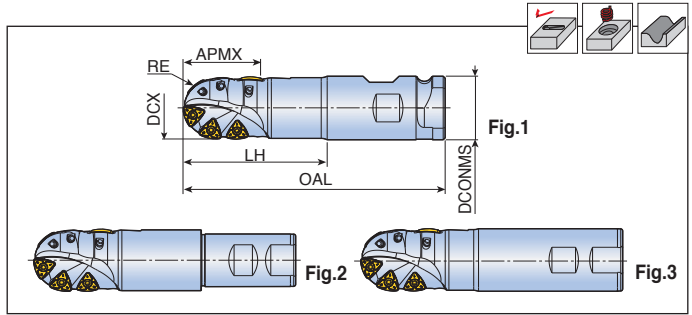
Designation	Dimension (mm)							Coolant hole	Fig.	Insert			
	DCX	RE	DCONMS	OAL	LU	LH	APMX			Ball	Periphery		
<b>2F 16-11-W20-L120</b>	16	8	20	120	35.5	60	11.8	●	3	2FB160	2	-	-
<b>16-11-20-L130</b>	16	8	20	130	45.9	60	11.8	●	4		2	-	-
<b>16-11-20-L200</b>	16	8	20	200	45.9	60	11.8	●	4	E214	2	-	-
<b>16-20-W20-L120-P</b>	16	8	20	120	41.8	60	20.5	X	5	E214	2	APKT 09T3	1
<b>16-20-25-L200-P</b>	16	8	25	200	43.4	65	20.5	X	5		2	E225	1
<b>20-13-W25-L105</b>	20	10	25	105	-	45	13.6	●	1	2FB200	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	E214	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	E214	2	-	-
<b>20-22-25-L125-P</b>	20	10	25	125	45.7	65	22.3	●	5		2	-	-
<b>20-22-25-L200-P</b>	20	10	25	200	74.3	90	22.3	●	5	E214	2	APKT 09T3	1
<b>20-22-32-L250-P</b>	20	10	32	250	72.3	100	22.3	●	5		2	E225	1
<b>25-17-W25-L150</b>	25	12.5	25	150	-	60	17.7	●	1	2FB250	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	E214	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	E214	2	-	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	E214	2	E225	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	2FB300	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	E214	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	E214	2	-	2
<b>30-43-32-L200-P</b>	30	15	32	200	-	85.6	43.7	●	5		2	APKT 1204	2
<b>30-43-32-L250-P</b>	30	15	32	250	-	125.6	43.7	●	5	E214	2	E226	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	2FB320	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	E214	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	E214	2	APKT 1204	2
<b>32-44-32-L250-P</b>	32	16	32	250	-	123.7	44.7	●	5		2	E226	2
<b>32-44-32-L300-P</b>	32	16	32	300	-	143.7	44.7	●	5	2	-	2	







## End mills



Designation		Dimension (mm)						Fig.	Insert
		DCX	RE	DCONMS	OAL	LH	APMX		
<b>TDB50X 59-CN50.8-L200</b>	6	50	25	50.8	200	110	59	1	6RBE 50-M... E222
<b>69-CN50.8-L250</b>	7	50	25	50.8	250	160	69	1	
<b>TDB50X 59-W40-L200</b>	6	50	25	40	200	128	59	2	
<b>69-W40-L250</b>	7	50	25	40	250	178	69	2	
<b>59-W42-L200</b>	6	50	25	42	200	128	59	2	
<b>69-W42-L250</b>	7	50	25	42	250	178	69	2	
<b>59-W50-L200</b>	6	50	25	50	200	90	59	3	
<b>69-W50-L250</b>	7	50	25	50	250	140	69	3	

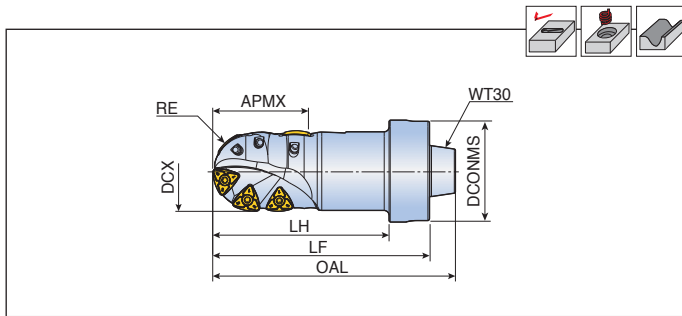
## Spare parts

Designation	Screw	Wrench			
	<b>TDB50X</b>	 TS50B106/HG	 T-T20		



# TDB50X-WT

## End mills



Designation		Dimension (mm)							Insert
		DCX	RE	DCONMS	OAL	LH	LF	APMX	
<b>TDB50X 59-WT30-L150</b>	6	50	25	63	150	109	134	59	6RBE 50-M...
<b>69-WT30-L200</b>	7	50	25	63	200	159	184	69	E222

## Spare parts

Designation	Screw	Wrench			
<b>TDB50X-WT</b>	TS50B106I/HG	T-T20			





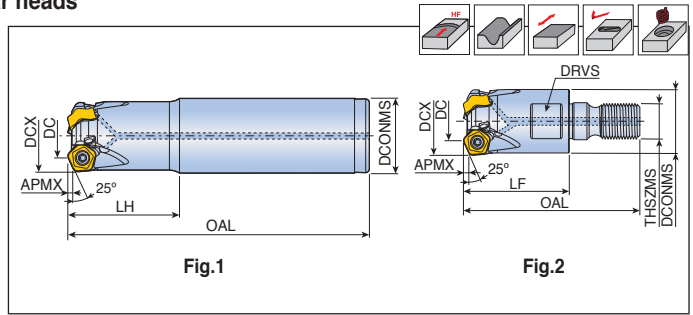






# TEPT-05/10

## 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... E242
<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	
<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... E242
<b>TEPT 340-M16-10</b>	3	40	23.5	29	43	68	M16	-	25	3.0	●	2	

• Matched with T-FLEXTEC holder

## 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	

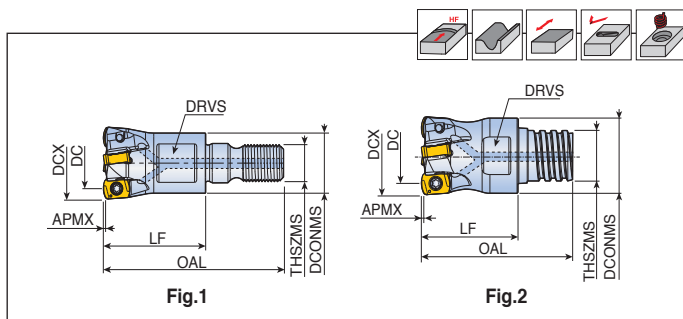




# TEBL-M(S)-04



High feed modular heads



Designation		Dimension (mm)								Coolant hole	Fig.	Insert
		DCX	DC	DCONMS	LF	OAL	THSZMS	APMX	DRVS			
<b>TEBL 210-M06-04</b>	2	10	5.7	9.7	17	31.5	M06	0.5	8	●	1	BLMP 0402... E232
<b>211-M06-04</b>	2	11	6.6	9.7	17	31.5	M06	0.5	8	●	1	
<b>312-M06-04</b>	3	12	7.6	11	17	31.5	M06	0.5	8	●	1	
<b>313-M06-04</b>	3	13	8.6	11	17	31.5	M06	0.5	8	●	1	
<b>416-M08-04</b>	4	16	11.6	13	23	40.5	M08	0.5	10	●	1	
<b>417-M08-04</b>	4	17	12.6	13	23	40.5	M08	0.5	10	●	1	
<b>520-M10-04</b>	5	20	15.5	18	23	43	M10	0.5	15	●	1	
<b>725-M12-04</b>	7	25	20.6	21	27	49	M12	0.5	17	●	1	
<b>832-M16-04</b>	8	32	27.5	29	27	52	M16	0.5	25	●	1	
<b>TEBL 210-S06-04</b>	2	10	5.6	9.6	15	21.3	S06	0.5	8	●	2	
<b>312-S08-04</b>	3	12	7.6	11.5	16	23.5	S08	0.5	10	●	2	
<b>416-S10-04</b>	4	16	11.6	15.2	20	31.3	S10	0.5	13	●	2	

• Matched with T-FLEXTEC holder(Fig.1) & MAXI-RUSH holder(Fig.2)

## Spare parts

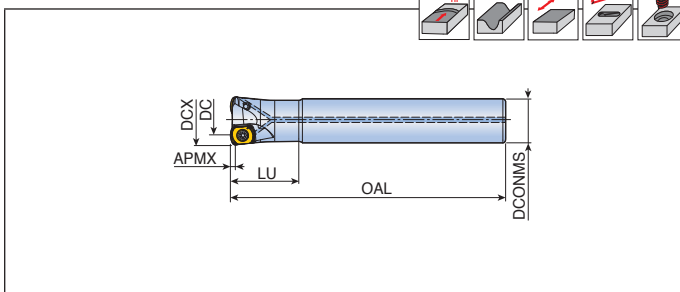
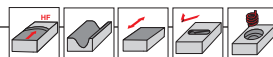
Designation	Screw	Wrench			
<b>TEBL-04</b>	TS 180411/HG	T 6P			



# TEBL-06



## High feed end mills

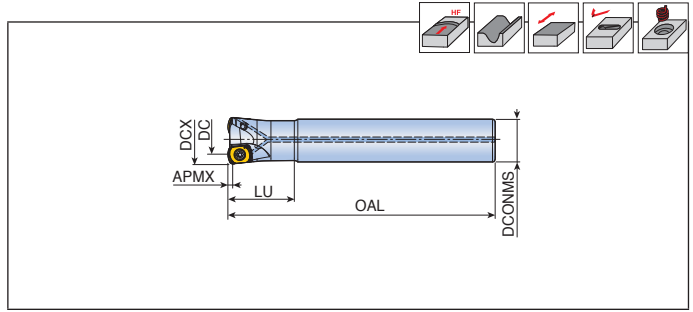


Designation	⚙️	Dimension (mm)						Coolant hole	Insert
		DCX	DC	DCONMS	OAL	LU	APMX		
<b>TEBL 216-15-06-L150</b>	2	16	9.4	15	150	40	0.7	●	BLMP 0603... E232
<b>216-16-06</b>	2	16	9.4	16	150	40	0.7	●	
<b>216-16-06-S</b>	2	16	9.4	16	100	30	0.7	●	
<b>217-16-06</b>	2	17	10.1	16	150	40	0.7	●	
<b>217-16-06-S</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	●	



# TEBL-06

High feed end mills



Designation		Dimension (mm)						Coolant hole	Insert
		DCX	DC	DCONMS	OAL	LU	APMX		
<b>TEBL 435-32-06-L200</b>	4	35	27.3	32	200	50	1.0	●	BLMP 0603... E232
<b>435-32-06-L300</b>	4	35	27.3	32	300	50	1.0	●	
<b>535-32-06-L200</b>	5	35	27.3	32	200	50	1.0	●	
<b>535-32-06-L300</b>	5	35	27.3	32	300	50	1.0	●	
<b>540-32-06-L220</b>	5	40	32.2	32	220	40	1.0	●	
<b>640-32-06-S</b>	6	40	32.2	32	150	40	1.0	●	
<b>640-32-06-L220</b>	6	40	32.2	32	220	40	1.0	●	

## Spare parts

Designation	Screw	Wrench			
<b>TEBL-06</b>	TS 25064I/HG-P	TD 8P			

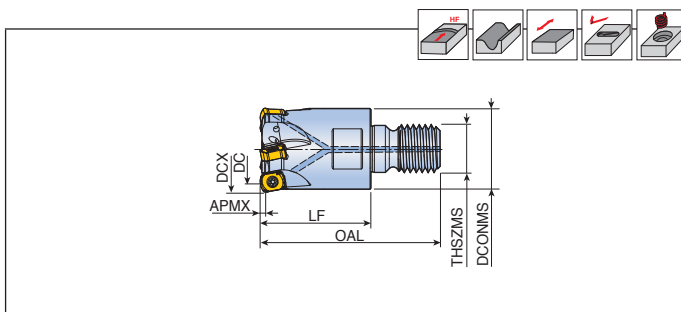




# TEBL-M-06



High feed modular heads



Designation		Dimension (mm)							Coolant hole	Insert
		DCX	DC	DCONMS	LF	OAL	THSZMS	APMX		
<b>TEBL 216-M08-06</b>	2	16	9.4	13	25	42.5	M08	0.7	●	BLMP 0603... E232
<b>217-M08-06</b>	2	17	10.1	13	25	42.5	M08	0.7	●	
<b>218-M08-06</b>	2	18	11.1	13	25	42.5	M08	0.7	●	
<b>220-M10-06</b>	2	20	12.4	18	30	50	M10	1.0	●	
<b>320-M10-06</b>	3	20	12.4	18	30	50	M10	1.0	●	
<b>321-M10-06</b>	3	21	13.4	18	30	50	M10	1.0	●	
<b>322-M10-06</b>	3	22	14.4	18	30	50	M10	1.0	●	
<b>325-M12-06</b>	3	25	17.3	21	35	57	M12	1.0	●	
<b>425-M12-06</b>	4	25	17.3	21	35	57	M12	1.0	●	
<b>326-M12-06</b>	3	26	18.3	21	35	57	M12	1.0	●	
<b>426-M12-06</b>	4	26	18.3	21	35	57	M12	1.0	●	
<b>530-M16-06</b>	5	30	22.3	29	40	65	M16	1.0	●	
<b>432-M16-06</b>	4	32	24.3	29	40	65	M16	1.0	●	
<b>532-M16-06</b>	5	32	24.3	29	40	65	M16	1.0	●	
<b>433-M16-06</b>	4	33	25.3	29	40	65	M16	1.0	●	
<b>533-M16-06</b>	5	33	25.3	29	40	65	M16	1.0	●	
<b>435-M16-06</b>	4	35	27.3	29	43	68	M16	1.0	●	
<b>535-M16-06</b>	5	35	27.3	29	43	68	M16	1.0	●	
<b>640-M16-06</b>	6	40	32.2	29	43	68	M16	1.0	●	
<b>542-M16-06</b>	5	42	34.2	29	43	68	M16	1.0	●	
<b>642-M16-06</b>	6	42	34.2	29	43	68	M16	1.0	●	

• Matched with T-FLEXTEC holder

## Spare parts

Designation	Screw	Wrench			
	<b>TEBL-06</b>	 TS 25064I/HG-P	 TD 8P		

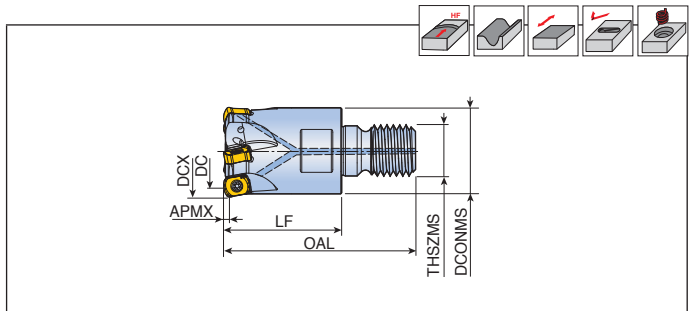




# TEBL-M-09



High feed modular heads



Designation	⌀	Dimension (mm)							Coolant hole	Insert
		DCX	DC	DCONMS	LF	OAL	THSZMS	APMX		
<b>TEBL 225-M12-09</b>	2	25	14.7	21	35	57	M12	1.5	●	BLMP 0904... E232
<b>325-M12-09</b>	3	25	14.7	21	35	57	M12	1.5	●	
<b>326-M12-09</b>	3	26	15.7	21	35	57	M12	1.5	●	
<b>330-M16-09</b>	3	30	19.6	29	43	68	M16	1.5	●	
<b>332-M16-09</b>	3	32	21.6	29	43	68	M16	1.5	●	
<b>432-M16-09</b>	4	32	21.6	29	43	68	M16	1.5	●	
<b>433-M16-09</b>	4	33	22.6	29	43	68	M16	1.5	●	
<b>335-M16-09</b>	3	35	24.6	29	43	68	M16	1.5	●	
<b>435-M16-09</b>	4	35	24.6	29	43	68	M16	1.5	●	
<b>440-M16-09</b>	4	40	29.6	29	43	68	M16	1.5	●	
<b>540-M16-09</b>	5	40	29.6	29	43	68	M16	1.5	●	
<b>542-M16-09</b>	5	42	31.6	29	43	68	M16	1.5	●	

• Matched with T-FLEXTEC holder

## Spare parts

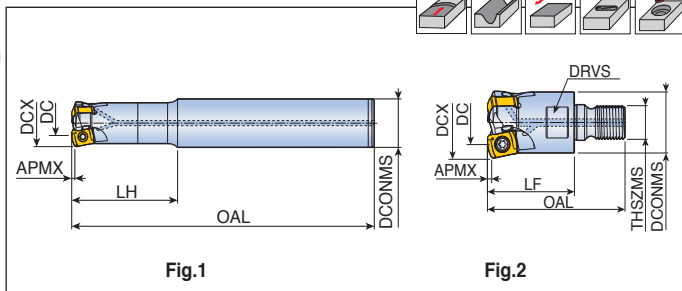
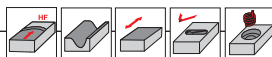
Designation	Screw	Wrench			
	<b>TEBL-09</b>	TS 35A088I/HG	TD 10P		

Cutting Condition  
E271-E273

Ramping Data  
E333

# TEBL-11

## High feed end mills & modular heads



Designation	Flutes	Dimension (mm)									Coolant hole	Fig.	Insert
		DCX	DC	DCONMS	OAL	THSZMS	LH	LF	DRVS	APMX			
<b>TEBL 230-32-11-L150</b>	2	30	14.7	32	150	-	70	-	-	2.0	●	1	BLMP 1105... E232
<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	25	2.0	●	2	
<b>232-M16-11</b>	2	32	16.6	29	68	M16	-	43	25	2.0	●	2	
<b>233-M16-11</b>	2	33	17.6	29	68	M16	-	43	25	2.0	●	2	
<b>335-M16-11</b>	3	35	19.5	29	68	M16	-	43	25	2.0	●	2	
<b>340-M16-11</b>	3	40	24.4	29	68	M16	-	43	25	2.0	●	2	
<b>342-M16-11</b>	3	42	26.4	29	68	M16	-	43	25	2.0	●	2	

• Matched with T-FLEXTEC holder

## Spare parts

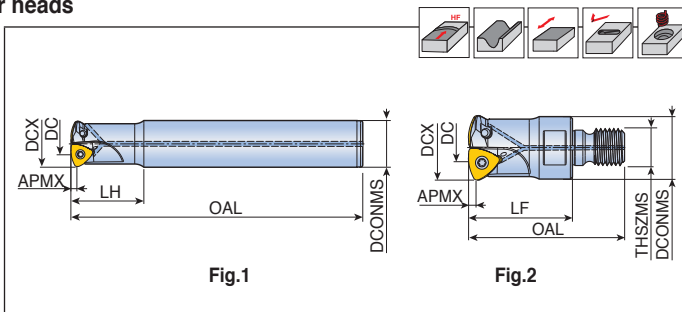
Designation	Screw 	Wrench 	Wrench handle 		
<b>TEBL-11</b>	TS 50A121I/HG	TBLD T20-W6	THND 6W		



# TEBL-13



## High feed end mills & Modular heads



Designation		Dimension (mm)								Coolant hole	Fig.	Insert
		DCX	DC	DCONMS	OAL	THSZMS	LH	LF	APMX			
<b>TEBL 232-32-13-L150</b>	2	32	12.9	32	150	-	50	-	2.0	●	1	BLMP 1306... E233
<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	●	2	
<b>233-M16-13</b>	2	33	14.3	30	75	M16	-	50	2.0	●	2	
<b>235-M16-13</b>	2	35	16.1	30	75	M16	-	50	2.0	●	2	
<b>340-M16-13</b>	3	40	20.7	30	75	M16	-	50	2.0	●	2	
<b>342-M16-13</b>	3	42	22.6	30	75	M16	-	50	2.0	●	2	

• Matched with T-FLEXTEC holder

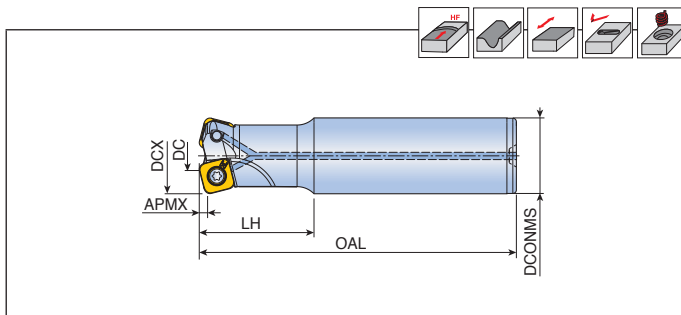
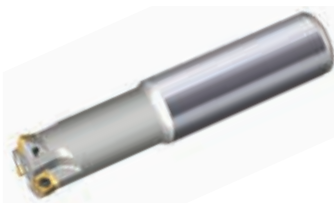
## Spare parts

Designation	Screw	Wrench			
	<b>TEBL-13</b>	TS50B106I/HG	T-T20		



# TESB-06/09

High feed end mills

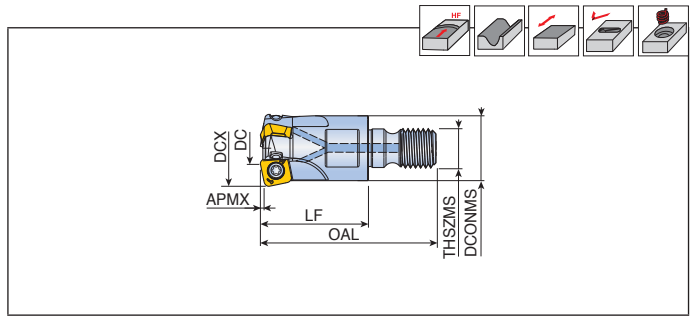


Designation		Dimension (mm)						Coolant hole	Insert
		DCX	DC	DCONMS	OAL	LH	APMX		
<b>TESB 216-16-06-L150</b>	2	16	5.9	16	150	40	1.0	●	SBMT 0603... 247
<b>217-16-06-L200</b>	2	17	6.8	16	200	20	1.0	●	
<b>320-20-06-L160</b>	3	20	9.8	20	160	50	1.0	●	
<b>420-20-06-L130</b>	4	20	9.8	20	130	50	1.0	●	
<b>321-20-06-L200</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	●	
<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 modular heads



Designation		Dimension (mm)							Coolant hole	Insert
		DCX	DC	DCONMS	LF	OAL	THSZMS	APMX		
<b>TESB 216-M08-06</b>	2	16	5.9	13	25	42.5	M08	1.0	●	SBMT 0603...
<b>320-M10-06</b>	3	20	9.8	18	30	50	M10	1.0	●	E247
<b>425-M12-06</b>	4	25	14.8	21	35	57	M12	1.0	●	
<b>532-M16-06</b>	5	32	21.8	29	40	65	M16	1.0	●	
<b>TESB 225-M12-09</b>	2	25	10.8	21	35	57	M12	1.2	●	SBMT 0904...
<b>325-M12-09</b>	3	25	10.8	21	35	57	M12	1.2	●	E247
<b>332-M16-09</b>	3	32	17.4	29	43	68	M16	1.2	●	
<b>432-M16-09</b>	4	32	17.4	29	43	68	M16	1.2	●	
<b>435-M16-09</b>	4	35	20.4	29	43	68	M16	1.2	●	
<b>440-M16-09</b>	4	40	25.4	29	43	68	M16	1.2	●	
<b>540-M16-09</b>	5	40	25.4	29	43	68	M16	1.2	●	
<b>542-M16-09</b>	5	42	27.4	29	43	68	M16	1.2	●	
<b>TESB 232-M16-13</b>	2	32	11.6	29	50	75	M16	2.0	●	SBMT 1306...
<b>233-M16-13</b>	2	33	12.6	29	50	75	M16	2.0	●	E247
<b>340-M16-13</b>	3	40	19.5	29	50	75	M16	2.0	●	
<b>342-M16-13</b>	3	42	21.5	29	50	75	M16	2.0	●	

• 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		



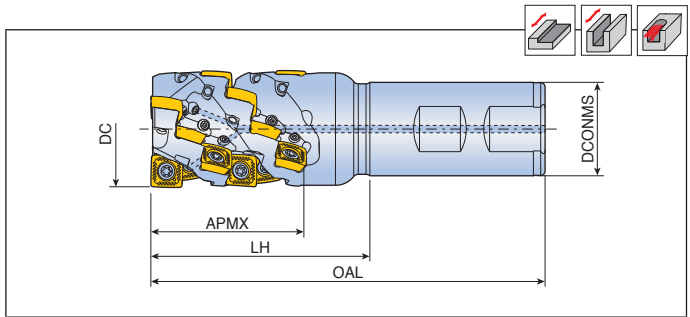






# 4S-TEF-11V

## Extended flute cutters



Designation		No. of insert	Dimension (mm)					Coolant hole	Insert
			DC	DCONMS	OAL	LH	APMX		
<b>4S-TEF- D32-52-W32-11V-2F</b>	2	12	32	32	135	70	52	●	SVK(H)T 1145... E258
<b>D40-52-W32-11V-3F</b>	3	18	40	32	135	75	52	●	
<b>D40-60-W32-11V-3F</b>	3	21	40	32	180	85	60	●	
<b>D50-52-W40-11V-4F</b>	4	24	50	40	145	75	52	●	
<b>D50-77-W40-11V-4F</b>	4	36	50	40	170	100	77.9	●	

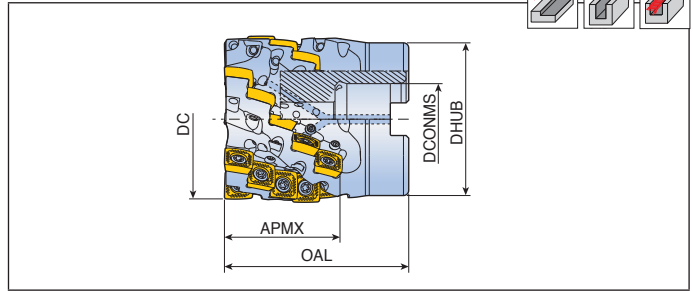
## Spare parts

Designation	Screw	Wrench	Wrench handle	Coolant Nozzle	
<b>4S-TEF-11V</b>	 TS 400931/HG	 TBLD T15-W6	 THND 6W	 SS 3003-06C	



# 4S-TES-11V

## Extended flute cutters



Designation	No. of inserts	Dimension (mm)					Coolant hole	Arbor style	Kg	Mounting bolt	Insert	
		DC	DCONMS	DHUB	OAL	APMX						
<b>4S-TES-D40-27-16R-11V-3F</b>	3	9	40	16	38	55	27	●	A	0.3	SH M8x40	SVK(H)T 1145... E258
<b>D50-43-22R-11V-4F</b>	4	20	50	22	45	65	43	●	A	0.6	SH M10x50	
<b>D50-69-22R-11V-4F</b>	4	32	50	22	45	90	69	●	A	0.8	SH M10x80	
<b>D63-60-27R-11V-5F</b>	5	35	63	27	58	85	60	●	A	1.2	SH M12x60	
<b>D63-69-27R-11V-5F</b>	5	40	63	27	58	93	69	●	A	1.4	SH M12x80	
<b>D80-76-32R-11V-6F</b>	6	54	80	32	76	100	76	●	A	2.6	SH M16x80	

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

## Spare parts

Designation	Screw	Wrench	Wrench handle	Coolant Nozzle	
<b>4S-TES-11V</b>	TS 40093I/HG	TBLD T15-W6	SW6-T	SS 3003-06C	

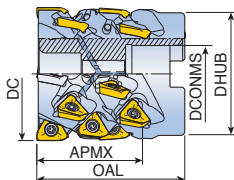
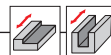
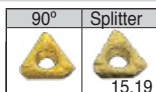




# 3P TES-10/15/19



## Extended flute cutters



Designation		No. of insert	Dimension (mm)					Coolant hole	Kg	Mounting bolt	Insert
			DC	DCONMS	DHUB	OAL	APMX				
<b>3P TES D50-48-22R-10</b>		4	32	50	22	45	65	48	●	0.6 SH M10x50	3PK(H)T 1004...
<b>D63-54-27R-10</b>		4	36	63	27	58	75	54	●	1.2 SH M12x50	
<b>3P TES D50-40-22R-15-2F</b>		2	8	50	22	45	65	40	●	0.6 SH M10x50	3PK(H)T 1505...
<b>D50-40-22R-15</b>		3	12	50	22	45	65	40	●	0.6 SH M10x50	
<b>D63-50-27R-15</b>		4	20	63	27	58	70	50	●	1.0 SH M12x50	
<b>D80-60-32R-15</b>		4	24	80	32	77	75	60	●	2.0 SH M16x50	
<b>D100-78-40R-15-4F</b>		4	32	100	40	96	110	78	●	5.0 SH M20x80	3PK(H)T 1906... E216-E217
<b>3P TES D63-42-27R-19</b>		3	9	63	27	58	70	42	●	1.0 SH M12x50	
<b>D63-42-27R-19-4F</b>		4	12	63	27	58	70	42	●	1.0 SH M12x50	
<b>D80-56-32R-19</b>		4	16	80	32	76	75	56	●	1.7 SH M16x50	
<b>D100-83-40R-19-4F</b>		4	24	100	40	96	110	83	●	4.4 SH M20x80	
<b>D100-83-40R-19</b>		5	30	100	40	96	110	83	●	4.5 SH M20x80	
<b>D100-83-40R-19-6F</b>		6	36	100	40	96	110	83	●	4.6 SH M20x80	

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

## Spare parts

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 45120I	-	T-T20		



E271-E273

E274-E275

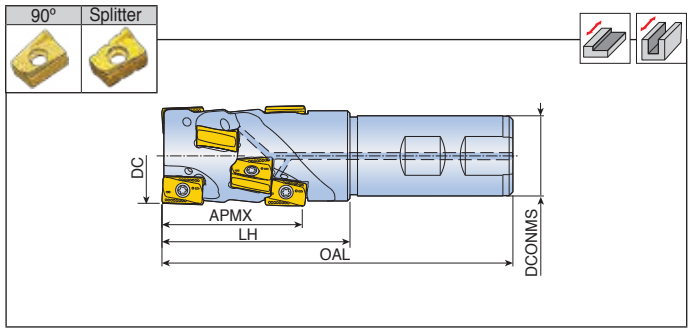






# TEF-AN11/16

## Extended flute cutters



Designation		No. of insert	Dimension (mm)					Coolant hole	Insert
			DC	DCONMS	OAL	LH	APMX		
<b>TEF D32-40-W32-AN11</b>	2	8	32	32	110	48	40	●	ANM(H)X 1106...
<b>D40-40-W32-AN11</b>	3	12	40	32	125	50	40	●	E224
<b>TEF D40-42-W32-AN16</b>	2	6	40	32	120	55	42	●	ANM(H)X 1106...
<b>D40-56-W32-AN16</b>	2	8	40	32	140	75	56	●	ANM(H)X 1607...
<b>D50-56-W40-AN16</b>	3	12	50	40	140	70	56	●	E224

## Spare parts

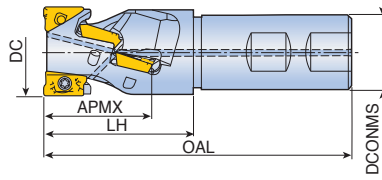
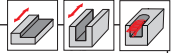
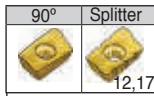
Designation	Screw	Wrench			
<b>TEF-AN11</b>	TS 35A088/HG	TD 10P	-		
<b>TEF-AN16</b>	TS 40120/HG	-	T-T15		





# TEF-AP(AX)

## Extended flute cutters



Designation		No. of insert	Dimension (mm)						Coolant hole	Insert
			DC	DCONMS	OAL	LH	APMX			
<b>TEF D16-16-W16-AX06</b>	2	6	16	16	80	28	16	x	AXM(C)T 0602...	
	3	12	20	20	85	33	21	●	E231	
	4	20	25	25	95	38	26	●		
<b>2S-TEF D20-25-W20-AP09</b>	1	3	20	20	110	38	26	●	APK(C)T 09T3...	
	2	10	25	25	115	48	42	●	E225	
	2	10	32	32	120	51	42	●		
<b>TEF D25-34-W25-AP12</b>	2	6	25	25	120	47	34	●	APK(C)T 1204...	
	2	8	32	32	120	58	45	●	E226	
	3	12	40	32	140	65	45	●		
<b>TEF D32-30-W32-AP17</b>	2	4	32	32	120	50	30	●	APK(C)T 1705...	
	2	6	40	32	140	65	44	●	E227-E228	

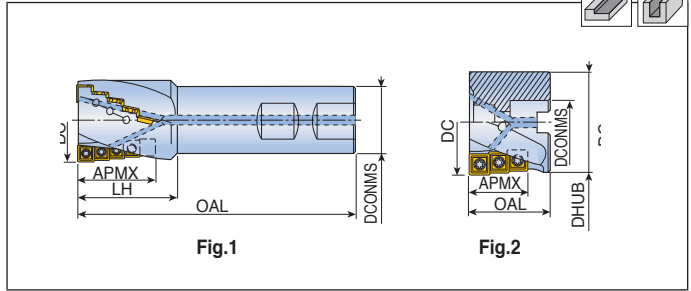
## Spare parts

Designation	Screw	Wrench			
<b>TEF-AX06</b>	TS 18041 I/HG	TD 6P			
<b>2S-TEF-AP09</b>	TS 25055I/HG	TD 8			
<b>TEF-AP12(Ø16-Ø25)</b>	TS 35A070I/HG	TD 10P			
<b>TEF-AP12(Ø32-)</b>	TS 35A088I/HG	TD 10P			
<b>TEF-AP17</b>	TS 40093I/HG	TD 15			





## Extended flute cutters



Designation		No. of insert	Dimension (mm)					Coolant hole	Fig.	Insert	
			DC	DCONMS	OAL	LH	APMX				
<b>TEF D32-23-W32-09</b>		2	6	32	32	120	40	23.8	●	1	SPMG(T) 090408-EM
<b>D40-38-W32-11</b>		2	8	40	32	130	60	38.9	●	1	SPMG(T)110408-EM
<b>D50-48-W40-11</b>		3	15	50	40	140	70	48.4	●	1	E255
<b>D50-48-W42-11</b>		3	15	50	42	140	70	48.4	●	1	

Designation		No. of insert	Dimension (mm)					Coolant hole	Fig.	Mounting bolt	Insert	
			DC	DCONMS	DHUB	OAL	APMX					
<b>TES D50-29-22-11</b>		3	9	50	22	47.3	52	29.0	●	2	SH M10x30	SPMG(T) 110408-EM
<b>D63-35-27-11</b>		4	16	63	27	60.5	55	35.0	●	2	SH M12x35	E255
<b>D80-47-32-14</b>		4	16	80	32	77.2	65	47.0	●	2	SH M16x40	

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

## Spare parts

Designation	Screw	Wrench			
<b>TEF (Ø32)</b>	TS 350881	TD 10	-		
<b>TEF (Ø40-Ø50)</b>	TS 400931	TD 15	-		
<b>TES (Ø50-Ø63)</b>	TS 400931	TD 15	-		
<b>TES (Ø80)</b>	TS 50A1211/HG	-	T-T20		



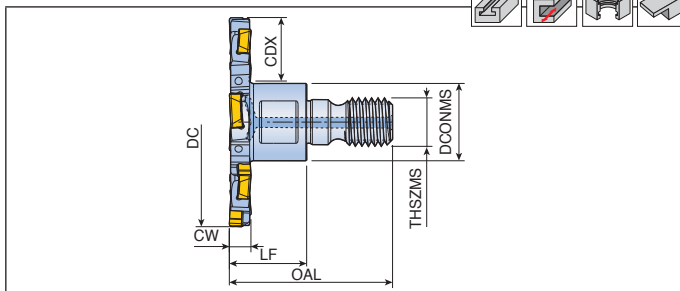
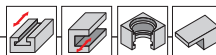








## Slotting cutters: modular heads



Designation	CW (mm)		Dimension (mm)						Coolant hole	Insert
			DC	DCONMS	LF	OAL	THSZMS	CDX		
<b>TSM D25-03-M08-SL18</b>	3	1+1	25	13	18	35.5	M08	6	●	SLOT 018...
<b>D32-03-M08-SL18</b>	3	2+2	32	13	18	35.5	M08	9	●	E250
<b>D40-03-M08-SL18</b>	3	3+3	40	13	18	35.5	M08	13	●	●
<b>D50-03-M10-SL18</b>	3	4+4	50	18	18	38	M10	15	●	●
<b>D63-03-M10-SL18</b>	3	5+5	63	18	18	38	M10	22	●	●
<b>TSM D25-04-M08-SL23</b>	4	1+1	25	13	18	35.5	M08	6	●	SLOT 023...
<b>D32-04-M08-SL23</b>	4	2+2	32	13	18	35.5	M08	9	●	E250
<b>D40-04-M08-SL23</b>	4	3+3	40	13	18	35.5	M08	13	●	●
<b>D50-04-M10-SL23</b>	4	4+4	50	18	18	38	M10	15	●	●
<b>D63-04-M10-SL23</b>	4	5+5	63	18	18	38	M10	22	●	●
<b>TSM D25-05-M08-SL28</b>	5	1+1	25	13	18	35.5	M08	6	●	SLOT 028...
<b>D32-05-M08-SL28</b>	5	2+2	32	13	18	35.5	M08	9	●	E250
<b>D40-05-M08-SL28</b>	5	3+3	40	13	18	35.5	M08	13	●	●
<b>D50-05-M10-SL28</b>	5	4+4	50	18	18	38	M10	15	●	●
<b>D63-05-M10-SL28</b>	5	5+5	63	18	18	38	M10	22	●	●
<b>TSM D25-06-M08-SL33</b>	6	1+1	25	13	18	35.5	M08	6	●	SLOT 033...
<b>D32-06-M08-SL33</b>	6	2+2	32	13	18	35.5	M08	9	●	E250
<b>D40-06-M08-SL33</b>	6	3+3	40	13	18	35.5	M08	13	●	●
<b>D50-06-M10-SL33</b>	6	4+4	50	18	18	38	M10	15	●	●
<b>D63-06-M10-SL33</b>	6	5+5	63	18	18	38	M10	22	●	●

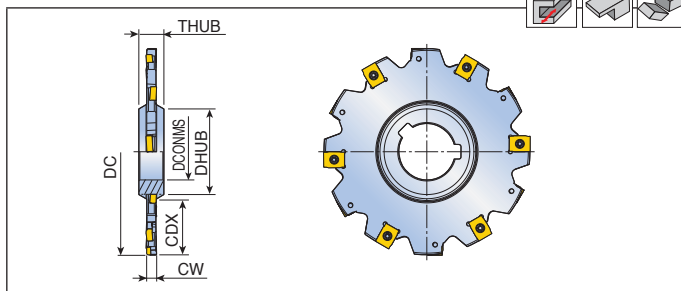
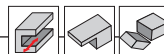
• Matched with T-FLEXTEC holder

## 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		



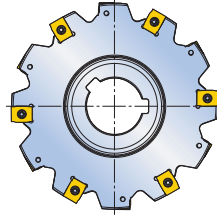
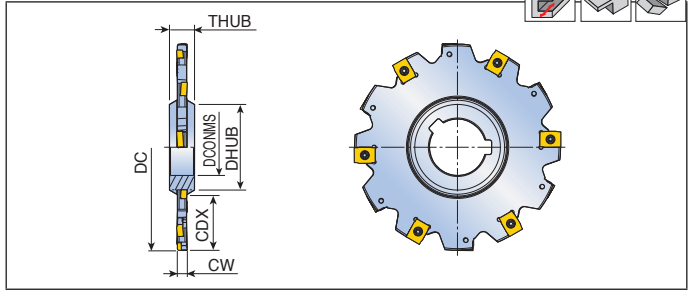
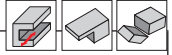
## Slotting cutters: Fixed pocket disk type



Designation	CW (mm)		Dimension (mm)					Kg	Insert
			DC	DCONMS	DHUB	OAL	CDX		
<b>TSM 063FD-03-22N-Z018</b>	3	4+4	63	22	34	8	12.0	0.1	ZNHT 018...
<b>080FD-03-22N-Z018</b>	3	5+5	80	22	34	8	20.5	0.1	E267
<b>100FD-03-27N-Z018</b>	3	6+6	100	27	41	12	26.0	0.2	
<b>125FD-03-40N-Z018</b>	3	7+7	125	40	55	12	31.5	0.3	
<b>160FD-03-40N-Z018</b>	3	9+9	160	40	55	12	49.0	0.4	
<b>TSM 063FD-04-22N-Z023</b>	4	4+4	63	22	34	8	12.0	0.1	ZNHT 023...
<b>080FD-04-22N-Z023</b>	4	5+5	80	22	34	8	21.0	0.1	E267
<b>100FD-04-27N-Z023</b>	4	6+6	100	27	41	12	27.0	0.2	
<b>125FD-04-40N-Z023</b>	4	7+7	125	40	55	12	32.0	0.4	
<b>160FD-04-40N-Z023</b>	4	9+9	160	40	55	12	50.0	0.6	
<b>TSM 063FD-05-22N-Z028</b>	5	4+4	63	22	34	8	13.0	0.1	ZNHT 028...
<b>080FD-05-22N-Z028</b>	5	5+5	80	22	34	8	21.0	0.2	E267
<b>100FD-05-27N-Z028</b>	5	6+6	100	27	41	12	27.0	0.3	
<b>125FD-05-40N-Z028</b>	5	7+7	125	40	55	12	33.0	0.4	
<b>160FD-05-40N-Z028</b>	5	9+9	160	40	55	12	50.0	0.7	
<b>TSM 063FD-06-22N-Z033</b>	6	4+4	63	22	34	8	13.0	0.1	ZNHT 033...
<b>080FD-06-22N-Z033</b>	6	5+5	80	22	34	8	21.5	0.2	E267
<b>100FD-06-27N-Z033</b>	6	6+6	100	27	41	12	27.0	0.3	
<b>125FD-06-40N-Z033</b>	6	7+7	125	40	55	12	33.0	0.5	
<b>160FD-06-40N-Z033</b>	6	9+9	160	40	55	12	50.0	0.8	
<b>200FD-06-50N-Z033</b>	6	10+10	200	50	69	12	63.0	1.2	
<b>250FD-06-50N-Z033</b>	6	12+12	250	50	69	12	88.0	2.0	
<b>TSM 080FD-07-22N-Z038</b>	7	4+4	80	22	34	12	20.0	0.2	ZNHT 038...
<b>100FD-07-27N-Z038</b>	7	5+5	100	27	41	12	26.5	0.3	E267
<b>125FD-07-40N-Z038</b>	7	6+6	125	40	55	12	32.0	0.5	
<b>160FD-07-40N-Z038</b>	7	8+8	160	40	55	12	49.5	0.8	
<b>200FD-07-50N-Z038</b>	7	9+9	200	50	69	12	62.5	1.3	
<b>250FD-07-50N-Z038</b>	7	12+12	250	50	69	12	87.5	1.9	



## Slotting cutters: Fixed pocket disk type



Designation	CW (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...
<b>100FD-08-27N-Z043</b>	8	5+5	100	27	41	12	27.0	0.3	E267
<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	
<b>TSM 100FD-09-27N-Z048</b>	9	5+5	100	27	41	12	27.5	0.4	ZNHT 048...
<b>125FD-09-40N-Z048</b>	9	6+6	125	40	55	12	33.0	0.6	E267
<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	
<b>TSM 100FD-10-27N-Z053</b>	10	5+5	100	27	41	12	28.0	0.4	ZNHT 053...
<b>125FD-10-40N-Z053</b>	10	6+6	125	40	55	12	33.5	0.6	E267
<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

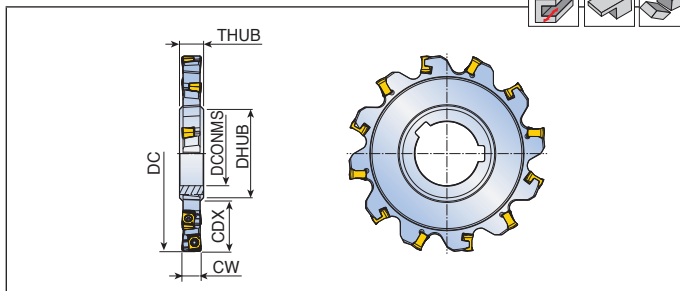
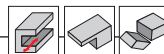
## Spare parts

Designation	Screw	Wrench		Designation	Screw	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



# TSM FD-N-ZN08/11

Slotting cutters: Fixed pocket disk type



Designation	CW (mm)		Dimension (mm)						Insert
			DC	DCONMS	DHUB	OAL	CDX		
<b>TSM 080FD-10-27N-ZN08</b>	10.0	4+4	80	27	41	15	15.5	0.3	ZNHU 080... E268
<b>100FD-10-27N-ZN08</b>	10.0	5+5	100	27	41	15	25.5	0.5	
<b>125FD-10-40N-ZN08</b>	10.0	6+6	125	40	55	15	31.0	0.7	
<b>080FD-12-27N-ZN08</b>	12.0	4+4	80	27	41	15	16.5	0.3	
<b>100FD-12-27N-ZN08</b>	12.0	5+5	100	27	41	15	26.5	0.5	
<b>125FD-12-40N-ZN08</b>	12.0	6+6	125	40	55	15	32.0	0.8	
<b>TSM 125FD-14-40N-ZN11</b>	14.0	6+6	125	40	55	15	34.5	0.9	ZNHU 110... E268
<b>125FD-17-40N-ZN11</b>	17.0	6+6	125	40	55	18	34.5	1.1	
<b>125FD-20-40N-ZN11</b>	20.0	6+6	125	40	55	20	34.5	1.3	

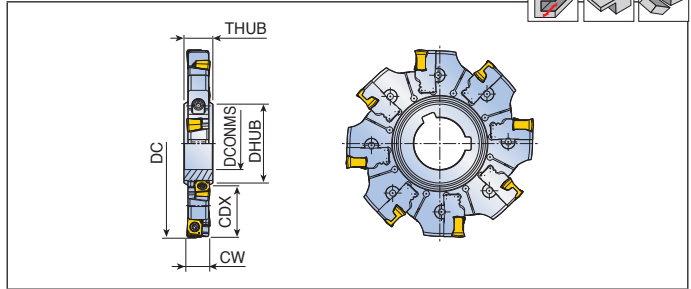
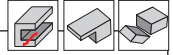
• Arbor: SCA

## Spare parts

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 (mm)		Dimension (mm)						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... E268
<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

## Spare parts

Designation	Right cartridge	Left cartridge	Wedge	Adjust screw	Insert screw
<b>TSM...FD-S/W...-ZN08</b>					
	TCT-SR-ZN08	TCT-SL-ZN08	WFZ 5	SA M8-6.0	TS 30085/HG
	TCT-WR-ZN08	TCT-WL-ZN08			
	Wedge screw	Wrench	L-Wrench	Wedge Wrench	
WS 5	TD 9	L-W 3	F-W 2.5		

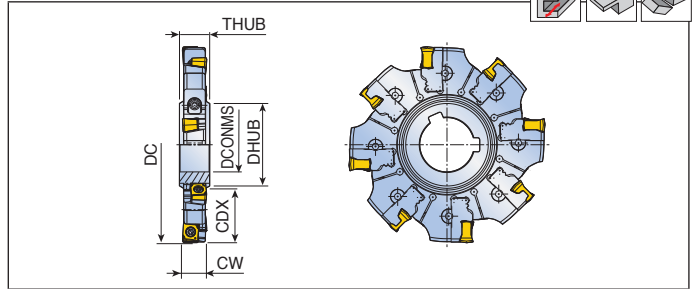
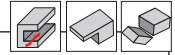
Cutting Condition  
E271-E273

Technical Data  
E281-E283

# TSM FD-S/W-ZN11



Slotting cutters: Adjustable disk type



Designation	CW (mm)		Dimension (mm)					Kg	Insert
			DC	DCONMS	DHUB	OAL	CDX		
<b>TSM 100FD-S-27N-ZN11</b>	14-17	3+3	100	27	41	18	28.0	0.6	ZNHU 110... E268
<b>125FD-S-40N-ZN11</b>	14-17	4+4	125	40	55	18	31.0	1.0	
<b>160FD-S-40N-ZN11</b>	14-17	6+6	160	40	55	18	48.5	1.6	
<b>200FD-S-50N-ZN11</b>	14-17	7+7	200	50	69	18	61.5	2.6	
<b>250FD-S-50N-ZN11</b>	14-17	9+9	250	50	69	18	86.5	4.2	
<b>100FD-W-27N-ZN11</b>	17-20	3+3	100	27	41	22	28.0	0.8	
<b>125FD-W-40N-ZN11</b>	17-20	4+4	125	40	55	22	31.0	1.2	
<b>160FD-W-40N-ZN11</b>	17-20	6+6	160	40	55	22	48.5	2.0	
<b>200FD-W-50N-ZN11</b>	17-20	7+7	200	50	69	22	61.5	3.2	
<b>250FD-W-50N-ZN11</b>	17-20	9+9	250	50	69	22	86.5	5.2	
<b>315FD-W-60N-ZN11</b>	17-20	12+12	315	60	85	22	110.0	8.5	

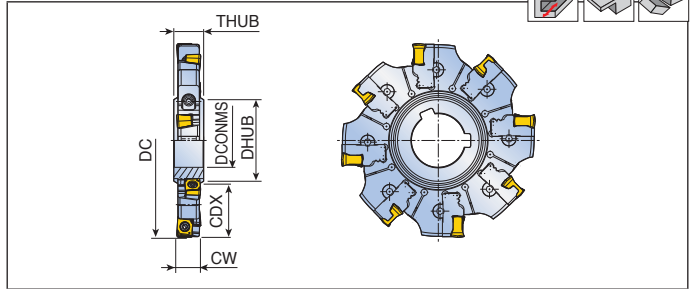
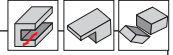
• Width of cut is set at the smallest unless a specific width is requested • Arbor: SCA

## Spare parts

Designation	Right cartridge	Left cartridge	Wedge	Adjust screw	Insert screw
<b>TSM...FD-S/W...-ZN11</b>					
	TCT-SR-ZN11 TCT-WR-ZN11	TCT-SL-ZN11 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	



Slotting cutters: Adjustable disk type



Designation	CW (mm)		Dimension (mm)					Kg	Insert
			DC	DCONMS	DHUB	OAL	CDX		
<b>TSM 125FD-S-40N-ZN14</b>	20-23	3+3	125	40	55	24.5	32.0	1.4	ZNHU 140... E268
<b>160FD-S-40N-ZN14</b>	20-23	5+5	160	40	55	24.5	49.0	2.4	
<b>200FD-S-50N-ZN14</b>	20-23	6+6	200	50	69	24.5	62.5	3.9	
<b>250FD-S-50N-ZN14</b>	20-23	8+8	250	50	69	24.5	87.0	6.3	
<b>315FD-S-60N-ZN14</b>	20-23	10+10	315	60	85	24.5	111.5	10.2	
<b>125FD-W-40N-ZN14</b>	23-26	3+3	125	40	55	27.5	32.0	1.6	
<b>160FD-W-40N-ZN14</b>	23-26	5+5	160	40	55	27.5	49.0	2.7	
<b>200FD-W-50N-ZN14</b>	23-26	6+6	200	50	69	27.5	62.5	4.3	
<b>250FD-W-50N-ZN14</b>	23-26	8+8	250	50	69	27.5	87.0	7.1	
<b>315FD-W-60N-ZN14</b>	23-26	10+10	315	60	85	27.5	111.5	11.6	

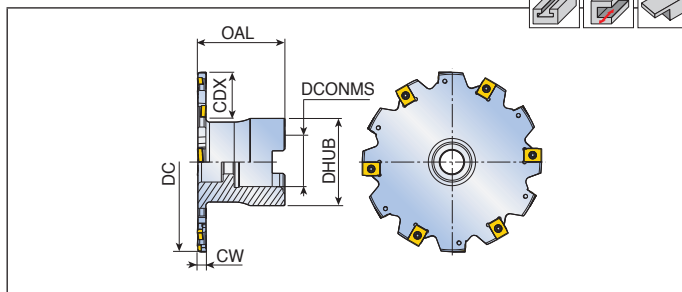
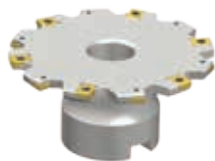
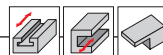
• Width of cut is set at the smallest unless a specific width is requested • Arbor: SCA

## 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	



## Slotting cutters: Fixed pocket flange type



Designation	CW (mm)		Dimension (mm)					Arbor style	Kg	Mounting 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	ZNHT 023...
<b>100FF-04-27R-Z023</b>	4	6+6	100	27	48	50	26.0	A	0.6	SH M12x35	
<b>080FF-05-22R-Z028</b>	5	5+5	80	22	40	50	20.0	A	0.5	SH M10x35	ZNHT 028...
<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...
<b>100FF-06-27R-Z033</b>	6	6+6	100	27	48	50	26.0	A	0.7	SH M12x35	E267
<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	-	
<b>080FF-07-22R-Z038</b>	7	4+4	80	22	40	50	20.0	A	0.5	SH M10x40	ZNHT 038...
<b>100FF-07-27R-Z038</b>	7	5+5	100	27	48	50	25.5	A	0.7	SH M12x35	E267
<b>125FF-07-40R-Z038</b>	7	6+6	125	40	70	50	24.5	B	1.1	-	
<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	ZNHT 043...
<b>100FF-08-27R-Z043</b>	8	5+5	100	27	48	50	25.5	A	0.8	SH M12x35	E267
<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 048...
<b>125FF-09-40R-Z048</b>	9	6+6	125	40	70	50	24.5	B	1.2	-	E267
<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...
<b>125FF-10-40R-Z053</b>	10	6+6	125	40	70	50	24.5	B	1.4	-	E267
<b>160FF-10-40R-Z053</b>	10	8+8	160	40	70	50	42.0	B	1.7	-	

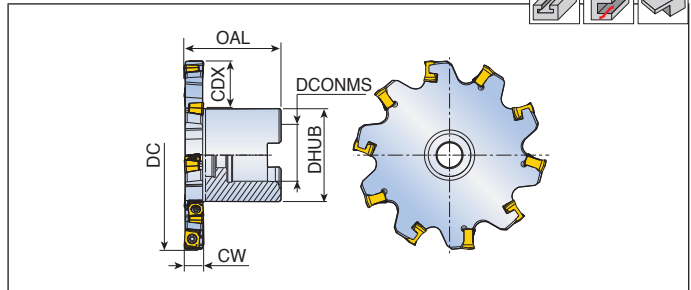
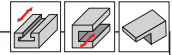
## Spare parts

Designation	Screw		Wrench		Designation	Screw		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 (mm)		Dimension (mm)					Arbor style	Kg	Mounting bolt	Insert
			DC	DCONMS	SDHUB	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... E268
<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	ZNHU 110... E268
<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	
<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		

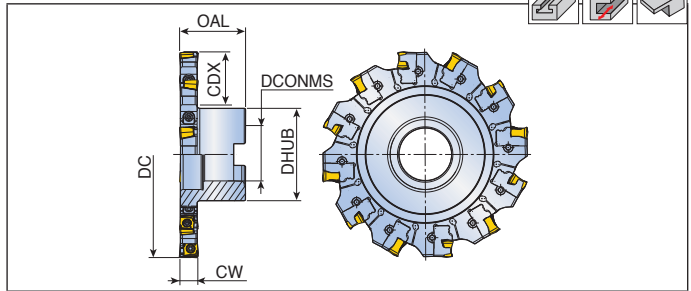
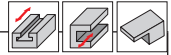




# TSM FF-S/W-ZN11



Slotting cutters: Adjustable flange type



Designation	CW (mm)		Dimension (mm)					Arbor style	Kg	Mounting bolt	Insert
			DC	DCONMS	DHUB	OAL	CDX				
<b>TSM 100FF-S-27R-ZN11</b>	14-17	3+3	100	27	48	50	25.0	A	0.9	SH M12x35	ZNHU 110... E268
<b>125FF-S-32R-ZN11</b>	14-17	4+4	125	32	58	50	31.5	B	1.3	-	
<b>160FF-S-40R-ZN11</b>	14-17	6+6	160	40	70	50	43.0	B	2.2	-	
<b>200FF-S-40R-ZN11</b>	14-17	7+7	200	40	90	50	53.0	C	3.9	-	
<b>250FF-S-60R-ZN11</b>	14-17	9+9	250	60	130	50	55.0	C	6.2	-	
<b>315FF-S-60R-ZN11</b>	14-17	12+12	315	60	130	50	90.0	C	8.9	-	
<b>100FF-W-27R-ZN11</b>	17-20	3+3	100	27	48	50	25.0	A	1.0	SH M12x35	
<b>125FF-W-32R-ZN11</b>	17-20	4+4	125	32	58	50	31.5	B	1.5	-	
<b>160FF-W-40R-ZN11</b>	17-20	6+6	160	40	70	50	43.0	B	2.2	-	
<b>200FF-W-40R-ZN11</b>	17-20	7+7	200	40	90	50	53.0	C	4.1	-	
<b>250FF-W-60R-ZN11</b>	17-20	9+9	250	60	130	50	55.0	C	6.9	-	
<b>315FF-W-60R-ZN11</b>	17-20	12+12	315	60	130	50	90.0	C	10.2	-	

• Width of cut is set at the smallest unless a specific width is requested

## Spare parts

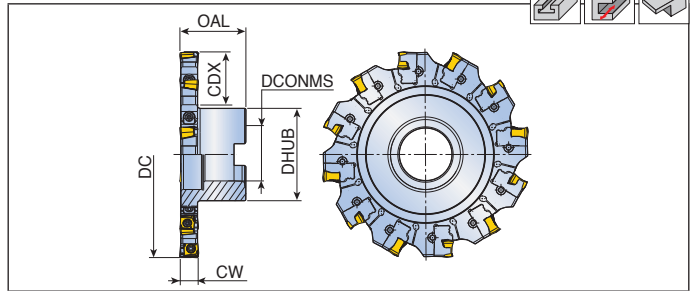
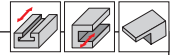
Designation	Right cartridge	Left cartridge	Wedge	Adjust screw	Insert screw
<b>TSM...FD-S/W...-ZN11</b>					
	TCT-SR-ZN11 TCT-WR-ZN11	TCT-SL-ZN11 TCT-WL-ZN11	WFZ 6	SA M8-9.0	TS 40120I/HG
	Wedge screw	Wrench	L-Wrench	Wedge Wrench	
	WS 6	T-T15	L-W 4	T-W 3	



# TSM FF-S/W-ZN14



Slotting cutters: Adjustable flange type



Designation	CW (mm)		Dimension (mm)					Arbor style	Kg	Insert
			DC	DCONMS	DHUB	OAL	CDX			
<b>TSM 125FF-S-32R-ZN14</b>	20-23	3+3	125	32	58	50	32.5	B	2.6	ZNHU 140... E268
<b>160FF-S-40R-ZN14</b>	20-23	5+5	160	40	70	50	43.0	B	2.8	
<b>200FF-S-40R-ZN14</b>	20-23	6+6	200	40	90	50	53.0	C	4.6	
<b>250FF-S-60R-ZN14</b>	20-23	8+8	250	60	130	50	58.0	C	7.2	
<b>315FF-S-60R-ZN14</b>	20-23	10+10	315	60	130	50	90.0	C	11.3	
<b>125FF-W-32R-ZN14</b>	23-26	3+3	125	32	58	50	32.5	B	1.8	
<b>160FF-W-40R-ZN14</b>	23-26	5+5	160	40	70	50	43.0	B	3.0	
<b>200FF-W-40R-ZN14</b>	23-26	6+6	200	40	90	50	53.0	C	5.0	
<b>250FF-W-60R-ZN14</b>	23-26	8+8	250	60	130	50	58.0	C	7.5	
<b>315FF-W-60R-ZN14</b>	23-26	10+10	315	60	130	50	90.0	C	12.2	

• Width of cut is set at the smallest unless a specific width is requested

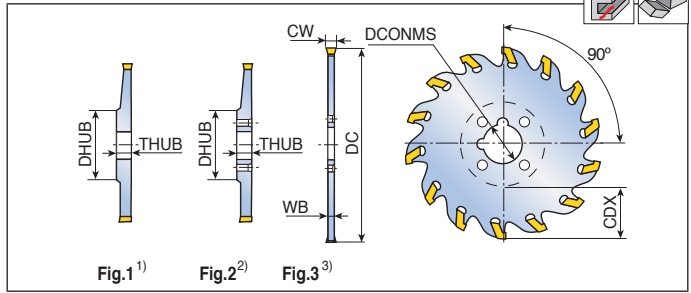
## Spare parts

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	



# TSC

## Slotting cutters



Designation	CW (mm)		Dimension (mm)						Fig.	Insert seat 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 TIMJ TIPV E259-E260
<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

## 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		



- Extractor(ESG 0.5 or ESG 1) supplied with each cutter
- Flange set and shank should be ordered separately

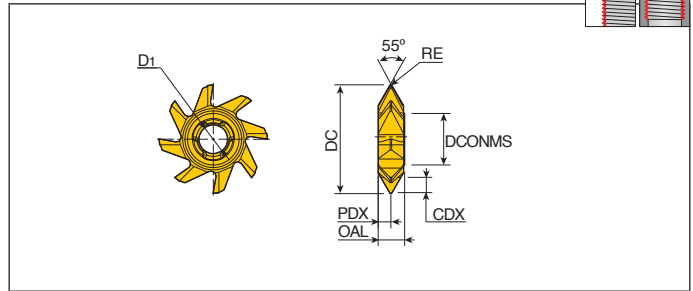
E271-E273 E284-E285





# TR-T-W55

## Interchangeable solid carbide threading heads - 55° partial profile



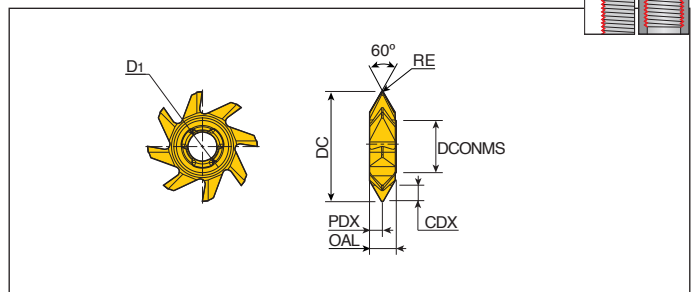
Designation	TPI	Dimension (mm)										Grade
		DC	DMIN	PDX	RE	D1	CDX	OAL	ZEFP	DCONMS	TT5525	
<b>TR13-T-24.7-W55-3T</b>	5-3	24.7	36	2.2	0.5	7.5	3.5	7.7	6	13	●	
<b>15-T-31.7-W55-4T</b>	6-4	31.7	46	3.7	0.5	8.4	4.7	7.7	8	15	●	
<b>17-T-39.7-W55-3T</b>	4-3	39.7	57	4.5	0.8	9.8	6.2	9.5	10	17	●	

- TPI: Threads per inch
- ZEFP: Peripheral effective cutting edge count

●: Standard items

# TR-T-M60

## Interchangeable solid carbide threading heads - 60° partial profile



Designation	TP (mm)	TPI	Dimension (mm)										Grade
			DC	DMIN	PDX	RE	D1	CDX	OAL	ZEFP	DCONMS	TT5525	
<b>TR13-T-24.7-M60-5P</b>	3-5	5-3	24.7	36	2.2	0.2	7.5	3.5	7.7	6	13	●	
<b>15-T-31.7-M60-6P</b>	4-6	6-4	31.7	46	3.7	0.3	8.4	4.7	7.7	8	15	●	
<b>17-T-39.7-M60-8P</b>	6-8	4-3	39.7	57	4.5	0.4	9.8	6.2	9.5	10	17	●	



- TP: Threads pitch, TPI: Threads per inch
- ZEFP: Peripheral effective cutting edge count

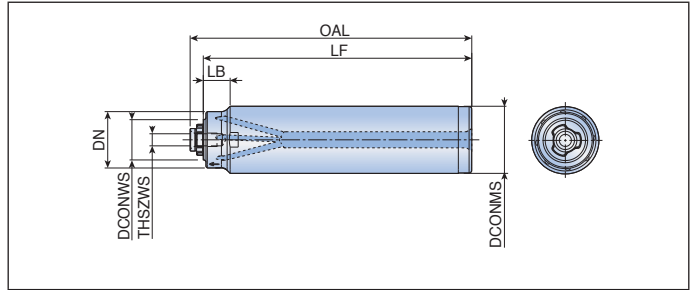
●: Standard items





# TR-F-C

## Facing holders



Designation	Dimension (mm)							Coolant hole	Carbide head
	DCONMS	DCONWS	LB	LF	OAL	THSZWS	DN		
<b>TR13-20-L100-F-C</b>	20	13	10	100	104.35	M4x0.5	16	●	TR-F..... E206
<b>13-25-L100-F-C</b>	25	13	12.5	100	104.35	M4x0.5	16	●	
<b>15-25-L100-F-C</b>	25	15	10	100	104.90	M5x0.5	21	●	
<b>15-32-L110-F-C</b>	32	15	13.5	110	114.90	M5x0.5	21	●	
<b>17-32-L140-F-C</b>	32	17	10	140	146.00	M6x0.5	28	●	
<b>17-42-L140-F-C</b>	42	17	15	140	146.00	M6x0.5	28	●	

## 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>	TS 60T130/HG-P	BLD IP20/S7	SW6-T		



# Milling Inserts



# Insert Designation System



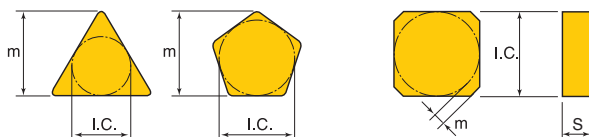
## 1 Shape

											<b>Special</b>
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	±0.130	±0.130	±0.05	•	•				
			±0.08			•			
			±0.10				•	•	
			±0.13						•

## 4 Chipformer and clamp type

								<b>Special</b>
A	F	G	M	N	R	T	W	X

# Insert Designation System



## 5 Cutting edge length(mm)

I.C(mm)	C	R,S	T	H	O
5.56			09		
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			

## 6 Thickness(mm)

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

## 7 Corner radius(mm)

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

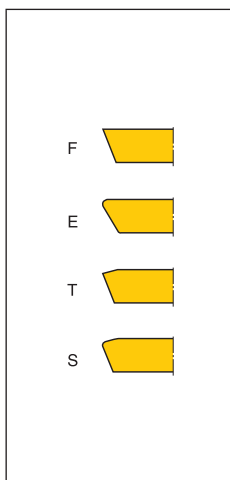
A=45° D=60°  
E=75° F=85°  
P=90° Z=Special

Entering angle

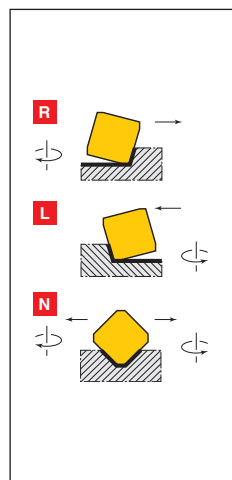
B= 5° F=25°  
C= 7° G=30°  
D=15° N= 0°  
E=20° P=11°  
Z=Special

Clearance angle of wiper

## 8 Edge condition



## 9 Hand of tool



## 10 Manufacturer's option

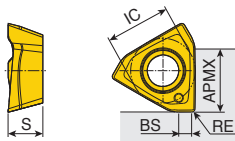
AL	Aluminum
WC	Wiper crown
MR	Medium rough
M	Medium
L	Light
ML	Medium light
E□□	Economical



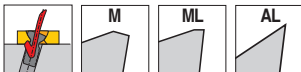




## Inserts



Size	Dimension (mm)					
	IC	S	APMX	BS	RE	
<b>04</b>	3.9	2.1	3.5	0.5-0.7	0.2-0.4	
<b>06</b>	5.3	2.8	4.7	0.6-1.2	0.2-0.8	
<b>10</b>	6.9	4.0	7.0	0.5-1.3	0.4-1.6	
<b>15</b>	10.7	5.0	11.0	0.5-2.0	0.4-2.4	
<b>19</b>	13.5	6.0	15.0	0.5-2.0	0.4-3.2	



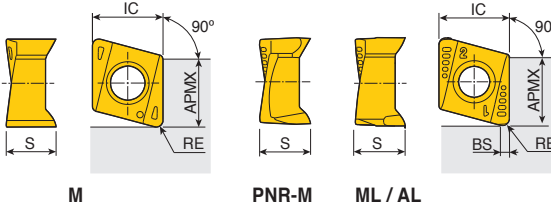
Insert	Designation	Recommended machining conditions		Material												
		ap (mm)	Feed (mm/tooth)	Cermet		Coated						Uncoated				
				CT7000	TT9080	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510	K10			
	<b>3PKT 040202R-M</b>	0.5-3.0	0.08-0.04		●	●										
	<b>040204R-M</b>	0.5-3.0	0.08-0.04		●	●										
	<b>060302R-M</b>	1.0-4.0	0.10-0.04		●	●	●							●		
	<b>060304R-M</b>	1.0-4.0	0.10-0.04		●	●	●							●		
	<b>060308R-M</b>	1.0-4.0	0.10-0.04		●	●	●							●		
	<b>100404R-M</b>	2.0-6.0	0.12-0.05		●	●	●			●	●	●	●			
	<b>100408R-M</b>	2.0-6.0	0.12-0.05		●	●	●			●	●	●	●			
	<b>100416R-M</b>	2.0-6.0	0.12-0.05		●									●		
	<b>150508R-M</b>	3.0-9.0	0.17-0.07		●	●	●	●	●	●	●	●	●			
	<b>150516R-M</b>	3.0-9.0	0.17-0.07		●				●					●		
	<b>150524R-M</b>	3.0-12.0	0.17-0.07		●									●		
	<b>190608R-M</b>	4.5-12.0	0.22-0.09		●	●	●	●	●	●	●	●	●			
	<b>190616R-M</b>	4.5-12.0	0.22-0.09		●	●	●		●					●		
	<b>190624R-M</b>	4.5-12.0	0.22-0.09		●									●		
<b>190632R-M</b>	4.5-12.0	0.22-0.09		●									●			
	<b>3PHT 100404R-M</b>	2.0-6.0	0.12-0.05	●	●											
	<b>100408R-M</b>	2.0-6.0	0.12-0.05	●	●											
	<b>150504R-M</b>	3.0-9.0	0.17-0.07		●											
	<b>150508R-M</b>	3.0-9.0	0.17-0.07	●	●											
	<b>150516R-M</b>	3.0-9.0	0.17-0.07	●	●											
	<b>190608R-M</b>	4.5-12.0	0.22-0.09	●	●											
	<b>3PKT 100404R-ML</b>	2.0-6.0	0.10-0.04		●	●	●						●			
	<b>100408R-ML</b>	2.0-6.0	0.10-0.04		●	●	●									
	<b>150508R-ML</b>	3.0-9.0	0.12-0.05		●	●	●						●			
	<b>190608R-ML</b>	4.5-12.0	0.14-0.06		●	●	●						●			
	<b>3PHT 100408R-ML</b>	2.0-6.0	0.10-0.04		●	●										
	<b>150508R-ML</b>	3.0-9.0	0.12-0.05		●	●										
	<b>3PHT 060304R-AL</b>	1.0-4.0	0.22-0.07												●	
	<b>100404R-AL</b>	2.0-6.0	0.40-0.10												●	
	<b>100408R-AL</b>	2.0-6.0	0.40-0.10												●	
	<b>150504R-AL</b>	3.0-9.0	0.50-0.10												●	
	<b>150508R-AL</b>	3.0-9.0	0.50-0.10												●	
	<b>190604R-AL</b>	4.5-12.0	0.50-0.15												●	
<b>190608R-AL</b>	4.5-12.0	0.50-0.15												●		

● : Standard items





## Inserts



Size	Dimension (mm)				
	IC	S	APMX	BS	RE
<b>04</b>	4.0	3.1	3.5	-	0.2-0.8
<b>06</b>	6.6	4.2-5.0	5.8-6.2	0.6-1.0	0.4-2.0
<b>09</b>	8.6	5.7-6.3	8.0	0.8-1.2	0.4-1.6
<b>11</b>	10.7	8.1	9.9-10.5	1.0	0.8
<b>14</b>	14.0	9.2-9.4	13.5-13.8	1.25	0.8

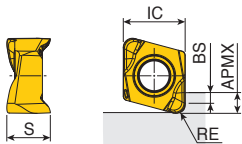


Insert	Designation	Recommended machining conditions		Coated							Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510	K10	
	<b>4NKT 040202R-M</b>	0.5-3.0	0.08-0.04	●	●								
	<b>040204R-M</b>	1.0-3.0	0.12-0.06	●	●				●				
	<b>040208R-M</b>	1.0-3.0	0.12-0.06	●	●								
	<b>060304R-M</b>	0.5-5.0	0.15-0.07	●	●				●				
	<b>060308R-M</b>	1.0-5.0	0.15-0.07	●	●				●	●			
	<b>060312R-M</b>	1.0-5.0	0.15-0.07	●	●								
	<b>060316R-M</b>	2.0-4.5	0.15-0.07	●	●				●	●	●		
	<b>060320R-M</b>	2.0-4.5	0.15-0.07	●	●					●			
	<b>090408R-M</b>	2.5-7.0	0.15-0.07	●	●				●	●	●		
	<b>090416R-M</b>	2.5-7.0	0.15-0.07	●	●					●			
	<b>110608R-M</b>	3.5-10.0	0.18-0.09	●	●					●			
	<b>110616R-M</b>	2.5-9.5	0.18-0.09	●									
<b>110624R-M</b>	2.5-9.5	0.18-0.09	●										
<b>140708R-M</b>	4.0-12.0	0.18-0.09	●	●		●	●		●				
	<b>4NKT 110608 PNR-M</b>	3.5-10.0	0.18-0.09	●	●		●						
	<b>140708 PNR-M</b>	4.0-12.0	0.18-0.09	●	●		●						
	<b>4NKT 060304R-ML</b>	0.5-5.0	0.10-0.05	●	●					●			
	<b>060308R-ML</b>	1.0-5.0	0.10-0.05	●	●				●	●			
	<b>060312R-ML</b>	1.0-5.0	0.10-0.05	●	●					●			
	<b>060316R-ML</b>	2.0-4.5	0.10-0.05	●	●				●	●			
	<b>060320R-ML</b>	2.0-4.5	0.12-0.05	●	●					●			
	<b>4NHT 060304R-ML</b>	0.5-5.0	0.13-0.05	●									
	<b>060308R-ML</b>	1.0-5.0	0.13-0.05	●	●								
	<b>090404R-ML</b>	2.5-7.0	0.10-0.04	●									
	<b>090408R-ML</b>	2.5-7.0	0.10-0.04	●	●								
	<b>4NHT 060304R-AL</b>	1.0-5.0	0.40-0.10									●	
	<b>060308R-AL</b>	1.0-5.0	0.40-0.10									●	
	<b>090404R-AL</b>	2.5-7.0	0.50-0.10									●	
	<b>090408R-AL</b>	2.5-7.0	0.50-0.10									●	
	<b>110608R-AL</b>	3.5-10.0	0.50-0.10									●	
	<b>140708R-AL</b>	4.0-12.0	0.50-0.10									●	

● : Standard items



## Inserts



Size	Dimension (mm)					
	IC	S	APMX	BS	RE	
<b>05R</b>	6.6	4.9	2.3	1.8	0.5	
<b>10R</b>	6.6	4.7	2.1	1.1	1.0	
<b>15R</b>	6.6	4.5	3.3	1.8	1.5	
<b>20R</b>	6.6	4.3	3.0	1.1	2.0	



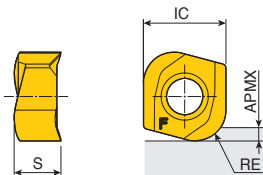
Insert	Designation	Recommended machining conditions		Coated						Uncoated			
		ap (mm)	Feed (mm/tooth)	TT9080	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510		K10
	<b>4NHT 060305R-F</b>	0.2-2.0	1.15-0.07	●									
	<b>060310R-F</b>	0.2-1.8	1.15-0.07	●						●			
	<b>060315R-F</b>	0.2-3.0	1.15-0.07	●						●			
	<b>060320R-F</b>	0.2-2.7	1.15-0.07	●						●			



● : Standard items

# 4NKT-HF

## High feed inserts



Size	Dimension (mm)				
	IC	S	APMX	RE	
<b>04-HF</b>	4.0	2.65	0.5	1.2	
<b>06-HF</b>	6.6	3.85	1.0	2.0	
<b>09-HF</b>	8.6	4.76	1.5	3.2	
<b>11-HF</b>	10.7	6.56	2.0	4.0	
<b>14-HF</b>	14.0	7.34	3.0	5.0	

Insert	Designation	Recommended machining conditions		Coated						Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT8080	TT8525B	TT7515	TT7080	TT6080	TT2510		K10
	<b>4NKT 040212R-HF</b>	0.2-0.4	0.60-0.10	●								
	<b>060320R-HF</b>	0.2-0.6	0.80-0.20	●	●	●				●		
	<b>090432R-HF</b>	0.3-0.8	1.00-0.20	●								
	<b>110640R-HF</b>	0.3-1.2	1.20-0.30	●								
	<b>140750R-HF</b>	0.3-1.5	1.50-0.30	●		●						

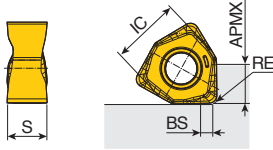


● : Standard items





## Inserts



Size	Dimension (mm)					
	IC	S	APMX	BS	RE	
<b>04</b>	7	3.9	4.1	0.85-1.25	0.4-0.8	



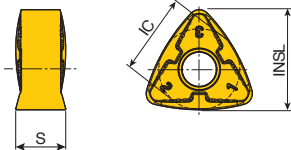
Insert	Designation	Recommended machining conditions		Coated							Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510		K10
	<b>6NKU 040304R-M</b>	1.0-3.0	0.10-0.05	●	●					●	●		
	<b>040308R-M</b>	1.0-3.0	0.10-0.05	●	●					●	●		



● : Standard items

# 6RBE

## Inserts



Size	Dimension (mm)					
	IC	S	INSL			
<b>6RBE 50</b>	13	8	16			

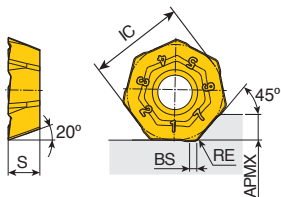


Insert	Designation	Recommended machining conditions		Coated							Uncoated			
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510		K10
	<b>6RBE 50-M</b>	1.0-5.0	0.80-0.10	●		●	●	●			●	●		



● : Standard items

## Inserts



Size	Dimension (mm)					
	IC	S	APMX	BS	RE	
<b>06</b>	12.8	4.2	3.2	1.0	0.8	



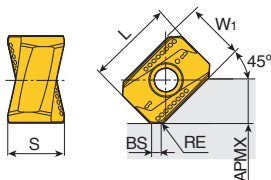
Insert	Designation	Recommended machining conditions		Coated							Uncoated	
		ap (mm)	Feed (mm/tooth)	TT9080	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510	K10
	<b>7EMT 0604 AETR-M</b>	1.0-2.5	0.15-0.06	●	●			●		●		
	<b>7EMT 0604 AETR-ML</b>	1.0-2.5	0.15-0.06	●	●					●		



●: Standard items

# ANHX 1607 ANR-M

## Inserts



Size	Dimension (mm)					
	L	W1	S	APMX	BS	RE
<b>16</b>	16	11	10.4	8.4	1.6	1.0



Insert	Designation	Recommended machining conditions		Coated							Uncoated	
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10
	<b>ANHX 1607 ANR-M</b>	2.5-7.0	0.30-0.15	●		●		●	●	●		

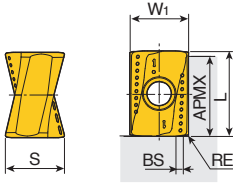


● Use only for 45° cutter

●: Standard items



## Inserts



Size	Dimension (mm)					
	L	W1	S	APMX	BS	RE
<b>11</b>	12	9.2	8.5	11	0.7-1.5	0.4-1.6
<b>16</b>	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	TT8525B	TT7080	TT7515	TT6080	TT2510	K10
	<b>ANMX 110608R-M</b>	3.0-9.0	0.20-0.10	●		●							
	<b>160708R-M</b>	4.5-12.0	0.20-0.10	●		●							
	<b>ANHX 110604R-M</b>	3.0-9.0	0.15-0.08	●		●				●	●		
	<b>110608R-M</b>	3.0-9.0	0.15-0.08	●		●	●	●	●	●	●		
	<b>110616R-M</b>	3.0-9.0	0.15-0.08	●		●							
	<b>160704R-M</b>	4.5-12.0	0.20-0.10	●	●				●	●	●	●	
	<b>160708R-M</b>	4.5-12.0	0.20-0.10	●	●	●	●	●	●	●	●	●	
	<b>160716R-M</b>	4.5-12.0	0.20-0.10	●		●			●	●	●		
	<b>160724R-M</b>	4.5-12.0	0.20-0.10	●		●		●	●	●	●		
	<b>ANHX 160708R-ML</b>	4.5-12.0	0.12-0.06			●	●	●					
	<b>ANHX 160708R-MR</b>	4.5-12.0	0.25-0.13			●		●					
	<b>ANHX 110604R-AL</b>	3.0-9.0	0.40-0.10										●
	<b>110608R-AL</b>	3.0-9.0	0.40-0.10										●
	<b>160704R-AL</b>	4.5-12.0	0.40-0.10										●
	<b>160708R-AL</b>	4.5-12.0	0.40-0.10										●
	<b>ANHX 110608R-SM</b>	3.0-9.0	0.15-0.08	●		●		●		●			
	<b>160708R-SM</b>	4.5-12.0	0.20-0.10	●		●		●	●	●			
	<b>ANHX 110608R-SML</b>	3.0-9.5	0.15-0.06	●		●							
	<b>160708R-SML</b>	4.5-13.5	0.20-0.06	●		●				●			

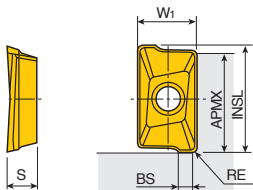


● : Standard items

# APK(C)T 09



## Inserts



Size	Dimension (mm)					
	INSL	W1	S	APMX	BS	RE
<b>09</b>	9.7-10.6	6.20	3.8	8.8	0.5-1.79	0.4-3.2
<b>09T3 PER</b>	9.8-9.9	6.20	3.8	8.8	0-1.14	0.4



Insert	Designation	Recommended machining conditions		Material										
		ap (mm)	Feed (mm/tooth)	Cermert		Coated								Uncoated
				CT7000	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510	K10
	<b>APKT 09T3 PER-EM</b>	2.5-7.5	0.10-0.05	●	●	●	●	●	●	●		●	●	●
	<b>09T305R-EM</b>	2.5-7.5	0.10-0.05					●						
	<b>09T308R-EM</b>	2.5-7.5	0.10-0.05		●	●	●	●		●		●	●	
	<b>09T316R-EM</b>	2.5-7.5	0.10-0.05		●	●	●	●		●		●	●	
	<b>09T320R-EM</b>	2.5-7.5	0.10-0.05		●		●			●			●	
	<b>09T332R-EM</b>	2.5-7.5	0.10-0.05		●		●						●	
	<b>09T3 PER-M</b>	2.5-7.5	0.10-0.05					●		●		●	●	
	<b>APCT 09T3 PER-ML</b>	3.0-7.5	0.10-0.05		●		●	●		●		●		
	<b>APCT 09T3 PER-AL</b>	2.5-7.5	0.35-0.05											●

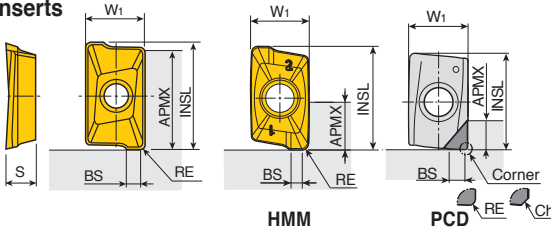
●: Standard items



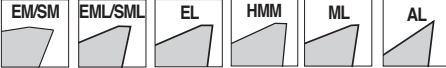
# APK(C)T 12



## 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	0.4-4.0
<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)



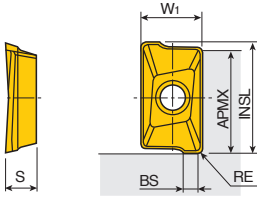
Insert	Designation	Recommended machining conditions		PCD	Coated								Uncoated	
		ap (mm)	Feed (mm/tooth)		TD830	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510
	<b>APKT 1204 PER-EM</b>	3.5-10.0	0.14-0.07		●	●	●	●	●	●	●	●	●	
	<b>120404R-EM</b>	3.5-10.0	0.14-0.07			●		●			●	●		
	<b>120416R-EM</b>	3.5-10.0	0.14-0.07		●	●	●	●	●			●	●	
	<b>120424R-EM</b>	3.5-10.0	0.14-0.07			●	●	●					●	
	<b>120430R-EM</b>	3.5-10.0	0.14-0.07		●	●	●	●	●			●	●	
	<b>120432R-EM</b>	3.5-10.0	0.14-0.07			●		●				●	●	
	<b>120440R-EM</b>	3.5-10.0	0.14-0.07		●		●						●	
	<b>APKT 1204 PER-SM</b>	3.5-10.0	0.14-0.07		●		●		●		●			
	<b>APKT 1204 PER-SML</b>	3.5-10.5	0.14-0.06		●		●							
	<b>APKT 1204 PER-EML</b>	3.5-10.0	0.08-0.04		●		●							
	<b>APKT 1204 PER-EL</b>	3.5-10.0	0.05-0.03		●	●	●	●						
	<b>APKT 1204 PER-HMM</b>	3.5-6.5	0.12-0.05		●									
	<b>APCT 120430R-ML</b>	3.5-10.0	0.08-0.04		●		●							
	<b>120432R-ML</b>	3.5-10.0	0.08-0.04		●		●							
	<b>120440R-ML</b>	3.5-9.5	0.08-0.04		●		●							
	<b>APCT 1204 PER-AL</b>	3.5-10.0	0.50-0.10											●
	<b>120404R-AL</b>	3.5-10.0	0.50-0.10											●
	<b>120416R-AL</b>	3.5-10.0	0.50-0.10											●
	<b>APCT 120404R-PCD35</b>	0.2-3.0	0.30-0.05	●										
	<b>1204C025-PCD35</b>	0.2-3.0	0.30-0.05	●										



● : Standard items



## Inserts



Size	Dimension (mm)					
	INSL	W1	S	APMX	BS	RE
<b>17</b>	16.8-18.5	10.7	5.56	15-16	0.9-3.17	0.4-6.4
<b>17 PER</b>	18.5-18.9	10.7	5.56-6.5	16	0.9-3.17	0.8



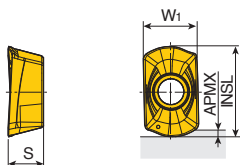
Insert	Designation	Recommended machining conditions		Coated								Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510	K10	
	<b>APKT 1705 PER-EM</b>	4.5-13.0	0.18-0.09	●	●	●	●	●	●	●	●	●	●	
	<b>170504R-EM</b>	4.5-13.0	0.18-0.09	●		●	●		●	●	●			
	<b>170510R-EM</b>	4.5-13.0	0.17-0.09	●	●	●		●	●	●	●			
	<b>170516R-EM</b>	4.5-13.0	0.17-0.09	●	●	●	●	●		●	●			
	<b>170524R-EM</b>	4.5-13.0	0.17-0.09	●	●	●	●	●		●	●			
	<b>170530R-EM</b>	4.5-13.0	0.17-0.09	●	●	●	●	●			●			
	<b>170532R-EM</b>	4.5-13.0	0.17-0.09	●	●	●	●	●		●	●			
	<b>170535R-EM</b>	4.5-13.0	0.17-0.09	●	●					●	●			
	<b>170540R-EM</b>	4.5-13.0	0.20-0.10	●	●		●				●			
	<b>170548R-EM</b>	4.5-13.0	0.17-0.09	●	●	●	●	●	●	●	●			
	<b>170550R-EM</b>	4.5-13.0	0.20-0.10		●		●				●			
<b>170564R-EM</b>	4.5-13.0	0.18-0.09	●	●	●	●	●		●	●				
	<b>APKT 1705 PER-M</b>	4.5-13.0	0.18-0.09				●		●	●	●	●		
	<b>170516R-M</b>	4.5-13.0	0.30-0.15				●							
	<b>170532R-M</b>	4.5-13.0	0.20-0.10				●		●	●	●			
	<b>170548R-M</b>	4.5-13.0	0.20-0.10				●							
	<b>APKT 1705 PER-SM</b>	4.5-13.0	0.17-0.09	●		●		●		●				
	<b>APKT 1705 PER-SML</b>	4.5-14.5	0.17-0.06	●		●								
	<b>APKT 1705 PER-EML</b>	4.5-13.0	0.14-0.07	●		●		●						
	<b>APKT 1705 PER-EL</b>	4.5-13.0	0.10-0.05	●	●	●	●	●						

● : Standard items





## High feed inserts



Size	Dimension (mm)				
	INSL	W1	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	

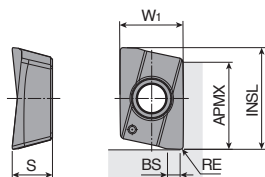
Insert	Designation	Recommended machining conditions		Coated							Uncoated			
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510	K10	
	<b>AXMT 0602R-HF</b>	0.2-0.5	0.70-0.30	●		●						●		
	<b>APKT 09T3R-HF</b>	0.1-1.0	0.80-0.30	●		●						●		
	<b>1204R-HF</b>	0.2-1.0	0.80-0.10	●		●						●		



● : Standard items

# AXCT 06-L

## Inserts



Size	Dimension (mm)					
	INSL	W1	S	APMX	BS	RE
<b>06</b>	6.5	4.2	2.6	5.5	0.6-1.0	0-0.4



Insert	Designation	Recommended machining conditions		Coated							Uncoated			
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT5525	K10	
	<b>AXCT 060200R-L</b>	0.1-5.0	0.08-0.03									●		
	<b>060202R-L</b>	0.2-5.0	0.10-0.03									●		
	<b>060204R-L</b>	0.3-5.0	0.10-0.03									●		



● : Standard items



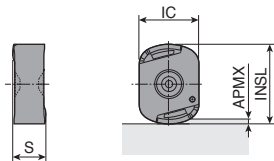






# BNGX 09

## High feed inserts



Size	Dimension (mm)					
	INSL	IC	S	APMX		
<b>09</b>	12	9	5	1.5		

Insert	Designation	Recommended machining conditions		Coated								Uncoated			
		ap (mm)	Feed (mm/tooth)	TC3030	TC3020	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10	
	<b>BNGX 0904 CH-E04</b>	0.5-1.0	0.35-0.15	●											

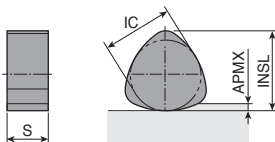


● E04: Honing 0.04-0.05mm

●: Standard items

# BNGX 12

## High feed inserts



Size	Dimension (mm)					
	INSL	IC	S	APMX		
<b>12</b>	13.6	12	7	2.5		

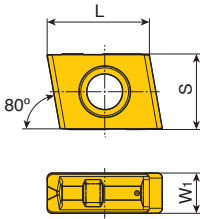
Insert	Designation	Recommended machining conditions		Coated								Uncoated			
		ap (mm)	Feed (mm/tooth)	TC3030	TC3020	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10	
	<b>BNGX 1207-E04</b>	1.0-2.0	0.35-0.15	●											



● E04: Honing 0.04-0.05mm

●: Standard items

## Inserts



Size	Dimension (mm)			
	L	S	W <sub>1</sub>	
<b>131108T</b>	12.7	11	5.4	
<b>160608T</b>	16.0	12	6.4	

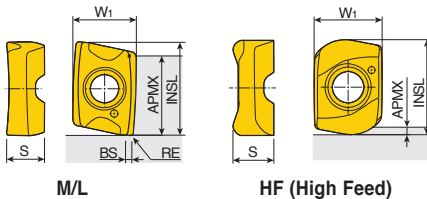
Insert	Designation	Recommended machining conditions		Coated							Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10	
	<b>CNHX 131108T</b>	1.2-5.5	0.55-0.17					●					
	<b>160608T</b>	1.2-5.5	0.60-0.20					●					



●: Standard items

## CVK(H)T

## Inserts



Size	Dimension (mm)					
	INSL	W <sub>1</sub>	S	APMX	BS	RE
<b>05-M</b>	6.3	4.2	2.6	5.0	0.35	0.2
<b>05-L</b>	6.3	4.1	2.6	5.0	0.30	0.2
<b>05-HF</b>	5.6	4.1	2.5	0.5	-	-



Insert	Designation	Recommended machining conditions		Coated								Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT5525	TT2510	K10
	<b>CVKT 0502PNR-M</b>	0.5-4.0	0.08-0.04	●		●								
	<b>CVHT 0502PNR-L</b>	0.5-4.0	0.07-0.03	●		●					●			
	<b>CVKT 0502R-HF</b>	0.2-0.4	0.70-0.30	●		●						●		

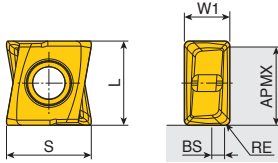


●: Standard items

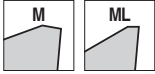




## Inserts



Size	Dimension (mm)					
	L	W1	S	APMX	BS	RE
<b>05</b>	5	2.7	5.0	4.6	-	0.4
<b>09</b>	9	4.5	8.6	8.3	0.6	0.4-0.8
<b>14</b>	13.5	6.7	13.5	12.5	0.9	0.8

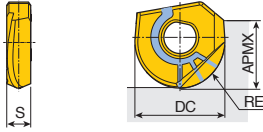


Insert	Designation	Recommended machining conditions		Coated							Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10	
	<b>LPKU 050204 PNR-M</b>	1.0-3.5	0.08-0.04	●		●							
	<b>090404 PNR-M</b>	2.5-6.0	0.15-0.06	●		●		●					
	<b>090408 PNR-M</b>	2.5-6.0	0.15-0.06	●		●				●			
	<b>140708 PNR-M</b>	3.5-10.0	0.20-0.10	●		●		●			●		
	<b>LPHU 050204 PNR-ML</b>	1.0-3.5	0.08-0.04				●				●		
	<b>LPHU 090404 PNR-M</b>	2.5-6.0	0.15-0.06				●					●	

●: Standard items



## Inserts



Size	Dimension (mm)				
	DC	S	APMX	RE	
<b>060</b>	6	2.0	4.5-4.8	3.0	
<b>080</b>	8	2.2	6.6-6.9	4.0	
<b>100</b>	10	2.7	8.0-8.2	5.0	
<b>120</b>	12	3.2	9.6-9.7	6.0	
<b>160</b>	16	4.2	12.3-12.7	8.0	
<b>200</b>	20	5.2	14.4-14.7	10.0	
<b>250</b>	25	6.2	16.8-17.4	12.5	
<b>300</b>	30	7.2	18.6-19.2	15.0	
<b>320</b>	32	7.2	18.4-19.2	16.0	

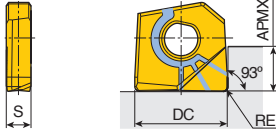
Insert	Designation	Recommended machining conditions		Coated							Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT8080	TT8525B	TT7080	TT7515	TT6080	TT5525	TT5515	TT2510	K10
 Straight cutting edge	<b>NFB 060-FM</b>	0.05-0.2	0.15-0.05										
	<b>080-FM</b>	0.05-0.3	0.20-0.05							●			
	<b>100-FM</b>	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							●	●		
 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



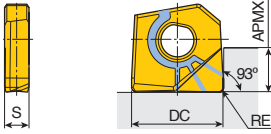
Size	Dimension (mm)				
	DC	S	APMX	RE	
<b>060</b>	6	2.0	2.5	0.3-1.0	
<b>080</b>	8	2.2	3.4	0.3-1.0	
<b>100</b>	10	2.7	4.0	0.3-2.0	
<b>110</b>	11	2.7	4.4	0.3-2.0	
<b>120</b>	12	3.2	5.0	0.3-2.0	
<b>130</b>	13	3.2	5.4	0.3-2.0	
<b>160</b>	16	4.2	6.9	0.3-3.0	
<b>170</b>	17	4.2	7.4	1.0-2.0	

Insert	Designation	Recommended machining conditions		Coated							Uncoated			
		ap (mm)	Feed (mm/tooth)	TT9080	TT8080	TT8525B	TT7080	TT7515	TT6080	TT5525	TT5515	TT2510	K10	
	<b>NFR 060A-R03</b>	0.05-0.15	0.10-0.05								●			
	<b>060A-R05</b>	0.10-0.15	0.10-0.05								●			
	<b>060A-R10</b>	0.10-0.15	0.10-0.05								●			
	<b>080A-R03</b>	0.05-0.2	0.12-0.05							●	●	●		
	<b>080A-R05</b>	0.05-0.2	0.12-0.05							●	●	●		
	<b>080A-R06</b>	0.05-0.2	0.12-0.05							●	●	●		
	<b>080A-R10</b>	0.05-0.2	0.12-0.05							●	●	●		
	<b>100A-R03</b>	0.05-0.3	0.12-0.05							●	●	●		
	<b>100A-R05</b>	0.05-0.3	0.12-0.05							●	●	●		
	<b>100A-R08</b>	0.05-0.3	0.12-0.05							●	●	●		
	<b>100A-R10</b>	0.05-0.3	0.12-0.05							●	●	●		
	<b>100A-R15</b>	0.05-0.3	0.12-0.05							●	●	●		
	<b>100A-R20</b>	0.05-0.3	0.12-0.05								●	●		
	<b>110A-R10</b>	0.05-0.3	0.12-0.05							●	●	●		
	<b>110A-R20</b>	0.05-0.3	0.12-0.05							●	●	●		
	<b>120A-R03</b>	0.07-0.3	0.15-0.08							●	●	●		
	<b>120A-R05</b>	0.07-0.3	0.15-0.08							●	●	●		
	<b>120A-R10</b>	0.07-0.3	0.15-0.08							●	●	●		
	<b>120A-R15</b>	0.07-0.3	0.15-0.08							●	●	●		
	<b>120A-R20</b>	0.07-0.3	0.15-0.08							●	●	●		
	<b>130A-R10</b>	0.07-0.3	0.15-0.08							●	●	●		
	<b>130A-R20</b>	0.07-0.3	0.15-0.08							●	●	●		
	<b>160A-R03</b>	0.08-0.5	0.15-0.08							●	●	●		
	<b>160A-R05</b>	0.08-0.5	0.15-0.08							●	●	●		
	<b>160A-R10</b>	0.08-0.5	0.15-0.08							●	●	●		
	<b>160A-R13</b>	0.08-0.5	0.15-0.08								●	●		
	<b>160A-R15</b>	0.08-0.5	0.15-0.08							●	●	●		
	<b>160A-R20</b>	0.08-0.5	0.15-0.08							●	●	●		
<b>160A-R30</b>	0.08-0.5	0.15-0.08							●	●	●			
<b>170A-R10</b>	0.08-0.5	0.15-0.08								●	●			
<b>170A-R20</b>	0.08-0.5	0.15-0.08								●				

● : Standard items



## Inserts



Size	Dimension (mm)				
	DC	S	APMX	RE	
<b>200</b>	20	5.2	8.7-9.2	0.3-3.0	
<b>210</b>	21	5.2	9.2	1.0-2.0	
<b>250</b>	25	6.2	10.6	0.3-3.0	
<b>260</b>	26	6.2	11	1.0-2.0	
<b>300</b>	30	7.1	12.7	1.0-2.0	
<b>320</b>	32	7.1	13.6	1.0-2.0	

Insert	Designation	Recommended machining conditions		Coated							Uncoated			
		ap (mm)	Feed (mm/tooth)	TT9080	TT8080	TT8525B	TT7080	TT7515	TT6080	TT5525	TT5515	TT2510	K10	
	<b>NFR 200A-R03</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>200A-R05</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>200A-R10</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>200A-R15</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>200A-R16</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>200A-R20</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>200A-R30</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>210A-R10</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>210A-R20</b>	0.1-0.7	0.15-0.08							●	●	●		
	<b>250A-R03</b>	0.1-1.0	0.15-0.08							●	●	●		
	<b>250A-R05</b>	0.1-1.0	0.15-0.08							●	●	●		
	<b>250A-R10</b>	0.1-1.0	0.15-0.08							●	●	●		
	<b>250A-R15</b>	0.1-1.0	0.15-0.08							●	●	●		
	<b>250A-R20</b>	0.1-1.0	0.15-0.08							●	●	●		
	<b>250A-R30</b>	0.1-1.0	0.15-0.08							●	●	●		
	<b>260A-R10</b>	0.1-1.0	0.15-0.08							●	●	●		
	<b>260A-R20</b>	0.1-1.0	0.15-0.08							●	●	●		
	<b>300A-R05</b>	0.1-1.0	0.20-0.08							●	●	●		
	<b>300A-R10</b>	0.1-1.0	0.20-0.08								●	●		
	<b>300A-R20</b>	0.1-1.0	0.20-0.08								●	●		
<b>320A-R10</b>	0.1-1.0	0.20-0.08							●	●	●			
<b>320A-R20</b>	0.1-1.0	0.20-0.08								●	●			

●: Standard items

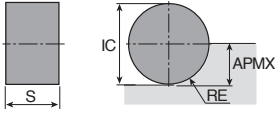




# RNGN 12-FL



## Inserts



Size	Dimension (mm)				
	RE	IC	S	APMX	
<b>12</b>	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	TT8525B	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	●	●									

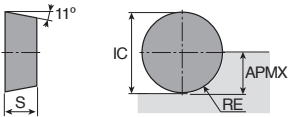


● : Standard items

# RPGN 09/12-FL



## Inserts



Size	Dimension (mm)				
	RE	IC	S	APMX	
<b>09</b>	4.76	9.52	3.18	4.7	
<b>12</b>	6.35	12.7	4.76	6.3	

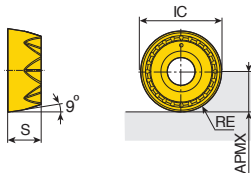
Insert	Designation	Recommended machining conditions		Ceramic		Coated						Uncoated		
		ap (mm)	Feed (mm/tooth)	TC3020	TC3030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510	K10	
	<b>RPGN 0903 FL-E04</b>	0.5-1.5	0.15-0.07	●	●									
	<b>1204 FL-E</b>	0.5-2.0	0.20-0.07	●	●									
	<b>1204 FL-E04</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	
<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	TT8525B	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	●		●	●								



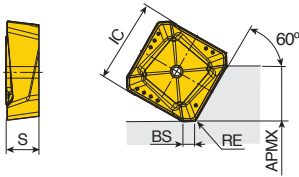
●: Standard items



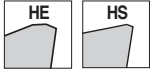




## Inserts



Size	Dimension (mm)					
	IC	S	APMX	BS	RE	
<b>21-HE</b>	20.8	7	13	2	1.5	
<b>21-HS</b>	21	6.95	13	2	1.5	
<b>27-HE</b>	26.8	8.95	18	2	2	
<b>27-HS</b>	27	8.9	18	2	2	



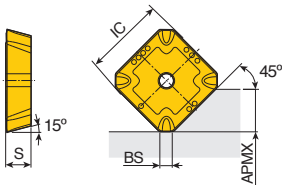
Insert	Designation	Recommended machining conditions		Coated						Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10
	<b>SCKN 2107 DDTR-HE</b>	3.5-10.5	0.25-0.13					●	●	●		
	<b>2708 DDTR-HE</b>	5.0-14.5	0.30-0.15					●	●			
	<b>SCKN 2107 DDTR-HS</b>	3.5-10.5	0.25-0.13					●				
	<b>2708 DDTR-HS</b>	5.0-14.5	0.25-0.13					●				



● : Standard items

# SDKN 12/15

## Inserts



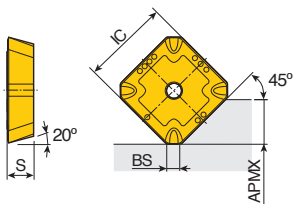
Size	Dimension (mm)					
	IC	S	APMX	BS		
<b>12</b>	12.7	3.18	6.5	2.00		
<b>15</b>	15.875	4.76	8.7	1.89		

Insert	Designation	Recommended machining conditions		Coated						Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	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					●				
	<b>SDKN 1203 MT-GPN</b>	1.5-6.0	0.25-0.10					●				



● : Standard items

## Inserts



Size	Dimension (mm)				
	IC	S	APMX	BS	
<b>12</b>	12.7	3.18	6.5	2.08	
<b>15</b>	15.875	4.76	8.7	2.06	

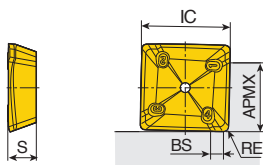
Insert	Designation	Recommended machining conditions		Coated							Uncoated	
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10
	<b>SEKN 1203 AFTN-HPN</b>	1.5-6.0	0.25-0.10					●				
	<b>1504 AFTN-HPN</b>	1.5-8.0	0.25-0.10					●				



●: Standard items

# SEKX 21

## Inserts



Size	Dimension (mm)				
	IC	S	APMX	BS	RE
<b>21 PETR-M</b>	21.85	7	17	2	1.2

Insert	Designation	Recommended machining conditions		Coated							Uncoated	
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10
	<b>SEKX 2107 PETR-M</b>	5.5-13.0	0.22-0.10					●		●		

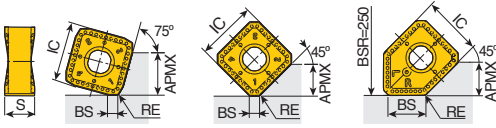


●: Standard items





## 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/AL</b>	13.5	6.8	7.0	2.2	0.4
<b>13 ANTR-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	1.2
<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



Insert	Designation	Recommended machining conditions		Coated							Uncoated			
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	TT2510	K10	
	<b>SNGX 1306 ENTN-M</b>	2.5-8.0	0.20-0.10	●		●		●	●	●				
	<b>SNMX 1306 ENTN-M</b>	2.5-8.0	0.20-0.10	●		●		●	●	●				
	<b>SNGX 1306 ANTN-M</b>	2.0-6.0	0.20-0.10	●		●		●	●					
	<b>1306 ANTN-ML</b>	2.0-6.0	0.25-0.13	●		●				●				
	<b>SNMX 1306 ANTN-M</b>	2.0-6.0	0.20-0.10	●		●		●	●	●	●			
	<b>SNGX 1306 ANN-AL</b>	2.0-6.0	0.35-0.10										●	
	<b>SNMX 1306 ANTR-MP</b>	2.0-6.0	0.20-0.10	●		●		●		●				
	<b>SNMX 1306 XTN</b>	2.5-6.5	0.20-0.10	●	●			●	●	●	●			
	<b>SNGX 1306 ANTN-W</b>	0.2-1.0	0.20-0.10	●						●				

● : Standard items





















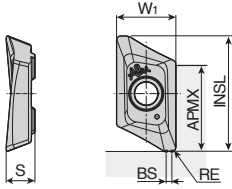








## Inserts



Size	Dimension (mm)					
	INSL	W1	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

Insert	Designation	Recommended machining conditions		Coated							Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	TT7080	TT7515	TT6080	K10	
	<b>XEVT 160504R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160508R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160512R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160516R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160520R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160524R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160530R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160532R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160540R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>160550R-AL</b>	3.5-12.0	0.4-0.1									●	
	<b>220605R-AL</b>	3.5-18.0	0.6-0.1									●	
	<b>220608R-AL</b>	3.5-18.0	0.6-0.1									●	
	<b>220616R-AL</b>	3.5-18.0	0.6-0.1									●	
	<b>220620R-AL</b>	3.5-18.0	0.6-0.1									●	
	<b>220630R-AL</b>	3.5-18.0	0.6-0.1									●	
	<b>220632R-AL</b>	3.5-18.0	0.6-0.1									●	
	<b>220640R-AL</b>	3.5-18.0	0.6-0.1									●	
	<b>220650R-AL</b>	3.5-18.0	0.6-0.1									●	
	<b>220664R-AL</b>	3.5-18.0	0.6-0.1									●	

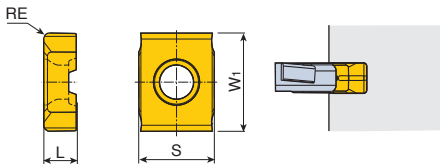
● : Standard items







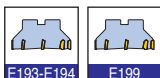
## Inserts



Size	Dimension (mm)				
	W <sub>1</sub>	S	L	RE	
<b>018</b>	10	7.5	1.8	0.2-0.8	
<b>023</b>	10	7.5	2.3	0.2-0.8	
<b>028</b>	10	7.5	2.8	0.2-0.8	
<b>033</b>	10	7.5	3.3	0.2-0.8	
<b>038</b>	13	10	3.8	0.4-0.8	
<b>043</b>	13	10	4.3	0.4-0.8	
<b>048</b>	13	10	4.8	0.4-0.8	
<b>053</b>	13	10	5.3	0.4-0.8	



Insert	Designation	Recommended machining conditions		Coated							Uncoated		
		ap (mm)	Feed (mm/tooth)	TT9080	TT9030	TT8080	TT8020	TT8525B	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




# Tailor-made Insert

## Tangential inserts



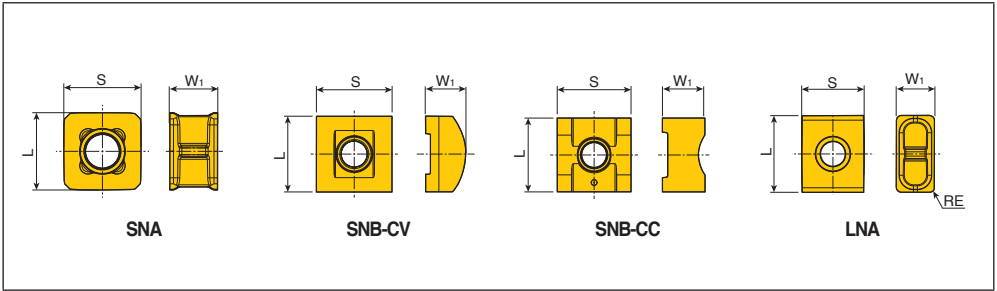
Insert	Designation	Dimension (mm)			
		L	S	W <sub>1</sub>	RE
	<b>LNC 1060-C</b>	10.0	11.5	6.0	chamfer
	<b>LNC 137020-L</b>	13.6	11.6	6.7	2.0
	<b>LNCX 136508 PNR-ML</b>	13.0	10.6	6.5	0.8







Insert	Designation	Dimension (mm)			
		L	S	W <sub>1</sub>	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-SLOT

ISO	Material		Hardness 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. 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

## Machining data for CBN grade

ISO	Material	D.O.C. (mm)	Grade		
			TB7015		
			Cutting speed Vc(m/min)	Feed (mm/tooth)	Cutting edge
<b>P</b>	Bearing steel	< 2	180 - 220	0.05 - 0.25	Chamfer
	Ferrous powder metal	< 2	150 - 300	0.1 - 0.15	Chamfer
<b>K</b>	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
	Compared graphite iron (CGI)	< 0.5	400 - 600	0.1 - 0.2	Hone
<b>S</b>	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
<b>H</b>	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   
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 ■ High temp. alloys   
 ■ Hardened steel



# Recommended Cutting Conditions

## Machining data

Cutting Speed :Vc(m/min)

ISO	Material	Condition	Tensile strength (N/mm <sup>2</sup> )	Hardness HB	Material No.	Uncoated				
						K10	TT9080	TT9030		
P	Non-alloy steel, cast steel, free cutting steel	< 0.25%C	Annealed	420	125	1		220-370	190-310	
		≥ 0.25%C	Annealed	650	190	2		180-310	160-260	
		< 0.55%C	Quenched and tempered	850	250	3		115-195	105-185	
		≥ 0.55%C	Annealed	750	220	4		130-210	120-200	
			Quenched and tempered	1000	300	5		115-175	95-160	
	Low alloy steel and cast steel (less than 5% of alloying elements)	Annealed		600	200	6		175-265	160-250	
				930	275	7		130-215	120-200	
		Quenched and tempered		1000	300	8		105-185	95-175	
				1200	350	9		95-160	80-150	
	High alloy steel, cast steel and tool steel	Annealed		680	200	10		85-155	75-135	
Quenched and tempered			1100	325	11		75-135	65-120		
M	Stainless steel and cast steel	Ferritic / martensitic		680	200	12		115-270	100-250	
		Martensitic		820	240	13		100-230	80-200	
		Austenitic		600	180	14		120-275	110-260	
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		
			Electrolytic copper			100	28	210-280		
	Non-metallic		Duroplastics, fiber plastics				29	150-250		
			Hard rubber				30	150-250		
S	High temp. alloys	Fe based	Annealed			200	31		40-80	
			Cured			280	32		30-60	
		Ni or Co based	Annealed			250	33		35-70	
			Cured			350	34		30-60	
			Cast			320	35		35-65	
	Titanium, Ti alloys			Rm 400		36		90-130		
			Alpha+beta alloys cured		Rm 1050		37	35-70		
H	Hardened steel	Hardened			55HRC	38		40-75	40-60	
		Hardened			60HRC	39		30-55	30-55	
	Chilled cast iron	Cast			400	40		70-105	60-100	
	Cast iron nodular	Hardened			55HRC	41		50-65	40-60	

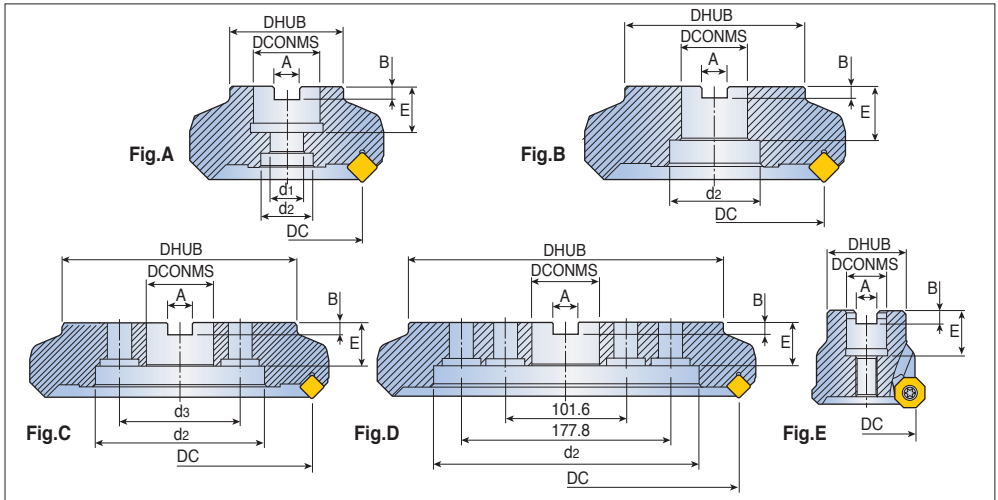
• For more information of material groups, see the materials & grades "material conversion table"

■ Steel   
 ■ Stainless steel   
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 ■ Hardened steel



# Mounting Reference

## Arbor style



Dimension (mm)										Fig.	Arbor
DC	DCONMS	A	B	E	DHUB		d1	d2	d3		
					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)

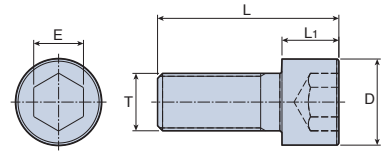
# Mounting Reference

## Mounting bolt

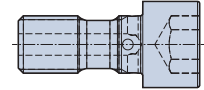
### SH type

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

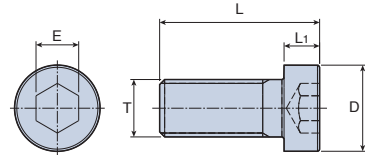


SH-C

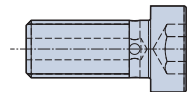
### LH type

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



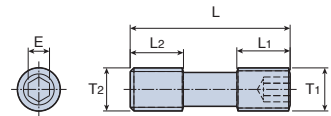
LH



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

## ► Quick change cutter adapter

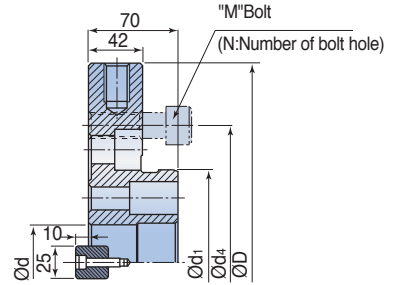
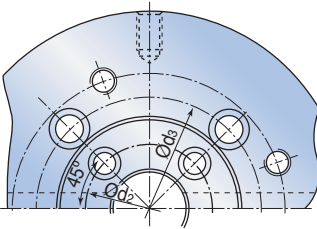
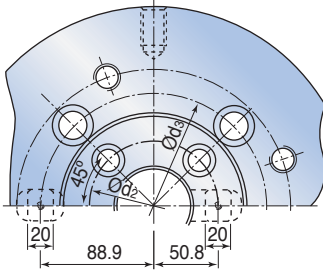


Fig.1

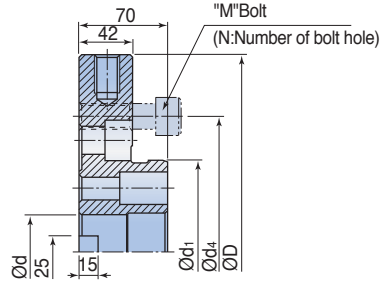


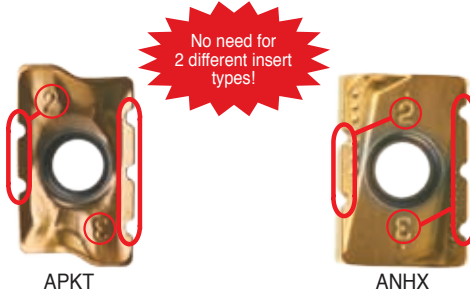
Fig.2

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	
<b>QA 08 K/M</b>	198	47.625	63.5	101.6	-	114.3	M16x40	4	10
<b>QA 10 K/M</b>	248	60	133.35	101.6	-	177.8	M16x50	4	15
<b>QA 12 K/M</b>	313	60	146.05	101.6	177.8	215.9	M20x50	4	19.7
<b>QA 14 K/M</b>	353	60	215.9	101.6	177.8	260.4	M20x50	6	24
<b>QA 16 K/M</b>	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

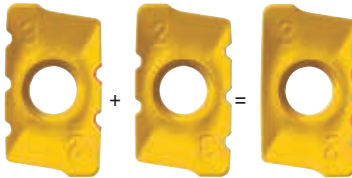


- Full proof configuration-inserts have metal color appearance only on the 3 groove side for simplified mounting

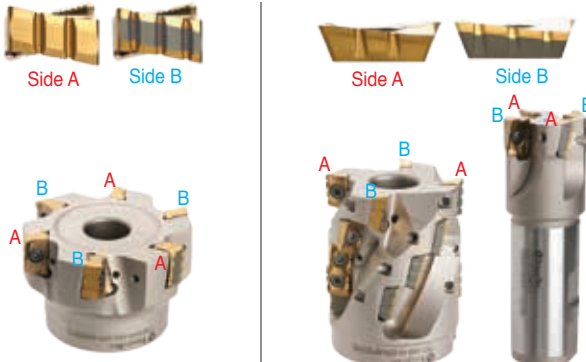


**Notice:** When insert mounting, ensure they are mounted in a staggered formation i.e. 1st tooth-2 groove side; 2nd tooth-3 groove side and repeat action for the remaining teeth

- Both cutting edges split chip to small pieces for cutting load reduction and create complete cutting edge when combined.

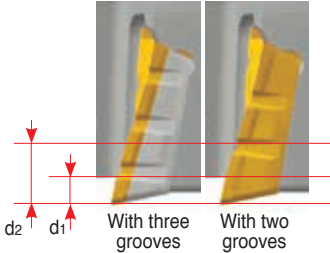


- For optimum machining efficiency, use even numbered flute type cutters

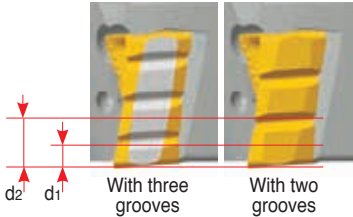


Also applicable to odd numbered flute type cutters

- The splitter inserts effective in axial depth of cuts  $\geq d_1$

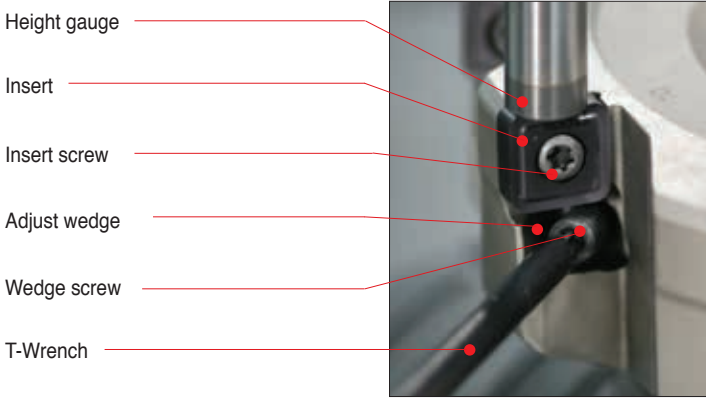


Depth of cut	APKT 17	APKT 12
d1	3mm	2.4mm
d2	6.5mm	5.2mm



Depth of cut	ANHX 16
d1	2.5mm
d2	6mm

## ▶ Setting instructions



**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")

**5** Adjust Runout in the range -2 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**

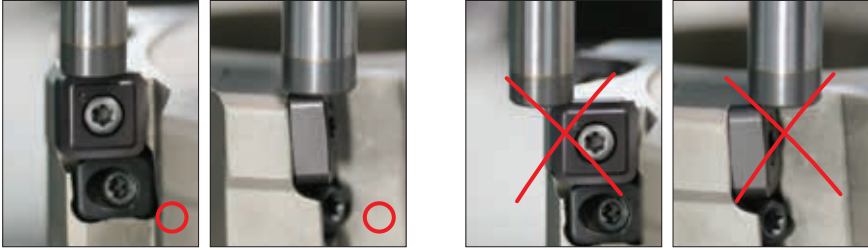


**6** Runout adjustment is completed.(you don't have to clamp the insert screw anymore once it is fixed.)



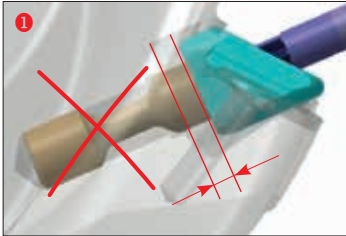


## ► Gauge user guide

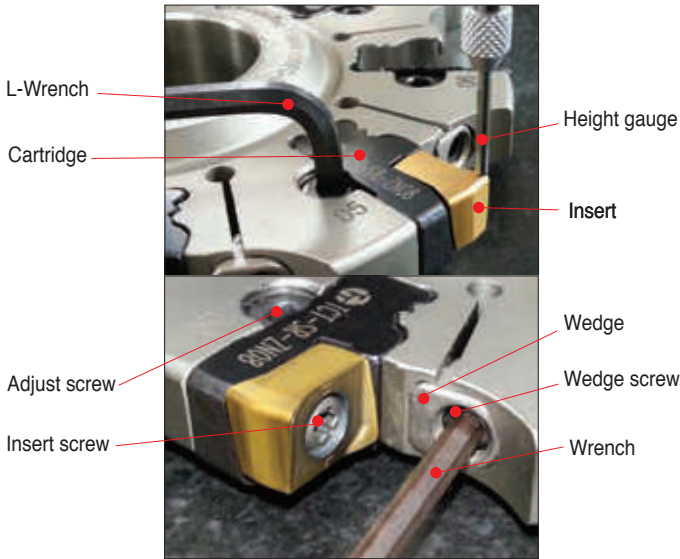


## ► Special precautions

- 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.



- ④ Follow the same method about other cartridges. (the same as opposite side)

- ② Unfasten the wedge screw 1 turn counter-clockwise.



- ⑤ After setting all cartridges, sequentially fasten the wedge 100% over two or three times.

- ③ After fastening the wedge around 80%, adjust the cartridge to the desired "X" value after setting the datum zero point.



- 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.)



- ④ After fastening the wedge around 80%, adjust the cartridge to the desired (A+X) value.



- 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.



- ⑤ Follow the same method about other cartridges.

- ③ Put the cutter bottom face on the setting plate and unfasten wedge screw 1 turn counter-clockwise



- 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.

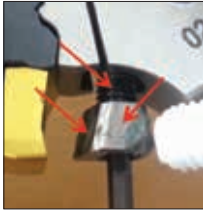


Fig.1 Lubricant



Fig.2 "X" setting



Fig.3 WIDTH

## ▶ Narrow width slotting cutters

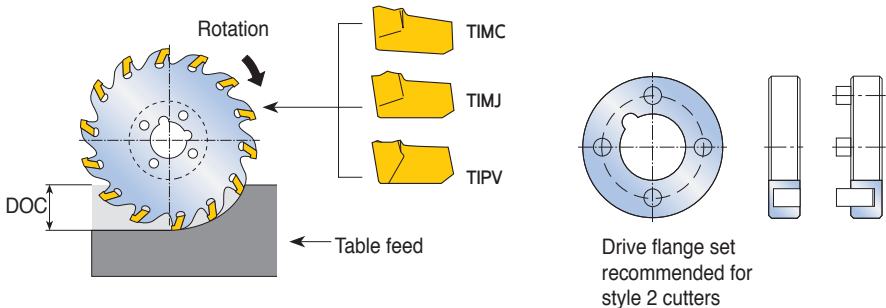


- Metric cutting diameters: 75mm, 100mm, 125mm, 160mm, 250mm
- Cutting width ranges: 1.6mm - 6.35mm
- Geometry: Positive Rake
- Applications: Slotting and sawing
- Materials: Carbon steels, alloy steels, stainless steels, cast iron, aluminum and exotics

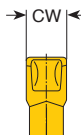
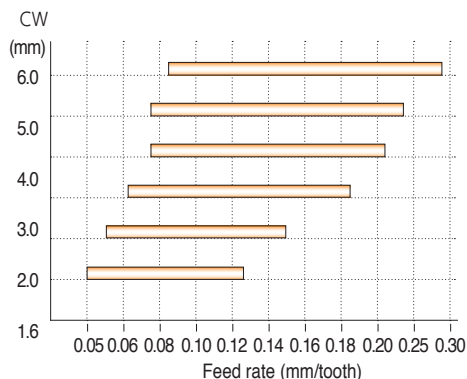
### ■ Features / Benefits of slotting cutters

- 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



## ► 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

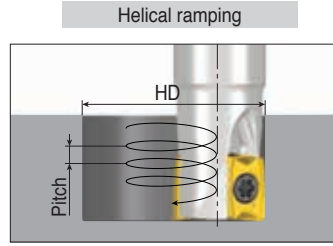
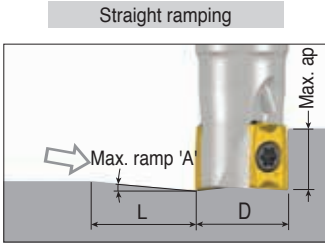
The use of drive flange sets are recommended to prevent denting of arbor drive keys and to provide added stability during increased metal removal rates.

### ■ 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.

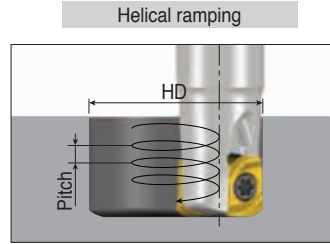
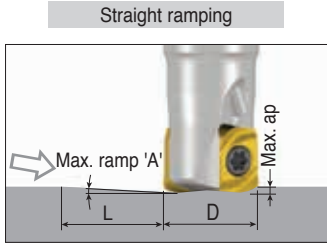


## CVK(H)T 05: R0.2

(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

# Ramping Data

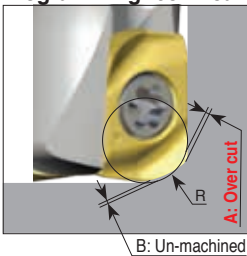


## CVKT 05-HF

(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

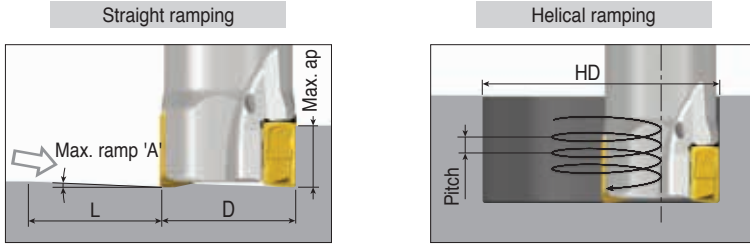
## Programming technical data



	R Program	A Over cut	B Un-machined
CVKT 05-HF	0.8	0	0.21
	0.9	0	0.18
	1.0	0.02	0.14

Yellow background: Recommended program 'R'





## LPK(H)U 05

(unit: mm)

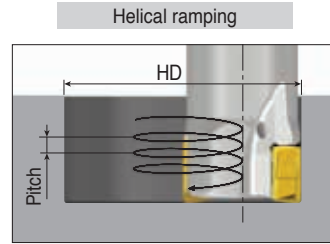
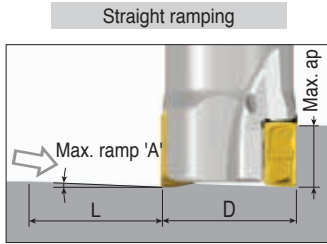
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø10	1.8	4.6	142	16.8		0.6
					20	0.9
Ø11	1.6	4.6	160	18.8		0.6
					22	0.8
Ø12	1.5	4.6	176	20.8		0.6
					24	0.8
Ø13	1.3	4.6	195	22.8		0.6
					26	0.8
Ø16	1.0	4.6	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

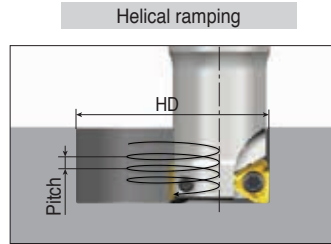
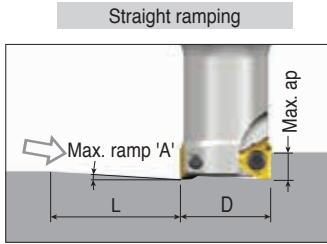
# Ramping Data



## 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

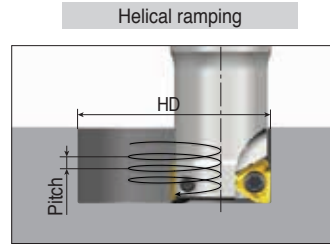
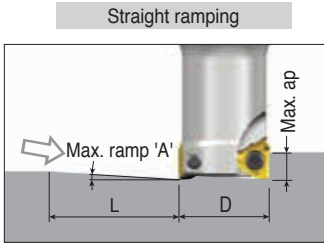


### 3PKT 04

(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	2.1	3.5	95	13.2		0.6
					16	0.9
Ø10	2.2	3.5	91	17.2		0.8
					20	1.2
Ø11	3.6	3.5	56	19.2		1.6
					22	2.1
Ø12	3.3	3.5	61	21.2		1.6
					24	2.1
Ø13	2.5	3.5	80	23.2		1.4
					26	1.7
Ø14	2.2	3.5	91	25.2		1.3
					28	1.6
Ø16	1.6	3.5	125	29.2		1.1
					32	1.4

# Ramping Data



## 3PK(H)T 06

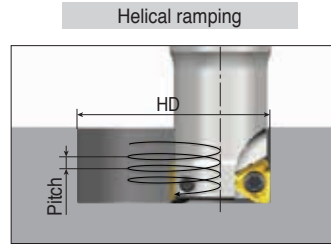
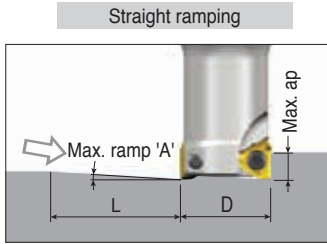
(unit: mm)

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
						2.1
Ø14	2.8	4.7	96	23.5	28	1.2
						1.8
Ø16	2.3	4.7	117	27.5	32	1.2
						1.7
Ø17	2.0	4.7	135	29.5	34	1.2
						1.6
Ø18	2.0	4.7	135	31.5	36	1.3
						1.7
Ø20	1.6	4.7	168	35.5	40	1.2
						1.5
Ø21	1.5	4.7	180	37.5	42	1.2
						1.5
Ø22	1.5	4.7	180	39.5	44	1.2
						1.5
Ø25	1.5	4.7	180	45.5	50	1.4
						1.7
Ø30	1.2	4.7	224	55.5	60	1.4
						1.7
Ø32	1.2	4.7	224	59.5	64	1.5
						1.8
Ø35	1.0	4.7	269	65.5	70	1.4
						1.6
Ø40	0.7	4.7	385	75.5	80	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
						5.2
Ø20	3.3	7.0	121	33.9	40	2.1
						3.1
Ø21	3.2	7.0	125	35.9	42	2.2
						3.1
Ø22	3.2	7.0	125	37.9	44	2.4
						3.3
Ø25	2.8	7.0	143	43.5	50	2.4
						3.3
Ø26	2.6	7.0	154	45.9	52	2.4
						3.1
Ø30	2.0	7.0	201	53.9	60	2.2
						2.8
Ø32	1.8	7.0	223	57.5	64	2.1
						2.7
Ø33	1.7	7.0	236	59.9	66	2.1
						2.6
Ø40	1.3	7.0	309	73.7	80	2.0
						2.4
Ø50	1.0	7.0	401	93.7	100	2.0
						2.3
Ø63	0.8	7.0	502	119.7	126	2.1
						2.3



## 3PK(H)T 15

(unit: mm)

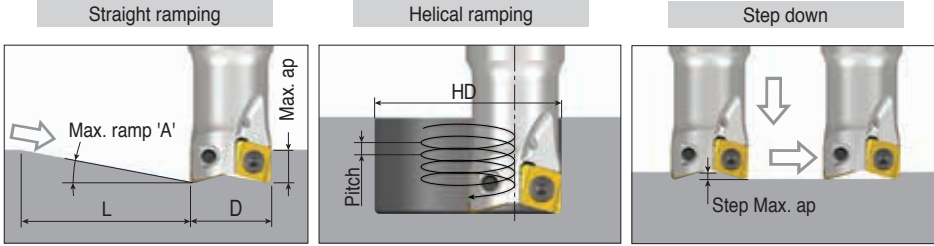
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø32	3.2	11.0	197	53.5	64	3.2
						4.8
Ø33	3.1	11.0	203	55.5	66	3.3
						4.8
Ø35	3.1	11.0	203	59.5	70	3.5
						5.1
Ø40	2.0	11.0	315	70.1	80	2.8
						3.7
Ø50	1.5	11.0	420	90.1	100	2.8
						3.5
Ø63	1.1	11.0	573	116.1	126	2.7
						3.2
Ø80	0.8	11.0	788	150.3	160	2.6
						3.0
Ø100	0.6	11.0	1051	190.5	200	2.5
						2.8
Ø125	0.5	11.0	1261	240.3	250	2.7
						2.9
Ø160	0.3	11.0	2102	310.3	320	2.1
						2.2
Ø200	0.2	11.0	3153	390.3	400	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
						6.7
Ø50	2.2	15.0	391	87.9	100	3.9
						5.1
Ø63	1.7	15.0	506	113.9	126	4
						5
Ø80	1.3	15.0	661	147.9	160	4.1
						4.8
Ø100	1.0	15.0	860	187.9	200	4.1
						4.7
Ø125	0.8	15.0	1075	237.9	250	4.2
						4.7
Ø160	0.6	15.0	1433	307.9	320	4.1
						4.5
Ø200	0.4	15.0	2150	387.9	400	3.5
						3.7
Ø250	0.3	15.0	2866	487.9	500	3.3
						3.5

# Ramping Data



## 4NKT 04: R0.2

(unit: mm)

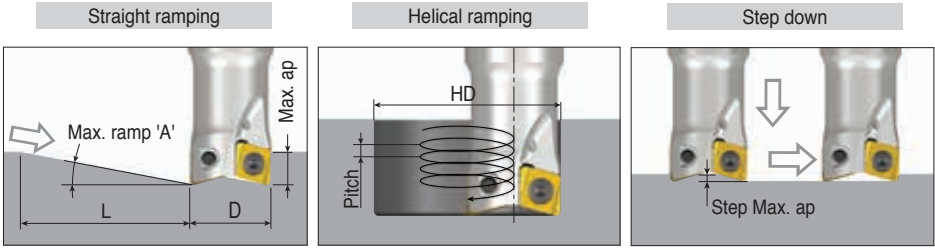
Cutter dia.(D)	Straight ramp down			Helical ramp down			Step down
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.	Max. ap
Ø8	4.2	3.5	48	9.9	16	0.4	0.4
				13.9		3.1	
Ø10	4.6	3.5	44	13.9	20	0.8	0.6
				15.9		2.1	
Ø11	5.2	3.5	38	15.9	22	1.2	0.7
				17.9		2.7	
Ø12	4.8	3.5	42	17.9	24	1.3	0.8
				19.9		2.7	
Ø13	5.1	3.5	39	19.9	26	1.6	0.8
				25.9		3.1	
Ø16	4.4	3.5	46	25.9	32	2.0	1.0
				33.9		3.3	
Ø20	3.3	3.5	61	33.9	40	2.1	1.0
				43.9		3.1	
Ø25	2.5	3.5	80	43.9	50	2.2	1.0
				57.9		2.9	
Ø32	1.9	3.5	106	57.9	64	2.3	1.0
				73.9		2.8	
Ø40	1.4	3.5	138	73.9	80	2.3	1.0
						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	16	0.3	0.4
				13.9		2.8	
Ø10	4.2	3.5	48	13.9	20	0.8	0.5
				15.9		2.0	
Ø11	4.8	3.5	42	15.9	22	1.1	0.6
				17.9		2.5	
Ø12	4.5	3.5	44	17.9	24	1.2	0.7
				19.9		2.5	
Ø13	4.7	3.5	43	19.9	26	1.5	0.8
				25.9		2.9	
Ø16	4.1	3.5	49	25.9	32	1.9	0.9
				33.9		3.1	
Ø20	3.1	3.5	65	33.9	40	2.0	0.9
				43.9		2.9	
Ø25	2.3	3.5	85	43.9	50	2.1	0.9
				57.9		2.7	
Ø32	1.7	3.5	115	57.9	64	2.1	0.9
				73.9		2.6	
Ø40	1.3	3.5	149	73.9	80	2.1	0.9
						2.5	

# Ramping Data

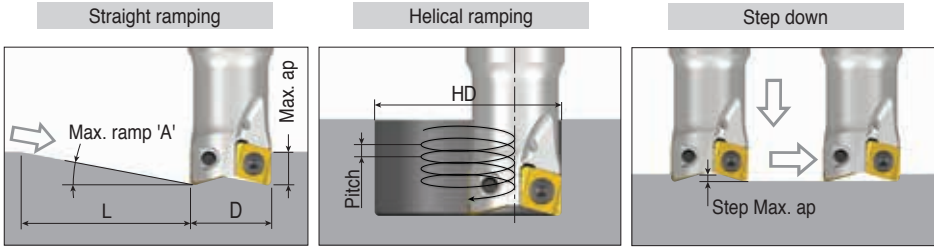


## 4NKT 04: R0.8

(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	

# Ramping Data



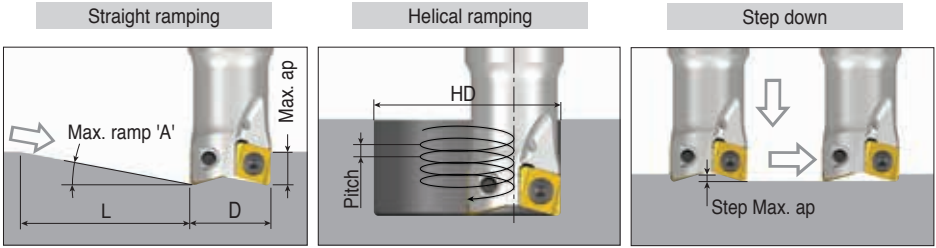
## 4NKT 06: R0.4

(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	6.0	80	21.5	32	1.1	0.9
						3.2	
Ø17	4.3	6.0	80	23.5	34	1.3	1.0
						3.4	
Ø18	4.7	6.0	73	25.5	36	1.6	1.1
						3.9	
Ø20	4.9	6.0	70	29.5	40	2.2	1.3
						4.6	
Ø21	5.0	6.0	69	31.5	42	2.5	1.4
						4.9	
Ø25	4.9	6.0	70	39.5	50	3.3	1.6
						5.7	
Ø26	4.6	6.0	75	41.5	52	3.3	1.6
						5.6	
Ø32	3.5	6.0	98	53.5	64	3.5	1.7
						5.2	
Ø33	3.4	6.0	101	55.5	66	3.6	1.7
						5.2	
Ø35	3.1	6.0	111	59.5	70	3.5	1.7
						5.1	
Ø36	3.0	6.0	115	61.5	72	3.6	1.7
						5.0	
Ø38	2.8	6.0	123	65.5	76	3.6	1.7
						5.0	
Ø40	2.6	6.0	130	69.5	80	3.6	1.7
						4.9	
Ø43	2.4	6.0	143	75.5	86	3.6	1.7
						4.8	
Ø50	2.0	6.0	168	89.5	100	3.8	1.7
						4.8	
Ø63	1.6	6.0	215	115.5	126	3.9	1.7
						4.7	



# Ramping Data

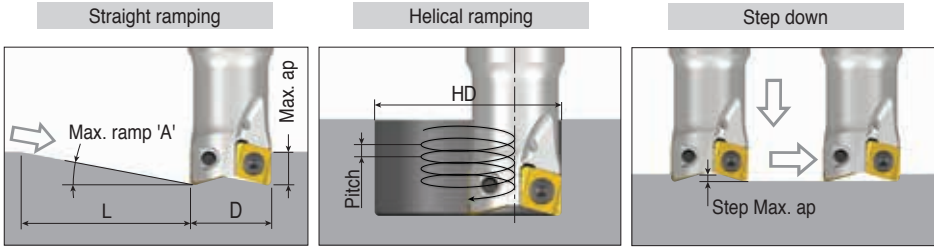


## 4NKT 06: R0.8

(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	

# Ramping Data

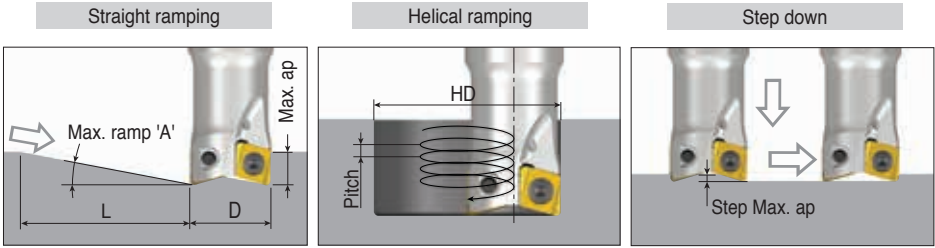


## 4NKT 06: R1.2

(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		0.8	0.5
					32	2.2	
Ø17	3.2	6.0	107	23.5		1.0	0.7
					34	2.5	
Ø18	3.6	6.0	95	25.5		1.3	0.8
					36	3.0	
Ø20	3.9	6.0	88	29.5		1.7	1.0
					40	3.6	
Ø21	4.1	6.0	84	31.5		2.0	1.1
					42	4.0	
Ø25	4.2	6.0	82	39.5		2.8	1.3
					50	4.9	
Ø26	3.9	6.0	88	41.5		2.8	1.3
					52	4.7	
Ø32	2.9	6.0	119	53.5		2.9	1.4
					64	4.3	
Ø33	2.8	6.0	123	55.5		2.9	1.4
					66	4.3	
Ø35	2.6	6.0	132	59.5		3.0	1.4
					70	4.2	
Ø36	2.5	6.0	137	61.5		3.0	1.4
					72	4.2	
Ø38	2.3	6.0	146	65.5		3.0	1.4
					76	4.2	
Ø40	2.2	6.0	156	69.5		3.0	1.4
					80	4.1	
Ø43	2.0	6.0	168	75.5		3.1	1.4
					86	4.1	
Ø50	1.7	6.0	202	89.5		3.1	1.4
					100	4.0	
Ø63	1.3	6.0	265	115.5		3.2	1.4
					126	3.8	

# Ramping Data

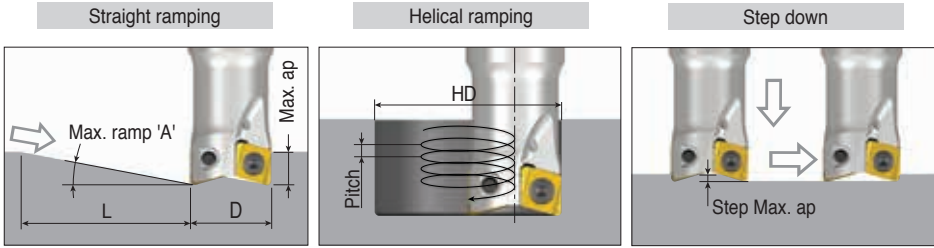


## 4NKT 06: R1.6

(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	6.0	156	21.5	32	0.6	0.4
						1.6	
Ø17	2.4	6.0	143	23.5	34	0.7	0.5
						1.9	
Ø18	2.8	6.0	123	25.5	36	1.0	0.6
						2.3	
Ø20	3.2	6.0	107	29.5	40	1.4	0.8
						3.0	
Ø21	3.4	6.0	101	31.5	42	1.7	0.9
						3.3	
Ø25	3.7	6.0	93	39.5	50	2.5	1.1
						4.3	
Ø26	3.4	6.0	101	41.5	52	2.5	1.1
						4.1	
Ø32	2.5	6.0	135	53.5	64	2.6	1.2
						3.8	
Ø33	2.4	6.0	140	55.5	66	2.6	1.2
						3.8	
Ø35	2.3	6.0	149	59.5	70	2.6	1.2
						3.8	
Ø36	2.2	6.0	156	61.5	72	2.6	1.2
						3.7	
Ø38	2.0	6.0	168	65.5	76	2.6	1.2
						3.6	
Ø40	1.9	6.0	176	69.5	80	2.7	1.2
						3.6	
Ø43	1.8	6.0	191	75.5	86	2.7	1.2
						3.6	
Ø50	1.5	6.0	229	89.5	100	2.8	1.2
						3.5	
Ø63	1.1	6.0	299	115.5	126	2.8	1.2
						3.4	

# Ramping Data

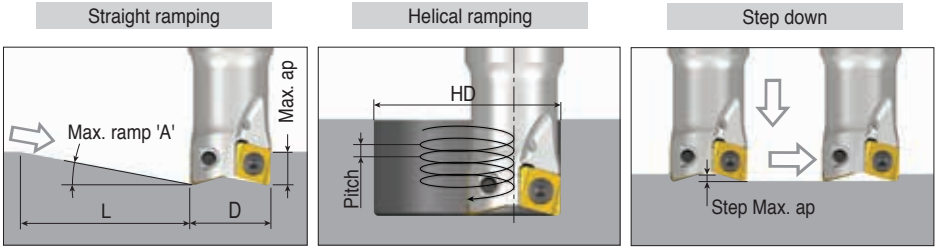


## 4NKT 06: R2.0

(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	6.0	215	21.5		0.4	0.3
					32	1.2	
Ø17	1.8	6.0	191	23.5		0.5	0.3
					34	1.4	
Ø18	2.3	6.0	149	25.5		0.8	0.5
					36	1.9	
Ø20	2.7	6.0	125	29.5		1.2	0.6
					40	2.6	
Ø21	3.0	6.0	115	31.5		1.5	0.7
					42	2.9	
Ø25	3.3	6.0	104	39.5		2.2	1.0
					50	3.8	
Ø26	3.1	6.0	111	41.5		2.2	1.0
					52	3.8	
Ø32	2.3	6.0	149	53.5		2.3	1.0
					64	3.4	
Ø33	2.2	6.0	156	55.5		2.3	1.0
					66	3.4	
Ø35	2.0	6.0	168	59.5		2.3	1.0
					70	3.3	
Ø36	2.0	6.0	172	61.5		2.4	1.0
					72	3.4	
Ø38	1.8	6.0	186	65.5		2.4	1.0
					76	3.3	
Ø40	1.7	6.0	196	69.5		2.4	1.0
					80	3.3	
Ø43	1.3	6.0	265	75.5		2.0	1.0
					86	2.6	
Ø50	1.3	6.0	255	89.5		2.5	1.0
					100	3.1	
Ø63	1.0	6.0	328	115.5		2.6	1.0
					126	3.1	

# Ramping Data

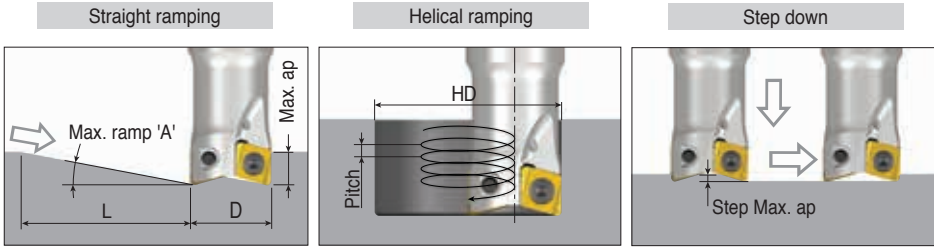


## 4NHT 06: R0.4

(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		0.7	0.6
					32	2.2	
Ø17	3.0	6.0	115	23.5		0.9	0.6
					34	2.4	
Ø18	3.4	6.0	101	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	1.2	6.0	275	115.5		3.1	1.3
					126	3.7	

# Ramping Data

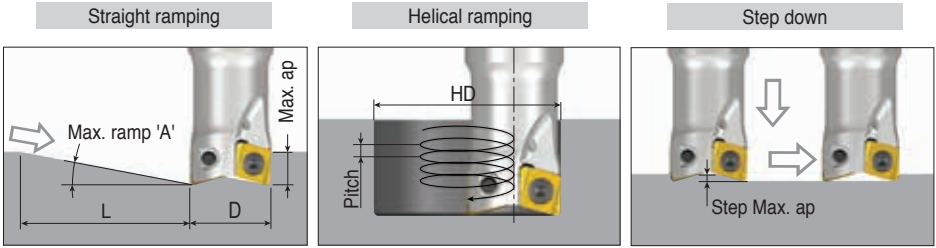


## 4NHT 06: R0.8

(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	

# Ramping Data

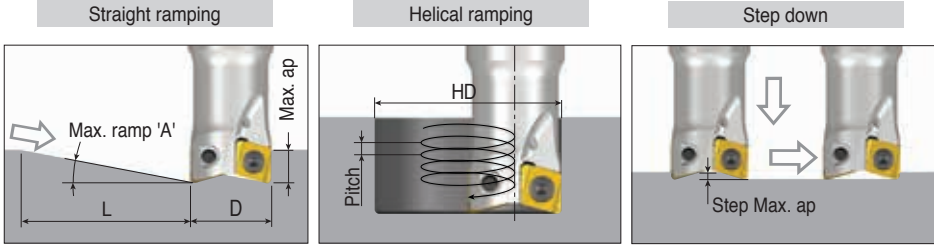


## 4NHT 06: R0.5-F

(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		0.9	0.8
					32	2.6	
Ø17	3.6	2.3	37	23.5		1.1	0.8
					34	2.9	
Ø18	4.0	2.3	33	25.5		1.4	1.0
					36	3.4	
Ø20	4.3	2.3	31	29.5		1.9	1.2
					40	4.0	
Ø21	4.4	2.3	30	31.5		2.2	1.2
					42	4.3	
Ø25	4.9	2.3	27	39.5		3.3	1.6
					50	5.7	
Ø26	4.6	2.3	29	41.5		3.3	1.6
					52	5.6	
Ø32	3.5	2.3	38	53.5		3.5	1.6
					64	5.2	
Ø33	3.3	2.3	40	55.5		3.5	1.6
					66	5.1	
Ø35	3.1	2.3	42	59.5		3.5	1.6
					70	5.1	
Ø36	3.0	2.3	44	61.5		3.6	1.6
					72	5.0	
Ø38	2.8	2.3	47	65.5		3.6	1.7
					76	5.0	
Ø40	2.6	2.3	51	69.5		3.6	1.7
					80	4.8	
Ø43	2.4	2.3	55	75.5		3.6	1.7
					86	4.8	
Ø50	2.0	2.3	64	89.5		3.8	1.7
					100	4.8	
Ø63	1.7	2.3	78	115.5		4.2	1.7
					126	5.0	

# Ramping Data



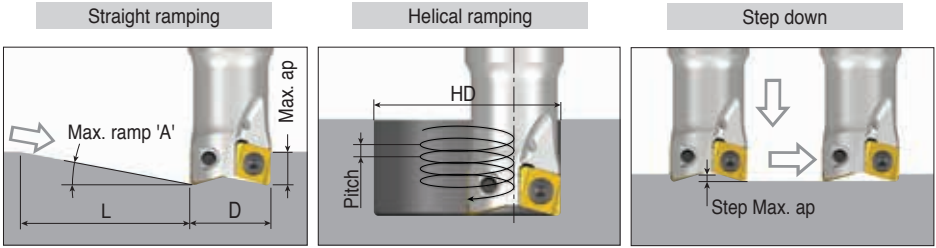
## 4NHT 06: R0.8-F

(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	2.3	
Ø17	3.2	1.9	34	23.5		1.0	0.7
					34	2.5	
Ø18	3.6	1.9	30	25.5		1.3	0.9
					36	3.0	
Ø20	3.9	1.9	28	29.5		1.7	1.0
					40	3.6	
Ø21	4.1	1.9	27	31.5		2.0	1.1
					42	4.0	
Ø25	4.6	1.9	24	39.5		3.1	1.5
					50	5.4	
Ø26	4.4	1.9	25	41.5		3.2	1.5
					52	5.3	
Ø32	3.3	1.9	33	53.5		3.3	1.5
					64	4.9	
Ø33	3.1	1.9	35	55.5		3.3	1.5
					66	4.8	
Ø35	2.9	1.9	38	59.5		3.3	1.5
					70	4.7	
Ø36	2.8	1.9	39	61.5		3.3	1.5
					72	4.7	
Ø38	2.6	1.9	41	65.5		3.4	1.5
					76	4.7	
Ø40	2.4	1.9	44	69.5		3.4	1.5
					80	4.6	
Ø43	2.2	1.9	48	75.5		3.4	1.5
					86	4.5	
Ø50	1.9	1.9	57	89.5		3.5	1.6
					100	4.4	
Ø63	1.4	1.9	75	115.5		3.5	1.6
					126	4.3	



# Ramping Data

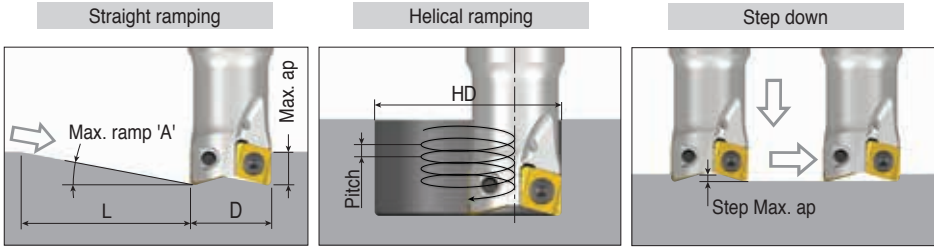


## 4NHT 06: R1.0-F

(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		0.7	0.6
					32	2.1	
Ø17	2.9	2.1	41	23.5		0.9	0.7
					34	2.3	
Ø18	3.3	2.1	36	25.5		1.2	0.8
					36	2.8	
Ø20	3.6	2.1	33	29.5		1.6	1.0
					40	3.4	
Ø21	3.8	2.1	32	31.5		1.9	1.0
					42	3.7	
Ø25	4.4	2.1	27	39.5		3.0	1.4
					50	5.1	
Ø26	4.2	2.1	29	41.5		3.0	1.4
					52	5.1	
Ø32	3.1	2.1	39	53.5		3.1	1.4
					64	4.6	
Ø33	3.0	2.1	40	55.5		3.1	1.4
					66	4.6	
Ø35	2.8	2.1	43	59.5		3.2	1.4
					70	4.6	
Ø36	2.6	2.1	45	61.5		3.1	1.4
					72	4.4	
Ø38	2.5	2.1	48	65.5		3.2	1.5
					76	4.4	
Ø40	2.3	2.1	51	69.5		3.2	1.5
					80	4.4	
Ø43	2.1	2.1	56	75.5		3.3	1.5
					86	4.3	
Ø50	1.8	2.1	67	89.5		3.3	1.5
					100	4.2	
Ø63	1.4	2.1	86	115.5		3.4	1.5
					126	4.1	

# Ramping Data

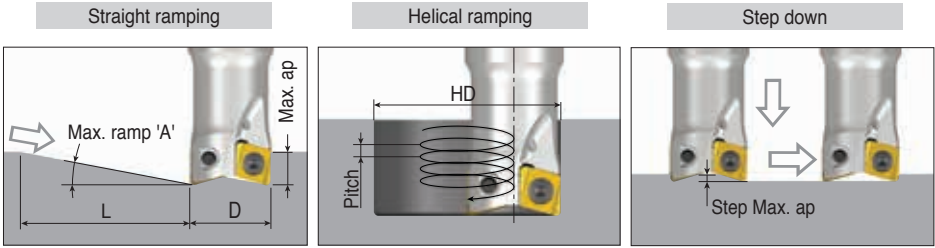


## 4NHT 06: R1.5-F

(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	4.5	
Ø26	3.7	3.3	51	41.5		2.7	1.2
					52	4.5	
Ø32	2.7	3.3	70	53.5		2.7	1.2
					64	4.0	
Ø33	2.6	3.3	71	55.5		2.8	1.2
					66	4.1	
Ø35	2.4	3.3	77	59.5		2.8	1.3
					70	4.0	
Ø36	2.3	3.3	80	61.5		2.8	1.3
					72	3.9	
Ø38	2.2	3.3	86	65.5		2.8	1.3
					76	3.9	
Ø40	2.1	3.3	90	69.5		2.9	1.3
					80	3.9	
Ø43	1.9	3.3	100	75.5		2.9	1.3
					86	3.8	
Ø50	1.6	3.3	118	89.5		2.9	1.3
					100	3.7	
Ø63	1.2	3.3	151	115.5		3.1	1.3
					126	3.7	

# Ramping Data

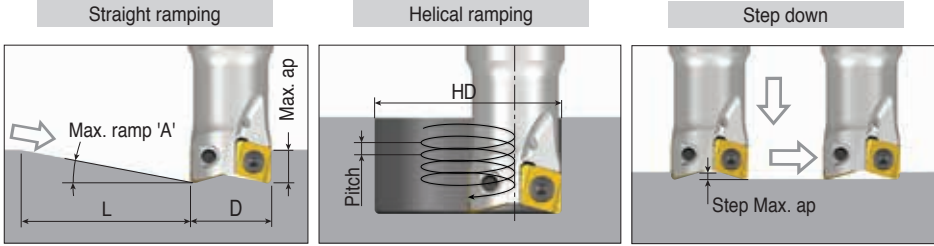


## 4NHT 06: R2.0-F

(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	2.1	142	21.5		0.2	0.1
					32	0.6	
Ø17	1.1	2.1	109	23.5		0.3	0.2
					34	0.9	
Ø18	1.6	2.1	75	25.5		0.6	0.3
					36	1.3	
Ø20	2.1	2.1	57	29.5		0.9	0.5
					40	2.0	
Ø21	2.3	2.1	51	31.5		1.1	0.6
					42	2.3	
Ø25	3.2	2.1	38	39.5		2.2	0.9
					50	3.7	
Ø26	3.0	2.1	40	41.5		2.2	1.0
					52	3.6	
Ø32	2.2	2.1	53	53.5		2.3	1.0
					64	3.4	
Ø33	2.1	2.1	56	55.5		2.3	1.0
					66	3.3	
Ø35	2.0	2.1	60	59.5		2.3	1.0
					70	3.3	
Ø36	1.9	2.1	62	61.5		2.3	1.0
					72	3.3	
Ø38	1.8	2.1	67	65.5		2.3	1.0
					76	3.2	
Ø40	1.7	2.1	71	69.5		2.3	1.0
					80	3.2	
Ø43	1.5	2.1	78	75.5		2.3	1.0
					86	3.1	
Ø50	1.3	2.1	93	89.5		2.4	1.0
					100	3.0	
Ø63	1.0	2.1	120	115.5		2.4	1.0
					126	2.9	

# Ramping Data



## 4NKT 09: R0.8

(unit: mm)

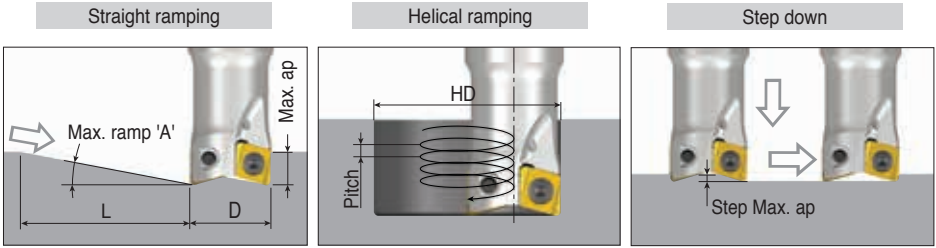
Cutter dia.(D)	Straight ramp down			Helical ramp down			Step down
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.	Max. ap
Ø20	3.7	8.0	124	25.5		0.9	1.0
					40	3.5	
Ø25	4.9	8.0	93	35.5		2.4	1.6
					50	5.7	
Ø32	4.9	8.0	93	49.5		4.0	2.1
					64	7.3	
Ø40	3.6	8.0	127	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	

# Ramping Data



## 4NHT 09: R0.4

(unit: mm)

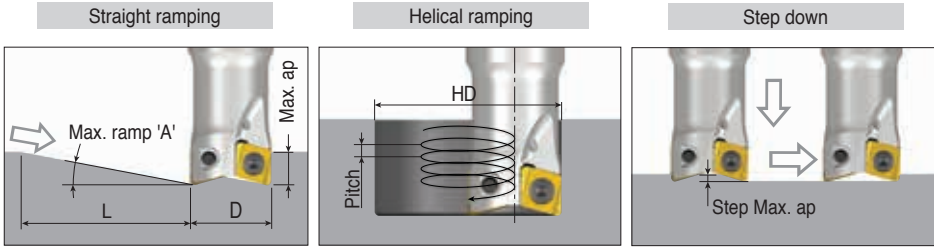
Cutter dia.(D)	Straight ramp down			Helical ramp down			Step down
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.	Max. ap
Ø20	2.9	8.0	155	25.5	40	0.8	0.8
						2.7	
Ø25	4.3	8.0	106	35.5	50	2.1	1.3
						5.0	
Ø32	4.5	8.0	102	49.5	64	3.7	1.8
						6.7	
Ø40	3.2	8.0	143	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



## 4NKT 11: R0.8

(unit: mm)

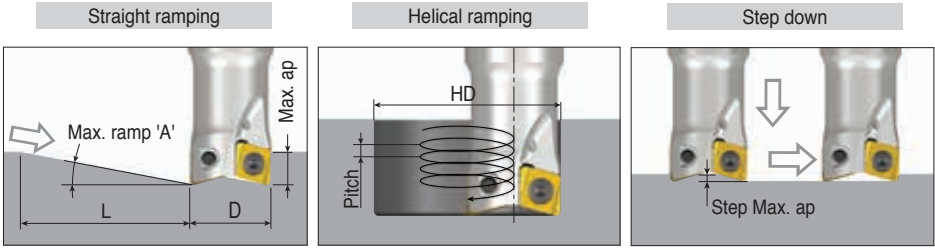
Cutter dia.(D)	Straight ramp down			Helical ramp down			Step down
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.	Max. ap
Ø25	5.1	10.3	115	31.5	1.5	1.7	
				50	6.0		
Ø32	5.3	10.3	111	45.5	3.3	2.4	
				64	7.9		
Ø40	5.0	10.3	118	61.5	5.0	2.7	
				80	9.3		
Ø50	3.7	10.3	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		

# Ramping Data



## 4NKT 11 PNR: R0.8

(unit: mm)

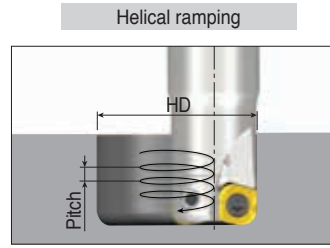
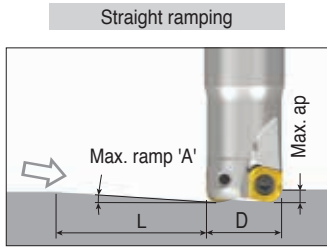
Cutter dia.(D)	Straight ramp down			Helical ramp down			Step down
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.	Max. ap
Ø25	4.0	10.3	147	31.5		1.2	1.1
					50	4.7	
Ø32	4.3	10.3	135	45.5		2.7	1.0
					64	6.5	
Ø40	4.5	10.3	131	61.5		4.5	0.9
					80	8.4	
Ø50	3.2	10.3	184	81.5		4.7	0.9
					100	7.5	
Ø63	2.4	10.3	246	107.5		5.0	0.9
					126	7.0	
Ø80	1.8	10.3	328	141.5		5.2	0.9
					160	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		1.4	1.1
					64	6.1	
Ø40	4.3	13.5	180	55.5		3.1	0.9
					80	8.0	
Ø50	4.7	13.5	163	75.5		5.7	0.9
					100	11.1	
Ø63	3.5	13.5	221	101.5		6.3	0.9
					126	10.3	
Ø80	2.6	13.5	297	135.5		6.7	0.9
					160	9.7	

# Ramping Data



## 4NKT 04-HF: R1.2

(unit: mm)

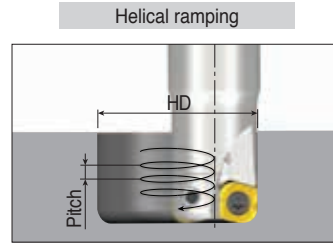
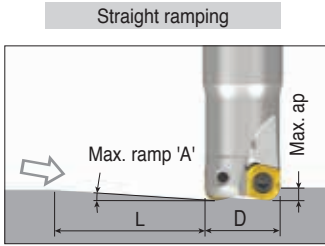
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø8	0.1	0.5	191	9.9	16	0.0
						0.1
Ø10	0.8	0.5	34	13.9	20	0.2
						0.4
Ø11	1.6	0.5	18	15.9	22	0.4
						0.5
Ø12	1.6	0.5	18	17.9	24	0.4
						0.5
Ø13	2.0	0.5	14	19.9	26	0.5
						0.5
Ø16	1.9	0.5	15	25.9	32	0.5
						0.5
Ø20	2.3	0.5	12	33.9	40	0.5
						0.5
Ø25	1.7	0.5	16	43.9	50	0.5
						0.5
Ø32	1.3	0.5	22	57.9	64	0.5
						0.5
Ø40	1.0	0.5	29	73.9	80	0.5
						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	32	0.2
						0.5
Ø17	0.7	1.0	76	23.4	34	0.2
						0.6
Ø18	1.1	1.0	50	25.4	36	0.4
						1.0
Ø20	1.7	1.0	34	29.4	40	0.7
						1.0
Ø21	1.9	1.0	29	31.4	42	0.9
						1.0
Ø25	2.3	1.0	24	39.4	50	1.0
						1.0
Ø26	3.2	1.0	18	41.4	52	1.0
						1.0
Ø32	2.4	1.0	24	53.4	64	1.0
						1.0
Ø40	1.8	1.0	32	69.4	80	1.0
						1.0
Ø50	1.4	1.0	41	89.4	100	1.0
						1.0
Ø63	1.1	1.0	52	115.4	126	1.0
						1.0





## 4NKT 09-HF: R3.2

(unit: mm)

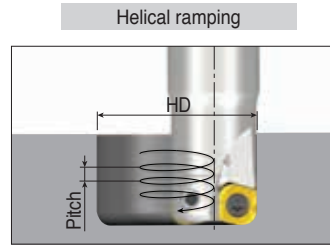
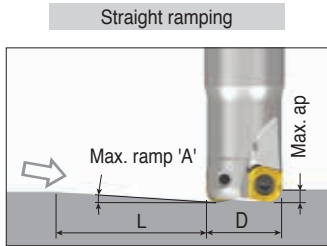
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø20	0.3	1.5	287	25		0.1
					40	0.3
Ø25	1.2	1.5	69	35		0.6
					50	1.5
Ø32	2.4	1.5	35	49		1.5
					64	1.5
Ø40	2.3	1.5	37	65		1.5
					80	1.5
Ø50	1.7	1.5	49	85		1.5
					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

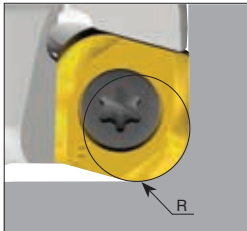


## 4NKT 14-HF: R5.0

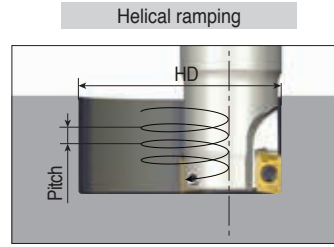
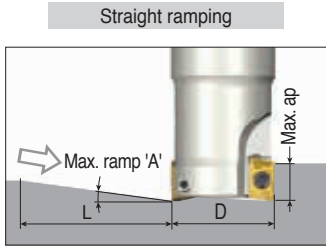
(unit: mm)

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
						1.5
Ø40	1.8	3.0	96	55	80	1.3
						3.0
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 Program	A Over cut	B 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

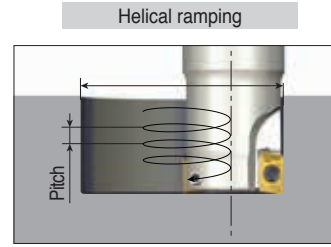
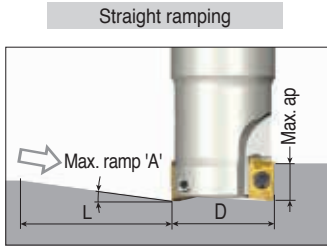


## AXMT 06

(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

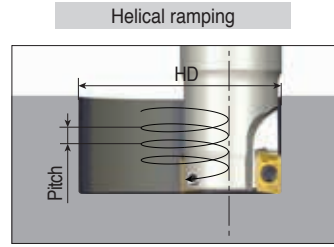
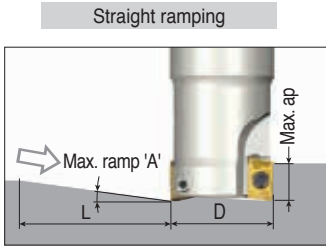
# Ramping Data



## 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
						3.5
Ø12	7.3	9.0	70	16	24	1.4
						4.1
Ø14	6.0	9.0	86	18	28	1.1
						3.9
Ø16	4.9	9.0	105	21.08	32	1.2
						3.7
Ø17	4.4	9.0	117	23.08	34	1.2
						3.5
Ø18	4.0	9.0	129	25.08	36	1.3
						3.4
Ø20	3.4	9.0	152	29.08	40	1.4
						3.2
Ø21	3.1	9.0	166	31.08	42	1.5
						3.0
Ø22	2.8	9.0	184	33.08	44	1.4
						2.9
Ø25	1.8	9.0	287	39.08	50	1.2
						2.1
Ø26	2.0	9.0	258	41.08	52	1.4
						2.4
Ø30	2.2	9.0	234	49.08	60	2.0
						3.1
Ø32	2.0	9.0	258	53.08	64	2.0
						3.0
Ø33	1.7	9.0	303	55.08	66	1.7
						2.6
Ø40	1.5	9.0	344	69.08	80	2.0
						2.8
Ø50	1.1	9.0	469	89.08	100	2.0
						2.6
Ø63	0.8	9.0	645	115.08	126	1.9
						2.3
Ø80	0.5	9.0	1032	149.08	160	1.6
						1.9

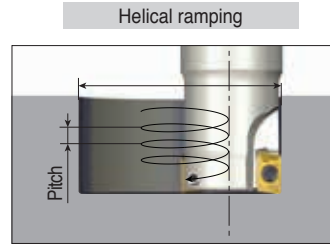
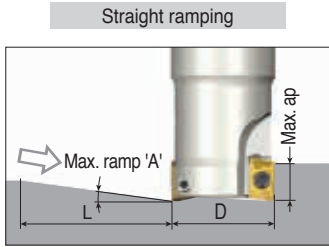


## APKT 12

(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	32	0.5
						9.5
Ø18	9.7	12.0	70	20.9	36	1.3
						8.2
Ø20	6.8	12.0	101	24.9	40	1.6
						6.4
Ø21	6.2	12.0	111	26.9	42	1.7
						6.1
Ø25	8.0	12.0	85	34.9	50	3.7
						9.4
Ø26	7.5	12.0	91	36.9	52	3.8
						9.1
Ø32	5.0	12.0	137	48.9	64	3.9
						7.5
Ø33	4.6	12.0	149	50.9	66	3.8
						7.1
Ø40	3.5	12.0	196	64.9	80	4.1
						6.5
Ø50	2.5	12.0	275	84.9	100	4.8
						5.8
Ø63	1.7	12.0	405	110.9	126	4.5
						5.0
Ø80	1.3	12.0	529	144.9	160	4.6
						4.8

# Ramping Data



## APKT 17

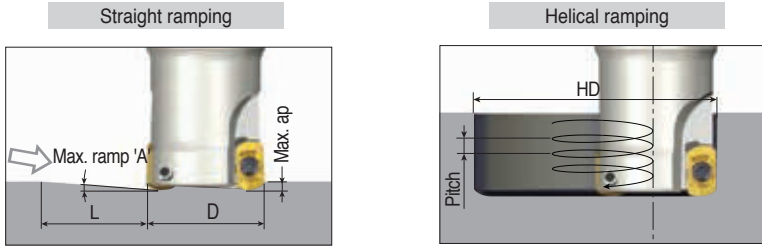
(unit: mm)

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
						7.5
Ø25	5.0	16.1	184	30.6	50	1.3
						5.8
Ø26	4.0	16.1	230	32.6	52	1.2
						4.9
Ø32	9.0	16.1	102	44.6	64	5.3
						13.5
Ø33	9.0	16.1	102	46.6	66	5.7
						13.9
Ø40	5.0	16.1	184	60.6	80	4.8
						9.3
Ø50	4.4	16.1	209	80.6	100	6.3
						10.3
Ø63	3.2	16.1	288	106.6	126	6.5
						9.4
Ø80	2.3	16.1	401	140.6	160	6.5
						8.6
Ø100	1.8	16.1	513	180.6	200	6.8
						8.4
Ø125	1.4	16.1	659	230.6	250	6.9
						8.1
Ø160	1.0	16.1	923	300.6	320	6.5
						7.5
Ø200	0.7	16.1	1318	380.6	400	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
						11.2
Ø50	4.0	17.5	250	76	100	4.9
						9.3
Ø63	2.9	17.5	346	102	126	5.3
						8.5
Ø80	2.1	17.5	477	136	160	5.5
						7.8
Ø100	1.6	17.5	627	176	200	5.7
						7.5
Ø125	1.2	17.5	736	226	250	5.6
						7.0
Ø160	0.9	17.5	1115	296	320	5.7
						6.7
Ø200	0.7	17.5	1433	376	400	5.7
						6.5

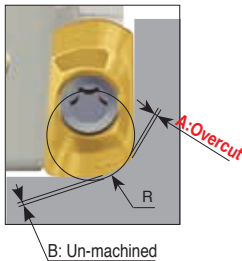


## AXMT 0602R-HF

(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
						0.1
Ø10	0.5	0.5	57	14	20	0.2
						0.3
Ø11	1.0	0.5	29	18	22	0.5
						0.5
Ø12	2.3	0.5	12	18	24	0.5
						0.5
Ø13	4.5	0.5	6	18	26	0.5
						0.5
Ø14	3.5	0.5	8	18	28	0.5
						0.5
Ø15	3.0	0.5	10	26	30	0.5
						0.5
Ø16	2.8	0.5	10	26	32	0.5
						0.5
Ø17	2.5	0.5	11	26	34	0.5
						0.5
Ø18	2.3	0.5	12	26	36	0.5
						0.5
Ø19	2.2	0.5	13	26	38	0.5
						0.5
Ø20	1.9	0.5	15	34	40	0.5
						0.5
Ø21	1.7	0.5	17	34	42	0.5
						0.5
Ø25	1.4	0.5	20	44	50	0.5
						0.5
Ø32	1.0	0.5	29	58	64	0.5
						0.5
Ø40	0.7	0.5	41	74	80	0.5
						0.5

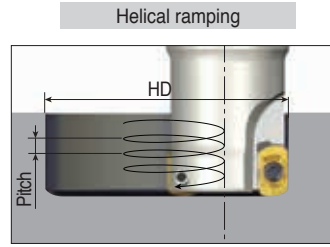
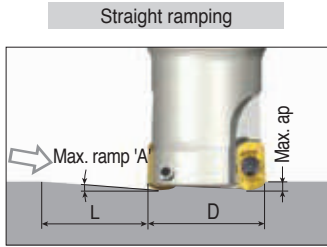
## Programming technical data



	R Program	A Over cut	B 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



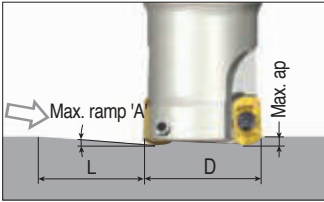
## APKT 09T3R-HF

(unit: mm)

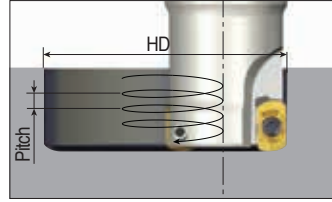
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø16	3.8	1.0	15	22	32	1.0
						1.0
Ø17	3.5	1.0	16	24	34	1.0
						1.0
Ø18	3.4	1.0	17	26	36	1.0
						1.0
Ø20	3.0	1.0	19	30	40	1.0
						1.0
Ø21	2.3	1.0	25	32	42	1.0
						1.0
Ø22	2.0	1.0	29	34	44	1.0
						1.0
Ø25	2.1	1.0	27	40	50	1.0
						1.0
Ø26	2.0	1.0	29	42	52	1.0
						1.0
Ø30	1.8	1.0	32	50	60	1.0
						1.0
Ø32	1.6	1.0	36	54	64	1.0
						1.0
Ø33	1.5	1.0	38	56	66	1.0
						1.0
Ø40	1.2	1.0	48	70	80	1.0
						1.0
Ø50	0.9	1.0	64	90	100	1.0
						1.0
Ø63	0.5	1.0	115	116	126	1.0
						1.0
Ø80	0.4	1.0	143	150	160	1.0
						1.0



Straight ramping



Helical ramping

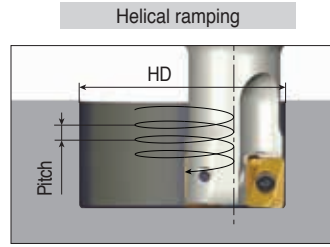
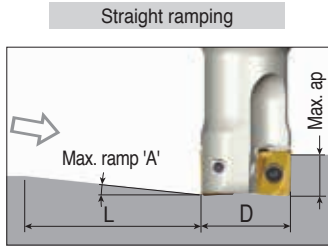


## APKT 1204R-HF

(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

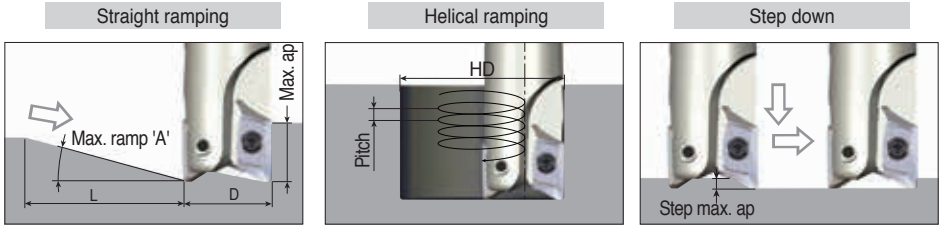
(unit: mm)

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	50	0.3
						1.7
Ø26	1.4	11.0	450	32	52	0.4
						1.7
Ø32	1.1	11.0	573	44	64	0.6
						1.6
Ø33	1.0	11.0	631	46	66	0.6
						1.5
Ø40	0.8	11.0	788	60	80	0.7
						1.5
Ø50	0.6	11.0	1051	80	100	0.8
						1.4
Ø63	0.4	11.0	1576	106	126	0.8
						1.2
Ø80	0.3	11.0	2102	140	160	0.8
						1.1
Ø100	0.2	11.0	3153	180	200	0.7
						0.9
Ø125	0.2	11.0	3153	230	250	1.0
						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	64	0.7
						1.8
Ø33	1.0	15.0	560	46	66	0.6
						1.5
Ø40	0.9	15.0	955	60	80	0.8
						1.7
Ø50	0.8	15.0	1075	80	100	1.1
						1.9
Ø63	0.6	15.0	1433	106	126	1.2
						1.8
Ø80	0.45	15.0	1911	140	160	1.3
						1.7
Ø100	0.35	15.0	2457	180	200	1.3
						1.6
Ø125	0.25	15.0	3439	230	250	1.2
						1.5
Ø160	0.15	15.0	5732	300	320	1.0
						1.1
Ø200	0.1	15.0	8599	380	400	0.8
						0.9



## XEVT 16: 0.4R-1.6R

(unit: mm)

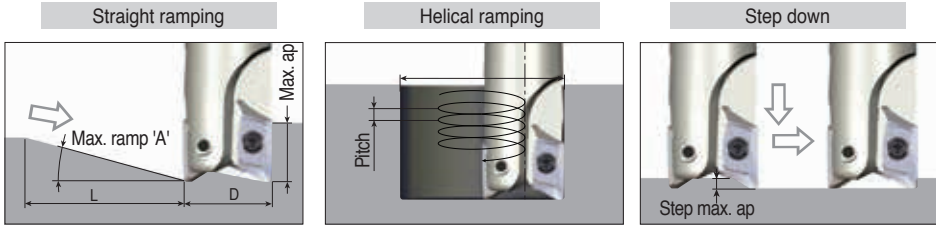
Cutter dia.(D)	Straight ramp down			Helical ramp down			Step down
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.	Max. ap
Ø25	23.5	16	37	29.1	50	4.8	4
						13.6	4
Ø32	14.5	16	62	43.1	64	7.7	4
						13.6	4
Ø40	10.0	16	91	59.1	80	9.0	4
						13.6	4
Ø50	7.5	16	122	79.1	100	10.2	4
						13.6	4
Ø63	5.5	16	166	105.1	126	10.8	4
						13.6	4
Ø80	4.5	16	203	139.1	160	12.4	4
						13.6	4
Ø100	3.3	16	278	179.1	200	12.2	4
						13.6	4
Ø125	2.5	16	367	229.1	250	12.1	4
						13.6	4
Ø160	1.5	16	611	299.1	320	9.7	4
						11.2	4
Ø200	1.0	16	917	379.1	400	8.3	4
						9.3	4

## XEVT 16: 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
Ø25	23.5	15.5	36	29.1	50	4.8	3.5
						13.2	3.5
Ø32	14.5	15.5	60	43.1	64	7.7	3.5
						13.2	3.5
Ø40	10.0	15.5	88	59.1	80	9.0	3.5
						13.2	3.5
Ø50	7.5	15.5	118	79.1	100	10.2	3.5
						13.2	3.5
Ø63	5.5	15.5	161	105.1	126	10.8	3.5
						13.2	3.5
Ø80	4.5	15.5	197	139.1	160	12.4	3.5
						13.2	3.5
Ø100	3.3	15.5	269	179.1	200	12.2	3.5
						13.2	3.5
Ø125	2.5	15.5	355	229.1	250	12.1	3.5
						13.2	3.5
Ø160	1.5	15.5	592	299.1	320	9.7	3.5
						11.2	3.5
Ø200	1.0	15.5	888	379.1	400	8.3	3.5
						9.3	3.5

# Ramping Data



## XEVT 16: 3.0R-3.2R

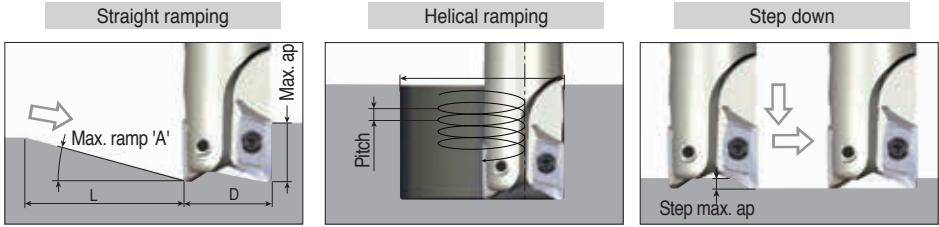
(unit: mm)

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	22.5	14.5	35	29.1	50	4.5	2.8
						12.3	2.8
Ø32	13.5	14.5	60	43.1	64	7.1	2.8
						12.3	2.8
Ø40	9.0	14.5	92	59.1	80	8.1	2.8
						12.3	2.8
Ø50	6.5	14.5	127	79.1	100	8.8	2.8
						12.3	2.8
Ø63	5.0	14.5	166	105.1	126	9.8	2.8
						12.3	2.8
Ø80	4.0	14.5	207	139.1	160	11.0	2.8
						12.3	2.8
Ø100	3.0	14.5	277	179.1	200	11.1	2.8
						12.3	2.8
Ø125	2.0	14.5	415	229.1	250	9.7	2.8
						11.6	2.8
Ø160	1.1	14.5	756	299.1	320	7.1	2.8
						8.2	2.8
Ø200	0.8	14.5	1039	379.1	400	6.7	2.8
						7.4	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	20.0	14.5	40	29.1	50	4.0	2.4
						12.3	2.4
Ø32	12.0	14.5	68	43.1	64	6.3	2.4
						12.3	2.4
Ø40	7.5	14.5	110	59.1	80	6.7	2.4
						12.3	2.4
Ø50	5.5	14.5	151	79.1	100	7.5	2.4
						12.3	2.4
Ø63	4.5	14.5	184	105.1	126	8.8	2.4
						12.3	2.4
Ø80	3.5	14.5	237	139.1	160	9.6	2.4
						12.3	2.4
Ø100	3.0	14.5	277	179.1	200	11.1	2.4
						12.3	2.4
Ø125	2.0	14.5	415	229.1	250	9.7	2.4
						11.6	2.4
Ø160	1.0	14.5	831	299.1	320	6.5	2.4
						7.5	2.4
Ø200	0.7	14.5	1187	379.1	400	5.8	2.4
						6.5	2.4



## XEVT 22: 0.5R-0.8R

(unit: mm)

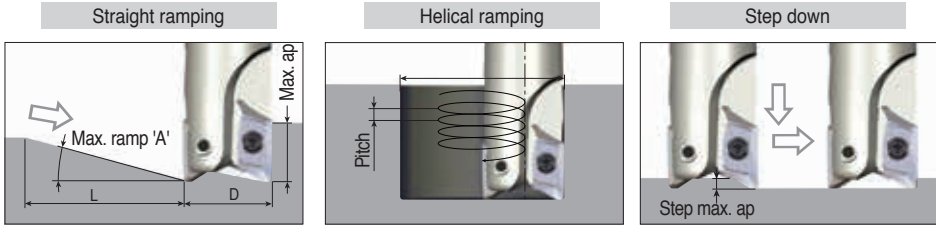
Cutter dia.(D)	Straight ramp down			Helical ramp down			Step down
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.	Max. ap
Ø32	20.0	21	58	38.5	64	6.3	4.7
						17.9	4.7
Ø40	14.0	21	84	54.5	80	9.6	4.7
						17.9	4.7
Ø50	9.5	21	126	74.5	100	10.9	4.7
						17.9	4.7
Ø63	7.0	21	171	100.5	126	12.3	4.7
						17.9	4.7
Ø80	5.0	21	240	134.5	160	12.7	4.7
						17.9	4.7
Ø100	3.7	21	325	174.5	200	12.9	4.7
						17.3	4.7
Ø125	2.6	21	463	224.5	250	12.1	4.7
						15.1	4.7
Ø200	1.6	21	752	374.5	400	13.0	4.7
						14.9	4.7

## 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	19.5	20.3	57	38.5	64	6.1	4.2
						17.3	4.2
Ø40	13.5	20.3	85	54.5	80	9.3	4.2
						17.3	4.2
Ø50	9.5	20.3	121	74.5	100	10.9	4.2
						17.3	4.2
Ø63	6.7	20.3	173	100.5	126	11.8	4.2
						17.3	4.2
Ø80	4.7	20.3	247	134.5	160	12.0	4.2
						17.3	4.2
Ø100	3.5	20.3	332	174.5	200	12.2	4.2
						16.3	4.2
Ø125	2.5	20.3	465	224.5	250	11.6	4.2
						14.6	4.2
Ø200	1.5	20.3	776	374.5	400	12.2	4.2
						14.0	4.2

# Ramping Data



## XEVT 22: 3.0R-4.0R

(unit: mm)

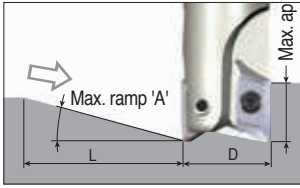
Cutter dia.(D)	Straight ramp down			Helical ramp down			Step down
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.	Max. ap
Ø32	18.5	19.5	58	38.5	64	5.8	3.3
						16.6	3.3
Ø40	12.5	19.5	88	54.5	80	8.6	3.3
						16.6	3.3
Ø50	8.5	19.5	131	74.5	100	9.8	3.3
						16.6	3.3
Ø63	5.5	19.5	203	100.5	126	9.6	3.3
						16.2	3.3
Ø80	4.0	19.5	279	134.5	160	10.2	3.3
						14.9	3.3
Ø100	3.0	19.5	372	174.5	200	10.4	3.3
						14.0	3.3
Ø125	2.0	19.5	559	224.5	250	9.3	3.3
						11.6	3.3
Ø200	1.0	19.5	1118	374.5	400	8.1	3.3
						9.3	3.3

## XEVT 22: 5.0R

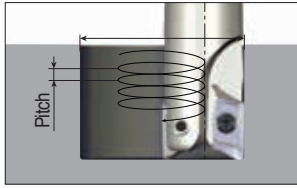
(unit: mm)

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	17.5	19	60	38.5	64	5.5	2.8
						16.2	2.8
Ø40	11.5	19	93	54.5	80	7.9	2.8
						16.2	2.8
Ø50	7.5	19	144	74.5	100	8.6	2.8
						16.2	2.8
Ø63	5.0	19	217	100.5	126	8.8	2.8
						14.7	2.8
Ø80	3.5	19	311	134.5	160	8.9	2.8
						13.1	2.8
Ø100	2.5	19	435	174.5	200	8.7	2.8
						11.6	2.8
Ø125	1.7	19	641	224.5	250	7.9	2.8
						9.9	2.8
Ø200	0.8	19	1361	374.5	400	6.5	2.8
						7.4	2.8

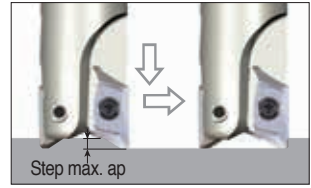
Straight ramping



Helical ramping



Step down

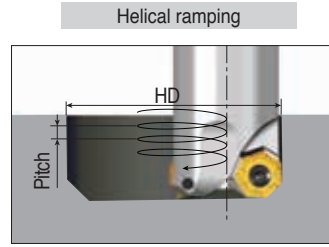
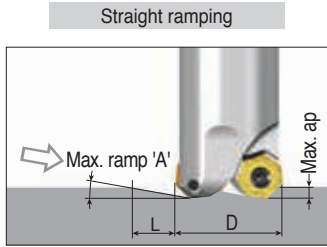


## XEVT 22: 6.4R

(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	16	18.2	64	38.5	64	5.0	2.1
						15.5	2.1
Ø40	10	18.2	103	54.5	80	6.8	2.1
						15.5	2.1
Ø50	6.5	18.2	160	74.5	100	7.4	2.1
						15.2	2.1
Ø63	4.5	18.2	231	100.5	126	7.9	2.1
						13.2	2.1
Ø80	3.0	18.2	347	134.5	160	7.6	2.1
						11.2	2.1
Ø100	2.0	18.2	521	174.5	200	6.9	2.1
						9.3	2.1
Ø125	1.5	18.2	695	224.5	250	7.0	2.1
						8.7	2.1
Ø200	0.7	18.2	1490	374.5	400	5.7	2.1
						6.5	2.1

# Ramping Data

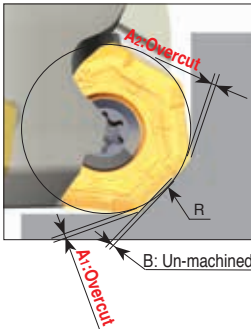


## 7EMT 06

(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	64	3.2
						3.2
Ø40	15.5	3.2	12	61.5	80	3.2
						3.2
Ø50	9.5	3.2	19	81.5	100	3.2
						3.2
Ø63	5.5	3.2	33	107.5	126	3.2
						3.2
Ø80	4.0	3.2	46	141.5	160	3.2
						3.2
Ø100	3.0	3.2	61	181.5	200	3.2
						3.2
Ø125	2.0	2.3	66	231.5	250	3.2
						3.2

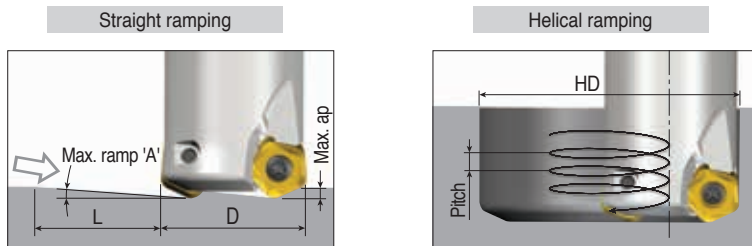
## Programming technical data



	R Program	A Over cut		B Un-machined
		A1	A2	B
7EMT 06	3	0	0	1.77
	4.5	0	0	1.51
	5	0.03	0.02	0.94
	6	0.21	0.19	0.53

**Yellow background** :Recommended program 'R'



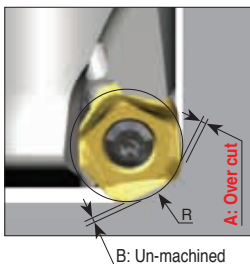


## PTKU 05

(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

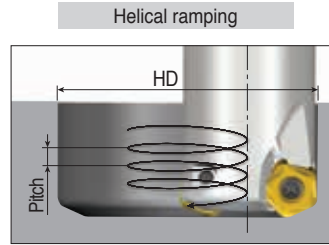
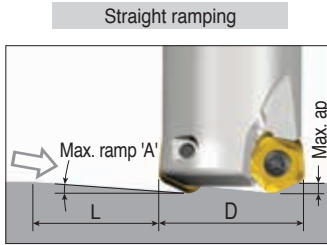
## Programming technical data



	R Program	A Over cut	B Un-machined
PTKU 05	2.5	0.00	0.83
	2.7	0.00	0.76
	3.0	0.04	0.66

Yellow background: Recommended program 'R'

# Ramping Data

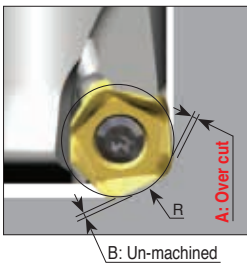


## PTKU 10

(unit: mm)

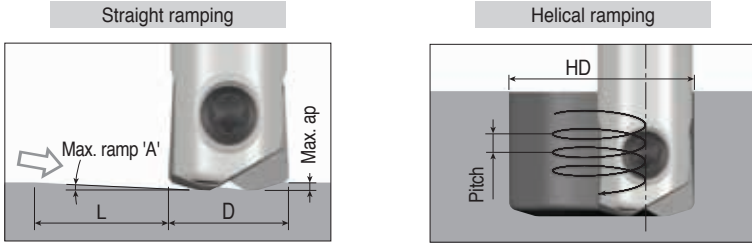
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø40	1.5	3.0	111	63		1.7
					80	2.2
Ø50	1.9	3.0	88	83		2.8
					100	3.0
Ø63	1.7	3.0	101	109		3.0
					126	3.0
Ø66	2.2	3.0	78	115		3.0
					132	3.0
Ø80	1.5	3.0	115	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 Program	A Over cut	B 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'

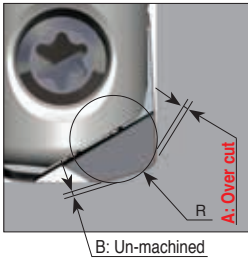


## HFN

(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	11	0.3
						0.3
Ø8	2.5	0.5	11	12	15	0.5
						0.5

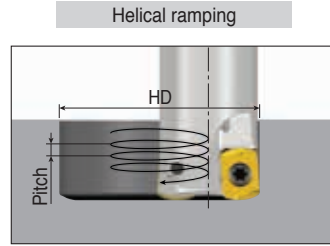
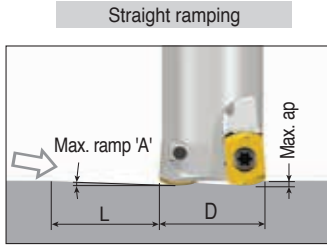
## Programming technical data



	R Program	A Over cut	B 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

**Yellow background**: Recommended program 'R'

# Ramping Data

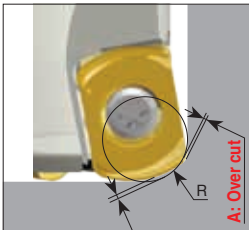


## BLMP 04

(unit: mm)

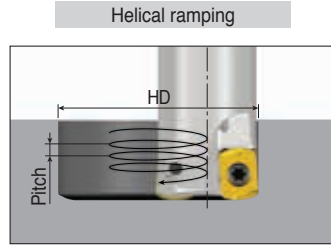
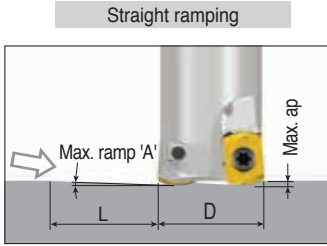
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø8	0.4	0.5	72	12.6		0.1
					16	0.1
Ø10	0.6	0.5	44	16.6		0.2
					20	0.2
Ø11	0.7	0.5	38	18.6		0.2
					22	0.3
Ø12	1.0	0.5	29	20.6		0.4
					24	0.4
Ø13	1.1	0.5	25	22.6		0.5
					26	0.5
Ø16	1.0	0.5	29	28.6		0.5
					32	0.5
Ø17	1.1	0.5	26	30.6		0.5
					34	0.5
Ø20	1.0	0.5	27	36.6		0.5
					40	0.5
Ø21	0.7	0.5	38	38.6		0.5
					42	0.5
Ø25	0.7	0.5	38	46.6		0.5
					50	0.5
Ø32	0.6	0.5	48	60.6		0.5
					64	0.5

## Programming technical data



	R Program	A Over cut	B Un-machined
BLMP 04	0.8	0.00	0.28
	0.9	0.00	0.25
	1.0	0.08	0.22

**Yellow background:** Recommended program 'R'

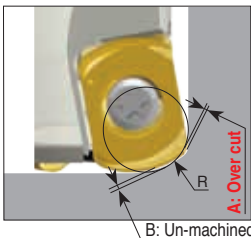


## BLMP 06

(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
				25	34	0.7
Ø17	2.0	0.7	15	27	36	0.7
				31	40	0.8
Ø18	2.3	0.7	16	33	42	1.0
				35	44	1.0
Ø20	1.5	1.0	38	41	50	1.0
				43	52	1.0
Ø21	1.5	1.0	38	51	60	1.0
				55	64	1.0
Ø22	1.5	1.0	38	57	66	1.0
				61	70	1.0
Ø25	1.3	1.0	41	71	80	1.0
				75	84	1.0
Ø26	1.2	1.0	44	91	100	1.0
				95	104	1.0
Ø30	1.0	1.0	52	117	126	1.0
				123	132	1.0
Ø32	0.9	1.0	57			1.0
						1.0
Ø33	0.9	1.0	57			1.0
						1.0
Ø35	0.8	1.0	57			1.0
						1.0
Ø40	0.7	1.0	64			1.0
						1.0
Ø42	0.7	1.0	72			1.0
						1.0
Ø50	0.6	1.0	96			1.0
						1.0
Ø52	0.6	1.0	96			1.0
						1.0
Ø63	0.5	1.0	115			1.0
						1.0
Ø66	0.5	1.0	115			1.0
						1.0

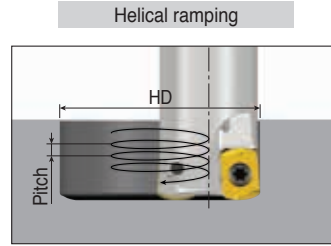
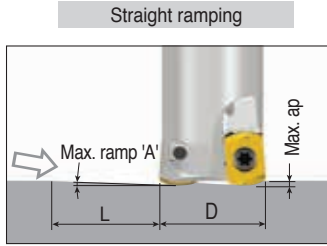
## Programming technical data



	R Program	A Over cut	B Un-machined
BLMP 06 (Ø16, Ø17, Ø18)	1.5	0	0.35
	2.0	0.1	0.22
	2.5	0.27	0.1
BLMP 06 (Ø20-)	2.0	0	0.42
	2.5	0.12	0.26
	3.0	0.29	0.17

■ : Recommended program 'R'

# Ramping Data

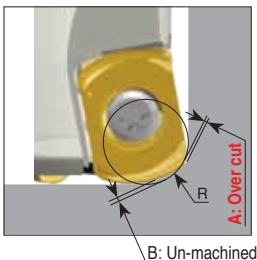


## BLMP 09

(unit: mm)

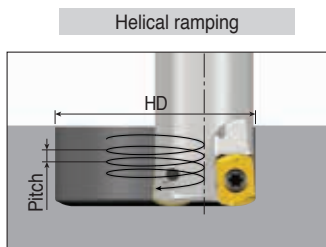
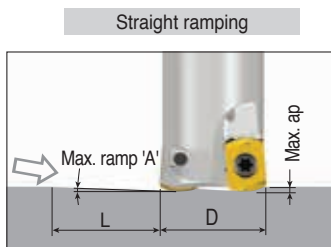
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø25	2.2	1.5	39	42	50	1.5
				44		1.5
Ø26	2.2	1.5	39	52	60	1.5
				56		1.5
Ø30	2.0	1.5	43	58	64	1.5
				60		1.5
Ø32	2.0	1.5	43	66	70	1.5
				72		1.5
Ø33	2.0	1.5	43	76	80	1.5
				84		1.5
Ø35	2.0	1.5	43	92	100	1.5
				96		1.5
Ø40	1.5	1.5	57	104	126	1.5
				118		1.5
Ø42	1.5	1.5	57	124	132	1.5
				152		1.5
Ø50	1.0	1.5	86	160	200	1.5
				192		1.5
Ø52	1.0	1.5	86	240	250	1.5
				250		1.5
Ø63	0.9	1.5	96			1.5
						1.5
Ø66	0.9	1.5	96			1.5
						1.5
Ø80	0.8	1.5	107			1.5
						1.5
Ø100	0.7	1.5	123			1.5
						1.5
Ø125	0.4	1.5	215			1.5
						1.5

## Programming technical data



	R Program	A Over cut	B Un-machined
BLMP 09	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'

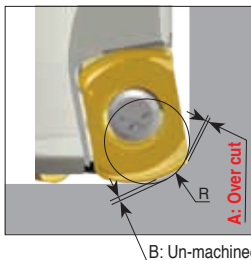


## BLMP 11

(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
						0.7
Ø32	0.50	2.0	229	45	64	0.3
						0.7
Ø33	0.45	2.0	255	47	66	0.3
						0.7
Ø35	0.50	2.0	229	51	70	0.4
						0.8
Ø40	0.55	2.0	208	61	80	0.5
						1.0
Ø42	0.50	2.0	229	65	84	0.5
						1.0
Ø50	0.50	2.0	229	81	100	0.7
						1.2
Ø52	0.45	2.0	255	85	104	0.7
						1.1
Ø63	0.45	2.0	255	107	126	0.9
						1.3
Ø66	0.40	2.0	287	113	132	0.9
						1.2
Ø80	0.35	2.0	328	141	160	1.0
						1.3
Ø100	0.30	2.0	382	181	200	1.1
						1.4
Ø125	0.25	2.0	459	231	250	1.2
						1.5
Ø160	0.20	2.0	573	301	320	1.3
						1.5
Ø200	0.15	2.0	764	381	400	1.3
						1.4

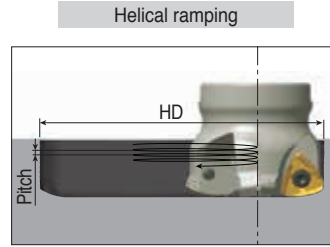
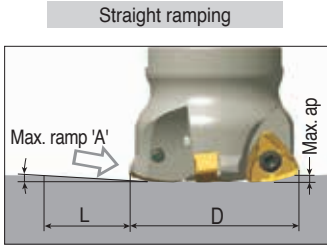
## Programming technical data



	R Program	A Over cut	B 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'

# Ramping Data

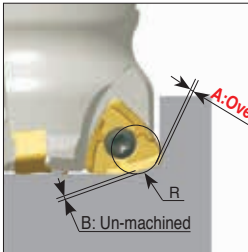


## BLMP 13

(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	64	0.7
				52		0.9
Ø33	1.1	2.0	104	56	66	1.0
				66		1.3
Ø35	1.1	2.0	104	70	70	1.1
				70		1.3
Ø40	1.2	2.0	96	66	80	1.4
				80		1.7
Ø42	1.1	2.0	104	70	84	1.3
				84		1.6
Ø50	0.8	2.0	143	86	100	1.2
				100		1.4
Ø52	0.8	2.0	143	90	104	1.3
				104		1.5
Ø63	0.6	2.0	191	112	126	1.2
				126		1.3
Ø66	0.6	2.0	191	118	132	1.2
				132		1.4
Ø80	0.5	2.0	229	146	160	1.3
				160		1.4
Ø100	0.4	2.0	287	186	200	1.3
				200		1.4
Ø125	0.3	2.0	382	236	250	1.2
				250		1.3
Ø160	0.3	2.0	382	306	320	1.6
				320		1.7
Ø200	0.2	2.0	573	386	400	1.3
				400		1.4
Ø250	0.2	2.0	573	486	500	1.7
				500		1.7

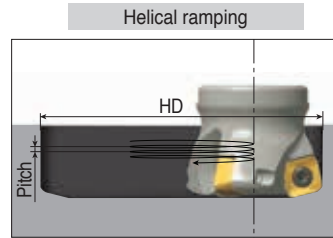
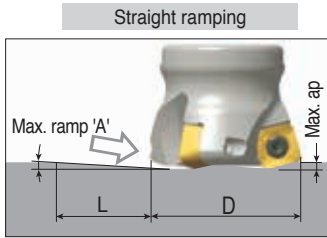
## Programming technical data



	R Program	A Over cut	B 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'



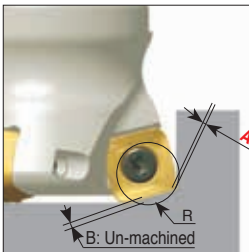


## SBMT 06

(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	2.2	1.0	25.5	22.8	32	0.7
						1.0
Ø17	2.4	1.0	23.4	24.8	34	0.9
						1.0
Ø20	3.2	1.0	17.9	30.8	40	1.0
						1.0
Ø21	3.1	1.0	18.5	32.8	42	1.0
						1.0
Ø25	2.4	1.0	23.4	40.8	50	1.0
						1.0
Ø32	1.8	1.0	31.8	54.8	64	1.0
						1.0
Ø40	1.3	1.0	42.5	70.8	80	1.0
						1.0
Ø50	1.0	1.0	57.3	90.8	100	1.0
						1.0
Ø63	0.7	1.0	76.4	116.8	126	1.0
						1.0

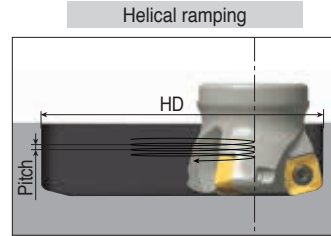
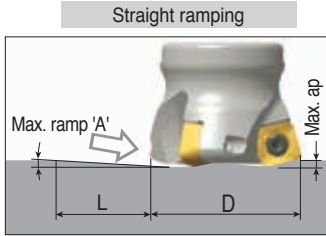
## Programming technical data



	R Program	A Over cut	B Un-machined
SBMT 06	1.8	0	0.81
	2.0	0	0.77
	2.2	0.01	0.73

   :Recommended program 'R'

# Ramping Data

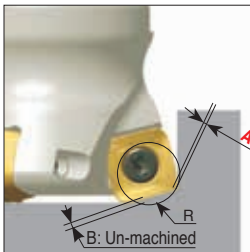


## SBMT 09

(unit: mm)

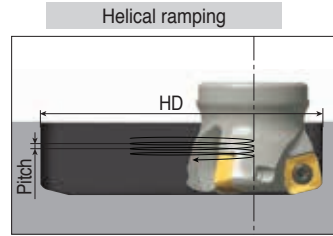
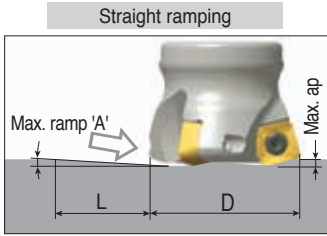
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø25	1.6	1.2	43	36	50	1
						1.2
Ø26	1.7	1.2	40	38	52	1.1
						1.2
Ø30	3.1	1.2	22	46	60	1.2
						1.2
Ø32	3.9	1.2	18	50	64	1.2
						1.2
Ø33	3.7	1.2	19	52	66	1.2
						1.2
Ø35	3.4	1.2	18	56	70	1.2
						1.2
Ø40	2.8	1.2	25	66	80	1.2
						1.2
Ø42	2.6	1.2	26	70	84	1.2
						1.2
Ø50	2.0	1.2	34	86	100	1.2
						1.2
Ø52	1.9	1.2	38	90	104	1.2
						1.2
Ø63	1.5	1.2	43	112	126	1.2
						1.2
Ø66	1.1	1.2	63	118	132	1.2
						1.2
Ø80	1.2	1.2	63	146	160	1.2
						1.2

## Programming technical data



	R Program	A Over cut	B 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'

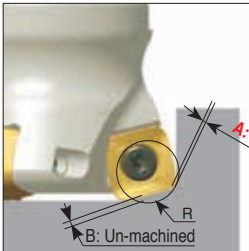


## SBMT 13

(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
				49	66	2.0
Ø33	6.9	2.0	17	53	70	2.0
				63	80	2.0
Ø40	5.3	2.0	22	67	84	2.0
				83	100	2.0
Ø42	4.4	2.0	26	87	104	2.0
				109	126	2.0
Ø50	4.3	2.0	27	143	160	2.0
				183	200	2.0
Ø52	4.0	2.0	29	233	250	2.0
				303	320	2.0
Ø63	2.9	2.0	40	383	400	2.0
				483	500	2.0
Ø80	2.0	2.0	57			2.0
						2.0
Ø100	1.5	2.0	76			2.0
						2.0
Ø125	1.1	2.0	104			2.0
						2.0
Ø160	0.8	2.0	104			2.0
						2.0
Ø200	0.6	2.0	127			2.0
						2.0
Ø250	0.5	2.0	164			2.0
						2.0

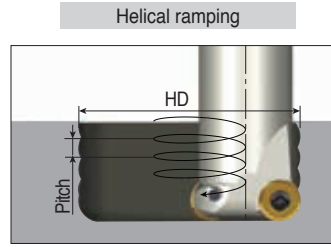
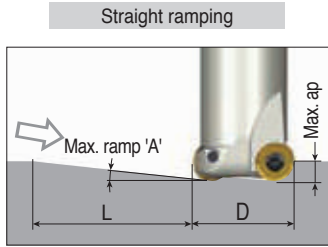
## Programming technical data



	R Program	A Over cut	B 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

■ :Recommended program 'R'

# Ramping Data



## RNMU 10

(unit: mm)

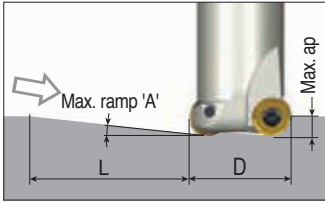
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø25	1.1	5.0	261	33	50	0.4
						1.3
Ø26	1.1	5.0	261	35	52	0.5
						1.3
Ø32	0.9	5.0	318	47	64	0.6
						1.3
Ø33	0.9	5.0	318	49	66	0.7
						1.4
Ø40	0.9	5.0	318	63	80	1.0
						1.7
Ø42	0.9	5.0	318	67	84	1.0
						1.8
Ø50	0.7	5.0	409	83	100	1.1
						1.6
Ø52	0.8	5.0	358	87	104	1.3
						1.9

## RNMU 12

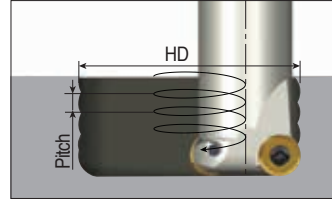
(unit: mm)

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	64	0.7
						2.1
Ø33	1.4	6.0	246	44	66	0.7
						2.2
Ø40	1.3	6.0	265	58	80	1.1
						2.4
Ø50	1.0	6.0	344	78	100	1.3
						2.3
Ø52	1.0	6.0	344	82	104	1.4
						2.4
Ø63	1.0	6.0	344	104	126	1.9
						2.9
Ø66	1.0	6.0	344	110	132	2.0
						3.1
Ø80	0.9	6.0	382	138	160	2.4
						3.4
Ø100	0.7	6.0	491	178	200	2.5
						3.3

Straight ramping



Helical ramping

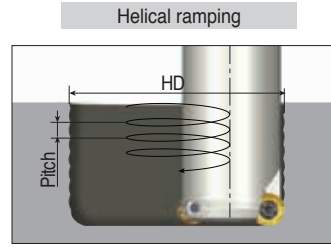
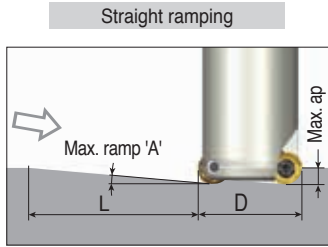


## RNMU 16

(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
						2.6
Ø42	1.4	8.0	328	56	84	0.9
						2.7
Ø50	1.3	8.0	353	72	100	1.3
						3.0
Ø52	1.0	8.0	459	76	104	1.1
						2.4
Ø63	1.0	8.0	459	98	126	1.6
						2.9
Ø66	1.0	8.0	459	104	132	1.8
						3.1
Ø80	1.0	8.0	459	132	160	2.4
						3.7
Ø100	0.9	8.0	510	172	200	3.0
						4.2
Ø125	0.9	8.0	510	222	250	4.1
						5.2

# Ramping Data



## RYM(H)X-08

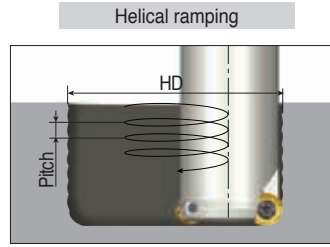
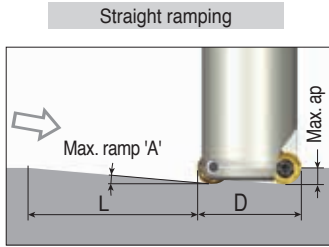
(unit: mm)

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	32	0.2
						1.9
Ø17	2.5	4.0	92	20	34	0.3
						2.0
Ø18	2.5	4.0	92	22	36	0.5
						2.1
Ø20	4.0	4.0	57	26	40	1.1
						3.4
Ø21	4.0	4.0	57	28	42	1.3
						3.4
Ø25	4.0	4.0	57	36	50	2.1
						3.4
Ø26	4.0	4.0	57	38	52	2.2
						3.4
Ø32	4.0	4.0	57	50	64	3.4
						3.4
Ø40	7.0	4.0	33	66	80	3.4
						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	40	0.4
						4.2
Ø21	4.5	5.0	64	24	42	0.6
						4.4
Ø25	5.0	5.0	57	32	50	1.6
						4.3
Ø26	5.0	5.0	57	34	52	1.9
						4.3
Ø32	5.0	5.0	57	46	64	3.3
						4.3
Ø35	5.0	5.0	57	52	70	4.0
						4.3
Ø40	5.0	5.0	57	62	80	4.3
						4.3
Ø42	5.0	5.0	57	66	84	4.3
						4.3
Ø50	6.5	5.0	44	82	100	4.3
						4.3
Ø52	6.0	5.0	48	86	104	4.3
						4.3
Ø66	4.5	5.0	64	114	132	4.3
						4.3

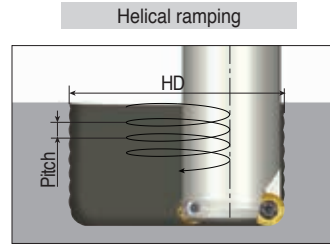
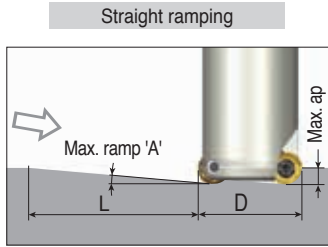


## RYM-12

(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	50	0.8
						5.1
Ø26	6.0	6.0	57	30	52	1.1
						5.1
Ø32	12.0	6.0	28	42	64	5.1
						5.1
Ø33	12.0	6.0	28	44	66	5.1
						5.1
Ø35	12.0	6.0	28	48	70	5.1
						5.1
Ø40	10.0	6.0	34	58	80	5.1
						5.1
Ø42	12.0	6.0	28	62	84	5.1
						5.1
Ø50	9.0	6.0	38	78	100	5.1
						5.1
Ø52	8.0	6.0	43	82	104	5.1
						5.1
Ø55	8.0	6.0	43	88	110	5.1
						5.1
Ø63	7.0	6.0	49	104	126	5.1
						5.1
Ø66	6.5	6.0	53	110	132	5.1
						5.1
Ø80	4.5	6.0	76	138	160	5.1
						5.1
Ø100	3.5	6.0	98	178	200	5.1
						5.1
Ø125	2.5	6.0	137	228	250	5.1
						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		0.7
					64	6.8
Ø40	9.5	8.0	48	50		4.5
					80	6.8
Ø42	9.0	8.0	51	54		5.1
					84	6.8
Ø50	9.0	8.0	51	70		6.8
					100	6.8
Ø52	9.0	8.0	51	74		6.8
					104	6.8
Ø63	8.5	8.0	54	96		6.8
					126	6.8
Ø66	8.5	8.0	54	102		6.8
					132	6.8
Ø80	6.0	8.0	76	130		6.8
					160	6.8
Ø100	5.0	8.0	91	170		6.8
					200	6.8
Ø125	3.5	8.0	131	220		6.8
					250	6.8
Ø160	3.5	8.0	131	290		6.8
					320	6.8

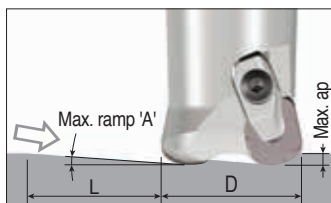
## RYMX-20

(unit: mm)

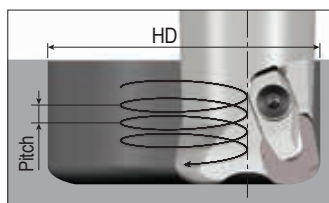
Cutter dia.(D)	Straight ramp down			Helical ramp down		
	Max. ramp (A°)	Max. ap	Min. length (L)	Min. dia.(HD)	Max. dia.(HD)	Max. pitch/rev.
Ø50	8.0	10.0	71	62		4.5
					100	8.5
Ø63	12.5	10.0	45	88		8.5
					126	8.5
Ø80	8.5	10.0	67	122		8.5
					160	8.5
Ø100	6.5	10.0	88	162		8.5
					200	8.5
Ø125	4.5	10.0	127	212		8.5
					250	8.5
Ø160	4.0	10.0	143	282		8.5
					320	8.5
Ø200	2.5	10.0	229	362		8.5
					400	8.5
Ø250	2.4	10.0	239	462		8.5
					500	8.5



Straight ramping



Helical ramping

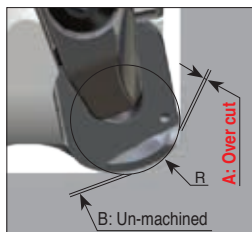


## BNGX 09

(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

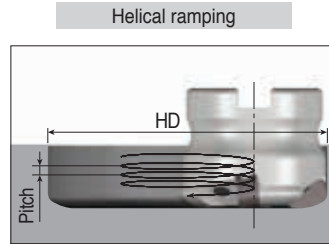
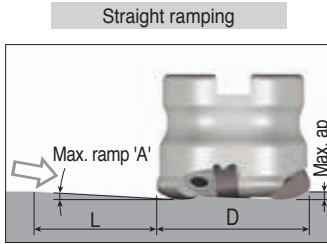
## Programming technical data



	R Program	A Over cut	B Un-machined
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

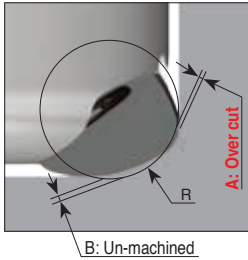


## BNGX 12

(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 Program	A Over cut	B Un-machined
BNGX 12	4.0	0.00	1.18
	4.5	0.00	1.00
	5.0	0.03	0.84

    : Recommended program 'R'



# SOLID END MILLS



# SOLID END MILLS



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<b>Spare Parts</b>	F139

## Guide to Icons



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➤ Helix Angle



➤ Cutting Condition Page



➤ Ball Nose



➤ Corner Radius



➤ Wave Cutting Edge



➤ Head Page



➤ Wrench



### Solid End Mill Line

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STAR-MILL (Difficult-to-Cut Materials - Stainless Steel, Titanium, Super Alloy and Steel)	F108
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# MAXI-RUSH Line















# Tool Selection Guide



## Modular solid carbide end mill heads

	MXEE-03	MXEE(D)-04	MXEE-03	MXEE-104	MXEE-R	MXEE-C04																																																																								
Series																																																																														
Type	Flat	Radius	Radius	Chamfer/Radius	Chamfer	Chamfer																																																																								
Flute																																																																														
Grades	TT5523	TT5523	TT5523	TT5523	TT5523	TT5523																																																																								
Material	<table border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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	●	○	●	○	○	○
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Diameter Range (mm)	Ø8 - Ø12	Ø6 - Ø20	Ø7.7 - Ø19.7	Ø8 - Ø25	Ø8 - Ø25	Ø8 - Ø25																																																																								
Pages	F10	F11	F12	F12	F13	F13																																																																								

	MXEE-A02	MXEE-A03	MXEE(D)-06	MXED-08/10	MXRB-02	MXRD-06																																																																																																												
Series																																																																																																																		
Type	Radius	Radius	Radius	Radius	Radius	Radius																																																																																																												
Flute																																																																																																																		
Grades	UF10	UF10	TT5523	TT5523	TT5523	TT5523																																																																																																												
Material	<table border="1"><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><tr><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table>	P	M	K	N	S	H	○	○	○	○	○	○	○	○	○	○	○	○	<table border="1"><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><tr><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table>	P	M	K	N	S	H	○	○	○	○	○	○	○	○	○	○	○	○	<table border="1"><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><tr><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table>	P	M	K	N	S	H	○	○	○	○	○	○	○	○	○	○	○	○	<table border="1"><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><tr><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table>	P	M	K	N	S	H	○	○	○	○	○	○	○	○	○	○	○	○	<table border="1"><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><tr><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table>	P	M	K	N	S	H	○	○	○	○	○	○	○	○	○	○	○	○	<table border="1"><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><tr><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr></table>	P	M	K	N	S	H	○	○	○	○	○	○	○	○	○	○	○	○
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Diameter range (mm)	Ø10 - Ø12	Ø8 - Ø20	Ø8 - Ø12	Ø16 - Ø25	Ø20	Ø8 - Ø16																																																																																																												
Pages	F14	F14	F15	F15	F16	F16																																																																																																												











● Recommended, ○ Suitable













# Tool Selection Guide



## Modular solid carbide end mill heads

	MXFX-02	MXBD-BG-02	MXBD(E)-BG-04	MXBB-SG-02	MXBE-BGA02																																																												
Series																																																																	
Type	Ball	Ball	Ball	Ball (Spherical)	Ball																																																												
Flute																																																																	
Grades	TT5523	TT5523	TT5523	TT5523	UF10																																																												
Material	<table border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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	●	○	●	○	○	○
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Diameter range (mm)	Ø10 - Ø16	Ø8 - Ø16	Ø6 - Ø25	Ø12	Ø8 - Ø20																																																												
Pages	F17	F17	F18	F18	F19																																																												

	MXCP-02	MXCA-04/06	MXCW-02	MXCSL	MXCSO																																																												
Series																																																																	
Type	Chamfer	Chamfer	Chamfer	Lens shape	Oval shape																																																												
Flute																																																																	
Grades	TT5523	TT5523	TT5523	TT5523	TT5523																																																												
Material	<table border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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	●	○	●	○	○	○
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P	M	K	N	S	H																																																												
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Diameter range (mm)	Ø8 - Ø16.5	Ø10 - Ø20	Ø11.8	Ø8 - Ø16	Ø8 - Ø16																																																												
Pages	F19	F20	F20	F21	F21																																																												

● Recommended, ○ Suitable

# Tool Selection Guide

## Modular solid carbide end mill heads

	MXDP-02	MXGC-02	MXCR-02																																						
Series																																									
Type	Center drill	Counter Boring	Concave																																						
Flute	2	2	2																																						
Grades	TT5523	TT5523	TT5523																																						
Material	<table border="1"><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 border="1"><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 border="1"><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	●	○	●	○	○			
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P	M	K	N	S	H																																				
●	○	●	○	○																																					
Diameter range (mm)	Ø3.28 - Ø6.46	Ø8 - Ø16	Ø8 - Ø20																																						
Pages	F22	F22	F23																																						







## Modular solid carbide slotting heads

	TST-3	TST-4/6	TST-A45	TTB-C15	TTB-06																																																												
Series																																																																	
Type	Slot	Slot	Slot Chamfer	Slot	Slot																																																												
Flute	3	4,6	3,4	6	6																																																												
Grades	TT5543	TT5543	TT5543	TT5543	TT5543																																																												
Material	<table border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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	●	○	○	○	○	
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P	M	K	N	S	H																																																												
●	○	○	○	○																																																													
Diameter range (mm)	Ø15.7 - Ø17.7	Ø21.7 - Ø27.7	Ø17.7 - Ø21.7	Ø13.5	Ø13.5 - Ø25																																																												
Width of cut (mm)	1.5-3.17	0.76-10.0	3.4-5.5	2	3-8																																																												
Pages	F24	F25	F26	F26	F27																																																												



● Recommended, ○ Suitable

# Tool Selection Guide

## Holders for MAXI-RUSH head

	<u>MXSSD</u>	<u>MXSSD-W-A</u>	<u>MXTSD</u>	<u>MXTSD-W-A</u>	<u>MXSC-C</u>	<u>MXSTD</u>
<b>Series</b>						
<b>Shank Type</b>	Straight & neck	Straight & neck	Straight & taper	Straight & taper	Straight	Straight
<b>Shank material</b>	Steel/Carbide	Tungsten	Steel/Carbide	Tungsten	Carbide	Steel
<b>Internal coolant</b>	X	●	X	X	●	●
<b>Connection size</b>	S05 - S15	S06 - S12	S05 - S15	S06	S06, S08	S05 - S10
<b>Shank range (mm)</b>	Ø8 - Ø25	Ø10 - Ø20	Ø12 - Ø32	Ø12 - Ø16	Ø10 - Ø12	Ø8 - Ø16
<b>Pages</b>	F28	F29	F30	F31	F31	F32

## Adaptor for MAXI-RUSH head

	<u>MXAD-M</u>	<u>MXER</u>				
<b>Series</b>						
<b>Shank Type</b>	Adapter	Adapter				
<b>Shank material</b>	Steel	Steel				
<b>Internal coolant</b>	X	X				
<b>Connection size</b>	S08/M8 - M12	S05 - S08				
<b>Shank range (mm)</b>	-	-				
<b>Pages</b>	F33	F34				

## MAXI-RUSH grades

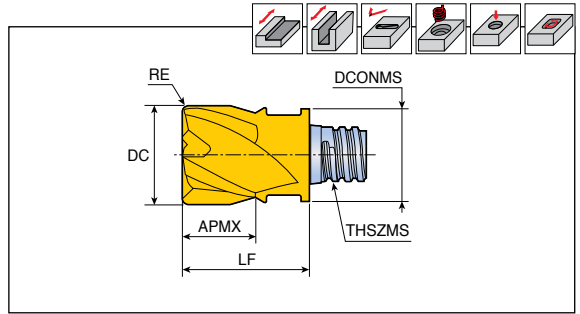
Grades	ISO	Characteristics & applications
<p><b>TT5523</b> PVD coated</p>	<p><b>P20 – P40</b> <b>M20 – M40</b> <b>S20 – S40</b></p>	<ul style="list-style-type: none"> <li>• High speed milling of steel, stainless steel and high-temp alloy</li> </ul>
<p><b>TT5543</b> PVD coated</p>	<p><b>P30 – P50</b> <b>M30 – M50</b> <b>S30 – S50</b></p>	<ul style="list-style-type: none"> <li>• Interrupted and rough machining of steel, stainless steel and high-temp alloy</li> </ul>
<p><b>UF10</b> Uncoated</p>	<p><b>P25 – P35</b> <b>M25 – M35</b> <b>N25 – N35</b></p>	<ul style="list-style-type: none"> <li>• General machining of steel, aluminum alloys, non-ferrous materials</li> <li>• Submicron substrate</li> </ul>



# MXEE(D)-04



4 flute, for general purpose



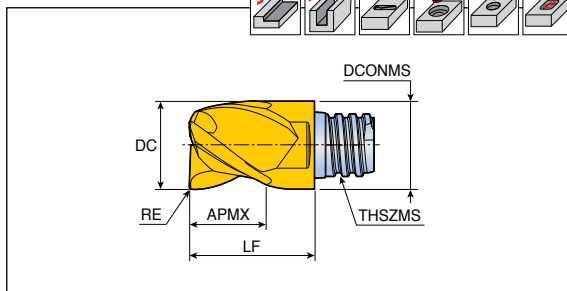
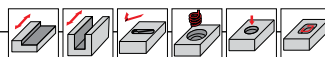
Designation	Feed (mm/tooth)	Dimension (mm)							Grade TT5523
		DC	RE	FHA	APMX	THSZMS	DCONMS	LF	
<b>MXEE 060L05R00-04S05</b>	0.025-0.060	6	-	45	5	S05	8.0	10	●
<b>MXEE 080L05R00-04S05</b>	0.030-0.080	8	-	45	5	S05	7.7	10	●
<b>MXED 080L05R05-04S05</b>	0.030-0.080	8	0.5	30	5	S05	7.7	10	●
<b>MXED 080L05R10-04S05</b>	0.030-0.080	8	1.0	30	5	S05	7.7	10	●
<b>MXED 080L05R15-04S05</b>	0.030-0.080	8	1.5	30	5	S05	7.7	10	●
<b>MXEE 100L07R00-04S06</b>	0.035-0.090	10	-	45	7	S06	9.7	13	●
<b>MXED 100L07R05-04S06</b>	0.035-0.090	10	0.5	30	7	S06	9.7	13	●
<b>MXEE 100L07R05-04S06</b>	0.035-0.090	10	0.5	45	7	S06	9.7	13	●
<b>MXED 100L07R10-04S06</b>	0.035-0.090	10	1.0	30	7	S06	9.7	13	●
<b>MXEE 100L07R10-04S06</b>	0.035-0.090	10	1.0	45	7	S06	9.7	13	●
<b>MXEE 120L09R00-04S08</b>	0.035-0.110	12	-	45	9	S08	11.7	16.5	●
<b>MXED 120L09R05-04S08</b>	0.035-0.110	12	0.5	30	9	S08	11.7	16.5	●
<b>MXEE 120L09R05-04S08</b>	0.035-0.110	12	0.5	45	9	S08	11.7	16.5	●
<b>MXED 120L09R10-04S08</b>	0.035-0.110	12	1.0	30	9	S08	11.7	16.5	●
<b>MXEE 120L09R10-04S08</b>	0.035-0.110	12	1.0	45	9	S08	11.7	16.5	●
<b>MXEE 160L12R00-04S10</b>	0.040-0.130	16	-	45	12	S10	15.3	20.5	●
<b>MXED 160L12R05-04S10</b>	0.040-0.130	16	0.5	30	12	S10	15.3	20.5	●
<b>MXEE 160L12R05-04S10</b>	0.040-0.130	16	0.5	45	12	S10	15.3	20.5	●
<b>MXED 160L12R10-04S10</b>	0.040-0.130	16	1.0	30	12	S10	15.3	20.5	●
<b>MXEE 160L12R10-04S10</b>	0.040-0.130	16	1.0	45	12	S10	15.3	20.5	●
<b>MXED 160L12R15-04S10</b>	0.040-0.130	16	1.5	30	12	S10	15.3	20.5	●
<b>MXEE 160L12R15-04S10</b>	0.040-0.130	16	1.5	45	12	S10	15.3	20.5	●
<b>MXED 160L12R20-04S10</b>	0.040-0.130	16	2.0	30	12	S10	15.3	20.5	●
<b>MXEE 160L12R20-04S10</b>	0.040-0.130	16	2.0	45	12	S10	15.3	20.5	●
<b>MXEE 160L12R30-04S10</b>	0.040-0.130	16	3.0	45	12	S10	15.3	20.5	●
<b>MXEE 160L12R40-04S10</b>	0.040-0.130	16	4.0	45	12	S10	15.3	20.5	●
<b>MXEE 200L15R00-04S12</b>	0.050-0.150	20	-	45	15	S12	18.3	25.5	●
<b>MXED 200L15R05-04S12</b>	0.050-0.150	20	0.5	30	15	S12	18.3	25.5	●
<b>MXED 200L15R10-04S12</b>	0.050-0.150	20	1.0	30	15	S12	18.3	25.5	●
<b>MXED 200L15R20-04S12</b>	0.050-0.150	20	2.0	30	15	S12	18.3	25.5	●
<b>MXED 200L15R30-04S12</b>	0.050-0.150	20	3.0	30	15	S12	18.3	25.5	●

- Wrench should be ordered separately
- FHA: Flute helix angle

●: Standard items

# MXEE-03

3 flute, for keyways



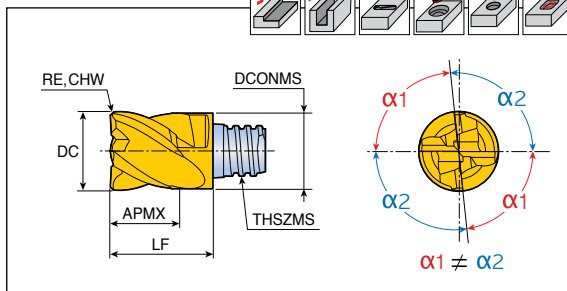
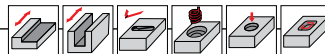
Designation	Feed (mm/tooth)	Dimension (mm)							Grade TT5523
		DC	RE	APMX	THSZMS	DCONMS	LF		
<b>MXEE 077L04R02-03S05</b>	0.030-0.080	7.7	0.2	4	S05	7.7	10	●	
<b>097L05R03-03S06</b>	0.035-0.090	9.7	0.3	5	S06	9.7	13	●	
<b>117L07R03-03S08</b>	0.035-0.110	11.7	0.3	7	S08	11.7	16.5	●	
<b>157L08R03-03S10</b>	0.040-0.130	15.7	0.3	8	S10	15.3	20.5	●	
<b>197L12R04-03S12</b>	0.050-0.150	19.7	0.4	12	S12	18.3	25.5	●	

• Wrench should be ordered separately

●: Standard items

# MXEE-104

4 flute, unequal spacing of cutting edges (vibration free)



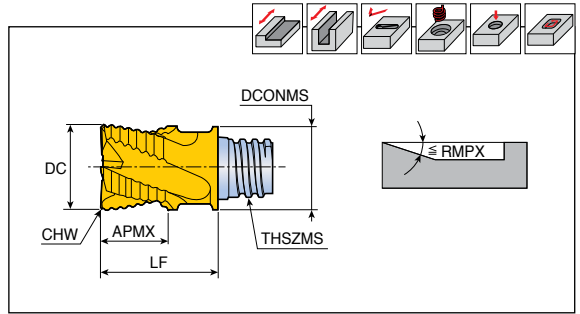
Designation	Feed (mm/tooth)	Dimension (mm)							Grade TT5523
		DC	RE	CHW	APMX	THSZMS	DCONMS	LF	
<b>MXEE 080L05C30I04S05</b>	0.030-0.080	8	-	0.3	5	S05	7.7	10	●
<b>100L07C40I04S06</b>	0.035-0.090	10	-	0.4	7	S06	9.7	13	●
<b>120L09C50I04S08</b>	0.035-0.110	12	-	0.5	9	S08	11.7	16.5	●
<b>160L12C60I04S10</b>	0.040-0.130	16	-	0.6	12	S10	15.3	20.5	●
<b>200L15C60I04S12</b>	0.050-0.150	20	-	0.6	15	S12	18.3	25.5	●
<b>250L22C60I04S15</b>	0.060-0.170	25	-	0.6	22	S15	23.9	37	●
<b>250L22R00I04S15</b>	0.060-0.170	25	-	-	22	S15	23.9	37	●
<b>250L22R05I04S15</b>	0.060-0.170	25	0.5	-	22	S15	23.9	37	●
<b>250L22R10I04S15</b>	0.060-0.170	25	1.0	-	22	S15	23.9	37	●
<b>250L22R20I04S15</b>	0.060-0.170	25	2.0	-	22	S15	23.9	37	●
<b>250L22R30I04S15</b>	0.060-0.170	25	3.0	-	22	S15	23.9	37	●

• Wrench should be ordered separately

●: Standard items

# MXEE-R

4-6 flute, for roughing



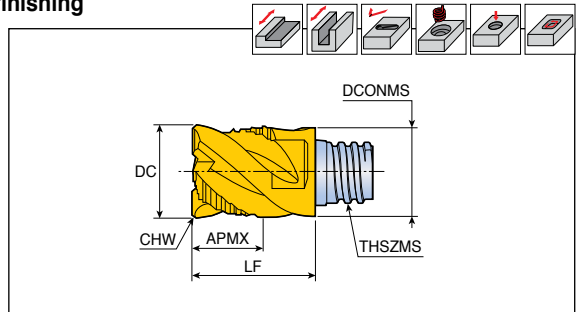
Designation	Feed (mm/tooth)	Dimension (mm)									Grade
		DC	NOF	APMX	CHW	THSZMS	DCONMS	LF	RMPX	TT5523	
<b>MXEE 080L05C25R04S05</b>	0.030-0.080	8	4	5	0.25	S05	7.7	10	90	●	
<b>100L07C30R04S06</b>	0.035-0.090	10	4	7	0.30	S06	9.7	13	90	●	
<b>120L09C35R04S08</b>	0.035-0.110	12	4	9	0.35	S08	11.7	16.5	90	●	
<b>160L12C40R05S10</b>	0.040-0.130	16	5	12	0.40	S10	15.3	20.5	7	●	
<b>200L15C40R06S12</b>	0.050-0.150	20	6	15	0.40	S12	18.3	25.5	3	●	
<b>250L22C50R06S15</b>	0.060-0.170	25	6	22	0.50	S15	23.9	37	3	●	

- Wrench should be ordered separately
- RMPX: Ramping angle maximum
- NOF: Number of flutes

●: Standard items

# MXEE-C04

4 flute, combined edges for roughing & finishing



Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	APMX	CHW	THSZMS	DCONMS	LF	
<b>MXEE 080L05C30C04S05</b>	0.030-0.080	8	5	0.3	S05	7.7	10	●
<b>100L07C30C04S06</b>	0.035-0.090	10	7	0.3	S06	9.7	13	●
<b>120L09C40C04S08</b>	0.035-0.110	12	9	0.4	S08	11.7	16.5	●
<b>160L12C60C04S10</b>	0.040-0.130	16	12	0.6	S10	15.3	20.5	●
<b>200L15C60C04S12</b>	0.050-0.150	20	15	0.6	S12	18.3	25.5	●
<b>250L22C60C04S15</b>	0.060-0.170	25	22	0.6	S15	23.9	37	●

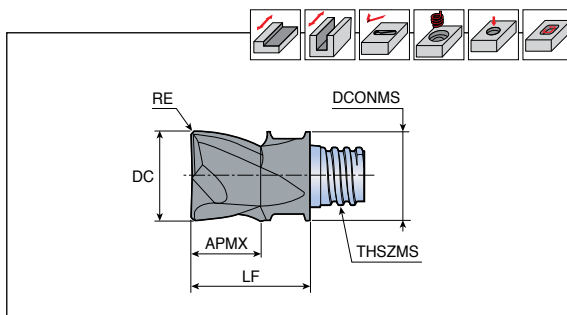
- Wrench should be ordered separately

●: Standard items



# MXEE-A02

2 flute, for aluminum machining



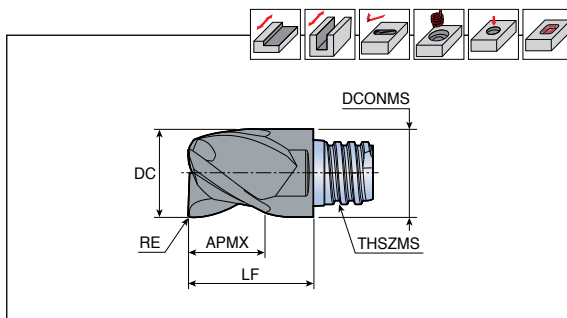
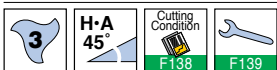
Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	APMX	THSZMS	DCONMS	LF	UF10	
<b>MXEE 100L07R05A02S06</b>	0.035-0.090	10	0.5	7	S06	9.7	13	●	
<b>100L07R10A02S06</b>	0.035-0.090	10	1.0	7	S06	9.7	13	●	
<b>120L09R05A02S08</b>	0.035-0.110	12	0.5	9	S08	11.7	16.5	●	

• Wrench should be ordered separately

●: Standard items

# MXEE-A03

3 flute, for aluminum machining



Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	APMX	THSZMS	DCONMS	LF	UF10	
<b>MXEE 080L05R05A03S05</b>	0.030-0.080	8	0.5	5	S05	7.7	10	●	
<b>100L06R05A03S06</b>	0.035-0.090	10	0.5	6	S06	9.7	13	●	
<b>100L06R10A03S06</b>	0.035-0.090	10	1.0	6	S06	9.7	13	●	
<b>120L08R05A03S08</b>	0.035-0.110	12	0.5	8	S08	11.7	16.5	●	
<b>120L08R10A03S08</b>	0.035-0.110	12	1.0	8	S08	11.7	16.5	●	
<b>160L10R00A03S10</b>	0.040-0.130	16	-	10	S10	15.3	20.5	●	
<b>160L10R10A03S10</b>	0.040-0.130	16	1.0	10	S10	15.3	20.5	●	
<b>160L10R20A03S10</b>	0.040-0.130	16	2.0	10	S10	15.3	20.5	●	
<b>200L12R05A03S12</b>	0.050-0.150	20	0.5	12	S12	18.3	25.5	●	
<b>200L12R10A03S12</b>	0.050-0.150	20	1.0	12	S12	18.3	25.5	●	
<b>200L12R20A03S12</b>	0.050-0.150	20	2.0	12	S12	18.3	25.5	●	

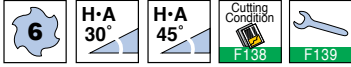
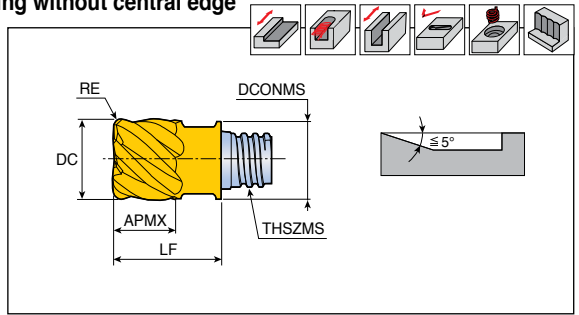
• Wrench should be ordered separately

●: 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	THSZMS	DCONMS	LF	
<b>MXEE 080L05R05-06S05</b>	0.030-0.080	8	0.5	45	5	S05	7.7	10	●
<b>MXEE 080L05R10-06S05</b>	0.030-0.080	8	1.0	45	5	S05	7.7	10	●
<b>MXED 100L07R05-06S06</b>	0.035-0.090	10	0.5	30	7	S06	9.7	13	●
<b>MXED 100L07R10-06S06</b>	0.035-0.090	10	1.0	30	7	S06	9.7	13	●
<b>MXEE 100L07R05-06S06</b>	0.035-0.090	10	0.5	45	7	S06	9.7	13	●
<b>MXEE 100L07R10-06S06</b>	0.035-0.090	10	1.0	45	7	S06	9.7	13	●
<b>MXEE 100L07R15-06S06</b>	0.035-0.090	10	1.5	45	7	S06	9.7	13	●
<b>MXED 120L09R05-06S08</b>	0.035-0.110	12	0.5	30	9	S08	11.7	16.5	●
<b>MXEE 120L09R00-06S08</b>	0.035-0.110	12	-	45	9	S08	11.7	16.5	●
<b>MXEE 120L09R10-06S08</b>	0.035-0.110	12	1.0	45	9	S08	11.7	16.5	●
<b>MXEE 120L09R15-06S08</b>	0.035-0.110	12	1.5	45	9	S08	11.7	16.5	●

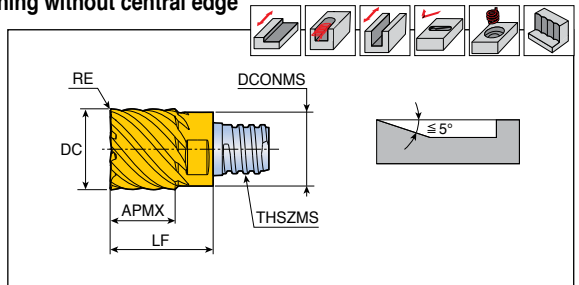
- Wrench should be ordered separately
- FHA : Flute Helix Angle

● : Standard items

# MXED-08/10



8, 10 flute, for difficult-to-cut material machining without central edge



Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	NOF	RE	APMX	THSZMS	DCONMS	LF	
<b>MXED 160L12R05-08S10</b>	0.040-0.130	16	8	0.5	12	S10	15.3	20.5	●
<b>160L12R10-08S10</b>	0.040-0.130	16	8	1.0	12	S10	15.3	20.5	●
<b>160L12R20-08S10</b>	0.040-0.130	16	8	2.0	12	S10	15.3	20.5	●
<b>200L15R10-10S12</b>	0.050-0.150	20	10	1.0	15	S12	18.3	25.5	●
<b>200L15R20-10S12</b>	0.050-0.150	20	10	2.0	15	S12	18.3	25.5	●
<b>250L22R10-10S15</b>	0.060-0.170	25	10	1.0	22	S15	23.9	37	●
<b>250L22R20-10S15</b>	0.060-0.170	25	10	2.0	22	S15	23.9	37	●

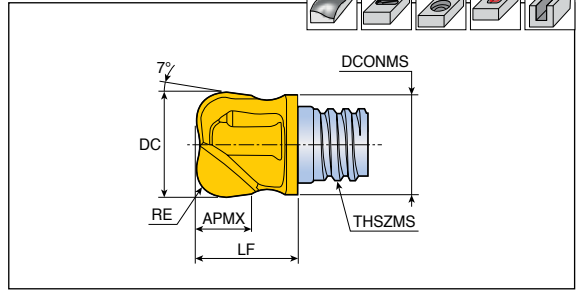
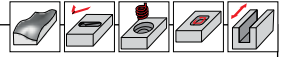
- Wrench should be ordered separately
- NOF: Number of flutes

● : Standard items

# MXRB-02



2 flute, 7° back taper flute



Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	RE	APMX	THSZMS	DCONMS	LF	
<b>MXRB 200L11R50-02S12</b>	0.05-0.150	20	5	11.3	S12	18.3	17.3	●

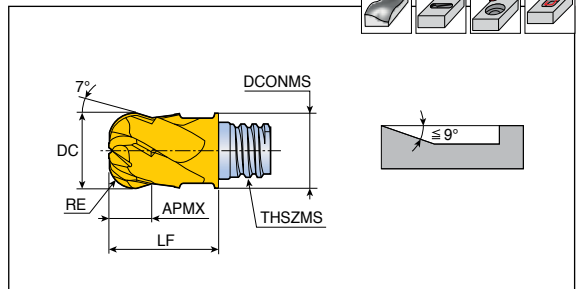
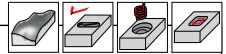
• Wrench should be ordered separately

●: Standard items

# MXRD-06



6 flute, 7° back taper sided ground flute



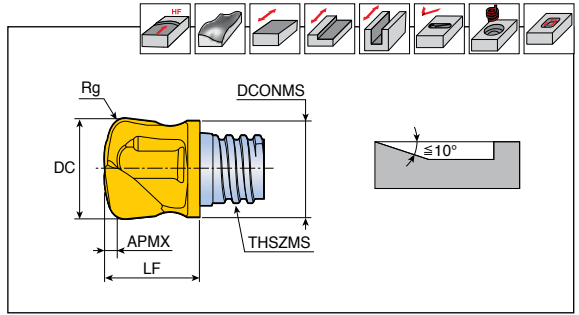
Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	RE	APMX	THSZMS	DCONMS	LF	
<b>MXRD 080L04R20-06S05</b>	0.030-0.080	8	2	4	S05	7.7	10	●
<b>100L05R30-06S06</b>	0.035-0.090	10	3	5	S06	9.7	13	●
<b>120L07R40-06S08</b>	0.035-0.110	12	4	7	S08	11.7	16.5	●
<b>160L09R50-06S10</b>	0.040-0.130	16	5	9	S10	15.3	20.5	●

• Wrench should be ordered separately

●: Standard items

# MXFX-02

2 flute, for high feed milling



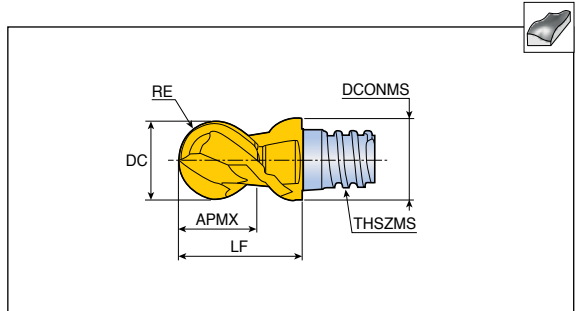
Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	Rg	APMX	THSZMS	DCONMS	LF	
<b>MXFX 100L0.6R20-02S06</b>	0.30-0.60	10	2.0	0.6	S06	9.6	12.5	●
<b>120L1.0R25-02S08</b>	0.50-1.00	12	2.5	0.68	S08	11.5	11.1	●
<b>160L1.1R30-02S10</b>	0.55-1.10	16	3.0	1.1	S10	15.2	20	●

- Wrench should be ordered separately
- Rg: Radius for programmers

●: Standard items

# MXBD-BG-02

2 flute, for high precision machining



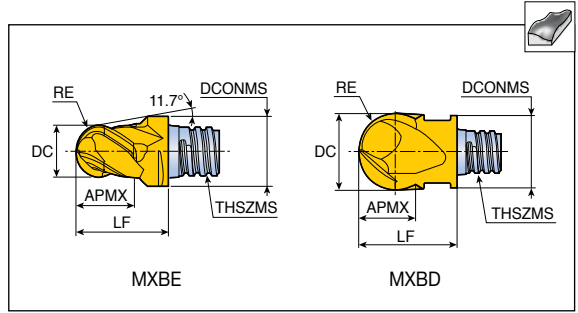
Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	RE	APMX	THSZMS	DCONMS	LF	
<b>MXBD 080L05-BG-02S05</b>	0.030-0.080	8	3.982 <sup>(1)</sup>	5	S05	7.7	10	●
<b>100L07-BG-02S06</b>	0.035-0.090	10	4.982 <sup>(1)</sup>	7	S06	9.7	13	●
<b>120L09-BG-02S08</b>	0.035-0.110	12	5.978 <sup>(2)</sup>	9	S08	11.7	16.5	●
<b>160L09-BG-02S10</b>	0.040-0.130	16	7.978 <sup>(2)</sup>	9	S10	15.3	20.5	●

- 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



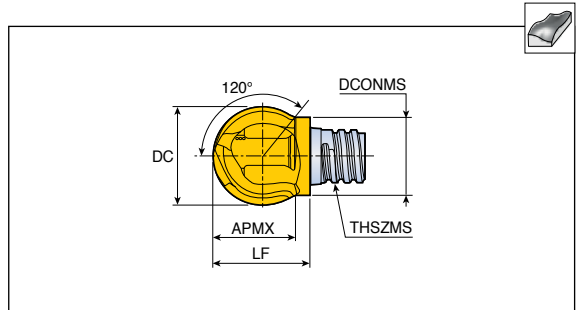
Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	FHA	APMX	THSZMS	DCONMS	LF	
<b>MXBE 06L05-BG-04S05</b>	0.025-0.060	6	2.987 <sup>(1)</sup>	38	5.5	S05	8.0	10	●
<b>MXBD 08L05-BG-04S05</b>	0.030-0.080	8	3.982 <sup>(1)</sup>	30	5	S05	7.7	10	●
<b>100L07-BG-04S06</b>	0.035-0.090	10	4.982 <sup>(1)</sup>	30	7	S06	9.7	13	●
<b>120L09-BG-04S08</b>	0.035-0.110	12	5.978 <sup>(2)</sup>	30	9	S08	11.7	16.5	●
<b>160L12-BG-04S10</b>	0.040-0.130	16	7.978 <sup>(2)</sup>	30	12	S10	15.3	20.5	●
<b>200L15-BG-04S12</b>	0.050-0.150	20	9.972 <sup>(2)</sup>	30	15	S12	18.3	25.5	●
<b>250L22-BG-04S15</b>	0.060-0.170	25	12.470 <sup>(3)</sup>	30	22	S15	23.9	37	●

- 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

# MXBB-SG-02

2 flute, spherical designed edge



Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	APMX	THSZMS	DCONMS	LF	
<b>* MXBB 120L09-SG-02S06</b>	0.035-0.110	12	9.0	S06	9.5	11.6	●

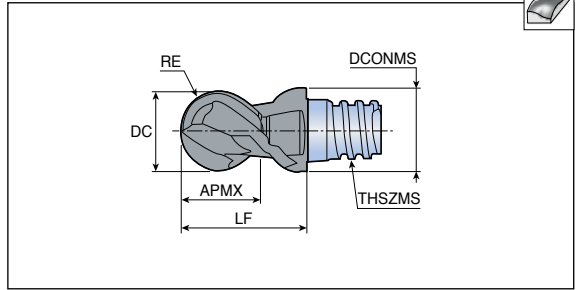
- Wrench should be ordered separately
- \* Use a different size wrench: MX KEY-S08

●: Standard items

# MXBE-BGA02



2 flute, spherical designed edge for aluminum machining



Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	RE	APMX	THSZMS	DCONMS	LF	
<b>MXBE 080L05-BGA02S05</b>	0.030-0.080	8	3.982 <sup>(1)</sup>	5	S05	7.7	10	●
<b>100L07-BGA02S06</b>	0.035-0.090	10	4.982 <sup>(1)</sup>	7	S06	9.7	13	●
<b>120L09-BGA02S08</b>	0.035-0.110	12	5.987 <sup>(2)</sup>	9	S08	11.7	16.5	●
<b>160L12-BGA02S10</b>	0.040-0.130	16	7.978 <sup>(2)</sup>	12	S10	15.3	20.5	●
<b>200L15-BGA02S12</b>	0.050-0.150	20	9.972 <sup>(2)</sup>	15	S12	18.3	25.5	●

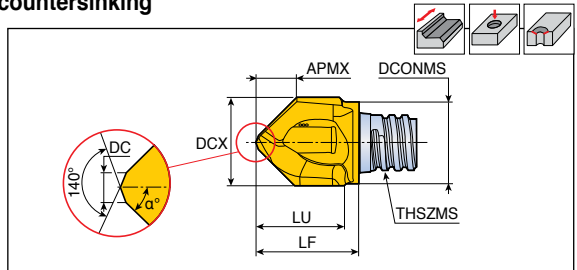
- Wrench should be ordered separately
- RE Tolerance: <sup>(1)</sup> ± 0.01, <sup>(2)</sup> ± 0.012

●: Standard items

# MXCP-02



2 flute, for spot drilling, chamfering and countersinking



Designation	Feed (mm/tooth)	Dimension (mm)								Grade
		DCX	DC	APMX	THSZMS	DCONMS	LU	LF	α°	
<b>MXCP 100L09A30-02S06</b>	0.035-0.090	10	1.5	7.5	S06	9.5	8.5	11.75	30	●
<b>120L12A30-02S08</b>	0.035-0.110	12	1.5	9.2	S08	11.5	11	15.4	30	●
<b>160L15A30-02S10</b>	0.040-0.130	16	2.5	12	S10	15.2	16	20.2	30	●
<b>080L07A45-02S05</b>	0.030-0.080	8	1.0	3.7	S05	7.6	7.5	9.75	45	●
<b>083L07A45-02S05</b>	0.030-0.080	8.3	1.0	3.8	S05	7.6	7.5	10	45	●
<b>100L09A45-02S06</b>	0.035-0.090	10	1.5	4.4	S06	9.5	9.5	11.75	45	●
<b>104L09A45-02S06</b>	0.035-0.090	10.4	1.5	4.6	S06	9.5	9.5	11.75	45	●
<b>120L12A45-02S08</b>	0.035-0.110	12	1.5	5.4	S08	11.5	11.5	15.4	45	●
<b>124L12A45-02S08</b>	0.035-0.110	12.4	1.5	5.6	S08	11.5	11.5	15.4	45	●
<b>160L15A45-02S10</b>	0.040-0.130	16	1.5	7.1	S10	15.2	15	18.8	45	●
<b>165L15A45-02S10</b>	0.040-0.130	16.5	1.5	7.1	S10	15.2	15	18.8	45	●
<b>100L09A60-02S06</b>	0.035-0.090	10	1.5	2.7	S06	9.5	9.5	12.7	60	●
<b>120L12A60-02S08</b>	0.035-0.110	12	1.5	3.3	S08	11.5	11.5	15.2	60	●
<b>160L15A60-02S10</b>	0.040-0.130	16	1.5	4.4	S10	15.2	16	19.9	60	●

- Wrench should be ordered separately

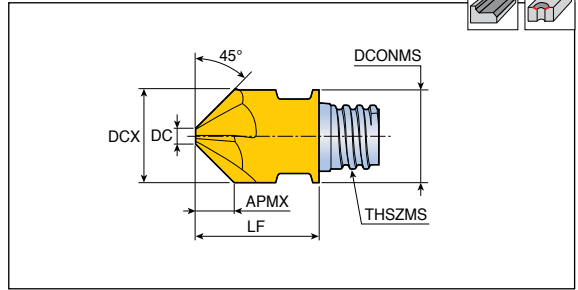
●: Standard items



# MXCA-04/06



4, 6 flute, chamfering and countersinking without central edge



Designation	Feed (mm/tooth)	Dimension (mm)								Grade TT5523
		DCX	DC	NOF	APMX	THSZMS	DCONMS	LF		
<b>MXCA 100L04A45-04S06</b>	0.035-0.090	10	1.95	4	4.0	S06	10	13	●	
<b>120L05A45-04S08</b>	0.035-0.110	12	1.95	4	5.0	S08	12	16.5	●	
<b>127L05A45-04S08</b>	0.035-0.110	12.7	1.98	4	5.3	S08	12.7	16.5	●	
<b>160L06A45-06S10</b>	0.040-0.130	16	3.0	6	6.5	S10	16	20.3	●	
<b>200L07A45-06S12</b>	0.050-0.150	20	5.0	6	7.5	S12	20	25.5	●	

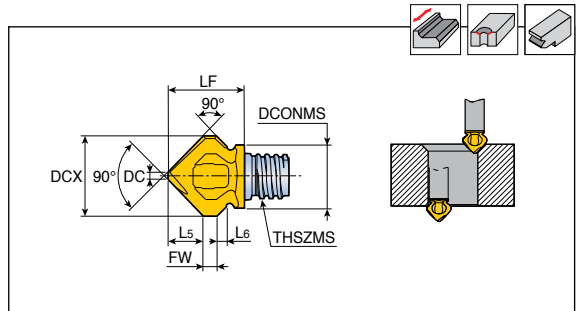
- Wrench should be ordered separately
- NOF: Number of flutes

●: Standard items

# MXCW-02



2 flute, for double chamfering



Designation	Feed (mm/tooth)	Dimension (mm)								Grade TT5523
		DCX	DC	L5	L6	FW	THSZMS	DCONMS	LF	
<b>*MXCW 118L05A45-02S06</b>	0.035-0.110	11.8	1.2	5.3	1.2	2	S06	9.3	11.2	●

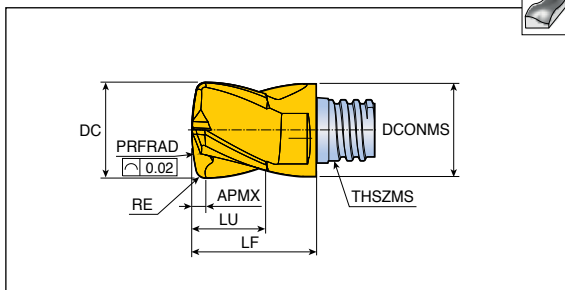
- Wrench should be ordered separately
- \* Use a different size wrench: MX KEY-S08

●: Standard items

# MXCSL



4 flute, lens shape for 5-axis profiling



Designation	Feed (mm/tooth)	Dimension (mm)								Grade
		DC	PRFRAD	RE	APMX	LU	THSZMS	DCONMS	LF	
<b>MXCSL 4080R016-S05</b>	0.02-0.08	8	16	0.5	0.9	5.5	S05	8	10	●
<b>4100R020-S06</b>	0.03-0.09	10	20	1	1.4	7.5	S06	10	13	●
<b>4120R024-S08</b>	0.03-0.10	12	24	1	1.6	9	S08	12	16.5	●
<b>4160R032-S10</b>	0.04-0.12	16	32	1	1.8	12	S10	16	20.5	●

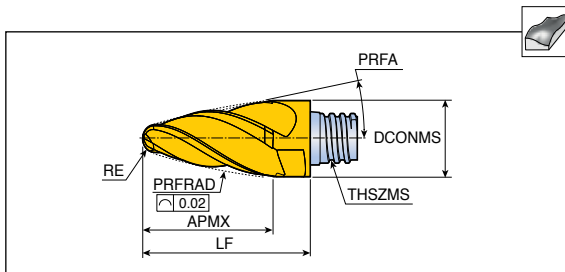
- Wrench should be ordered separately
- PRFRAD: Profile radius

●: Standard items

# MXCSO



4 flute, oval shape for 5-axis profiling



Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		PRFRAD	RE	APMX	PRFA	THSZMS	DCONMS	LF	
<b>MXCSO 4080R080-S05</b>	0.02-0.08	80	1.5	14.2	12	S05	8	18	●
<b>4100R085-S06</b>	0.03-0.09	85	2	16.5	12	S06	10	22	●
<b>4120R075-S08</b>	0.03-0.10	75	2	21.3	12	S08	12	27	●
<b>4160R075-S10</b>	0.04-0.12	75	3	27	12	S10	16	33.4	●

- Wrench should be ordered separately
- PRFRAD: Profile radius

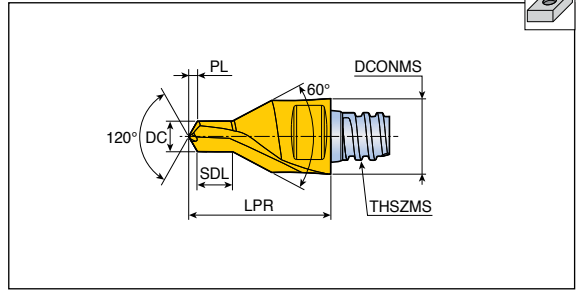
●: Standard items



# MXDP-02



2 flute, for center drilling



Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	PL	SDL	THSZMS	DCONMS	LPR	
<b>MXDP 328L04A30-02S05</b>	0.04-0.08	3.28	0.85	3.75	S05	8	15	●
<b>412L05A30-02S06</b>	0.05-0.10	4.12	1.07	4.83	S06	10	19	●
<b>513L07A30-02S08</b>	0.05-0.12	5.13	1.32	5.88	S08	12	23	●
<b>646L08A30-02S10</b>	0.06-0.15	6.46	1.65	7.25	S10	16	28	●

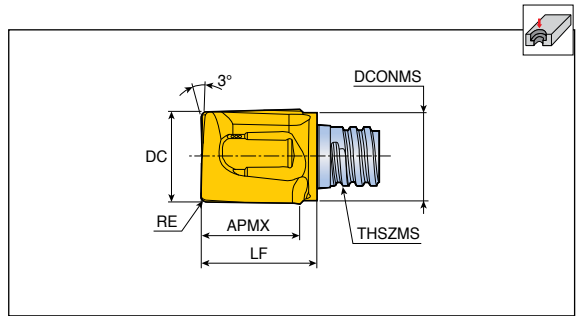
- Wrench should be ordered separately
- SDL: Step diameter length

●: Standard items

# MXGC-02



2 flute, for counter boring



Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	RE	APMX	THSZMS	DCONMS	LF	
<b>MXGC 080L08R04-02S05</b>	0.030-0.080	8	0.4	7.7	S05	7.6	10	●
<b>080L08R10-02S05</b>	0.030-0.080	8	1.0	7.7	S05	7.6	10	●
<b>100L09R04-02S06</b>	0.035-0.090	10	0.4	9.0	S06	9.5	12.4	●
<b>100L09R20-02S06</b>	0.035-0.090	10	2.0	9.0	S06	9.5	12.4	●
<b>120L10R04-02S08</b>	0.035-0.110	12	0.4	10	S08	11.5	14.2	●
<b>120L10R10-02S08</b>	0.035-0.110	12	1.0	10	S08	11.5	14.2	●
<b>120L10R20-02S08</b>	0.035-0.110	12	2.0	10	S08	11.5	14.2	●
<b>160L15R04-02S10</b>	0.040-0.130	16	0.4	14.9	S10	15.2	19	●

- Wrench should be ordered separately

●: Standard items

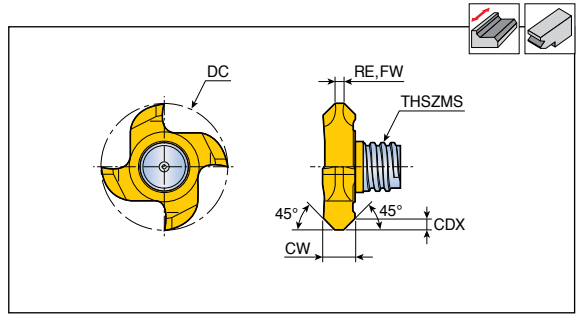






# TST-A45

3, 4 flute, for chamfering



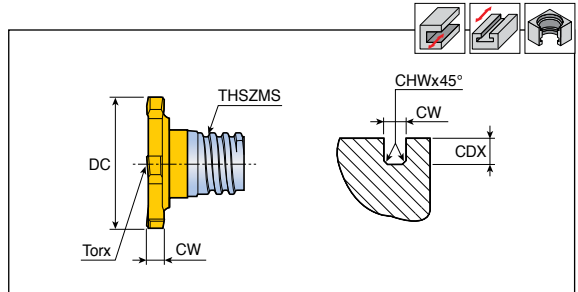
Designation	Feed (mm/tooth)	Dimension (mm)							Grade TT5543
		DC	NOF	CW	CDX	RE	FW	THSZMS	
<b>TST 177L01.40A45-3S06</b>	0.025-0.150	17.7	3	3.4	1.4	0.1	-	S06	●
<b>217L01.70A45-4S08</b>	0.025-0.170	21.7	4	5.5	1.7	-	1.5	S08	●

- Wrench should be ordered separately
- NOF: Number of flutes
- FW: Flat width

●: Standard items

# TTB-C15

6 flute, for chamfered slotting



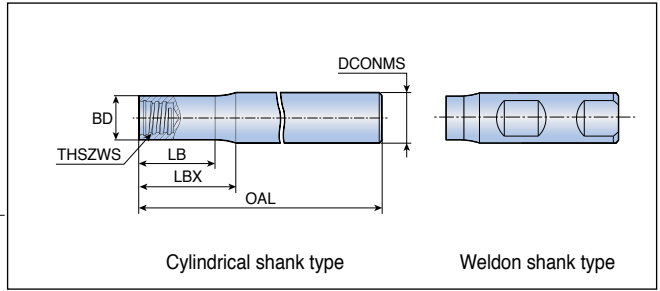
Designation	Feed (mm/tooth)	Dimension (mm)					Torx	Grade TT5543
		DC	CW	CDX	CHW	THSZMS		
<b>TTB 135W2.0C15-06S05</b>	0.025-0.120	13.5	2	2.65	0.15	S05	T20	●

- Wrench should be ordered separately
- CHW: Corner chamfer width

●: Standard items



## Straight shanks with neck



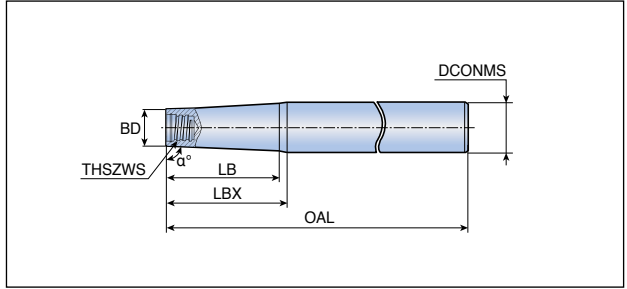
Designation	Dimension (mm)						Shank type	Shank material
	THSZWS	DCONMS	BD	OAL	LB	LBX		
<b>MXSSD 08L060S05-S</b>	S05	8	7.6	60	12.8	15	Cylindrical	Steel
<b>08L070S05-C</b>	S05	8	7.6	70	19	20	Cylindrical	Carbide
<b>08L090S05-C</b>	S05	8	7.6	90	39	40	Cylindrical	Carbide
<b>08L110S05-C</b>	S05	8	7.6	110	59	60	Cylindrical	Carbide
<b>10L070S06-C</b>	S06	10	9.6	70	18.5	20	Cylindrical	Carbide
<b>10L075S06-S</b>	S06	10	9.6	75	17.7	20	Cylindrical	Steel
<b>10L090S06-C</b>	S06	10	9.6	90	38.5	40	Cylindrical	Carbide
<b>10L110S06-C</b>	S06	10	9.6	110	58.5	60	Cylindrical	Carbide
<b>10L150S06-C</b>	S06	10	9.6	150	98.5	100	Cylindrical	Carbide
<b>12L055W05-S</b>	S05	12	7.6	55	-	3.8	Weldon	Steel
<b>12L070S08-C</b>	S08	12	11.5	70	17	20	Cylindrical	Carbide
<b>12L090S08-C</b>	S08	12	11.5	90	37	40	Cylindrical	Carbide
<b>12L090S08-S</b>	S08	12	11.5	90	13.6	16	Cylindrical	Steel
<b>12L110S08-C</b>	S08	12	11.5	110	57	60	Cylindrical	Carbide
<b>12L130S08-C</b>	S08	12	11.5	130	77	80	Cylindrical	Carbide
<b>16L065W06-S</b>	S06	16	9.6	65	-	6	Weldon	Steel
<b>16L065W08-S</b>	S08	16	11.5	65	-	4	Weldon	Steel
<b>16L090S10-C</b>	S10	16	15.2	90	38	40	Cylindrical	Carbide
<b>16L100S10-S</b>	S10	16	15.2	100	18	20	Cylindrical	Steel
<b>16L110S10-C</b>	S10	16	15.2	110	58	60	Cylindrical	Carbide
<b>16L130S10-C</b>	S10	16	15.2	130	78	80	Cylindrical	Carbide
<b>16L150S10-C</b>	S10	16	15.2	150	98	100	Cylindrical	Carbide
<b>20L070W10-S</b>	S10	20	15.2	70	-	4	Weldon	Steel
<b>20L090S12-C</b>	S12	20	18.3	90	37	40	Cylindrical	Carbide
<b>20L120S12-S</b>	S12	20	18.3	120	20.5	25	Cylindrical	Steel
<b>20L130S12-C</b>	S12	20	18.3	130	77	80	Cylindrical	Carbide
<b>20L200S12-C</b>	S12	20	18.3	200	117	120	Cylindrical	Carbide
<b>25L075W12-S</b>	S12	25	18.3	75	-	6	Weldon	Steel
<b>25L120S15-C</b>	S15	25	23.9	120	58	60	Cylindrical	Carbide
<b>25L135S15-S</b>	S15	25	23.9	135	33	35	Cylindrical	Steel
<b>25L170S15-C</b>	S15	25	23.9	170	98	100	Cylindrical	Carbide
<b>25L250S15-C</b>	S15	25	23.9	250	148	150	Cylindrical	Carbide

• THSZWS: Connection thread size





## Straight shanks with taper neck



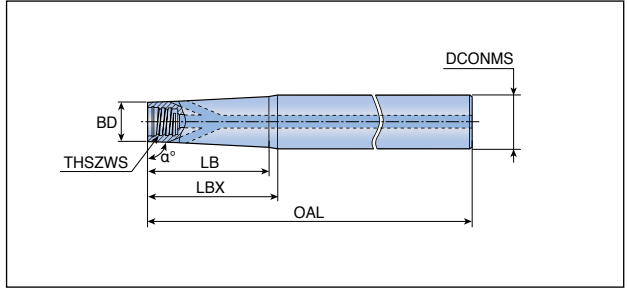
Designation	Dimension (mm)							Shank material
	$\alpha^\circ$	THSZWS	DCONMS	BD	OAL	LB	LBX	
<b>MXTSD 12L08S05-S</b>	85	S05	12	7.6	80	-	25	Steel
<b>12L100S05-S</b>	89	S05	12	7.6	100	31.0	35	Steel
<b>12L110S05-C</b>	89	S05	12	7.6	110	58.0	60	Carbide
<b>12L130S05-C</b>	89	S05	12	7.6	130	79.0	80	Carbide
<b>16L125S06-S</b>	85	S06	16	9.6	125	31.6	34	Steel
<b>16L130S08-C</b>	89	S08	16	11.5	130	78.8	80	Carbide
<b>16L140S08-S</b>	85	S08	16	11.5	140	19.3	22	Steel
<b>16L150S05-C</b>	89	S05	16	7.6	150	96.0	100	Carbide
<b>16L150S06-C</b>	89	S06	16	9.6	150	98.0	100	Carbide
<b>16L150S08-C</b>	89	S08	16	11.5	150	-	100	Carbide
<b>16L160S06-S</b>	89	S06	16	9.6	160	45.9	55	Steel
<b>16L170S06-C</b>	89	S06	16	9.6	170	119.0	120	Carbide
<b>20L140S10-S</b>	85	S10	20	15.2	140	-	27.5	Steel
<b>20L170S08-C</b>	89	S08	20	11.5	170	117.0	120	Carbide
<b>20L170S08-S</b>	89	S08	20	11.5	170	68.6	80	Steel
<b>20L170S10-C</b>	89	S10	20	15.2	170	-	120	Carbide
<b>20L190S10-C</b>	89	S10	20	15.2	190	-	140	Carbide
<b>20L190S10-S</b>	89	S10	20	15.2	190	73.0	80	Steel
<b>20L210S10-C</b>	89	S10	20	15.2	210	-	160	Carbide
<b>25L160S12-S</b>	85	S12	25	18.3	160	-	40	Steel
<b>25L170S10-S</b>	85	S10	25	15.2	170	-	56	Steel
<b>25L180S12-C</b>	89	S12	25	18.3	180	-	120	Carbide
<b>25L210S12-S</b>	89	S12	25	18.3	210	91.0	100	Steel
<b>25L250S12-C</b>	89	S12	25	18.3	250	-	140	Carbide
<b>32L155S15-S</b>	85	S15	32	23.9	155	40.0	45	Steel
<b>32L190S12-S</b>	85	S12	32	18.3	190	-	80	Steel
<b>32L220S15-S</b>	85	S15	32	23.9	220	-	100	Steel
<b>32L250S15-C</b>	89	S15	32	23.9	250	-	150	Carbide
<b>32L300S15-C</b>	89	S15	32	23.9	300	-	200	Carbide

• THSZWS: Connection thread size

# MXTSD-W-A



Straight tungsten shanks with taper neck & internal coolant hole



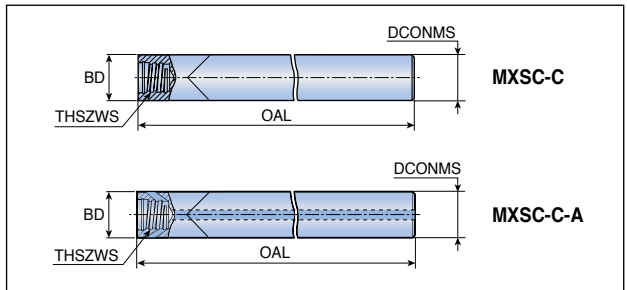
Designation	Dimension (mm)							Shank material
	$\alpha^\circ$	THSZWS	DCONMS	BD	OAL	LB	LBX	
<b>MXTSD 12L110S06-W-A</b>	89	S06	12	9.6	110	59	60	Tungsten
<b>16L170S06-W-A</b>	89	S06	16	9.6	170	116	120	Tungsten

• THSZWS: Connection thread size

# MXSC-C



Straight carbide shanks for TST & TTB slotting head



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

Note:

• For MXSC type shank, it is recommended to use the TST & TTB slotting head only. If other heads are used on the MXSC shank, the depth of cut must be smaller than the max. ap in each head. The MXSC-C type shank does not have external clearance, so the shank may interfere with the work piece.







# Solid End Mill Line



# Tool Selection Guide

## Solid end mill

Series	HARDMILL					
	HSB 2				HSF 2	
	HSB 2	HSB 2...S6	HSB 2...S/M	HSB 4...M	HSF 2	HSF 2...M
Type	Ball	Ball	Ball	Ball	Flat	Flat
Flute	2	2	2	4	2	2
Length	Long neck	Long neck	Short/Medium	Medium	Long neck	Medium
Grades	TT5505	TT5505	TT5505	TT5505	TT5505	TT5505
Application	* H.S.M	H.S.M	H.S.M	H.S.M	H.S.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 ○ ○ ○ ●
Range	Ø0.3 - Ø12.0	Ø0.6 - Ø2.0	Ø0.3 - Ø12.0	Ø4.0 - Ø12.0	Ø0.3 - Ø12.0	Ø0.3 - Ø12.0
Pages	F46 - F49	F50	F51 - F52	F53	F54 - F57	F58 - F59















Series	HARDMILL					
	HSF 4		HSF 6		HSR 2	
	HSF 4	HSF 4...M	HSF 6...M	HSF 6...XLT	HSR 2	HSR 2...M
Type	Flat	Flat	Flat	Flat	Radius	Radius
Flute	4	4	6	6	2	2
Length	Long neck	Medium	Medium	Extra long	Long neck	Medium
Grades	TT5505	TT5505	TT5505	TT5505	TT5505	TT5505
Application	H.S.M	H.S.M	Finishing	Finishing	H.S.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 ○ ○ ○ ●
Range	Ø1.0 - Ø12.0	Ø1.0 - Ø12.0	Ø3.0 - Ø12.0	Ø5.0 - Ø12.0	Ø0.3 - Ø12.0	Ø0.3 - Ø12.0
Pages	F60 - F61	F62	F63	F63	F64 - F70	F71 - F73















\* H.S.M : High Speed Machining

● Recommended, ○ Suitable

# Tool Selection Guide

## Solid end mill

HARDMILL					APEXMILL		
HSR 4		HSR 6			HSB 2CBN	SBE 2	
HSR 4	HSR 4...M	HSR 6	HSR 6...M	SBE 2...S		SBE 2/SBE 2...T	
							
Radius	Radius	Radius	Radius	CBN Ball	Ball	Ball	
							
Long neck	Medium	Long neck	Medium	Long neck	Short	Medium	
TT5505	TT5505	TT5505	TT5505	TB7015	TT5515	UF10N/TT5515	
* H.S.M	H.S.M	Finishing	Finishing	Finishing	General	General	
<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	
○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	
Ø1.0 - Ø12.0	Ø1.0 - Ø12.0	Ø6.0 - Ø12.0	Ø6.0 - Ø12.0	Ø0.4 - Ø4.0	Ø2.0 - Ø20.0	Ø1.0 - Ø20.0	
F74 - F77	F78 - F79	F80	F80	F81	F82	F83 - F84	

APEXMILL						
SBE 2		SBE 4	BES 2...T	BES 4...T	TSE 2...M	TSE 4...M
SBE 2...L	SBE 2...LT	SBE 4/SBE 4...T				
						
Ball	Ball	Ball	Ball (Spherical)	Ball (Spherical)	Flat	Flat
						
Long	Long	Medium	Medium	Medium	Medium	Medium
UF10N	TT5515	UF10N/TT5515	TT5515	TT5515	TT5515, TT5525, UF10	TT5515, TT5525, UF10
General	General	General	General	General	General	General
<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>
○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●
Ø1.0 - Ø20.0	Ø2.0 - Ø16.0	Ø1.0 - Ø20.0	Ø3.0 - Ø16.0	Ø3.0 - Ø16.0	Ø1.0 - Ø25.0	Ø1.0 - Ø25.0
F85	F86	F87 - F88	F89	F89	F90 - F91	F92 - F93







• \*H.S.M : High Speed Machining







● Recommended, ○ Suitable



# Tool Selection Guide

## Solid end mill

Series	APEX MILL																																																																													
	HES 2		HES 4		HES 2-R																																																																									
	HES 2...LT	HES 2...XLT	HES 4...LT	HES 4...XLT	HES 2...T-R	HES 2...LT-R																																																																								
Type	Flat	Flat	Flat	Flat	Radius	Radius																																																																								
Flute																																																																														
Length	Long	Extra long	Long	Extra long	Medium	Long																																																																								
Grades	TT5525	TT5515, TT5525	TT5525	TT5515, TT5525	TT5515, TT5525	TT5515, TT5525																																																																								
Application	General	General	General	General	General	General																																																																								
Material	<table border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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	●	○	●	○	○	○
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P	M	K	N	S	H																																																																									
●	○	●	○	○	○																																																																									
Range	Ø3.0 - Ø20.0	Ø3.0 - Ø20.0	Ø3.0 - Ø20.0	Ø3.0 - Ø20.0	Ø3.0 - Ø20.0	Ø3.0 - Ø12.0																																																																								
Pages	F94	F95	F96	F97	F98	F99																																																																								













Series	APEX MILL																																																																													
	HES 4-R		HFM 2	HFM 4	CFM 4...M	REL ...L																																																																								
	HES 4...T-R	HES 4...LT-R																																																																												
Type	Radius	Radius	Flat	Flat	Chamfer	Chamfer																																																																								
Flute																																																																														
Length	Medium	Long	Medium	Medium	Medium	Long																																																																								
Grades	TT5515, TT5525	TT5515, TT5525	TT5515	TT5515	TT5525	TT5515																																																																								
Application	General	General	* H.F.M	* H.F.M	General	Roughing																																																																								
Material	<table border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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	●	○	○	○	○	○
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P	M	K	N	S	H																																																																									
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●	○	○	○	○	○																																																																									
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Range	Ø3.0 - Ø20.0	Ø3.0 - Ø12.0	Ø4.0 - Ø12.0	Ø6.0 - Ø12.0	Ø6.0 - Ø25.0	Ø6.0 - Ø20.0																																																																								
Pages	F100	F101	F102	F102	F103	F103																																																																								













\*H.F.M : High Feed Machining

● Recommended, ○ Suitable

# Tool Selection Guide

## Solid end mill







<b>APEX MILL</b>					
<b>FSM 4...M</b>	<b>CEM 2...-C60</b>	<b>CEM 2</b>	<b>CEM 2...-C120</b>	<b>ECEM 2</b>	<b>ECEM 4</b>
					
Chamfer	Chamfer 60°	Chamfer 45°	Chamfer 30°	Chamfer 45°	Chamfer 45°
					
Medium	Long	Long	Long	Medium	Medium
TT5525	UF10	UF10, TT5525	UF10	UF10	UF10
Roughing+Finishing	General	General	General	General	General
<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>
● ○ ○ ○ ○	● ○ ○ ● ○ ○	● ○ ○ ● ○ ○	● ○ ○ ○ ○	● ○ ○ ● ○ ○	● ○ ○ ● ○ ○
Ø6.0 - Ø25.0	Ø4.0 - Ø20.0	Ø4.0 - Ø20.0	Ø4.0 - Ø20.0	Ø2.0 - Ø16.0	Ø6.0 - Ø12.0
F104	F104	F105	F105	F106	F106







<b>APEX MILL</b>		<b>STAR MILL</b>			
<b>HCEM 5</b>	<b>SBT 3...U</b>	<b>SBT 4...U</b>	<b>SED 4</b>		<b>SED 4...-R</b>
			<b>SED 4...U</b>	<b>SED 4...UL</b>	
					
Chamfer 45°	Ball	Ball	Flat	Flat	Radius
					
Medium	Medium	Medium	Medium	Long	Medium
TT5525	TT5515	TT5515	TT5515	TT5515	TT5515
General	Difficult-to-cut	Difficult-to-cut	Difficult-to-cut	Difficult-to-cut	Difficult-to-cut
<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>	<b>P M K N S H</b>
● ○ ● ○ ○	○ ● ● ○ ● ○	○ ● ● ○ ● ○	○ ● ● ○ ● ○	○ ● ● ○ ● ○	○ ● ● ○ ● ○
Ø0.8 - Ø16.0	Ø4.0 - Ø12.0	Ø4.0 - Ø12.0	Ø3.0 - Ø20.0	Ø3.0 - Ø12.0	Ø2.0 - Ø16.0
F107	F108	F108	F109	F109	F110

● Recommended, ○ Suitable

# Tool Selection Guide

## Solid end mill













Series	STAR MILL																																																																													
	SED 4...-C	SED 7		SER	REH																																																																									
		SED 7	SED 7...N		REH ...S	REH ...M																																																																								
Type	Chamfer	Radius	Radius	Splitter	Chamfer	Chamfer																																																																								
Flute																																																																														
Length	Medium	Medium	Medium	Medium	Short	Medium																																																																								
Grades	TT5515	TT5515	TT5515	TT5525	TT5525	TT5525																																																																								
Application	Difficult-to-cut	Difficult-to-cut	Difficult-to-cut	Difficult-to-cut	Roughing	Roughing																																																																								
Material	<table border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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	●	●			○	
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Pages	F111	F111	F112	F113	F114	F115																																																																								













Series	ALU MILL																																																																													
	REH	AES 2		AES 3																																																																										
	REH ...L	AES 2	AES 2...XL	AES 3	AES 3...ML	AES 3...XL																																																																								
Type	Chamfer	Flat	Flat	Flat	Flat	Flat																																																																								
Flute																																																																														
Length	Long	Medium	Extra long	Medium	Long	Extra long																																																																								
Grades	TT5525	UF10	UF10	UF10	UF10	UF10																																																																								
Application	Roughing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum																																																																								
Material	<table border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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 border="1"><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					●	
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Pages	F116	F117	F118	F119	F120	F121																																																																								

● Recommended, ○ Suitable

# Tool Selection Guide

## Solid end mill

<b>ALUMILL</b>					
AES 2...-R	AES 3...-R	REMA 3/3...C	REA 3...L	<b>AWE 3</b>	
					
Radius	Radius	Radius	Chamfer	Wave Flat	Wave Flat
					
Medium	Medium	Long neck	Long	Medium	Long
UF10	UF10	UF10	UF10	UF10	UF10
Aluminum	Aluminum	Roughing	Roughing	Aluminum	Aluminum
<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>
●	●	●	●	●	●
Ø6.0 - Ø16.0	Ø6.0 - Ø16.0	Ø6.0 - Ø20.0	Ø6.0 - Ø20.0	Ø6.0 - Ø20.0	Ø6.0 - Ø20.0
F122	F123	F124	F124	F125	F125

<b>ALUMILL</b>		<b>CERAMICFEED</b>			<b>DIA MILL</b>	
AWE 3...ML-R	CRF 4	CRF 6	CRH 4	DMB 2	<b>DEB 2</b>	
						
Wave Radius	Radius	Radius	Radius	Ball	Ball	
						
Long	Medium	Medium	Medium	Miniature	Short	
UF10	TC3030	TC3030	TC3030	TTD620	TTD620	
Aluminum	* H.S.M	* H.S.M	* H.F.M	Graphite	Graphite	
<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	<b>P</b> <b>M</b> <b>K</b> <b>N</b> <b>S</b> <b>H</b>	
●	●	●	●	●	●	
Ø6.0 - Ø12.0	Ø6.0 - Ø16.0	Ø6.0 - Ø16.0	Ø6.0 - Ø16.0	Ø0.6 - Ø2.0	Ø3.0 - Ø12.0	
F126	F126	F127	F127	F128	F128	











● \*H.S.M : High Speed Machining

● \*H.F.M : High Feed Machining

● Recommended, ○ Suitable

# Tool Selection Guide

## Solid end mill

Series	DIA MILL				
	DEB 2	DMR 2	DER 3		RRFE
	DEB 2...L		DER 3...S	DER 3...L	
					
Type	Ball	Radius	Radius	Radius	Flat
Flute					
Length	Long	Miniature	Short	Long	
Grades	TTD620	TTD620	TTD620	TTD620	TTD610
Application	Graphite	Graphite	Graphite	Graphite	Roughing
Material	Graphite	Graphite	Graphite	Graphite	Composite material
Range	Ø3.0 - Ø12.0	Ø0.6 - Ø2.0	Ø3.0 - Ø12.0	Ø4.0 - Ø12.0	Ø4.0 - Ø12.0
Pages	F129	F129	F130	F130	F131

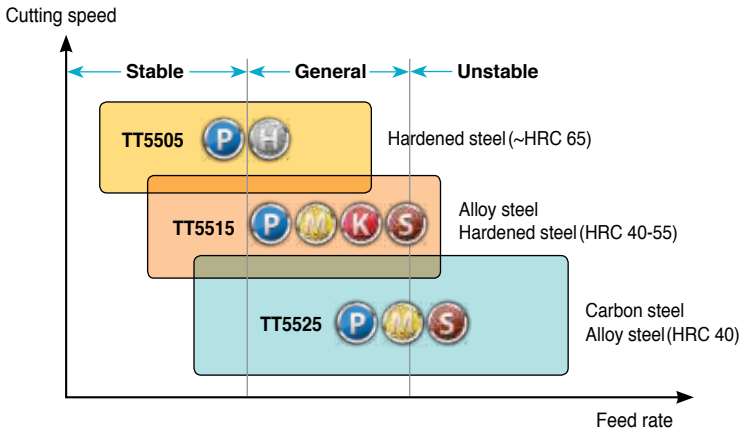
Series	DIA MILL				
	RCFE	RCME	RCDE	RCOM	RDCF
					
Type	Flat	Flat	Chamfer	Flat	Flat
Flute					
Length					
Grades	TTD610	TTD610	TTD610	TTD610	TTD610
Application	Roughing	Medium	Drilling + Medium	Finishing	Finishing
Material	Composite material	Composite material	Composite material	Composite material	Composite material
Range	Ø4.0 - Ø12.0	Ø4.0 - Ø12.0	Ø4.0 - Ø12.0	Ø6.0 - Ø12.0	Ø4.0 - Ø12.0
Pages	F131	F132	F132	F133	F133

# Grades

## Solid end mill grades

Grades	ISO	Characteristics & applications
<b>TT5505</b> PVD coated	<b>P05</b> – <b>P25</b> <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> PVD coated	<b>P10</b> – <b>P30</b> <b>M15</b> – <b>M30</b> <b>K10</b> – <b>K30</b> <b>S10</b> – <b>S30</b> <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>TT5525</b> PVD coated	<b>P20</b> – <b>P40</b> <b>M20</b> – <b>M40</b> <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> 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> 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> <b>UF10</b> Uncoated	<b>P25</b> – <b>P35</b> <b>M25</b> – <b>M35</b> <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> 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



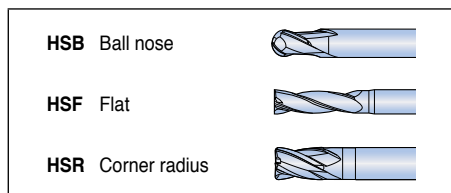
# Designation System

HARDMILL

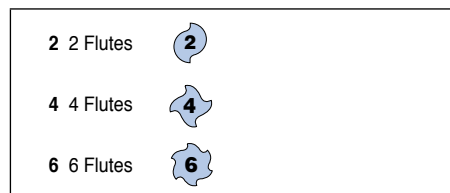
**HSB 2 010 M 010 030**

1 2 3 4 5/5\* 6

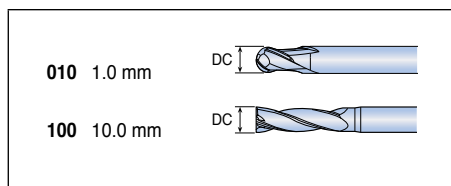
## 1 End mill type



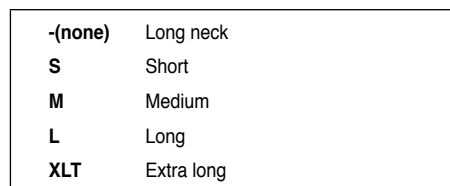
## 2 No. of flute



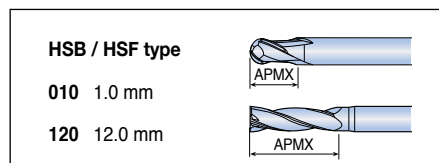
## 3 Cutting diameter



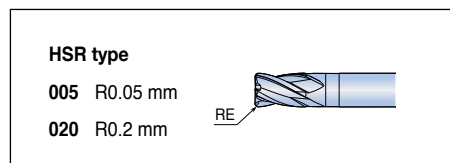
## 4 Cutting length type



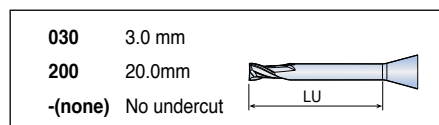
## 5 Length of cut



## 5\* Corner radius



## 6 Length of neck



# Designation System

APEX MILL

STAR MILL

ALUMILL

DIA MILL

**SBE**

**2**

**010**

**S -**

**\* \* \***

1



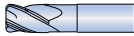
2

3




4

5

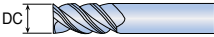
## 1 End mill type

SBE/SBT/DEB	Ball nose	
TSE/SED/AES	Flat	
DER	Corner radius	





## 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

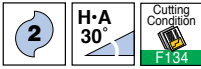
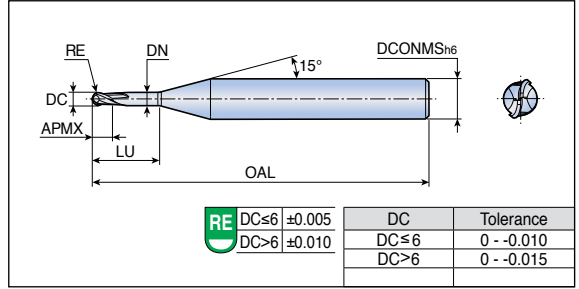
S	Short length	
M	Medium length	
L	Long length	
XL	Extra long length	

## 5 Others

-□	Shank diameter
-R□□	Corner radius



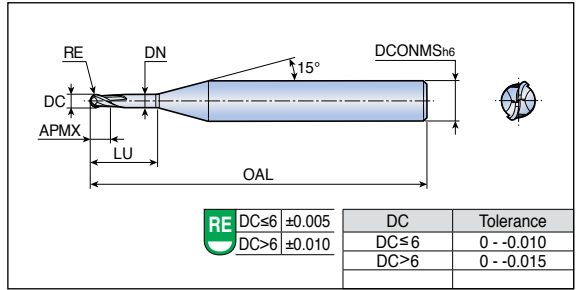
## 2 flute long neck ball



Designation	Dimension (mm)							Grade
	DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>HSB 2003 003 010</b>	0.3	0.15	45	0.3	1.0	0.27	4.0	●
<b>2003 003 020</b>	0.3	0.15	45	0.3	2.0	0.27	4.0	●
<b>2003 003 030</b>	0.3	0.15	45	0.3	3.0	0.27	4.0	●
<b>2004 004 010</b>	0.4	0.2	45	0.4	1.0	0.36	4.0	●
<b>2004 004 015</b>	0.4	0.2	45	0.4	1.5	0.36	4.0	●
<b>2004 004 020</b>	0.4	0.2	45	0.4	2.0	0.36	4.0	●
<b>2004 004 025</b>	0.4	0.2	45	0.4	2.5	0.36	4.0	●
<b>2004 004 030</b>	0.4	0.2	45	0.4	3.0	0.36	4.0	●
<b>2004 004 040</b>	0.4	0.2	45	0.4	4.0	0.36	4.0	●
<b>2005 005 010</b>	0.5	0.25	45	0.5	1.0	0.45	4.0	●
<b>2005 005 015</b>	0.5	0.25	45	0.5	1.5	0.45	4.0	●
<b>2005 005 020</b>	0.5	0.25	45	0.5	2.0	0.45	4.0	●
<b>2005 005 025</b>	0.5	0.25	45	0.5	2.5	0.45	4.0	●
<b>2005 005 030</b>	0.5	0.25	45	0.5	3.0	0.45	4.0	●
<b>2005 005 040</b>	0.5	0.25	45	0.5	4.0	0.45	4.0	●
<b>2005 005 050</b>	0.5	0.25	45	0.5	5.0	0.45	4.0	●
<b>2005 005 060</b>	0.5	0.25	45	0.5	6.0	0.45	4.0	●
<b>2005 005 080</b>	0.5	0.25	45	0.5	8.0	0.45	4.0	●
<b>2006 006 020</b>	0.6	0.3	45	0.6	2.0	0.55	4.0	●
<b>2006 006 030</b>	0.6	0.3	45	0.6	3.0	0.55	4.0	●
<b>2006 006 040</b>	0.6	0.3	45	0.6	4.0	0.55	4.0	●
<b>2006 006 050</b>	0.6	0.3	45	0.6	5.0	0.55	4.0	●
<b>2006 006 060</b>	0.6	0.3	45	0.6	6.0	0.55	4.0	●
<b>2006 006 080</b>	0.6	0.3	45	0.6	8.0	0.55	4.0	●
<b>2006 006 100</b>	0.6	0.3	45	0.6	10.0	0.55	4.0	●
<b>2008 008 020</b>	0.8	0.4	45	0.8	2.0	0.75	4.0	●
<b>2008 008 030</b>	0.8	0.4	45	0.8	3.0	0.75	4.0	●
<b>2008 008 040</b>	0.8	0.4	45	0.8	4.0	0.75	4.0	●
<b>2008 008 050</b>	0.8	0.4	45	0.8	5.0	0.75	4.0	●
<b>2008 008 060</b>	0.8	0.4	45	0.8	6.0	0.75	4.0	●
<b>2008 008 080</b>	0.8	0.4	45	0.8	8.0	0.75	4.0	●
<b>2008 008 100</b>	0.8	0.4	45	0.8	10.0	0.75	4.0	●
<b>2008 008 120</b>	0.8	0.4	45	0.8	12.0	0.75	4.0	●

●: Standard items

## 2 flute long neck ball



Designation	Dimension (mm)							Grade
	DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>HSB 2010 010 030</b>	1.0	0.5	50	1.0	3	0.97	4.0	●
<b>2010 010 040</b>	1.0	0.5	50	1.0	4	0.97	4.0	●
<b>2010 010 050</b>	1.0	0.5	50	1.0	5	0.97	4.0	●
<b>2010 010 060</b>	1.0	0.5	50	1.0	6	0.97	4.0	●
<b>2010 010 070</b>	1.0	0.5	50	1.0	7	0.97	4.0	●
<b>2010 010 080</b>	1.0	0.5	50	1.0	8	0.95	4.0	●
<b>2010 010 090</b>	1.0	0.5	50	1.0	9	0.95	4.0	●
<b>2010 010 100</b>	1.0	0.5	50	1.0	10	0.95	4.0	●
<b>2010 010 120</b>	1.0	0.5	50	1.0	12	0.93	4.0	●
<b>2010 010 140</b>	1.0	0.5	50	1.0	14	0.93	4.0	●
<b>2010 010 160</b>	1.0	0.5	50	1.0	16	0.93	4.0	●
<b>2010 010 180</b>	1.0	0.5	55	1.0	18	0.93	4.0	●
<b>2010 010 200</b>	1.0	0.5	55	1.0	20	0.93	4.0	●
<b>2012 012 040</b>	1.2	0.6	50	1.2	4	1.15	4.0	●
<b>2012 012 060</b>	1.2	0.6	50	1.2	6	1.15	4.0	●
<b>2012 012 080</b>	1.2	0.6	50	1.2	8	1.15	4.0	●
<b>2012 012 100</b>	1.2	0.6	50	1.2	10	1.15	4.0	●
<b>2012 012 120</b>	1.2	0.6	50	1.2	12	1.13	4.0	●
<b>2015 015 040</b>	1.5	0.75	50	1.5	4	1.45	4.0	●
<b>2015 015 060</b>	1.5	0.75	50	1.5	6	1.45	4.0	●
<b>2015 015 080</b>	1.5	0.75	50	1.5	8	1.45	4.0	●
<b>2015 015 100</b>	1.5	0.75	50	1.5	10	1.45	4.0	●
<b>2015 015 120</b>	1.5	0.75	50	1.5	12	1.43	4.0	●
<b>2015 015 140</b>	1.5	0.75	50	1.5	14	1.43	4.0	●
<b>2015 015 160</b>	1.5	0.75	50	1.5	16	1.41	4.0	●
<b>2015 015 180</b>	1.5	0.75	55	1.5	18	1.41	4.0	●
<b>2015 015 200</b>	1.5	0.75	55	1.5	20	1.39	4.0	●
<b>2020 030 060</b>	2.0	1.0	50	3.0	6	1.95	4.0	●
<b>2020 030 080</b>	2.0	1.0	50	3.0	8	1.95	4.0	●
<b>2020 030 100</b>	2.0	1.0	50	3.0	10	1.95	4.0	●
<b>2020 030 120</b>	2.0	1.0	50	3.0	12	1.93	4.0	●
<b>2020 030 140</b>	2.0	1.0	50	3.0	14	1.93	4.0	●
<b>2020 030 160</b>	2.0	1.0	50	3.0	16	1.93	4.0	●
<b>2020 030 180</b>	2.0	1.0	55	3.0	18	1.93	4.0	●
<b>2020 030 200</b>	2.0	1.0	55	3.0	20	1.93	4.0	●

●: Standard items









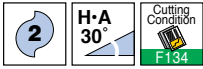
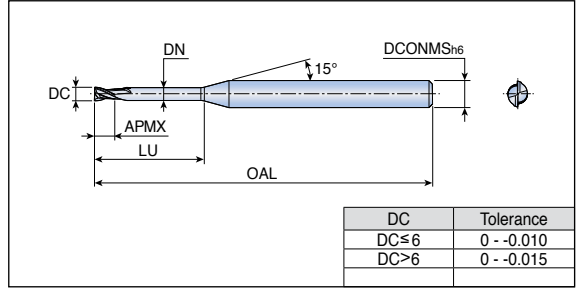






# HSF 2

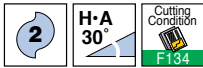
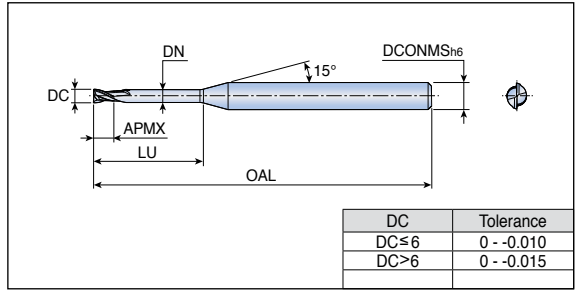
## 2 flute long neck flat



Designation	Feed (mm/tooth)	Dimension (mm)						Grade TT5505
		DC	OAL	APMX	LU	DN	DCONMS	
<b>HSF 2003 004 010</b>	0.006-0.010	0.3	45	0.4	1.0	0.27	4.0	●
<b>2003 004 015</b>	0.006-0.010	0.3	45	0.4	1.5	0.27	4.0	●
<b>2003 004 020</b>	0.006-0.010	0.3	45	0.4	2.0	0.27	4.0	●
<b>2003 004 025</b>	0.006-0.010	0.3	45	0.4	2.5	0.27	4.0	●
<b>2003 004 030</b>	0.006-0.010	0.3	45	0.4	3.0	0.27	4.0	●
<b>2003 004 040</b>	0.005-0.008	0.3	45	0.4	4.0	0.27	4.0	●
<b>2003 004 050</b>	0.005-0.008	0.3	45	0.4	5.0	0.27	4.0	●
<b>2004 006 010</b>	0.006-0.010	0.4	45	0.6	1.0	0.37	4.0	●
<b>2004 006 015</b>	0.006-0.010	0.4	45	0.6	1.5	0.37	4.0	●
<b>2004 006 020</b>	0.006-0.010	0.4	45	0.6	2.0	0.37	4.0	●
<b>2004 006 025</b>	0.006-0.010	0.4	45	0.6	2.5	0.37	4.0	●
<b>2004 006 030</b>	0.006-0.010	0.4	45	0.6	3.0	0.37	4.0	●
<b>2004 006 040</b>	0.006-0.010	0.4	45	0.6	4.0	0.37	4.0	●
<b>2004 006 050</b>	0.005-0.008	0.4	45	0.6	5.0	0.37	4.0	●
<b>2004 006 060</b>	0.005-0.008	0.4	45	0.6	6.0	0.37	4.0	●
<b>2005 007 010</b>	0.006-0.010	0.5	45	0.7	1.0	0.45	4.0	●
<b>2005 007 015</b>	0.006-0.010	0.5	45	0.7	1.5	0.45	4.0	●
<b>2005 007 020</b>	0.006-0.010	0.5	45	0.7	2.0	0.45	4.0	●
<b>2005 007 025</b>	0.006-0.009	0.5	45	0.7	2.5	0.45	4.0	●
<b>2005 007 030</b>	0.006-0.009	0.5	45	0.7	3.0	0.45	4.0	●
<b>2005 007 040</b>	0.006-0.008	0.5	45	0.7	4.0	0.45	4.0	●
<b>2005 007 050</b>	0.006-0.008	0.5	45	0.7	5.0	0.45	4.0	●
<b>2005 007 060</b>	0.005-0.007	0.5	45	0.7	6.0	0.45	4.0	●
<b>2005 007 080</b>	0.005-0.007	0.5	45	0.7	8.0	0.45	4.0	●
<b>2006 009 020</b>	0.008-0.013	0.6	45	0.9	2.0	0.55	4.0	●
<b>2006 009 030</b>	0.008-0.013	0.6	45	0.9	3.0	0.55	4.0	●
<b>2006 009 040</b>	0.008-0.013	0.6	45	0.9	4.0	0.55	4.0	●
<b>2006 009 050</b>	0.008-0.013	0.6	45	0.9	5.0	0.55	4.0	●
<b>2006 009 060</b>	0.008-0.013	0.6	45	0.9	6.0	0.55	4.0	●
<b>2006 009 080</b>	0.006-0.010	0.6	45	0.9	8.0	0.55	4.0	●
<b>2006 009 100</b>	0.006-0.010	0.6	45	0.9	10.0	0.55	4.0	●
<b>2007 012 020</b>	0.008-0.013	0.7	45	1.2	2.0	0.65	4.0	●
<b>2007 012 040</b>	0.008-0.013	0.7	45	1.2	4.0	0.65	4.0	●
<b>2007 012 060</b>	0.008-0.013	0.7	45	1.2	6.0	0.65	4.0	●
<b>2007 012 080</b>	0.008-0.013	0.7	45	1.2	8.0	0.65	4.0	●
<b>2007 012 100</b>	0.006-0.010	0.7	45	1.2	10.0	0.65	4.0	●

●: Standard items

## 2 flute long neck flat

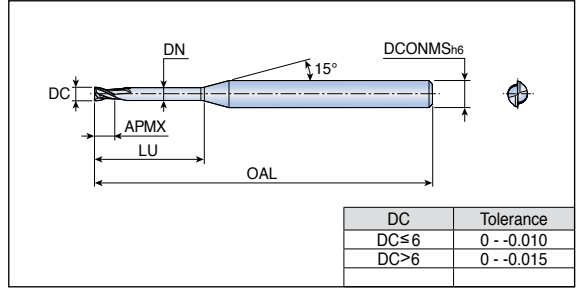


Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	OAL	APMX	LU	DN	DCONMS	
<b>HSF 2007 012 120</b>	0.006-0.010	0.7	45	1.2	12.0	0.65	4.0	●
<b>2008 012 020</b>	0.007-0.015	0.8	45	1.2	2.0	0.75	4.0	●
<b>2008 012 030</b>	0.007-0.015	0.8	45	1.2	3.0	0.75	4.0	●
<b>2008 012 040</b>	0.007-0.015	0.8	45	1.2	4.0	0.75	4.0	●
<b>2008 012 050</b>	0.007-0.015	0.8	45	1.2	5.0	0.75	4.0	●
<b>2008 012 060</b>	0.007-0.015	0.8	45	1.2	6.0	0.75	4.0	●
<b>2008 012 080</b>	0.007-0.013	0.8	45	1.2	8.0	0.73	4.0	●
<b>2008 012 100</b>	0.007-0.012	0.8	45	1.2	10.0	0.73	4.0	●
<b>2008 012 120</b>	0.007-0.012	0.8	45	1.2	12.0	0.73	4.0	●
<b>2010 015 030</b>	0.009-0.020	1.0	50	1.5	3.0	0.97	4.0	●
<b>2010 015 040</b>	0.009-0.020	1.0	50	1.5	4.0	0.97	4.0	●
<b>2010 015 050</b>	0.009-0.018	1.0	50	1.5	5.0	0.97	4.0	●
<b>2010 015 060</b>	0.009-0.018	1.0	50	1.5	6.0	0.97	4.0	●
<b>2010 015 070</b>	0.009-0.018	1.0	50	1.5	7.0	0.97	4.0	●
<b>2010 015 080</b>	0.009-0.018	1.0	50	1.5	8.0	0.95	4.0	●
<b>2010 015 100</b>	0.009-0.016	1.0	50	1.5	10.0	0.95	4.0	●
<b>2010 015 120</b>	0.008-0.014	1.0	50	1.5	12.0	0.93	4.0	●
<b>2010 015 140</b>	0.008-0.014	1.0	50	1.5	14.0	0.93	4.0	●
<b>2010 015 160</b>	0.008-0.014	1.0	50	1.5	16.0	0.91	4.0	●
<b>2010 015 180</b>	0.008-0.012	1.0	55	1.5	18.0	0.91	4.0	●
<b>2010 015 200</b>	0.008-0.012	1.0	55	1.5	20.0	0.85	4.0	●
<b>2012 018 040</b>	0.010-0.020	1.2	50	1.8	4.0	1.17	4.0	●
<b>2012 018 060</b>	0.010-0.020	1.2	50	1.8	6.0	1.17	4.0	●
<b>2012 018 080</b>	0.010-0.020	1.2	50	1.8	8.0	1.15	4.0	●
<b>2012 018 100</b>	0.010-0.019	1.2	50	1.8	10.0	1.15	4.0	●
<b>2012 018 120</b>	0.010-0.018	1.2	50	1.8	12.0	1.15	4.0	●
<b>2012 018 160</b>	0.010-0.018	1.2	50	1.8	16.0	1.13	4.0	●
<b>2015 023 040</b>	0.015-0.025	1.5	50	2.3	4.0	1.47	4.0	●
<b>2015 023 060</b>	0.015-0.025	1.5	50	2.3	6.0	1.47	4.0	●
<b>2015 023 080</b>	0.015-0.025	1.5	50	2.3	8.0	1.45	4.0	●
<b>2015 023 100</b>	0.015-0.025	1.5	50	2.3	10.0	1.45	4.0	●
<b>2015 023 120</b>	0.013-0.025	1.5	50	2.3	12.0	1.43	4.0	●
<b>2015 023 140</b>	0.013-0.025	1.5	50	2.3	14.0	1.43	4.0	●
<b>2015 023 160</b>	0.011-0.015	1.5	50	2.3	16.0	1.41	4.0	●
<b>2015 023 180</b>	0.011-0.015	1.5	55	2.3	18.0	1.41	4.0	●
<b>2015 023 200</b>	0.011-0.015	1.5	55	2.3	20.0	1.41	4.0	●

●: Standard items

# HSF 2

## 2 flute long neck flat



Designation	Feed (mm/tooth)	Dimension (mm)						Grade TT5505
		DC	OAL	APMX	LU	DN	DCONMS	
<b>HSF 2020 030 040</b>	0.018-0.040	2.0	50	3.0	4	1.95	4.0	●
<b>2020 030 060</b>	0.018-0.040	2.0	50	3.0	6	1.95	4.0	●
<b>2020 030 080</b>	0.018-0.040	2.0	50	3.0	8	1.95	4.0	●
<b>2020 030 100</b>	0.018-0.040	2.0	50	3.0	10	1.95	4.0	●
<b>2020 030 120</b>	0.016-0.025	2.0	50	3.0	12	1.93	4.0	●
<b>2020 030 140</b>	0.016-0.025	2.0	50	3.0	14	1.93	4.0	●
<b>2020 030 160</b>	0.015-0.022	2.0	50	3.0	16	1.91	4.0	●
<b>2020 030 180</b>	0.015-0.022	2.0	55	3.0	18	1.91	4.0	●
<b>2020 030 200</b>	0.013-0.019	2.0	55	3.0	20	1.91	4.0	●
<b>2020 030 250</b>	0.013-0.019	2.0	60	3.0	25	1.91	4.0	●
<b>2020 030 300</b>	0.010-0.015	2.0	70	3.0	30	1.91	4.0	●
<b>2025 040 080</b>	0.019-0.045	2.5	50	4.0	8	2.4	4.0	●
<b>2025 040 100</b>	0.019-0.045	2.5	50	4.0	10	2.4	4.0	●
<b>2025 040 120</b>	0.017-0.040	2.5	50	4.0	12	2.4	4.0	●
<b>2025 040 160</b>	0.015-0.030	2.5	50	4.0	16	2.4	4.0	●
<b>2025 040 200</b>	0.013-0.020	2.5	55	4.0	20	2.4	4.0	●
<b>2030 045 080</b>	0.021-0.060	3.0	55	4.5	8	2.85	6.0	●
<b>2030 045 100</b>	0.021-0.060	3.0	55	4.5	10	2.85	6.0	●
<b>2030 045 120</b>	0.018-0.050	3.0	55	4.5	12	2.85	6.0	●
<b>2030 045 140</b>	0.018-0.045	3.0	55	4.5	14	2.85	6.0	●
<b>2030 045 160</b>	0.018-0.045	3.0	55	4.5	16	2.85	6.0	●
<b>2030 045 180</b>	0.015-0.040	3.0	60	4.5	18	2.85	6.0	●
<b>2030 045 200</b>	0.015-0.040	3.0	60	4.5	20	2.85	6.0	●
<b>2030 045 250</b>	0.015-0.040	3.0	60	4.5	25	2.85	6.0	●
<b>2030 045 300</b>	0.015-0.038	3.0	70	4.5	30	2.85	6.0	●
<b>2030 045 350</b>	0.015-0.038	3.0	75	4.5	35	2.85	6.0	●
<b>2030 045 400</b>	0.015-0.030	3.0	80	4.5	40	2.85	6.0	●
<b>2040 060 100</b>	0.030-0.075	4.0	55	6.0	10	3.9	6.0	●
<b>2040 060 120</b>	0.030-0.075	4.0	55	6.0	12	3.9	6.0	●
<b>2040 060 160</b>	0.030-0.075	4.0	55	6.0	16	3.9	6.0	●
<b>2040 060 200</b>	0.030-0.070	4.0	60	6.0	20	3.9	6.0	●
<b>2040 060 250</b>	0.030-0.070	4.0	60	6.0	25	3.9	6.0	●
<b>2040 060 300</b>	0.030-0.070	4.0	70	6.0	30	3.9	6.0	●
<b>2040 060 350</b>	0.030-0.068	4.0	75	6.0	35	3.9	6.0	●
<b>2040 060 400</b>	0.030-0.068	4.0	80	6.0	40	3.9	6.0	●

●: Standard items









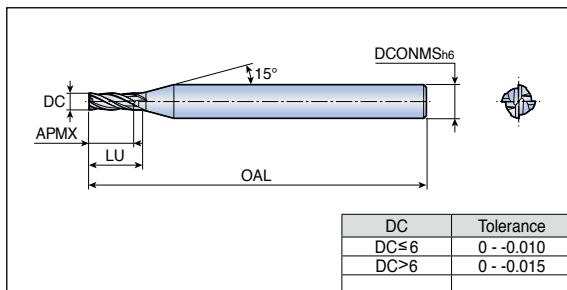




# HSF 4...M

RHINOSOLID HARDMILL

4 flute medium flat



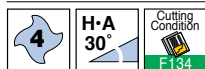
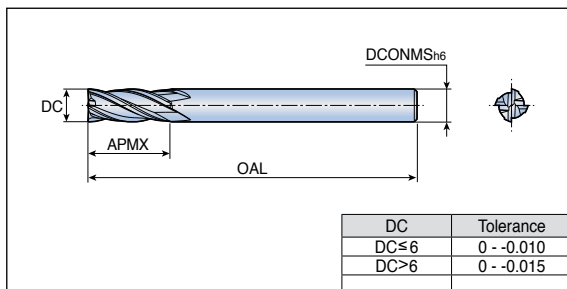
Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	OAL	APMX	LU	DCONMS	
<b>HSF 4010M 025</b>	0.009-0.020	1.0	50	2.5	3	6.0	●
<b>4012M 030</b>	0.010-0.020	1.2	50	3.0	4	6.0	●
<b>4015M 040</b>	0.015-0.025	1.5	50	4.0	5	6.0	●
<b>4020M 060</b>	0.018-0.040	2.0	50	6.0	7	6.0	●
<b>4025M 070</b>	0.019-0.045	2.5	50	7.0	8.5	6.0	●
<b>4030M 080</b>	0.021-0.060	3.0	60	8.0	9.5	6.0	●
<b>4035M 090</b>	0.026-0.068	3.5	60	9.0	11	6.0	●
<b>4040M 100</b>	0.030-0.075	4.0	60	10.0	12	6.0	●
<b>4050M 130</b>	0.056-0.090	5.0	60	13.0	15.5	6.0	●
<b>4070M 180</b>	0.079-0.110	7.0	65	18.0	22	8.0	●
<b>4090M 220</b>	0.104-0.125	9.0	70	22.0	25	10.0	●
<b>4110M 280</b>	0.122-0.149	11.0	80	28.0	33	12.0	●

●: Standard items

# HSF 4...M

RHINOSOLID HARDMILL

4 flute medium flat

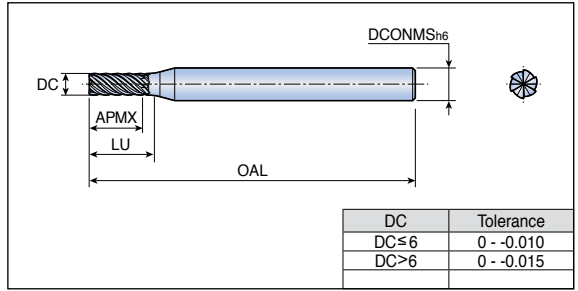


Designation	Feed (mm/tooth)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	
<b>HSF 4060M 150</b>	0.067-0.100	6.0	60	15.0	6.0	●
<b>4080M 200</b>	0.090-0.120	8.0	65	20.0	8.0	●
<b>4100M 250</b>	0.117-0.130	10.0	70	25.0	10.0	●
<b>4120M 300</b>	0.126-0.168	12.0	80	30.0	12.0	●

●: Standard items

# HSF 6...M

## 6 flute medium flat



• Finishing

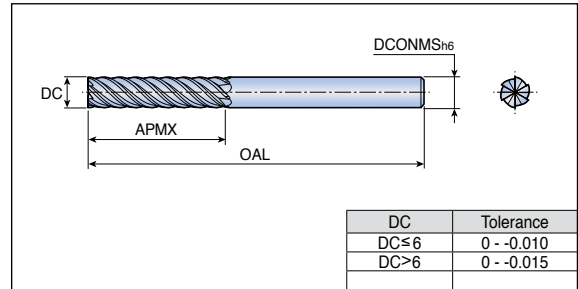


Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	OAL	APMX	LU	DCONMS	TT5505
<b>HSF 6030M 080</b>	0.010-0.030	3.0	50	8	10	6.0	●
<b>6040M 100</b>	0.010-0.050	4.0	60	10	12	6.0	●
<b>6050M 150</b>	0.020-0.050	5.0	60	15	17	6.0	●
<b>6060M 150</b>	0.038-0.050	6.0	60	15	-	6.0	●
<b>6080M 200</b>	0.045-0.060	8.0	65	20	-	8.0	●
<b>6100M 220</b>	0.045-0.060	10.0	70	22	-	10.0	●
<b>6120M 260</b>	0.053-0.070	12.0	80	26	-	12.0	●

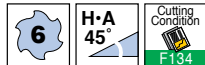
●: Standard items

# HSF 6...XLT

## 6 flute extra long flat



• Finishing

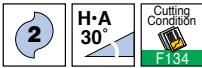
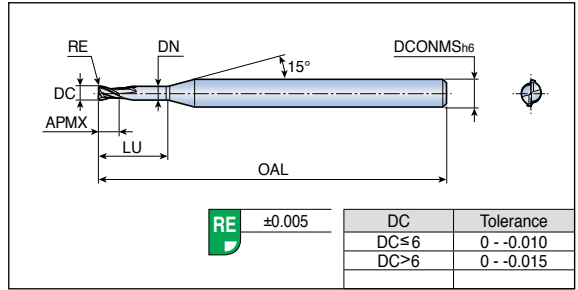


Designation	Feed (mm/tooth)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	TT5505
<b>HSF 6050XLT 250</b>	0.03-0.05	5.0	80	25	6.0	●
<b>6060XLT 250</b>	0.03-0.05	6.0	80	25	6.0	●
<b>6080XLT 350</b>	0.04-0.06	8.0	90	35	8.0	●
<b>6100XLT 450</b>	0.04-0.06	10.0	100	45	10.0	●
<b>6120XLT 550</b>	0.05-0.07	12.0	110	55	12.0	●

●: Standard items

# HSR 2

## 2 flute long neck corner radius

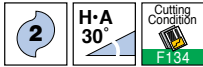
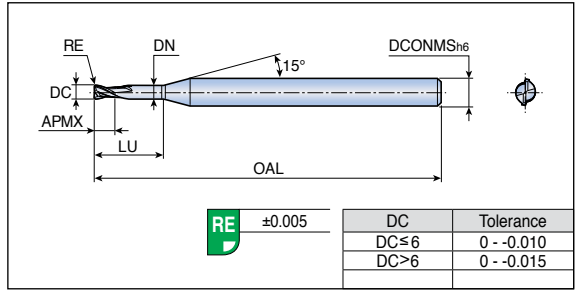


Designation	Feed (mm/tooth)	Dimension (mm)								Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	TT5505	
<b>HSR 2003 005 010</b>	0.006-0.010	0.3	0.05	45	0.4	1.0	0.27	4.0	●	
<b>2003 005 020</b>	0.006-0.010	0.3	0.05	45	0.4	2.0	0.27	4.0	●	
<b>2003 005 030</b>	0.006-0.010	0.3	0.05	45	0.4	3.0	0.27	4.0	●	
<b>2004 005 010</b>	0.006-0.010	0.4	0.05	45	0.6	1.0	0.37	4.0	●	
<b>2004 005 015</b>	0.006-0.010	0.4	0.05	45	0.6	1.5	0.37	4.0	●	
<b>2004 005 025</b>	0.006-0.010	0.4	0.05	45	0.6	2.5	0.37	4.0	●	
<b>2004 005 030</b>	0.006-0.010	0.4	0.05	45	0.6	3.0	0.37	4.0	●	
<b>2004 005 040</b>	0.006-0.010	0.4	0.05	45	0.6	4.0	0.37	4.0	●	
<b>2005 005 010</b>	0.006-0.010	0.5	0.05	45	0.7	1.0	0.45	4.0	●	
<b>2005 005 015</b>	0.006-0.010	0.5	0.05	45	0.7	1.5	0.45	4.0	●	
<b>2005 005 025</b>	0.006-0.009	0.5	0.05	45	0.7	2.5	0.45	4.0	●	
<b>2005 005 030</b>	0.006-0.009	0.5	0.05	45	0.7	3.0	0.45	4.0	●	
<b>2005 005 040</b>	0.006-0.008	0.5	0.05	45	0.7	4.0	0.45	4.0	●	
<b>2006 005 020</b>	0.008-0.013	0.6	0.05	45	0.9	2.0	0.55	4.0	●	
<b>2006 005 040</b>	0.008-0.013	0.6	0.05	45	0.9	4.0	0.55	4.0	●	
<b>2006 005 060</b>	0.008-0.013	0.6	0.05	45	0.9	6.0	0.55	4.0	●	
<b>2006 010 020</b>	0.008-0.013	0.6	0.10	45	0.9	2.0	0.55	4.0	●	
<b>2006 010 040</b>	0.008-0.013	0.6	0.10	45	0.9	4.0	0.55	4.0	●	
<b>2006 010 060</b>	0.008-0.013	0.6	0.10	45	0.9	6.0	0.55	4.0	●	
<b>2006 020 020</b>	0.008-0.013	0.6	0.20	45	0.9	2.0	0.55	4.0	●	
<b>2006 020 040</b>	0.008-0.013	0.6	0.20	45	0.9	4.0	0.55	4.0	●	
<b>2006 020 060</b>	0.008-0.013	0.6	0.20	45	0.9	6.0	0.55	4.0	●	
<b>2008 005 020</b>	0.007-0.015	0.8	0.05	45	1.2	2.0	0.75	4.0	●	
<b>2008 005 040</b>	0.007-0.015	0.8	0.05	45	1.2	4.0	0.75	4.0	●	
<b>2008 005 060</b>	0.007-0.015	0.8	0.05	45	1.2	6.0	0.75	4.0	●	
<b>2008 005 080</b>	0.007-0.013	0.8	0.05	45	1.2	8.0	0.73	4.0	●	
<b>2008 010 020</b>	0.007-0.015	0.8	0.10	45	1.2	2.0	0.75	4.0	●	
<b>2008 010 040</b>	0.007-0.015	0.8	0.10	45	1.2	4.0	0.75	4.0	●	
<b>2008 010 060</b>	0.007-0.015	0.8	0.10	45	1.2	6.0	0.75	4.0	●	
<b>2008 010 080</b>	0.007-0.013	0.8	0.10	45	1.2	8.0	0.73	4.0	●	
<b>2008 020 020</b>	0.007-0.015	0.8	0.20	45	1.2	2.0	0.75	4.0	●	
<b>2008 020 040</b>	0.007-0.015	0.8	0.20	45	1.2	4.0	0.75	4.0	●	
<b>2008 020 060</b>	0.007-0.015	0.8	0.20	45	1.2	6.0	0.75	4.0	●	
<b>2008 020 080</b>	0.007-0.013	0.8	0.20	45	1.2	8.0	0.73	4.0	●	

●: Standard items

# HSR 2

## 2 flute long neck corner radius

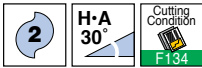
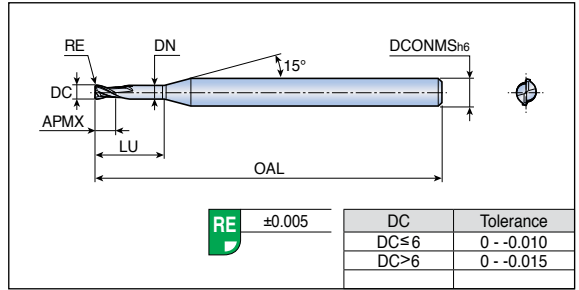


Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>HSR 2010 005 030</b>	0.009-0.020	1.0	0.05	50	2.0	3	0.97	4.0	●
<b>2010 005 040</b>	0.009-0.020	1.0	0.05	50	2.0	4	0.97	4.0	●
<b>2010 005 060</b>	0.009-0.018	1.0	0.05	50	2.0	6	0.97	4.0	●
<b>2010 005 080</b>	0.009-0.018	1.0	0.05	50	2.0	8	0.95	4.0	●
<b>2010 005 100</b>	0.009-0.016	1.0	0.05	50	2.0	10	0.95	4.0	●
<b>2010 010 030</b>	0.009-0.020	1.0	0.10	50	2.0	3	0.97	4.0	●
<b>2010 010 040</b>	0.009-0.020	1.0	0.10	50	2.0	4	0.97	4.0	●
<b>2010 010 060</b>	0.009-0.018	1.0	0.10	50	2.0	6	0.97	4.0	●
<b>2010 010 080</b>	0.009-0.018	1.0	0.10	50	2.0	8	0.95	4.0	●
<b>2010 010 100</b>	0.009-0.016	1.0	0.10	50	2.0	10	0.95	4.0	●
<b>2010 020 030</b>	0.009-0.020	1.0	0.20	50	2.0	3	0.97	4.0	●
<b>2010 020 040</b>	0.009-0.020	1.0	0.20	50	2.0	4	0.97	4.0	●
<b>2010 020 060</b>	0.009-0.018	1.0	0.20	50	2.0	6	0.97	4.0	●
<b>2010 020 080</b>	0.009-0.018	1.0	0.20	50	2.0	8	0.95	4.0	●
<b>2010 020 100</b>	0.009-0.016	1.0	0.20	50	2.0	10	0.95	4.0	●
<b>2010 030 030</b>	0.009-0.020	1.0	0.30	50	2.0	3	0.97	4.0	●
<b>2010 030 040</b>	0.009-0.020	1.0	0.30	50	2.0	4	0.97	4.0	●
<b>2010 030 060</b>	0.009-0.018	1.0	0.30	50	2.0	6	0.97	4.0	●
<b>2010 030 080</b>	0.009-0.018	1.0	0.30	50	2.0	8	0.95	4.0	●
<b>2010 030 100</b>	0.009-0.016	1.0	0.30	50	2.0	10	0.95	4.0	●
<b>2012 010 040</b>	0.010-0.020	1.2	0.10	50	2.2	4	1.17	4.0	●
<b>2012 010 060</b>	0.010-0.020	1.2	0.10	50	2.2	6	1.17	4.0	●
<b>2012 010 080</b>	0.010-0.020	1.2	0.10	50	2.2	8	1.15	4.0	●
<b>2012 010 100</b>	0.010-0.019	1.2	0.10	50	2.2	10	1.15	4.0	●
<b>2012 020 040</b>	0.010-0.020	1.2	0.20	50	2.2	4	1.17	4.0	●
<b>2012 020 060</b>	0.010-0.020	1.2	0.20	50	2.2	6	1.17	4.0	●
<b>2012 020 080</b>	0.010-0.020	1.2	0.20	50	2.2	8	1.15	4.0	●
<b>2012 020 100</b>	0.010-0.019	1.2	0.20	50	2.2	10	1.15	4.0	●
<b>2012 030 040</b>	0.010-0.020	1.2	0.30	50	2.2	4	1.17	4.0	●
<b>2012 030 060</b>	0.010-0.020	1.2	0.30	50	2.2	6	1.17	4.0	●
<b>2012 030 080</b>	0.010-0.020	1.2	0.30	50	2.2	8	1.15	4.0	●
<b>2012 030 100</b>	0.010-0.019	1.2	0.30	50	2.2	10	1.15	4.0	●

●: Standard items

# HSR 2

## 2 flute long neck corner radius

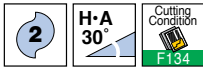
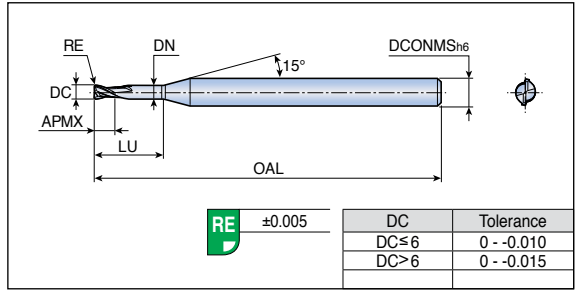


Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>HSR 2015 005 060</b>	0.015-0.025	1.5	0.05	50	2.5	6	1.47	4.0	●
<b>2015 005 080</b>	0.015-0.025	1.5	0.05	50	2.5	8	1.45	4.0	●
<b>2015 005 100</b>	0.015-0.025	1.5	0.05	50	2.5	10	1.45	4.0	●
<b>2015 005 120</b>	0.013-0.025	1.5	0.05	50	2.5	12	1.43	4.0	●
<b>2015 010 040</b>	0.015-0.025	1.5	0.10	50	2.5	4	1.47	4.0	●
<b>2015 010 060</b>	0.015-0.025	1.5	0.10	50	2.5	6	1.47	4.0	●
<b>2015 010 080</b>	0.015-0.025	1.5	0.10	50	2.5	8	1.45	4.0	●
<b>2015 010 100</b>	0.015-0.025	1.5	0.10	50	2.5	10	1.45	4.0	●
<b>2015 010 120</b>	0.013-0.025	1.5	0.10	50	2.5	12	1.43	4.0	●
<b>2015 020 040</b>	0.015-0.025	1.5	0.20	50	2.5	4	1.47	4.0	●
<b>2015 020 060</b>	0.015-0.025	1.5	0.20	50	2.5	6	1.47	4.0	●
<b>2015 020 080</b>	0.015-0.025	1.5	0.20	50	2.5	8	1.45	4.0	●
<b>2015 020 100</b>	0.015-0.025	1.5	0.20	50	2.5	10	1.45	4.0	●
<b>2015 020 120</b>	0.013-0.025	1.5	0.20	50	2.5	12	1.43	4.0	●
<b>2015 030 040</b>	0.015-0.025	1.5	0.30	50	2.5	4	1.47	4.0	●
<b>2015 030 060</b>	0.015-0.025	1.5	0.30	50	2.5	6	1.47	4.0	●
<b>2015 030 080</b>	0.015-0.025	1.5	0.30	50	2.5	8	1.45	4.0	●
<b>2015 030 100</b>	0.015-0.025	1.5	0.30	50	2.5	10	1.45	4.0	●
<b>2015 030 120</b>	0.013-0.025	1.5	0.30	50	2.5	12	1.43	4.0	●
<b>2015 050 040</b>	0.015-0.025	1.5	0.50	50	2.5	4	1.47	4.0	●
<b>2015 050 060</b>	0.015-0.025	1.5	0.50	50	2.5	6	1.47	4.0	●
<b>2015 050 080</b>	0.015-0.025	1.5	0.50	50	2.5	8	1.45	4.0	●
<b>2015 050 100</b>	0.015-0.025	1.5	0.50	50	2.5	10	1.45	4.0	●
<b>2015 050 120</b>	0.013-0.025	1.5	0.50	50	2.5	12	1.43	4.0	●
<b>2020 010 060</b>	0.018-0.040	2.0	0.10	50	3.0	6	1.95	4.0	●
<b>2020 010 080</b>	0.018-0.040	2.0	0.10	50	3.0	8	1.95	4.0	●
<b>2020 010 100</b>	0.018-0.040	2.0	0.10	50	3.0	10	1.95	4.0	●
<b>2020 010 120</b>	0.016-0.025	2.0	0.10	50	3.0	12	1.93	4.0	●
<b>2020 010 160</b>	0.015-0.022	2.0	0.10	50	3.0	16	1.91	4.0	●
<b>2020 010 200</b>	0.013-0.019	2.0	0.10	50	3.0	20	1.91	4.0	●

●: Standard items

# HSR 2

## 2 flute long neck corner radius

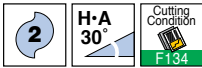
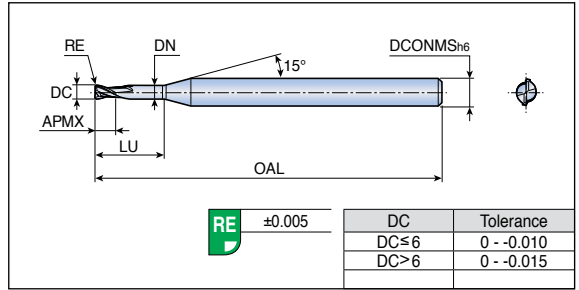


Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>HSR 2020 020 060</b>	0.018-0.040	2.0	0.2	50	3.0	6	1.95	4.0	●
<b>2020 020 080</b>	0.018-0.040	2.0	0.2	50	3.0	8	1.95	4.0	●
<b>2020 020 100</b>	0.018-0.040	2.0	0.2	50	3.0	10	1.95	4.0	●
<b>2020 020 120</b>	0.016-0.025	2.0	0.2	50	3.0	12	1.93	4.0	●
<b>2020 020 160</b>	0.015-0.022	2.0	0.2	50	3.0	16	1.91	4.0	●
<b>2020 020 200</b>	0.013-0.019	2.0	0.2	50	3.0	20	1.91	4.0	●
<b>2020 030 060</b>	0.018-0.040	2.0	0.3	50	3.0	6	1.95	4.0	●
<b>2020 030 080</b>	0.018-0.040	2.0	0.3	50	3.0	8	1.95	4.0	●
<b>2020 030 100</b>	0.018-0.040	2.0	0.3	50	3.0	10	1.95	4.0	●
<b>2020 030 120</b>	0.016-0.025	2.0	0.3	50	3.0	12	1.93	4.0	●
<b>2020 030 160</b>	0.015-0.022	2.0	0.3	50	3.0	16	1.91	4.0	●
<b>2020 030 200</b>	0.013-0.019	2.0	0.3	50	3.0	20	1.91	4.0	●
<b>2020 050 060</b>	0.018-0.040	2.0	0.5	50	3.0	6	1.95	4.0	●
<b>2020 050 080</b>	0.018-0.040	2.0	0.5	50	3.0	8	1.95	4.0	●
<b>2020 050 100</b>	0.018-0.040	2.0	0.5	50	3.0	10	1.95	4.0	●
<b>2020 050 120</b>	0.016-0.025	2.0	0.5	50	3.0	12	1.93	4.0	●
<b>2020 050 160</b>	0.015-0.022	2.0	0.5	50	3.0	16	1.91	4.0	●
<b>2020 050 200</b>	0.013-0.019	2.0	0.5	50	3.0	20	1.91	4.0	●
<b>2025 020 080</b>	0.019-0.045	2.5	0.2	55	3.5	8	2.4	4.0	●
<b>2025 020 100</b>	0.019-0.045	2.5	0.2	55	3.5	10	2.4	4.0	●
<b>2025 020 120</b>	0.017-0.040	2.5	0.2	55	3.5	12	2.4	4.0	●
<b>2025 020 160</b>	0.015-0.030	2.5	0.2	55	3.5	16	2.4	4.0	●
<b>2025 030 080</b>	0.019-0.045	2.5	0.3	55	3.5	8	2.4	4.0	●
<b>2025 030 100</b>	0.019-0.045	2.5	0.3	55	3.5	10	2.4	4.0	●
<b>2025 030 120</b>	0.017-0.040	2.5	0.3	55	3.5	12	2.4	4.0	●
<b>2025 030 160</b>	0.015-0.030	2.5	0.3	55	3.5	16	2.4	4.0	●
<b>2025 050 080</b>	0.019-0.045	2.5	0.5	55	3.5	8	2.4	4.0	●
<b>2025 050 100</b>	0.019-0.045	2.5	0.5	55	3.5	10	2.4	4.0	●
<b>2025 050 120</b>	0.017-0.040	2.5	0.5	55	3.5	12	2.4	4.0	●
<b>2025 050 160</b>	0.015-0.030	2.5	0.5	55	3.5	16	2.4	4.0	●

●: Standard items

# HSR 2

## 2 flute long neck corner radius



Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>HSR 2030 010 080</b>	0.021-0.060	3.0	0.1	55	4.5	8	2.85	6.0	●
<b>2030 010 100</b>	0.021-0.060	3.0	0.1	55	4.5	10	2.85	6.0	●
<b>2030 010 120</b>	0.018-0.050	3.0	0.1	55	4.5	12	2.85	6.0	●
<b>2030 010 160</b>	0.018-0.045	3.0	0.1	55	4.5	16	2.85	6.0	●
<b>2030 010 200</b>	0.015-0.040	3.0	0.1	60	4.5	20	2.85	6.0	●
<b>2030 010 250</b>	0.015-0.040	3.0	0.1	60	4.5	25	2.85	6.0	●
<b>2030 020 080</b>	0.021-0.060	3.0	0.2	55	4.5	8	2.85	6.0	●
<b>2030 020 100</b>	0.021-0.060	3.0	0.2	55	4.5	10	2.85	6.0	●
<b>2030 020 120</b>	0.018-0.050	3.0	0.2	55	4.5	12	2.85	6.0	●
<b>2030 020 160</b>	0.018-0.045	3.0	0.2	55	4.5	16	2.85	6.0	●
<b>2030 020 200</b>	0.015-0.040	3.0	0.2	60	4.5	20	2.85	6.0	●
<b>2030 020 250</b>	0.015-0.040	3.0	0.2	60	4.5	25	2.85	6.0	●
<b>2030 030 080</b>	0.021-0.060	3.0	0.3	55	4.5	8	2.85	6.0	●
<b>2030 030 100</b>	0.021-0.060	3.0	0.3	55	4.5	10	2.85	6.0	●
<b>2030 030 120</b>	0.018-0.050	3.0	0.3	55	4.5	12	2.85	6.0	●
<b>2030 030 160</b>	0.018-0.045	3.0	0.3	55	4.5	16	2.85	6.0	●
<b>2030 030 200</b>	0.015-0.040	3.0	0.3	60	4.5	20	2.85	6.0	●
<b>2030 030 250</b>	0.015-0.040	3.0	0.3	60	4.5	25	2.85	6.0	●
<b>2030 050 080</b>	0.021-0.060	3.0	0.5	55	4.5	8	2.85	6.0	●
<b>2030 050 100</b>	0.021-0.060	3.0	0.5	55	4.5	10	2.85	6.0	●
<b>2030 050 120</b>	0.018-0.050	3.0	0.5	55	4.5	12	2.85	6.0	●
<b>2030 050 160</b>	0.018-0.045	3.0	0.5	55	4.5	16	2.85	6.0	●
<b>2030 050 200</b>	0.015-0.040	3.0	0.5	60	4.5	20	2.85	6.0	●
<b>2030 050 250</b>	0.015-0.040	3.0	0.5	60	4.5	25	2.85	6.0	●
<b>2030 100 080</b>	0.021-0.060	3.0	1.0	55	4.5	8	2.85	6.0	●
<b>2030 100 100</b>	0.021-0.060	3.0	1.0	55	4.5	10	2.85	6.0	●
<b>2030 100 120</b>	0.018-0.050	3.0	1.0	55	4.5	12	2.85	6.0	●
<b>2030 100 160</b>	0.018-0.045	3.0	1.0	55	4.5	16	2.85	6.0	●
<b>2030 100 200</b>	0.015-0.040	3.0	1.0	60	4.5	20	2.85	6.0	●

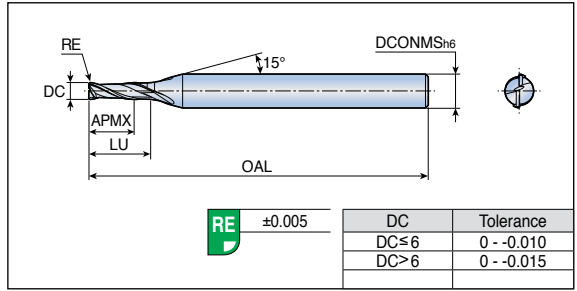
●: Standard items







## 2 flute medium corner radius



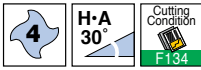
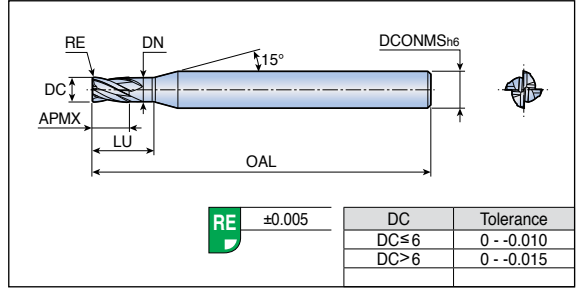
Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	RE	OAL	APMX	LU	DCONMS	
<b>HSR 2003M 002</b>	0.006-0.010	0.3	0.02	45	0.6	0.9	4.0	●
<b>2003M 005</b>	0.006-0.010	0.3	0.05	45	0.6	0.9	4.0	●
<b>2004M 005</b>	0.006-0.010	0.4	0.05	45	0.8	1.1	4.0	●
<b>2004M 010</b>	0.006-0.010	0.4	0.10	45	0.8	1.1	4.0	●
<b>2005M 005</b>	0.006-0.010	0.5	0.05	45	1.0	1.3	4.0	●
<b>2005M 010</b>	0.006-0.010	0.5	0.10	45	1.0	1.3	4.0	●
<b>2006M 005</b>	0.008-0.013	0.6	0.05	45	1.2	1.5	4.0	●
<b>2006M 010</b>	0.008-0.013	0.6	0.10	45	1.2	1.5	4.0	●
<b>2006M 020</b>	0.008-0.013	0.6	0.20	45	1.2	1.5	4.0	●
<b>2008M 005</b>	0.007-0.015	0.8	0.05	45	1.6	2	4.0	●
<b>2008M 010</b>	0.007-0.015	0.8	0.10	45	1.6	2	4.0	●
<b>2008M 020</b>	0.007-0.015	0.8	0.20	45	1.6	2	4.0	●
<b>2010M 005</b>	0.009-0.020	1.0	0.05	50	2.0	3.5	6.0	●
<b>2010M 010</b>	0.009-0.020	1.0	0.10	50	2.0	3.5	6.0	●
<b>2010M 020</b>	0.009-0.020	1.0	0.20	50	2.0	3.5	6.0	●
<b>2010M 030</b>	0.009-0.020	1.0	0.30	50	2.0	3.5	6.0	●
<b>2012M 005</b>	0.010-0.020	1.2	0.05	50	2.5	4	6.0	●
<b>2012M 010</b>	0.010-0.020	1.2	0.10	50	2.5	4	6.0	●
<b>2012M 020</b>	0.010-0.020	1.2	0.20	50	2.5	4	6.0	●
<b>2012M 030</b>	0.010-0.020	1.2	0.30	50	2.5	4	6.0	●
<b>2015M 005</b>	0.015-0.025	1.5	0.05	50	3.0	5	6.0	●
<b>2015M 010</b>	0.015-0.025	1.5	0.10	50	3.0	5	6.0	●
<b>2015M 020</b>	0.015-0.025	1.5	0.20	50	3.0	5	6.0	●
<b>2015M 030</b>	0.015-0.025	1.5	0.30	50	3.0	5	6.0	●
<b>2020M 010</b>	0.018-0.040	2.0	0.10	50	5.0	7	6.0	●
<b>2020M 020</b>	0.018-0.040	2.0	0.20	50	5.0	7	6.0	●
<b>2020M 030</b>	0.018-0.040	2.0	0.30	50	5.0	7	6.0	●
<b>2020M 050</b>	0.018-0.040	2.0	0.50	50	5.0	7	6.0	●
<b>2025M 010</b>	0.019-0.045	2.5	0.10	60	7.0	9	6.0	●
<b>2025M 020</b>	0.019-0.045	2.5	0.20	60	7.0	9	6.0	●
<b>2025M 030</b>	0.019-0.045	2.5	0.30	60	7.0	9	6.0	●
<b>2025M 050</b>	0.019-0.045	2.5	0.50	60	7.0	9	6.0	●

●: Standard items





## 4 flute long neck corner radius



Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>HSR 4010 010 030</b>	0.009-0.020	1.0	0.1	50	2.0	3	0.97	4.0	●
<b>4010 010 040</b>	0.009-0.020	1.0	0.1	50	2.0	4	0.97	4.0	●
<b>4010 010 060</b>	0.009-0.018	1.0	0.1	50	2.0	6	0.97	4.0	●
<b>4010 020 030</b>	0.009-0.020	1.0	0.2	50	2.0	3	0.97	4.0	●
<b>4010 020 040</b>	0.009-0.020	1.0	0.2	50	2.0	4	0.97	4.0	●
<b>4010 020 060</b>	0.009-0.018	1.0	0.2	50	2.0	6	0.97	4.0	●
<b>4010 030 030</b>	0.009-0.020	1.0	0.3	50	2.0	3	0.97	4.0	●
<b>4010 030 040</b>	0.009-0.020	1.0	0.3	50	2.0	4	0.97	4.0	●
<b>4010 030 060</b>	0.009-0.018	1.0	0.3	50	2.0	6	0.97	4.0	●
<b>4015 010 040</b>	0.015-0.025	1.5	0.1	50	2.5	4	1.45	4.0	●
<b>4015 010 060</b>	0.015-0.025	1.5	0.1	50	2.5	6	1.45	4.0	●
<b>4015 020 040</b>	0.015-0.025	1.5	0.2	50	2.5	4	1.45	4.0	●
<b>4015 020 060</b>	0.015-0.025	1.5	0.2	50	2.5	6	1.45	4.0	●
<b>4015 030 040</b>	0.015-0.025	1.5	0.3	50	2.5	4	1.45	4.0	●
<b>4015 030 060</b>	0.015-0.025	1.5	0.3	50	2.5	6	1.45	4.0	●
<b>4020 010 060</b>	0.018-0.040	2.0	0.1	50	3.0	6	1.95	4.0	●
<b>4020 010 080</b>	0.018-0.040	2.0	0.1	50	3.0	8	1.95	4.0	●
<b>4020 010 100</b>	0.018-0.040	2.0	0.1	50	3.0	10	1.95	4.0	●
<b>4020 010 120</b>	0.016-0.025	2.0	0.1	50	3.0	12	1.95	4.0	●
<b>4020 010 160</b>	0.015-0.022	2.0	0.1	50	3.0	16	1.95	4.0	●
<b>4020 020 060</b>	0.018-0.040	2.0	0.2	50	3.0	6	1.95	4.0	●
<b>4020 020 080</b>	0.018-0.040	2.0	0.2	50	3.0	8	1.95	4.0	●
<b>4020 020 100</b>	0.018-0.040	2.0	0.2	50	3.0	10	1.95	4.0	●
<b>4020 020 120</b>	0.016-0.025	2.0	0.2	50	3.0	12	1.95	4.0	●
<b>4020 020 160</b>	0.015-0.022	2.0	0.2	50	3.0	16	1.95	4.0	●
<b>4020 030 060</b>	0.018-0.040	2.0	0.3	50	3.0	6	1.95	4.0	●
<b>4020 030 080</b>	0.018-0.040	2.0	0.3	50	3.0	8	1.95	4.0	●
<b>4020 030 100</b>	0.018-0.040	2.0	0.3	50	3.0	10	1.95	4.0	●
<b>4020 030 120</b>	0.016-0.025	2.0	0.3	50	3.0	12	1.95	4.0	●
<b>4020 030 160</b>	0.015-0.022	2.0	0.3	50	3.0	16	1.95	4.0	●
<b>4020 050 060</b>	0.018-0.040	2.0	0.5	50	3.0	6	1.95	4.0	●
<b>4020 050 080</b>	0.018-0.040	2.0	0.5	50	3.0	8	1.95	4.0	●
<b>4020 050 100</b>	0.018-0.040	2.0	0.5	50	3.0	10	1.95	4.0	●
<b>4020 050 120</b>	0.016-0.025	2.0	0.5	50	3.0	12	1.95	4.0	●
<b>4020 050 160</b>	0.015-0.022	2.0	0.5	50	3.0	16	1.95	4.0	●

●: Standard items







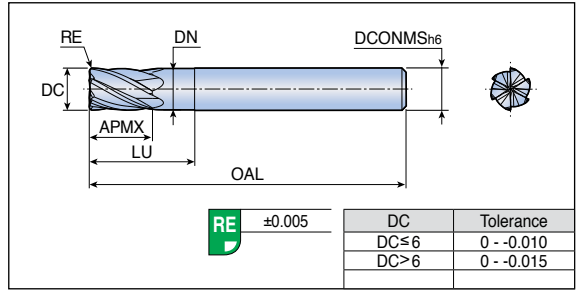






# HSR 6

## 6 flute long neck corner radius



• Finishing

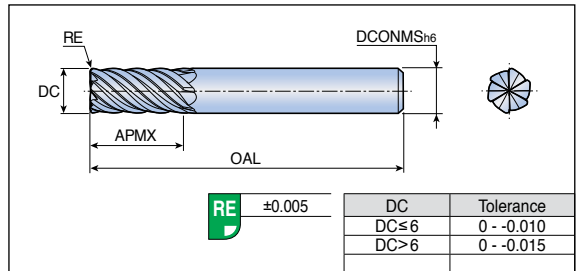
6 H·A 45° Cutting Condition F134

Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>HSR 6060 050 150</b>	0.038-0.050	6.0	0.5	60	9	15	5.8	6.0	●
<b>6060 100 150</b>	0.038-0.050	6.0	1.0	60	9	15	5.8	6.0	●
<b>6080 050 200</b>	0.045-0.060	8.0	0.5	70	12	20	7.8	8.0	●
<b>6080 100 200</b>	0.045-0.060	8.0	1.0	70	12	20	7.8	8.0	●
<b>6100 050 250</b>	0.045-0.060	10.0	0.5	75	15	25	9.8	10.0	●
<b>6100 100 250</b>	0.045-0.060	10.0	1.0	75	15	25	9.8	10.0	●
<b>6120 050 300</b>	0.053-0.070	12.0	0.5	85	18	30	11.6	12.0	●
<b>6120 100 300</b>	0.053-0.070	12.0	1.0	85	18	30	11.6	12.0	●

●: Standard items

# HSR 6...M

## 6 flute medium corner radius



• Finishing

6 H·A 45° Cutting Condition F134

Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	RE	OAL	APMX	DCONMS	
<b>HSR 6060M 050</b>	0.038-0.050	6.0	0.5	60	15	6.0	●
<b>6060M 100</b>	0.038-0.050	6.0	1.0	60	15	6.0	●
<b>6080M 050</b>	0.045-0.060	8.0	0.5	65	20	8.0	●
<b>6080M 100</b>	0.045-0.060	8.0	1.0	65	20	8.0	●
<b>6100M 050</b>	0.045-0.060	10.0	0.5	70	22	10.0	●
<b>6100M 100</b>	0.045-0.060	10.0	1.0	70	22	10.0	●
<b>6100M 150</b>	0.045-0.060	10.0	1.5	70	22	10.0	●
<b>6120M 050</b>	0.053-0.070	12.0	0.5	80	26	12.0	●
<b>6120M 100</b>	0.053-0.070	12.0	1.0	80	26	12.0	●
<b>6120M 150</b>	0.053-0.070	12.0	1.5	80	26	12.0	●

●: Standard items

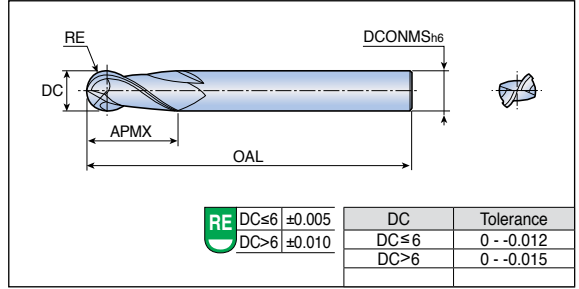






# SBE 2...T

## 2 flute medium ball



<b>2</b>	<b>H-A</b> 30°	Cutting Condition <b>F134</b>
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Designation	Dimension (mm)					Grade
	DC	RE	OAL	APMX	DCONMS	TT5515
<b>SBE 2010T</b>	1.0	0.5	50	1.5	4	●
<b>2010T-6</b>	1.0	0.5	50	1.5	6	●
<b>2012T</b>	1.2	0.6	50	1.8	4	●
<b>2015T</b>	1.5	0.75	50	2.3	4	●
<b>2015T-5X70</b>	1.5	0.75	70	5.0	6	●
<b>2015T-6</b>	1.5	0.75	50	2.3	6	●
<b>2016T</b>	1.6	0.8	50	2.4	4	●
<b>2020T</b>	2.0	1.0	50	3.0	4	●
<b>2020T-6</b>	2.0	1.0	50	3.0	6	●
<b>2020T-7X70</b>	2.0	1.0	70	7.0	6	●
<b>2025T</b>	2.5	1.25	50	3.8	4	●
<b>2025T-6</b>	2.5	1.25	50	3.8	6	●
<b>2030T</b>	3.0	1.5	70	8.0	6	●
<b>2030T-10X70</b>	3.0	1.5	70	10.0	6	●
<b>2035T</b>	3.5	1.75	70	8.0	6	●
<b>2040T</b>	4.0	2.0	70	8.0	6	●
<b>2040T-12X70</b>	4.0	2.0	70	12.0	6	●
<b>2045T</b>	4.5	2.25	80	8.0	6	●
<b>2050T</b>	5.0	2.5	80	12.0	6	●
<b>2050T-15X80</b>	5.0	2.5	80	15.0	6	●
<b>2060T</b>	6.0	3.0	80	12.0	6	●
<b>2060T-15X80</b>	6.0	3.0	80	15.0	6	●
<b>2065T</b>	6.5	3.25	90	12.0	8	●
<b>2070T</b>	7.0	3.5	90	15.0	8	●
<b>2080T</b>	8.0	4.0	90	15.0	8	●
<b>2080T-20X90</b>	8.0	4.0	90	20.0	8	●
<b>2090T</b>	9.0	4.5	100	20.0	10	●
<b>2100T</b>	10.0	5.0	100	20.0	10	●
<b>2100T-25X100</b>	10.0	5.0	100	25.0	10	●
<b>2110T</b>	11.0	5.5	110	25.0	12	●
<b>2120T</b>	12.0	6.0	110	25.0	12	●
<b>2120T-30X100</b>	12.0	6.0	100	30.0	12	●
<b>2140T</b>	14.0	7.0	120	30.0	12	●
<b>2150T</b>	15.0	7.5	125	35.0	16	●
<b>2160T</b>	16.0	8.0	125	35.0	16	●
<b>2180T</b>	18.0	9.0	150	40.0	20	●
<b>2200T</b>	20.0	10.0	150	40.0	20	●

• Weldon shank is available on request (Ordering example: SBEW 2...T)

●: Standard items





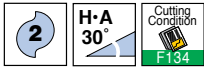
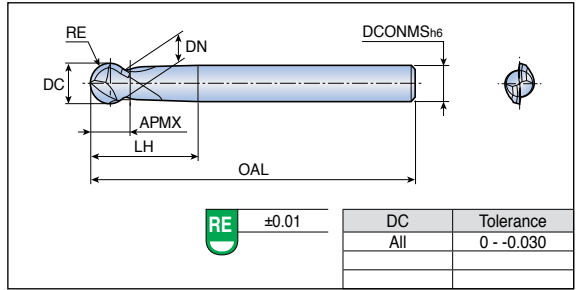






# BES 2...T

## 2 flute spherical ball

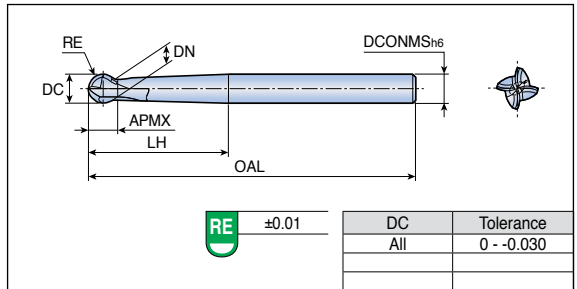


Designation	Dimension (mm)							Grade
	DC	RE	OAL	APMX	LH	DN	DCONMS	
<b>BES 2030T</b>	3	1.5	80	3.3	28.5	2.52	6	●
<b>2040T</b>	4	2.0	80	4.1	28.5	3.35	6	●
<b>2050T</b>	5	2.5	80	5.4	38.0	4.19	6	●
<b>2060T</b>	6	3.0	100	6.1	28.0	5.03	6	●
<b>2080T</b>	8	4.0	100	8.2	33.0	6.71	8	●
<b>2100T</b>	10	5.0	100	9.7	40.0	8.39	10	●
<b>2120T</b>	12	6.0	110	12.3	49.0	10.06	12	●
<b>2160T</b>	16	8.0	155	15.4	58.0	13.42	16	●

●: Standard items

# BES 4...T

## 4 flute spherical ball

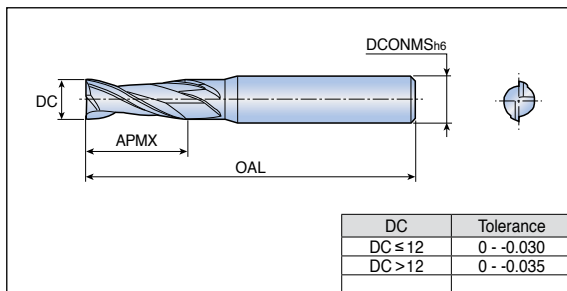


Designation	Dimension (mm)							Grade
	DC	RE	OAL	APMX	LH	DN	DCONMS	
<b>BES 4030T</b>	3	1.5	80	3.3	28.5	2.52	6	●
<b>4040T</b>	4	2.0	80	4.1	28.5	3.35	6	●
<b>4050T</b>	5	2.5	80	5.4	38.0	4.19	6	●
<b>4060T</b>	6	3.0	100	6.1	28.0	5.03	6	●
<b>4080T</b>	8	4.0	100	8.2	33.0	6.71	8	●
<b>4100T</b>	10	5.0	100	9.7	40.0	8.39	10	●
<b>4120T</b>	12	6.0	110	12.3	49.0	10.06	12	●

●: Standard items

# TSE 2...M

2 flute medium flat



Designation	Feed (mm/tooth)	Dimension (mm)				Grades	
		DC	OAL	APMX	DCONMS	TT5515	TT5525
<b>TSE 2010M-4</b>	0.008-0.030	1.0	40	3	4	●	●
<b>2010M</b>	0.008-0.030	1.0	42	3	6	●	●
<b>2012M</b>	0.008-0.030	1.2	42	3	6	●	●
<b>2015M-4</b>	0.008-0.030	1.5	40	4	4	●	●
<b>2015M</b>	0.008-0.030	1.5	42	4	6	●	●
<b>2020M-4</b>	0.010-0.030	2.0	40	6	4	●	●
<b>2020M</b>	0.010-0.030	2.0	42	6	6	●	●
<b>2025M-4</b>	0.010-0.030	2.5	40	8	4	●	●
<b>2025M</b>	0.010-0.030	2.5	42	8	6	●	●
<b>2030M</b>	0.010-0.030	3.0	57	10	6	●	●
<b>2035M-4</b>	0.010-0.030	3.5	50	12	4	●	●
<b>2035M</b>	0.010-0.030	3.5	47	10	6	●	●
<b>2040M-4</b>	0.010-0.050	4.0	50	12	4	●	●
<b>2040M</b>	0.010-0.050	4.0	57	12	6	●	●
<b>2045M</b>	0.010-0.050	4.5	57	14	6	●	●
<b>2050M-5</b>	0.015-0.060	5.0	50	14	5	●	●
<b>2050M</b>	0.015-0.060	5.0	57	14	6	●	●
<b>2055M</b>	0.015-0.060	5.5	57	16	6	●	●
<b>2060M</b>	0.020-0.060	6.0	57	16	6	●	●
<b>2065M-7</b>	0.020-0.060	6.5	60	20	7	●	●
<b>2065M</b>	0.020-0.060	6.5	60	20	8	●	●
<b>2070M</b>	0.030-0.070	7.0	60	20	8	●	●
<b>2075M</b>	0.030-0.070	7.5	63	20	8	●	●
<b>2080M</b>	0.030-0.100	8.0	63	20	8	●	●
<b>2085M</b>	0.030-0.100	8.5	72	22	10	●	●
<b>2090M</b>	0.030-0.100	9.0	68	25	10	●	●
<b>2095M</b>	0.030-0.100	9.5	72	24	10	●	●
<b>2100M(25X68)</b>	0.030-0.120	10.0	68	25	10	●	●
<b>2100M</b>	0.030-0.120	10.0	72	22	10	●	●
<b>2105M</b>	0.030-0.120	10.5	76	26	12	●	●
<b>2110M</b>	0.030-0.120	11.0	76	30	12	●	●
<b>2115M</b>	0.030-0.120	11.5	83	30	12	●	●
<b>2120M(30X76)</b>	0.030-0.120	12.0	76	30	12	●	●
<b>2120M</b>	0.030-0.120	12.0	83	25	12	●	●
<b>2130M</b>	0.030-0.132	13.0	85	35	14	●	●

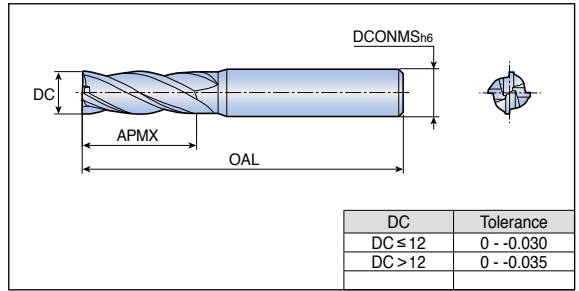
• Weldon shank is available on request (Ordering example: TSEW 2...M)

●: Standard items



# TSE 4...M

4 flute medium flat



Designation	Feed (mm/tooth)	Dimension (mm)				Grades	
		DC	OAL	APMX	DCONMS	TT5515	TT5525
<b>TSE 4010M</b>	0.005-0.010	1.0	42	2.5	6	●	●
<b>4015M</b>	0.005-0.012	1.5	42	4	6	●	●
<b>4020M</b>	0.008-0.017	2.0	42	6	6	●	●
<b>4025M-4</b>	0.008-0.017	2.5	40	8	4	●	●
<b>4025M</b>	0.008-0.017	2.5	42	8	6	●	●
<b>4030M</b>	0.009-0.020	3.0	57	10	6	●	●
<b>4035M-4</b>	0.010-0.028	3.5	50	12	4	●	●
<b>4035M</b>	0.010-0.028	3.5	47	10	6	●	●
<b>4040M-4</b>	0.010-0.042	4.0	50	12	4	●	●
<b>4040M</b>	0.010-0.042	4.0	57	12	6	●	●
<b>4045M</b>	0.010-0.042	4.5	57	12	6	●	●
<b>4050M</b>	0.020-0.059	5.0	57	14	6	●	●
<b>4055M</b>	0.020-0.059	5.5	57	14	6	●	●
<b>4060M</b>	0.020-0.075	6.0	57	16	6	●	●
<b>4065M</b>	0.020-0.075	6.5	60	20	8	●	●
<b>4070M</b>	0.020-0.075	7.0	60	20	8	●	●
<b>4075M</b>	0.020-0.075	7.5	60	20	8	●	●
<b>4080M</b>	0.030-0.100	8.0	63	20	8	●	●
<b>4085M</b>	0.030-0.100	8.5	68	25	10	●	●
<b>4090M</b>	0.030-0.100	9.0	68	25	10	●	●
<b>4095M</b>	0.030-0.100	9.5	68	25	10	●	●
<b>4100M(25X68)</b>	0.030-0.120	10.0	68	25	10	●	●
<b>4100M</b>	0.030-0.120	10.0	72	22	10	●	●
<b>4105M</b>	0.030-0.120	10.5	76	30	12	●	●
<b>4110M</b>	0.030-0.120	11.0	76	30	12	●	●
<b>4115M</b>	0.030-0.120	11.5	76	30	12	●	●
<b>4120M(30X76)</b>	0.030-0.136	12.0	76	30	12	●	●
<b>4120M</b>	0.030-0.136	12.0	83	25	12	●	●
<b>4130M</b>	0.030-0.136	13.0	85	35	14	●	●
<b>4140M-14</b>	0.030-0.136	14.0	83	25	14	●	●
<b>4140M</b>	0.030-0.136	14.0	85	35	16	●	●
<b>4140M(35X85)</b>	0.030-0.136	14.0	85	35	16	●	●
<b>4150M</b>	0.040-0.140	15.0	92	32	16	●	●
<b>4160M(40X90)</b>	0.040-0.146	16.0	90	40	16	●	●
<b>4160M</b>	0.040-0.146	16.0	92	32	16	●	●

• Weldon shank is available on request (Ordering example: TSEW 4...M)

●: Standard items







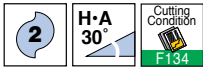
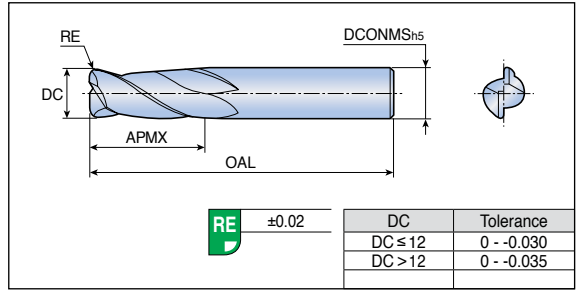






# HES 2...T-R

2 flute medium corner radius



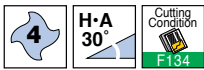
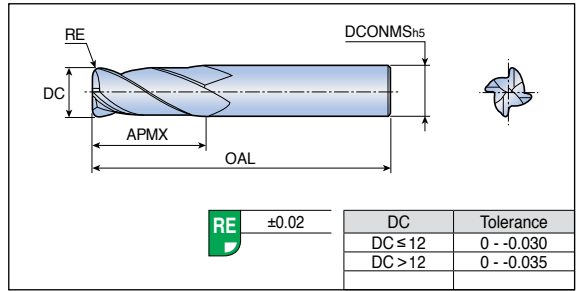
Designation	Feed (mm/tooth)	Dimension (mm)					Grades	
		DC	RE	OAL	APMX	DCONMS	TT5515	TT5525
HES 2030T-R0.5	0.010-0.030	3	0.5	47	10	6	●	●
2040T-R0.5	0.010-0.050	4	0.5	47	12	6	●	●
2050T-R0.5	0.020-0.060	5	0.5	52	15	6	●	●
2060T-R0.5	0.020-0.060	6	0.5	52	15	6	●	●
2060T-R1.0	0.020-0.060	6	1.0	52	15	6	●	●
2080T-R0.5	0.030-0.100	8	0.5	60	20	8	●	●
2080T-R1.0	0.030-0.100	8	1.0	60	20	8	●	●
2080T-R1.5	0.030-0.100	8	1.5	60	20	8	●	●
2080T-R2.0	0.030-0.100	8	2.0	60	20	8	●	●
2100T-R0.5	0.030-0.120	10	0.5	68	25	10	●	●
2100T-R1.0	0.030-0.120	10	1.0	68	25	10	●	●
2100T-R1.5	0.030-0.120	10	1.5	68	25	10	●	●
2100T-R2.0	0.030-0.120	10	2.0	68	25	10	●	●
2100T-R2.5	0.030-0.120	10	2.5	68	25	10	●	●
2100T-R3.0	0.030-0.120	10	3.0	68	25	10	●	●
2120T-R0.5	0.030-0.120	12	0.5	76	30	12	●	●
2120T-R1.0	0.030-0.120	12	1.0	76	30	12	●	●
2120T-R1.5	0.030-0.120	12	1.5	76	30	12	●	●
2120T-R2.0	0.030-0.120	12	2.0	76	30	12	●	●
2120T-R2.5	0.030-0.120	12	2.5	76	30	12	●	●
2120T-R3.0	0.030-0.120	12	3.0	76	30	12	●	●
2160T-R0.5	0.040-0.142	16	0.5	90	40	16	●	●
2160T-R1.0	0.040-0.142	16	1.0	90	40	16	●	●
2160T-R1.5	0.040-0.142	16	1.5	90	40	16	●	●
2160T-R2.0	0.040-0.142	16	2.0	90	40	16	●	●
2160T-R3.0	0.040-0.142	16	3.0	90	40	16	●	●
2200T-R0.5	0.040-0.142	20	0.5	110	45	20	●	●
2200T-R1.0	0.040-0.142	20	1.0	110	45	20	●	●
2200T-R1.5	0.040-0.142	20	1.5	110	45	20	●	●
2200T-R2.0	0.040-0.142	20	2.0	110	45	20	●	●
2200T-R3.0	0.040-0.142	20	3.0	110	45	20	●	●

●: Standard items



# HES 4...T-R

4 flute medium corner radius



Designation	Feed (mm/tooth)	Dimension (mm)					Grades	
		DC	RE	OAL	APMX	DCONMS	TT5515	TT5525
<b>HES 4030T-R0.3</b>	0.01-0.04	3	0.3	47	10	6	●	●
<b>4040T-R0.3</b>	0.02-0.05	4	0.3	47	12	6	●	●
<b>4050T-R0.3</b>	0.02-0.06	5	0.3	52	15	6	●	●
<b>4060T-R0.5</b>	0.03-0.07	6	0.5	52	15	6	●	●
<b>4060T-R1.0</b>	0.03-0.07	6	1.0	52	15	6	●	●
<b>4080T-R0.5</b>	0.03-0.09	8	0.5	60	20	8	●	●
<b>4080T-R1.0</b>	0.03-0.09	8	1.0	60	20	8	●	●
<b>4080T-R1.5</b>	0.03-0.09	8	1.5	60	20	8	●	●
<b>4080T-R2.0</b>	0.03-0.09	8	2.0	60	20	8	●	●
<b>4100T-R0.5</b>	0.03-0.10	10	0.5	68	25	10	●	●
<b>4100T-R1.0</b>	0.03-0.10	10	1.0	68	25	10	●	●
<b>4100T-R1.5</b>	0.03-0.10	10	1.5	68	25	10	●	●
<b>4100T-R2.0</b>	0.03-0.10	10	2.0	68	25	10	●	●
<b>4100T-R2.5</b>	0.03-0.10	10	2.5	68	25	10	●	●
<b>4100T-R3.0</b>	0.03-0.10	10	3.0	68	25	10	●	●
<b>4120T-R0.5</b>	0.04-0.11	12	0.5	76	30	12	●	●
<b>4120T-R1.0</b>	0.04-0.11	12	1.0	76	30	12	●	●
<b>4120T-R1.5</b>	0.04-0.11	12	1.5	76	30	12	●	●
<b>4120T-R2.0</b>	0.04-0.11	12	2.0	76	30	12	●	●
<b>4120T-R2.5</b>	0.04-0.11	12	2.5	76	30	12	●	●
<b>4120T-R3.0</b>	0.04-0.11	12	3.0	76	30	12	●	●
<b>4160T-R0.5</b>	0.05-0.13	16	0.5	90	40	16	●	●
<b>4160T-R1.0</b>	0.05-0.13	16	1.0	90	40	16	●	●
<b>4160T-R1.5</b>	0.05-0.13	16	1.5	90	40	16	●	●
<b>4160T-R2.0</b>	0.05-0.13	16	2.0	90	40	16	●	●
<b>4160T-R3.0</b>	0.05-0.13	16	3.0	90	40	16	●	●
<b>4200T-R0.5</b>	0.05-0.13	20	0.5	110	45	20	●	●
<b>4200T-R1.0</b>	0.05-0.13	20	1.0	110	45	20	●	●
<b>4200T-R1.5</b>	0.05-0.13	20	1.5	110	45	20	●	●
<b>4200T-R2.0</b>	0.05-0.13	20	2.0	110	45	20	●	●
<b>4200T-R3.0</b>	0.05-0.13	20	3.0	110	45	20	●	●

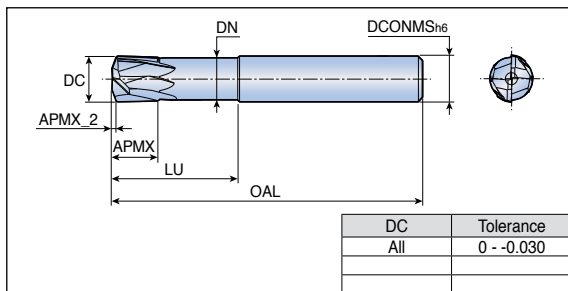
●: Standard items



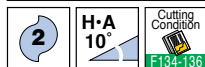


# HFM 2

## 2 flute high feed flat



• High Feed Machining (H.F.M)



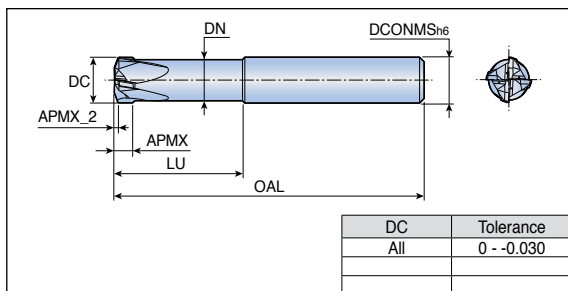
Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	OAL	APMX	APMX_2*	LU	DN	DCONMS	
<b>HFM 2040</b>	0.2-0.4	4	47	4	0.3	10	3.9	6	●
<b>2060</b>	0.3-0.6	6	52	6	0.5	16	5.5	6	●
<b>2080</b>	0.4-0.7	8	60	8	0.75	22	7.3	8	●
<b>2100</b>	0.5-0.9	10	68	10	1.0	28	9.2	10	●
<b>2120</b>	0.5-1.0	12	76	12	1.1	33	11.0	12	●

•\*: Maximum D.O.C for high feed milling

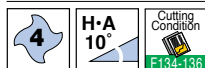
●: Standard items

# HFM 4

## 4 flute high feed flat



• High Feed Machining (H.F.M)



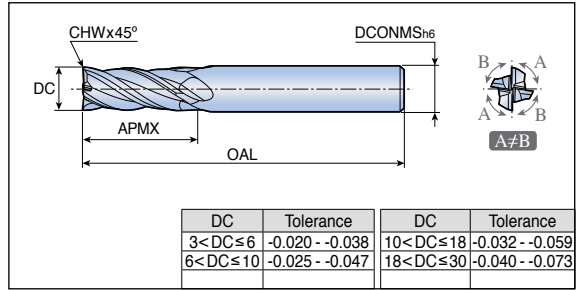
Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	OAL	APMX	APMX_2*	LU	DN	DCONMS	
<b>HFM 4060</b>	0.3-0.5	6	52	2.5	0.5	16	5.4	6	●
<b>4080</b>	0.3-0.6	8	60	3.5	0.7	24	7.2	8	●
<b>4100</b>	0.4-0.8	10	68	4.0	0.75	28	9.2	10	●
<b>4120</b>	0.4-1.0	12	76	5.0	1.05	33	11.0	12	●

•\*: Maximum D.O.C for high feed milling

●: Standard items

# CFM 4...M

## 4 flute corner chamfer



- Vibration free mill

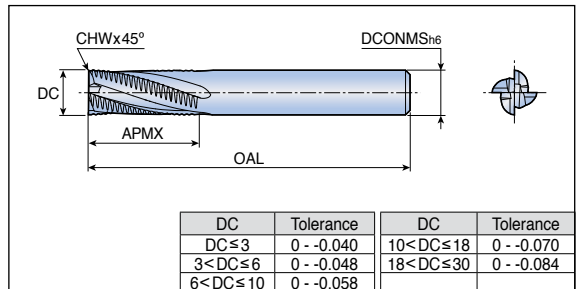


Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	CHW	OAL	APMX	DCONMS	
<b>CFM 4060M</b>	0.03-0.07	6	0.25	57	14	6	●
<b>4080M</b>	0.03-0.08	8	0.3	63	18	8	●
<b>4100M</b>	0.03-0.10	10	0.4	72	22	10	●
<b>4120M</b>	0.04-0.11	12	0.5	83	26	12	●
<b>4160M</b>	0.05-0.13	16	0.6	100	34	16	●
<b>4200M</b>	0.05-0.17	20	0.6	110	42	20	●
<b>4250M</b>	0.06-0.20	25	0.6	121	52	25	●

- Standard items

# REL ...L

## 3-4 flute rough long corner chamfer



Designation	Feed (mm/tooth)	Dimension (mm)					Grade	
		DC	NOF	CHW	OAL	APMX		
<b>REL 3060L</b>	0.03-0.06	6	3	0.38	57	16	6	●
<b>3080L</b>	0.03-0.08	8	3	0.38	63	16	8	●
<b>4100L</b>	0.03-0.09	10	4	0.61	72	22	10	●
<b>4120L</b>	0.04-0.10	12	4	0.61	83	26	12	●
<b>4140L-14</b>	0.05-0.11	14	4	0.61	83	26	14	●
<b>4160L</b>	0.05-0.11	16	4	0.61	92	32	16	●
<b>4200L</b>	0.05-0.11	20	4	0.61	104	38	20	●

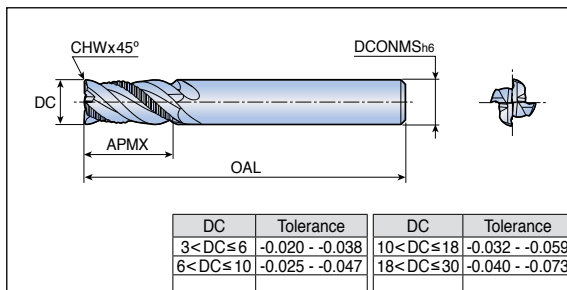
- Weldon shank is available on request (Ordering example: RELW ....L)
- NOF: Number of flutes

- Standard items

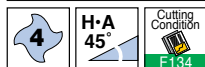
# FSM 4...M



## 4 flute medium corner chamfer



- MULTIMILL (Rough + Finish)



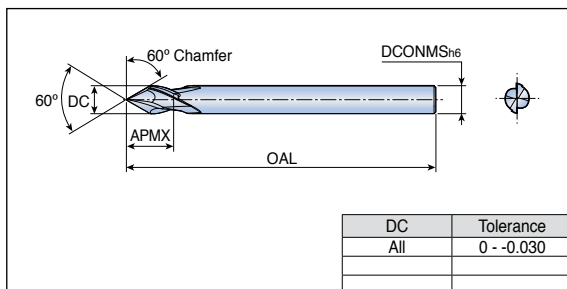
Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	CHW	OAL	APMX	DCONMS	
<b>FSM 4060M</b>	0.03-0.06	6	0.25	57	14	6	●
<b>4080M</b>	0.03-0.08	8	0.3	63	18	8	●
<b>4100M</b>	0.03-0.09	10	0.3	72	22	10	●
<b>4120M</b>	0.04-0.11	12	0.4	83	26	12	●
<b>4140M</b>	0.04-0.11	14	0.4	83	30	14	●
<b>4160M</b>	0.05-0.11	16	0.6	92	34	16	●
<b>4200M</b>	0.05-0.11	20	0.6	104	42	20	●
<b>4250M</b>	0.06-0.11	25	0.6	121	52	25	●

●: Standard items

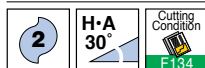
# CEM 2...-C60



## 2 flute, 60° chamfering



- Multi-function
- Chamfer boring, chamfer milling, side milling



Designation	Feed (mm/tooth)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	
<b>CEM 2040-C60</b>	0.02-0.04	4	70	7.5	6	●
<b>2060-C60</b>	0.02-0.04	6	80	11.2	6	●
<b>2080-C60</b>	0.03-0.06	8	90	14.9	8	●
<b>2100-C60</b>	0.03-0.08	10	100	18.7	10	●
<b>2120-C60</b>	0.04-0.09	12	110	22.4	12	●
<b>2160-C60</b>	0.05-0.10	16	125	29.9	16	●
<b>2200-C60</b>	0.05-0.10	20	150	37.3	20	●

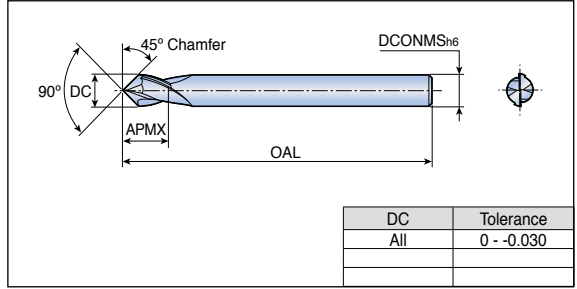
●: Standard items

# CEM 2

## 2 flute, 45° chamfering



- Multi-function
  - Chamfer boring, chamfer milling, side milling,
  - \*centering, V-slot milling



Designation	Feed (mm/tooth)	Dimension (mm)				Grade	
		DC	OAL	APMX	DCONMS	UF10	TT5525
<b>CEM 2040</b>	0.02-0.05	4	70	6	6	●	●
<b>2060</b>	0.02-0.05	6	80	9	6	●	●
<b>2080</b>	0.03-0.07	8	90	12	8	●	●
<b>2100</b>	0.03-0.10	10	100	15	10	●	●
<b>2120</b>	0.04-0.10	12	110	18	12	●	●
<b>2160</b>	0.05-0.10	16	125	24	16	●	●
<b>2200</b>	0.05-0.10	20	150	30	20	●	●

• \*Centering of 45° is only applicable on cast iron & non-ferrous material

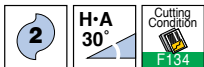
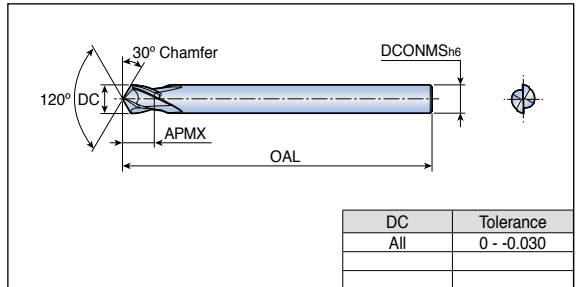
●: Standard items

# CEM 2...-C120

## 2 flute, 30° chamfering



- Multi-function
  - Chamfer boring, chamfer milling, side milling,
  - centering, V-slot milling, drilling



Designation	Feed (mm/tooth)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	UF10
<b>CEM 2040-C1204</b>	0.02-0.05	4	70	5.2	6	●
<b>2060-C120</b>	0.02-0.05	6	80	7.7	6	●
<b>2080-C120</b>	0.03-0.07	8	90	10.3	8	●
<b>2100-C120</b>	0.03-0.10	10	100	12.9	10	●
<b>2120-C120</b>	0.04-0.10	12	110	15.5	12	●
<b>2160-C120</b>	0.05-0.10	16	125	20.6	16	●
<b>2200-C120</b>	0.05-0.10	20	150	25.8	20	●

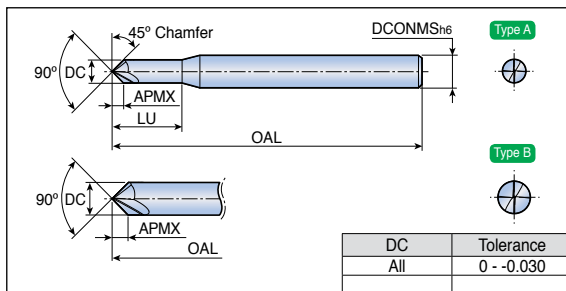
●: Standard items

# ECEM 2

## 2 flute, 45° chamfering - Economical type



- Multi-function
- Chamfer boring, chamfer milling, centering, V-slot milling



Designation	Feed (mm/tooth)	Dimension (mm)						Type	Grade UF10
		DC	OAL	APMX	LU	DCONMS	Type		
<b>ECEM 2020</b>	0.01-0.03	2	57	1.0	6	6	A	●	
<b>2030</b>	0.01-0.04	3	57	1.5	9	6	A	●	
<b>2040</b>	0.02-0.05	4	57	2.0	12	6	A	●	
<b>2060</b>	0.02-0.05	6	57	2.9	-	6	B	●	
<b>2080</b>	0.03-0.07	8	63	3.8	-	8	B	●	
<b>2100</b>	0.03-0.10	10	72	4.9	-	10	B	●	
<b>2120</b>	0.04-0.10	12	83	5.9	-	12	B	●	
<b>2160</b>	0.05-0.10	16	92	7.9	-	16	B	●	

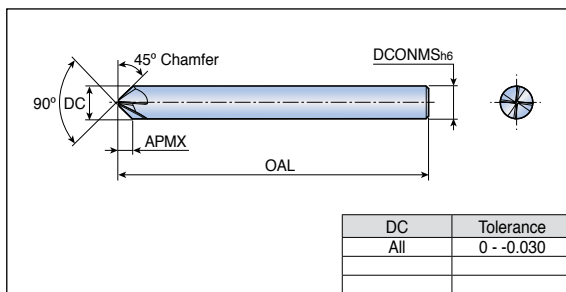
●: Standard items

# ECEM 4

## 4 flute, 45° chamfering - Economical type



- Chamfer milling



Designation	Feed (mm/tooth)	Dimension (mm)				Grade UF10
		DC	OAL	APMX	DCONMS	
<b>ECEM 4060</b>	0.02-0.04	6	57	2.5	6	●
<b>4080</b>	0.02-0.05	8	63	3.4	8	●
<b>4100</b>	0.03-0.08	10	72	4.4	10	●
<b>4120</b>	0.03-0.08	12	83	5.1	12	●

●: Standard items



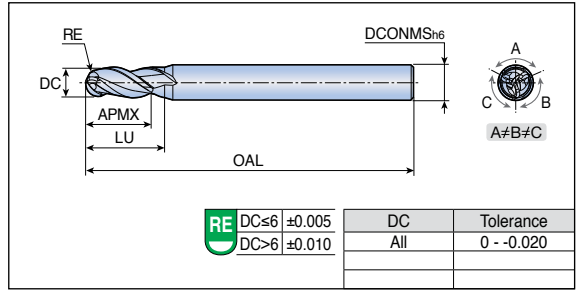
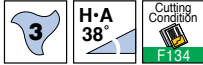
# SBT 3...U



## 3 flute medium ball



- Excellent chatter damping due to unequal spacing of cutting edges



Designation	Dimension (mm)						Grade
	DC	RE	OAL	APMX	LU	DCONMS	
<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

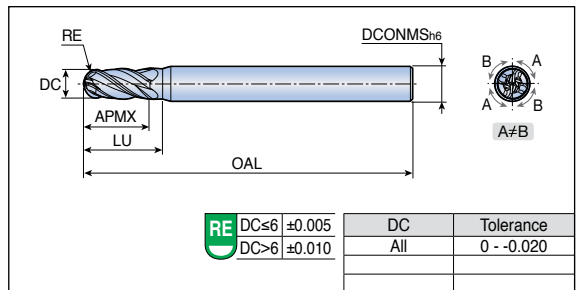
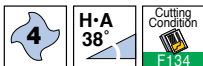
# SBT 4...U



## 4 flute medium ball



- Excellent chatter damping due to unequal spacing of cutting edges



Designation	Dimension (mm)						Grade
	DC	RE	OAL	APMX	LU	DCONMS	
<b>SBT 4040U</b>	4	2	70	8	10	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	●

●: Standard items

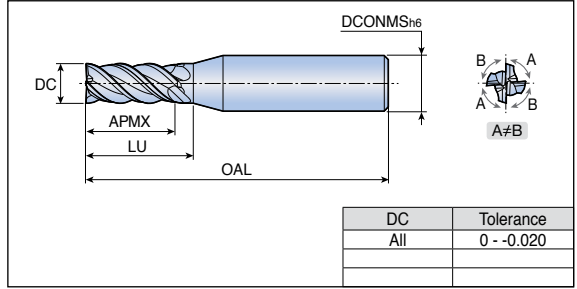
# SED 4...U



## 4 flute medium flat



- Excellent chatter damping credit to unequal spacing of cutting edges



Designation	Feed (mm/tooth)	Dimension (mm)					Grade TT5515
		DC	OAL	APMX	LU	DCONMS	
<b>SED 4030U</b>	0.015-0.030	3	57	10	12	6	●
<b>4040U</b>	0.020-0.040	4	57	12	14	6	●
<b>4050U</b>	0.020-0.040	5	57	15	16	6	●
<b>4060U</b>	0.025-0.070	6	57	15	-	6	●
<b>4080U</b>	0.030-0.090	8	70	25	-	8	●
<b>4100U</b>	0.030-0.100	10	72	25	-	10	●
<b>4120U</b>	0.035-0.110	12	83	30	-	12	●
<b>4160U</b>	0.050-0.130	16	100	42	-	16	●
<b>4200U</b>	0.050-0.170	20	104	48	-	20	●

●: Standard items

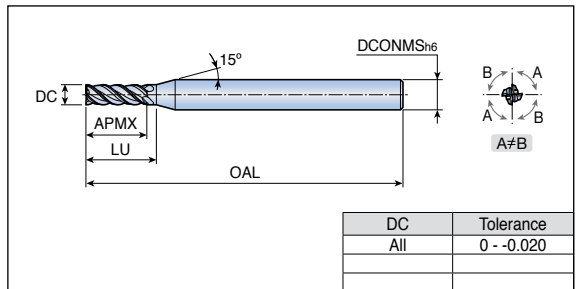
# SED 4...UL



## 4 flute long flat



- Excellent chatter damping credit to unequal spacing of cutting edges



Designation	Feed (mm/tooth)	Dimension (mm)					Grade TT5515
		DC	OAL	APMX	LU	DCONMS	
<b>SED 4030UL</b>	0.015-0.030	3	63	10	12	6	●
<b>4040UL</b>	0.020-0.040	4	63	12	14	6	●
<b>4060UL</b>	0.025-0.070	6	65	20	-	6	●
<b>4080UL</b>	0.030-0.090	8	83	30	-	8	●
<b>4100UL</b>	0.030-0.100	10	83	35	-	10	●
<b>4120UL</b>	0.035-0.110	12	92	40	-	12	●

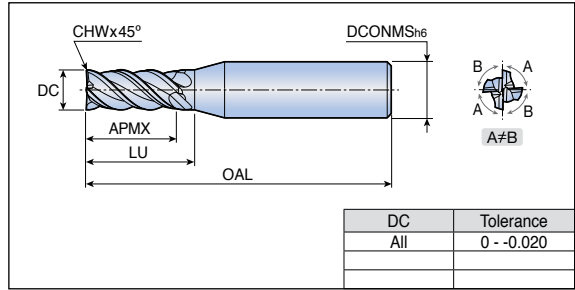
●: Standard items



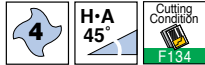


# SED 4...-C

## 4 flute medium corner chamfer



- Excellent chatter damping credit to unequal spacing of cutting edges

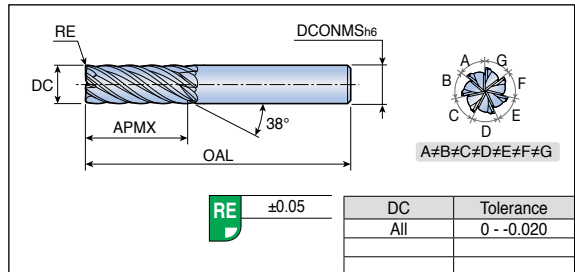


Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	CHW	OAL	APMX	LU	DCONMS	
<b>SED 4040U-C0.1</b>	0.020-0.040	4	0.1	57	12	14	6	●
<b>4060U-C0.2</b>	0.030-0.060	6	0.2	57	15	-	6	●
<b>4080U-C0.3</b>	0.030-0.090	8	0.3	70	25	-	8	●
<b>4100U-C0.3</b>	0.030-0.100	10	0.3	72	25	-	10	●
<b>4120U-C0.4</b>	0.035-0.110	12	0.4	83	30	-	12	●

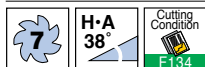
• Standard items

# SED 7

## 7 flute medium corner radius



- Excellent chatter damping credit to unequal spacing of cutting edges
- For trochoidal operation



Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	RE	OAL	APMX	DCONMS	
<b>SED 7060</b>	0.02-0.04	6	0.5	57	15	6	●
<b>7060-4D</b>	0.02-0.04	6	0.5	70	24	6	●
<b>7080</b>	0.02-0.05	8	0.5	70	25	8	●
<b>7080-4D</b>	0.02-0.05	8	0.5	90	32	8	●
<b>7100</b>	0.03-0.07	10	0.5	72	25	10	●
<b>7100-4D</b>	0.03-0.07	10	0.5	100	40	10	●
<b>7120</b>	0.03-0.09	12	0.5	83	30	12	●
<b>7120-4D</b>	0.03-0.09	12	0.5	110	48	12	●
<b>7140</b>	0.04-0.10	14	0.5	90	35	14	●
<b>7160</b>	0.04-0.11	16	0.5	100	42	16	●
<b>7160-4D</b>	0.04-0.11	16	0.5	125	64	16	●
<b>7200</b>	0.05-0.12	20	0.5	104	48	20	●
<b>7200-4D</b>	0.05-0.12	20	0.5	150	80	20	●

• 4D: 4xD depth of cut

• Standard items





















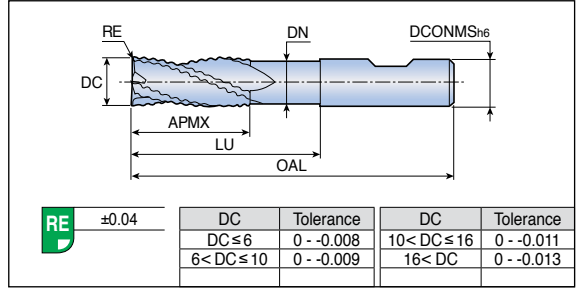






# REMA 3/ 3...C

3 flute rough corner radius

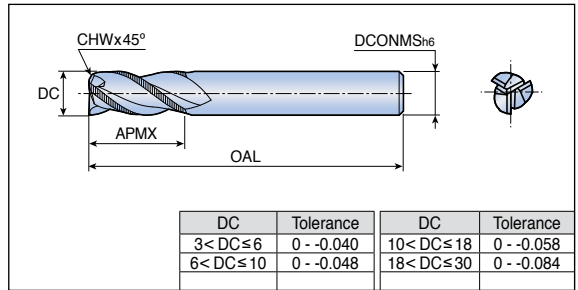


Designation		Feed (mm/tooth)	Dimension (mm)							Grade
Cylindrical shank	Welded shank		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>REMA 3060C</b>	<b>REMA 3060</b>	0.03-0.07	6	0.2	57	9	21	5.5	6	●
<b>3080C</b>	<b>3080</b>	0.03-0.11	8	0.2	63	12	27	7.2	8	●
<b>3100C</b>	<b>3100</b>	0.05-0.14	10	0.2	72	12	31	9.0	10	●
<b>3120C</b>	<b>3120</b>	0.07-0.16	12	0.2	83	12	37	11.0	12	●
<b>3160C</b>	<b>3160</b>	0.07-0.18	16	0.2	92	14	43	15.0	16	●
<b>3200C</b>	<b>3200</b>	0.07-0.20	20	0.2	104	17	53	18.8	20	●

●: Standard items

# REA 3...L

3 flute rough corner chamfer



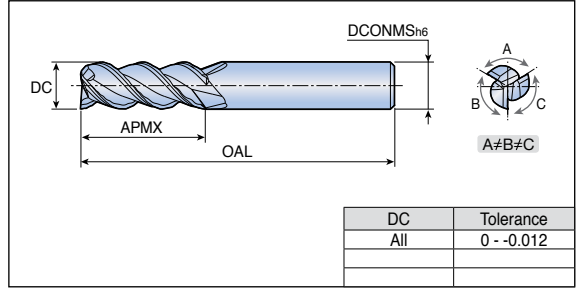
Designation		Feed (mm/tooth)	Dimension (mm)					Grade
Cylindrical shank	Welded shank		DC	CHW	OAL	APMX	DCONMS	
<b>REA 3060L</b>		0.03-0.07	6	0.61	57	16	6	●
<b>3080L</b>		0.03-0.15	8	0.61	63	16	8	●
<b>3100L</b>		0.05-0.20	10	0.61	72	22	10	●
<b>3120L</b>		0.07-0.22	12	0.66	83	26	12	●
<b>3140L-14</b>		0.07-0.22	14	0.99	83	26	14	●
<b>3160L</b>		0.07-0.25	16	0.99	92	32	16	●
<b>3200L</b>		0.07-0.25	20	0.99	104	38	20	●

●: Standard items

# AWE 3



## 3 flute wave flat



- Wave cutting edge



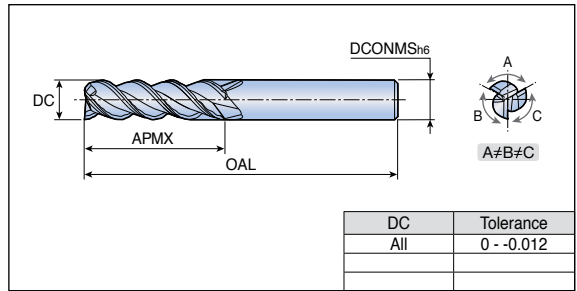
Designation	Feed (mm/tooth)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	UF10
<b>AWE 3060</b>	0.03-0.07	6	52	14	6	●
<b>3080</b>	0.03-0.09	8	60	14	8	●
<b>3100</b>	0.03-0.10	10	68	19	10	●
<b>3120</b>	0.03-0.12	12	76	22	12	●
<b>3140</b>	0.05-0.14	14	85	24	14	●
<b>3160</b>	0.05-0.14	16	90	30	16	●
<b>3180</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 (mm/tooth)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	UF10
<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	●

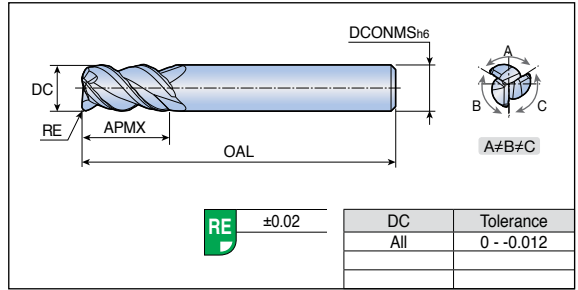
●: Standard items



# AWE 3...ML-R



3 flute wave long corner radius



• Wave cutting edge



RE	±0.02	DC	Tolerance
		All	0 - -0.012

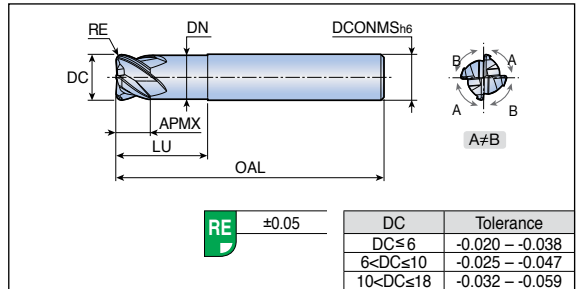
Designation	Feed (mm/tooth)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	
<b>AWE 3060ML-R0.5</b>	0.03-0.07	6	65	20	6	●
<b>3080ML-R0.5</b>	0.03-0.09	8	75	20	8	●
<b>3100ML-R1.0</b>	0.03-0.10	10	80	25	10	●
<b>3120ML-R1.0</b>	0.03-0.12	12	95	30	12	●

●: Standard items

# CRF 4



4 flute, Ceramic end mills



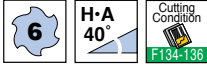
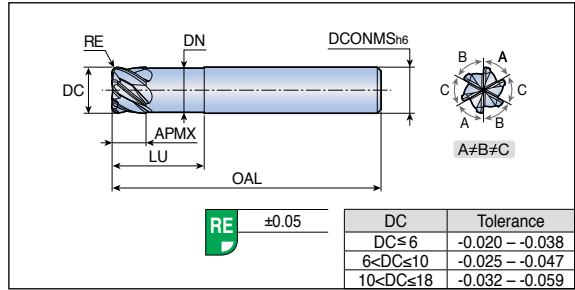
RE	±0.05	DC	Tolerance
		DC ≤ 6	-0.020 - -0.038
		6 < DC ≤ 10	-0.025 - -0.047
		10 < DC ≤ 18	-0.032 - -0.059

Designation	Feed (mm/tooth)	Dimension (mm)						Grade	
		DC	RE	OAL	APMX	LU	DN		
<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

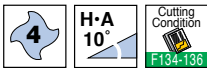
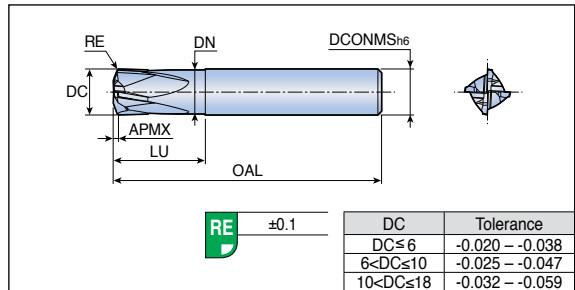


Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>CRF 6060 050 120</b>	0.02-0.03	6	0.5	50	4.5	12	5.8	6	●
<b>6080 100 160</b>	0.02-0.03	8	1.0	57	6.0	16	7.7	8	●
<b>6100 100 200</b>	0.02-0.04	10	1.0	63	7.5	20	9.6	10	●
<b>6120 150 240</b>	0.03-0.05	12	1.5	70	9.0	24	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



Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>CRH 4060</b>	0.1-0.15	6	0.7	50	0.55	12	5.8	6	●
<b>4080</b>	0.1-0.2	8	0.9	57	0.75	16	7.7	8	●
<b>4100</b>	0.1-0.2	10	1.0	63	0.85	20	9.6	10	●
<b>4120</b>	0.1-0.3	12	1.4	70	1.15	24	11.5	12	●
<b>4160</b>	0.1-0.3	16	1.8	83	1.55	32	15.5	16	●

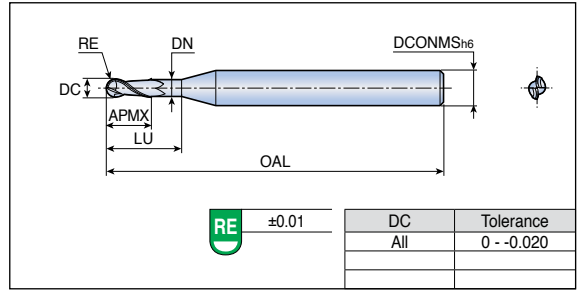
● RE: Program corner R

●: Standard items

# DMB 2



## 2 flute miniature ball



<b>2</b>	<b>H·A</b> 30°	Cutting Condition F134
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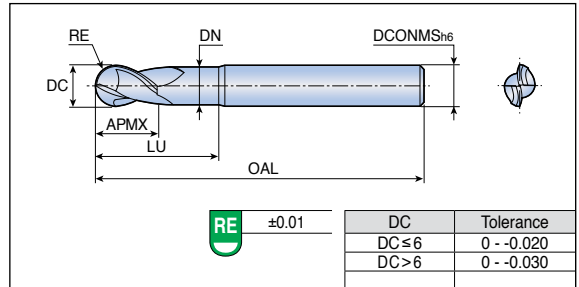
Designation	Dimension (mm)							Grade
	DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>DMB 2006-0.6x3.0</b>	0.6	0.3	40	0.6	3.0	0.55	3	●
<b>2010-1.0x5.0</b>	1.0	0.5	40	1.0	5.0	0.95	3	●
<b>2010-1.0x8.5</b>	1.0	0.5	40	1.0	8.5	0.95	3	●
<b>2015-1.5x7.5</b>	1.5	0.75	50	1.5	7.5	1.4	3	●
<b>2015-1.5x12.0</b>	1.5	0.75	50	1.5	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



<b>2</b>	<b>H·A</b> 30°	Cutting Condition F134
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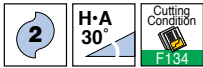
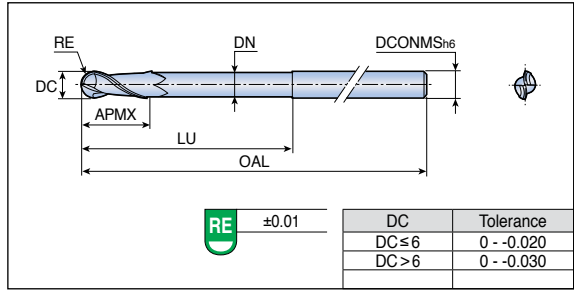
Designation	Dimension (mm)							Grade
	DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>DEB 2030S</b>	3	1.5	60	4.5	6.5	2.8	6	●
<b>2040S</b>	4	2.0	65	6.0	8.0	3.7	6	●
<b>2060S</b>	6	3.0	75	9.0	12.0	5.6	6	●
<b>2120S</b>	12	6.0	90	18.0	36.0	11.4	12	●

●: Standard items

# DEB 2...L



## 2 flute long neck ball



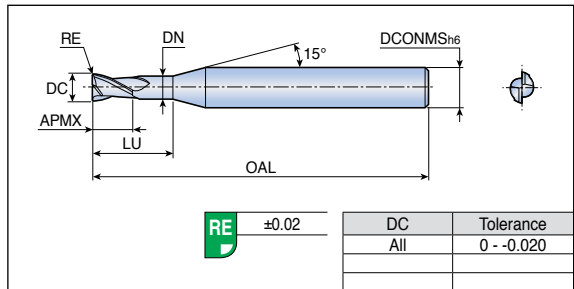
Designation	Dimension (mm)							Grade
	DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>DEB 2030L-4</b>	3	1.5	80	15	25	2.9	4	●
<b>2040L-4</b>	4	2.0	80	20	30	3.9	4	●
<b>2050L</b>	5	2.5	100	30	50	4.9	6	●
<b>2060L</b>	6	3.0	100	30	50	5.5	6	●
<b>2080L</b>	8	4.0	110	40	60	7.5	8	●
<b>2120L</b>	12	6.0	130	55	75	11.5	12	●

●: Standard items

# DMR 2



## 2 flute miniature corner radius



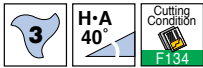
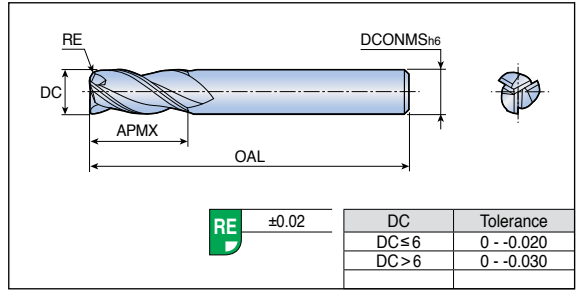
Designation	Feed (mm/tooth)	Dimension (mm)							Grade
		DC	RE	OAL	APMX	LU	DN	DCONMS	
<b>DMR 2006-0.9x3.0</b>	0.006-0.010	0.6	0.05	40	0.9	3.0	0.55	3	●
<b>2008-1.2x4.0</b>	0.008-0.015	0.8	0.05	40	1.2	4.0	0.75	3	●
<b>2010-1.5x5.0</b>	0.010-0.020	1.0	0.1	40	1.5	5.0	0.95	3	●
<b>2010-1.5x8.5</b>	0.010-0.020	1.0	0.1	40	1.5	8.5	0.95	3	●
<b>2012-1.8x6.0</b>	0.010-0.025	1.2	0.1	50	1.8	6.0	1.15	3	●
<b>2015-2.2x7.5</b>	0.015-0.035	1.5	0.15	50	2.2	7.5	1.4	3	●
<b>2015-2.2x12.0</b>	0.015-0.030	1.5	0.15	50	2.2	12.0	1.4	3	●
<b>2020-2.2x10.0</b>	0.015-0.040	2.0	0.15	60	2.2	10.0	1.9	3	●
<b>2020-2.2x16.0</b>	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



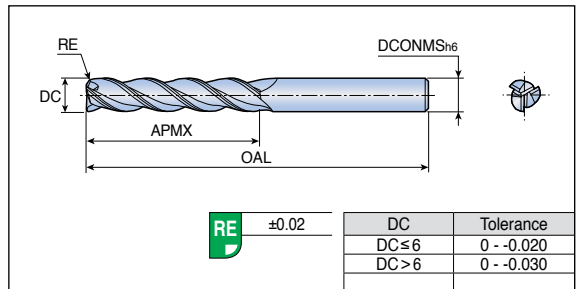
Designation	Feed (mm/tooth)	Dimension (mm)					Grade TTD620
		DC	RE	OAL	APMX	DCONMS	
<b>DER 3030S-3</b>	0.025-0.050	3	0.15	40	12	3	●
<b>3040S-4</b>	0.040-0.060	4	0.2	50	14	4	●
<b>3050S-5</b>	0.050-0.080	5	0.3	50	16	5	●
<b>3060S</b>	0.060-0.090	6	0.3	65	20	6	●
<b>3080S</b>	0.070-0.100	8	0.5	65	20	8	●
<b>3100S</b>	0.080-0.130	10	0.5	75	25	10	●
<b>3120S</b>	0.100-0.150	12	0.5	75	25	12	●

●: Standard items

# DER 3...L



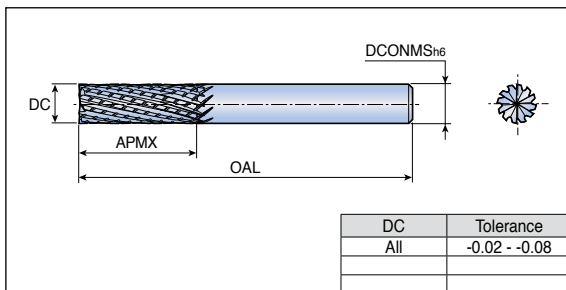
## 3 flute long corner radius



Designation	Feed (mm/tooth)	Dimension (mm)					Grade 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

## Roughing for composite material (Chip splitter)

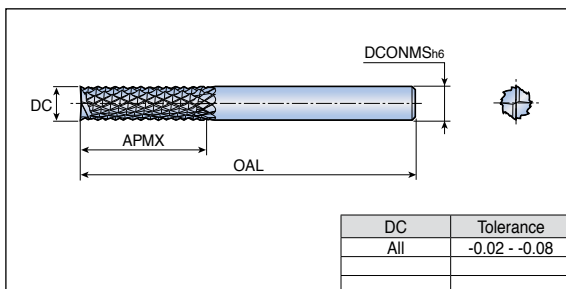


Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	NOF	OAL	APMX	DCONMS	
<b>RRFE 040</b>	0.01-0.02	4	6	50	12	4	●
<b>060</b>	0.01-0.02	6	8	65	18	6	●
<b>080</b>	0.01-0.03	8	10	75	24	8	●
<b>100</b>	0.02-0.04	10	12	85	30	10	●
<b>120</b>	0.02-0.05	12	12	100	36	12	●

• NOF: Number of flutes

●: Standard items

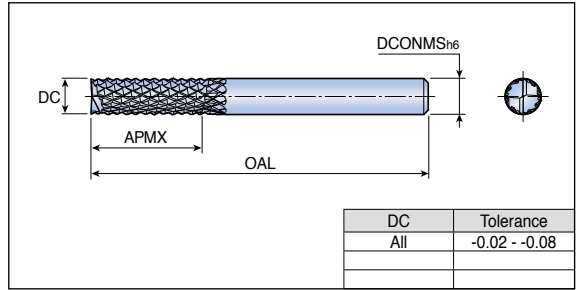
## Roughing for composite material (Multi-flute)



Designation	Feed (mm/rev)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	
<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)

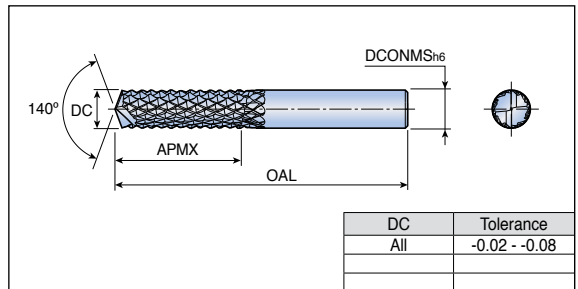


Designation	Feed (mm/rev)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	
<b>RCME 040</b>	0.03-0.06	4	50	12	4	●
<b>060</b>	0.07-0.15	6	65	18	6	●
<b>080</b>	0.10-0.20	8	75	24	8	●
<b>100</b>	0.15-0.30	10	85	30	10	●
<b>120</b>	0.20-0.40	12	100	36	12	●

●: Standard items

# RCDE

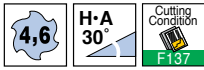
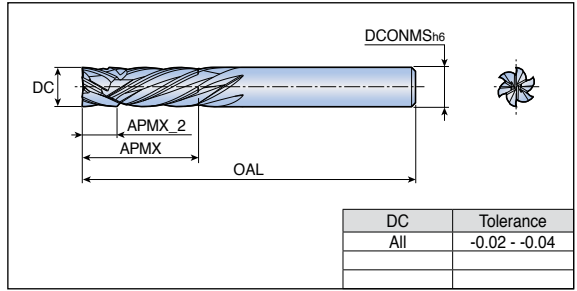
## Medium to finishing for composite materials (Cutting edge for drilling + multi-flute)



Designation	Feed (mm/rev)	Dimension (mm)				Grade
		DC	OAL	APMX	DCONMS	
<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)

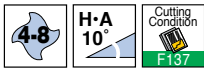
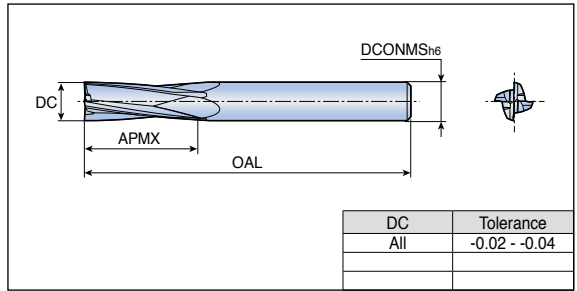


Designation	Feed (mm/tooth)	Dimension (mm)						Grade
		DC	NOF	OAL	APMX	APMX_2	DCONMS	
<b>RCOM 4060</b>	0.02-0.04	6	4	65	18	6.7	6	●
<b>4080</b>	0.02-0.05	8	4	75	24	9.2	8	●
<b>6100</b>	0.03-0.06	10	6	85	30	7.9	10	●
<b>6120</b>	0.04-0.08	12	6	100	36	9.2	12	●

- NOF: Number of flutes
- Notice: For best machining performance, the end mill's intersection point (APMX\_2) should be positioned at the center of the workpiece thickness.
- : Standard items

# RDCF

## 4-8 flute for finishing of composite materials (Low helix angle)



Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		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
			Electrolytic copper		100	28
	Non-metallic		Duroplastics, graphite			29
			Hard rubber			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
				Rm 400		36
		Alpha+beta alloys cured	Rm 1050		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 ceramic end mill

### CRF 4 teeth & 6 teeth

(Unit: mm)

Diameter	Cutting speed (m/min)	Feed (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 (m/min)	Feed (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

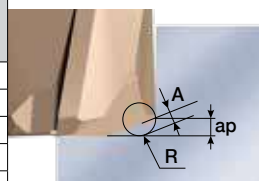
• Apply a 30% reduction in feed during ramping (less 2.5°)

ap: axial direction DOC

ae: radial direction DOC

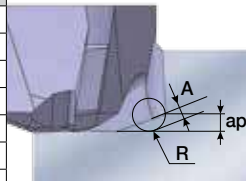
### Programming tip - CRH

Diameter (CRH 4 teeth)	R (Program)	A Un-machined 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 (Program)	A (Un-machined)	ap (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 2010	Ø10	1.09	0.71	1
HFM 2012	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 4010	Ø10	0.85	0.55	0.75
HFM 4012	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 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		

# Recommended Cutting Conditions

## Machining data for MAXI-RUSH

### fz for Square & Round heads (mm/tooth)

Slotting  
 $ap \leq 0.5D$   
 $ae \leq D$

Side Milling  
 $ae \leq 0.5D$   
 (1)  $ap \leq D$   
 (2)  $ap \leq 0.05D$

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

<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

Thread Size	Key	Clamping Torque (N.m)
S05	MX KEY-S05	7
S06	MX KEY-S06	10
S08	MX KEY-S08	15
S10	MX KEY-S10	28
S12	MX KEY-S12	28
S15	MX KEY-S15	40

### 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	A <sub>p</sub> max	0.7xD	0.50	0.55	0.65	0.75	0.85	0.95	
	17-20	A <sub>p</sub> max	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	

## Wrench

Appearance	Designation	Connection thread size	Torque (N.m)	Head
	MX KEY-S05	S05	7	Square Ball Round Drilling Chamfering Counter boring
	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	
	MX SKEY-S06	S06	10	TST-3S06
	MX SKEY-S08	S08	15	TST-4S08
	MX SKEY-T40L	S08	15	TST-6S10 TTB
		S10	28	
	MX SKEY-T20	S05	7	
		S06	10	
	MX SKEY-T25	S06	10	
	MX SKEY-T30L	S08	15	
	MX SKEY-T50L	S08	15	
S10		28		

- Wrench should be ordered separately

## Torque wrench

Appearance	Designation	Connection	Head designation	Torque (N.m)
Handle 	TORQUE WRENCH 5-50Nm 9X12	-	-	-
Open wrench for cylindrical head 	MX WRENCH 6-05	S05	MXED, MXEE MXRD, MXBE MXDP, MXCA	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
Open wrench for 2 flutes head 	MX WRENCH 4E-05	S05	MXRB, MXFX MXBB MXCP, MXGC MXCW, MXCR	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
90° adapter for torx bit 	INSERT TOOL 9X12mm	-	-	-
Torx bit socket 	BIT SOCKET T20 DRIVE	S05, S06	TTB TST277	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

- Wrench should be ordered separately



# TOOLING SYSTEM







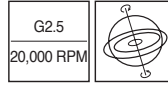
## Guide to Icons



➤ Run-out



➤ Surface Hardness



➤ Balance Grade



➤ Taper Shank Grade



➤ Surface Finish Grade



➤ Technical Data Page



➤ ER Collet Page



➤ TSK Collet Page



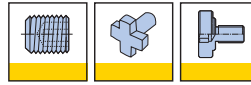
➤ ST / THC Collet Page



➤ Pull Stud Page



➤ Preset Screw Page



➤ Lock Screw Page



➤ ER 32 SRF Page



➤ Nut Page



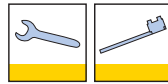
➤ Tap Adapter Page



➤ Cooling Tube Page



➤ Tube Wrench Page



➤ Wrench Page



➤ Driving Ring Page



➤ Induction Heating Unit Page



➤ Thermal Heating Unit Page

\* For non-stock items: Supply condition is subject to availability.  
If not available in stock then MOQ (Minimum order qty) will be applicable.



# Tool Selection Guide

## Tooling system

### Milling chuck

- DIN69871 G15
- HSK G39
- BT MAS-403 G66
- DIN2080 G87



Collet (NCSR) G151-G152



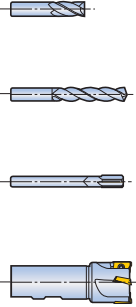
ST shank G109-G113



Collet (ER) G137-G145



GTIN collet G159-G160



### Collet chuck

- DIN69871 G11-G12
- HSK G33-G37
- BT MAS-403 G61-G63
- DIN2080 G86
- C-ADAPTER G97-G98
- ST shank G109-G113
- MT shank G124



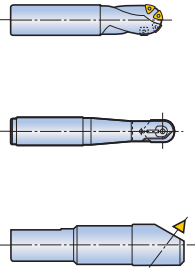
Collet (ER) G137-G145



T-SHRINK Collet G154-G158



GTIN collet G159-G160

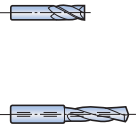


### TSK collet chuck

- DIN69871 G13
- HSK G38
- BT MAS-403 G64



TSK collet G146-G148

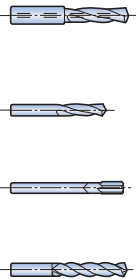


### TSHRINK chuck

- DIN69871 G19
- HSK G42-G44
- BT MAS-403 G70
- C-ADAPTER G105



- DIN69871 G20
- HSK G45-G47
- BT MAS-403 G71
- ST shank G121

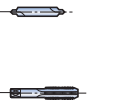


### THYCHUCK chuck

- DIN69871 G21
- HSK G48-G49
- BT MAS-403 G72-G73



THC collet G149-G150

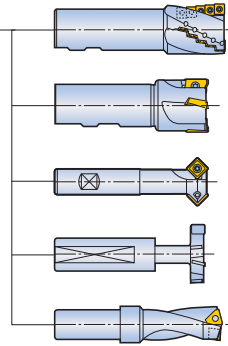


# Tool Selection Guide

## Tooling system

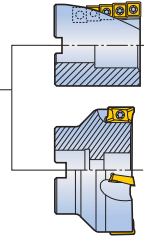
### End mill holder

- DIN69871 G16-G18
- HSK G40-G41
- BT MAS-403 G67-G69
- DIN2080 G88
- C-ADAPTER G99-G101



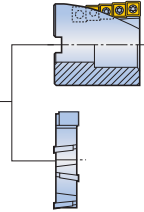
### Face mill / Shell end mill arbor

- DIN69871 G22-G23, G25
- HSK G50-G52, G54
- BT MAS-403 G75-G77, G79
- DIN2080 G89-G90
- C-ADAPTER G102, G104



### Combi face mill / Combi shell end mill arbor

- DIN69871 G24
- HSK G53
- BT MAS-403 G78
- DIN2080 G91
- C-ADAPTER G103



### Slotting cutter arbor

- DIN69871 G26
- BT MAS-403 G74



### Centering plug

- DIN2080 G94

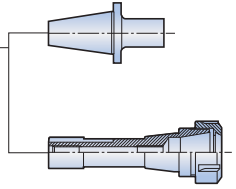


# Tool Selection Guide

## Tooling system

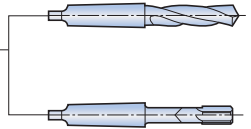
### Adapter

- DIN69871 G29
- BT MAS-403 G81



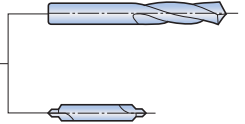
### Morse taper adapter

- DIN69871 G27-G28
- HSK G55
- BT MAS-403 G80-G81
- DIN2080 G92-G93



### Drill chuck arbor

- DIN69871 G29
- BT MAS-403 G82
- DIN2080 G94



### Tap chuck (GTI)

- DIN69871 G14
- BT MAS-403 G65



- GTI ER collet chuck G122



Collet (ER) G137-G145



Tap adapter G161

- DIN69871 G14
- BT MAS-403 G65
- MTA G124



# Tool Selection Guide

## Tooling system

### GFI floating reamer chuck (GFI)

- ST shank G123



### T FLEXTEC

- DIN69871 G30
- HSK G56-G57
- BT MAS-403 G83
- C-ADAPTER G106
- ST shank G114-G117



### Blank

- HSK G58
- C-ADAPTER G107



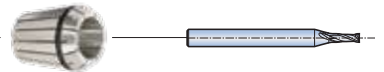
### GREEN Typhoon

- ER shank G126
- BT MAS-403 G127
- HSK G128
- C-ADAPTER G129
- ST shank G130



### HPC Typhoon

- ER shank G131
- BT MAS-403 G132
- HSK G133
- ST shank G134

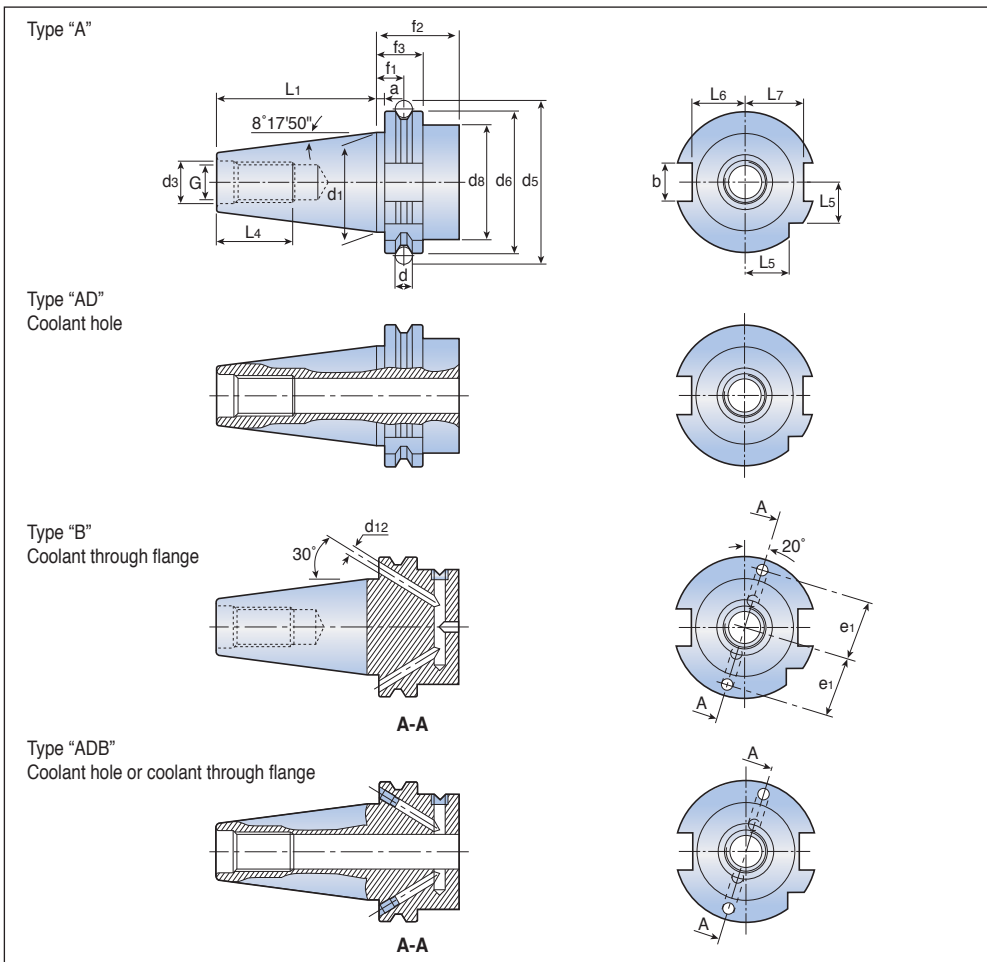


# DIN69871



# DIN69871 Form A/AD/B/ADB

## Standard toolholder



Shank	a ±0.1	b (H12)	d	d1	G	d3 (H7)	d5 ±0.05	d6	d8max	f1 ±0.1
<b>30</b>	3.2	16.1	7	31.75	M12	13	59.30	50.00	45	11.1
<b>40</b>	3.2	16.1	7	44.45	M16	17	72.30	63.55	50	11.1
<b>50</b>	3.2	25.7	7	69.85	M24	25	107.25	97.50	80	11.1

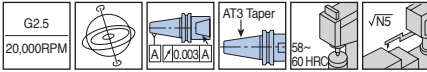
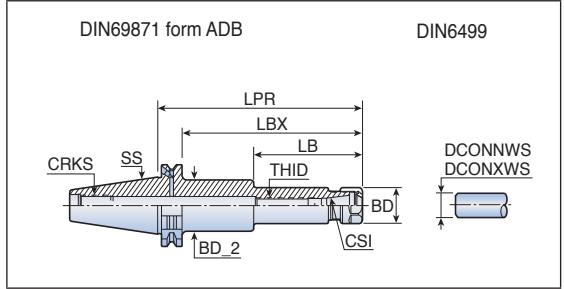
Shank	f2min	f3 -0.1	L1 -0.3	L4min	L5 -0.3	L6 -0.4	L7 -0.4	e1 ±0.1	d12	Taper AT3
<b>30</b>	35	19.1	47.80	24	15.0	16.4	19.0	21	4	0.002
<b>40</b>	35	19.1	68.40	32	18.5	22.8	25.0	27	4	0.003
<b>50</b>	35	19.1	101.75	47	30.0	35.5	37.7	42	6	0.004

\* For non-stock items: Supply condition is subject to availability.  
If not available in stock then MOQ (Minimum order qty) will be applicable.

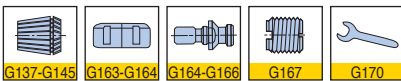


# DIN69871-ER

## ER collet chucks



Designation	Dimension (mm)											
	SS	CSI	DCONNWS	DCONXWS	BD	BD_2	LPR	LBX	LB	CRKS	THID	
<b>DIN69871 30 ER 16x63<sup>(1)</sup></b>	30	ER16	0.5	10.0	28	-	63	43.9	28	M12	M10	
<b>DIN69871 40 ER 16x63</b>	40	ER16	0.5	10.0	28	-	63	43.9	-	M16	M10	
<b>ER 16x100</b>	40	ER16	0.5	10.0	28	-	100	80.9	-	M16	M10	
<b>ER 16x160<sup>(1)</sup></b>	40	ER16	0.5	10.0	28	40	160	140.9	85	M16	M10	
<b>ER 20x63</b>	40	ER20	1.0	13.0	34	-	63	43.9	-	M16	M12	
<b>ER 20x100</b>	40	ER20	1.0	13.0	34	-	100	80.9	-	M16	M12	
<b>ER 20x160<sup>(1)</sup></b>	40	ER20	1.0	13.0	34	44	160	140.9	19	M16	M12	
<b>DIN69871 50 ER 16x100<sup>(1)</sup></b>	50	ER16	0.5	10.0	28	-	100	80.9	-	M24	M10	
<b>ER 16x160<sup>(1)</sup></b>	50	ER16	0.5	10.0	28	40	160	140.9	85	M24	M10	
<b>ER 16x200<sup>(1)</sup></b>	50	ER16	0.5	10.0	28	40	200	180.9	110	M24	M10	
<b>ER 20x100<sup>(1)</sup></b>	50	ER20	1.0	13.0	34	-	100	80.9	-	M24	M12	
<b>ER 20x160<sup>(1)</sup></b>	50	ER20	1.0	13.0	34	45	160	140.9	86	M24	M12	



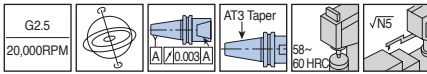
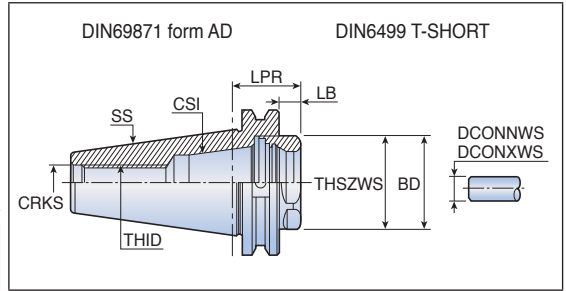
- Add B for coolant through flange
- <sup>(1)</sup> Balance to G6.3 at 12,000RPM



# DIN69871-ER-SHORT



Short ER collet chucks

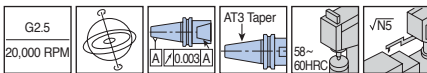
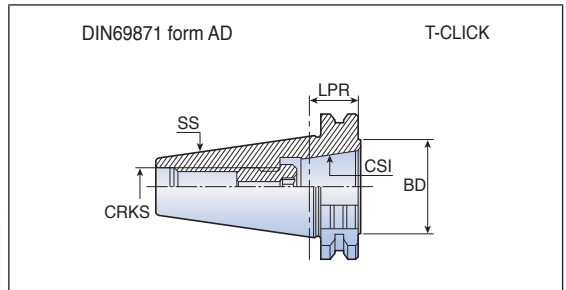


Designation	Dimension (mm)									
	SS	CSI	DCONNWS	DCONXWS	BD	LPR	LB	CRKS	THSZWS	THID
<b>DIN69871 40 ER32 SHORT</b>	40	ER32	2.0	20.0	40	25.1	6.0	M16	M40x1.5	-
<b>DIN69871 50 ER32 SHORT</b>	50	ER32	2.0	20.0	40	28.6	9.5	M24	M40x1.5	M22x1.5
<b>ER40 SHORT</b>	50	ER40	3.0	26.0	50	28.6	9.5	M24	M50x1.5	M28x1.5

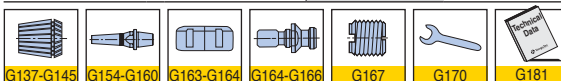
# DIN69871-ER-CLICK-IN



Quick change connection adapters



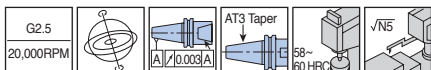
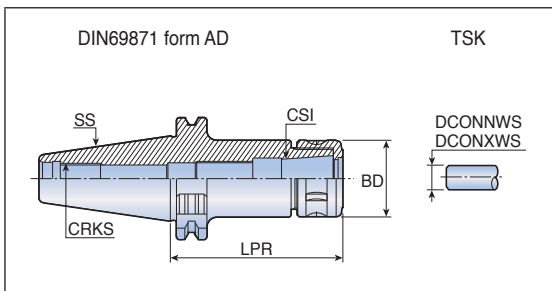
Designation	Dimension (mm)				
	SS	CSI	BD	LPR	CRKS
<b>DIN69871 50 ER32 CLICK-IN</b>	50	32 SRF	41	20.1	M24



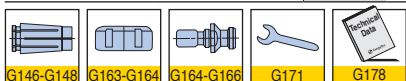
• Tightening torque: 24 kg x m

# DIN69871-TSK

## TSK collet chucks



Designation	Dimension (mm)								
	SS	CSI	DCONNWS	DCONXWS	BD	LPR	CRKS		
<b>DIN69871 40</b>	<b>TSK 6-90</b>	40	TSK6	1.5	6.0	19.5	90	M16	
	<b>TSK 6-120</b>	40	TSK6	1.5	6.0	19.5	120	M16	
	<b>TSK 10-90</b>	40	TSK10	1.5	10.0	27.5	90	M16	
	<b>TSK 10-120</b>	40	TSK10	1.5	10.0	27.5	120	M16	
	<b>TSK 16-90</b>	40	TSK16	2.5	16.0	40.0	90	M16	
	<b>TSK 16-120</b>	40	TSK16	2.5	16.0	40.0	120	M16	
	<b>TSK 25-90</b>	40	TSK25	7.5	25.0	55.0	90	M16	
	<b>TSK 25-120</b>	40	TSK25	7.5	25.0	55.0	120	M16	
	<b>DIN69871 50</b>	<b>TSK 6-120<sup>(1)</sup></b>	50	TSK6	1.5	6.0	19.5	120	M24
		<b>TSK 6-165<sup>(1)</sup></b>	50	TSK6	1.5	6.0	19.5	165	M24
<b>TSK 6-195<sup>(1)</sup></b>		50	TSK6	1.5	6.0	19.5	195	M24	
<b>TSK 10-120<sup>(1)</sup></b>		50	TSK10	1.5	10.0	27.5	120	M24	
<b>TSK 10-165<sup>(1)</sup></b>		50	TSK10	1.5	10.0	27.5	165	M24	
<b>TSK 10-195<sup>(1)</sup></b>		50	TSK10	1.5	10.0	27.5	195	M24	
<b>TSK 16-120<sup>(1)</sup></b>		50	TSK16	2.5	16.0	40.0	120	M24	
<b>TSK 16-165<sup>(1)</sup></b>		50	TSK16	2.5	16.0	40.0	165	M24	
<b>TSK 16-195<sup>(1)</sup></b>		50	TSK16	2.5	16.0	40.0	195	M24	
<b>TSK 25-120<sup>(1)</sup></b>		50	TSK25	7.5	25.0	55.0	120	M24	
<b>TSK 25-165<sup>(1)</sup></b>		50	TSK25	7.5	25.0	55.0	165	M24	
<b>TSK 25-195<sup>(1)</sup></b>		50	TSK25	7.5	25.0	55.0	195	M24	

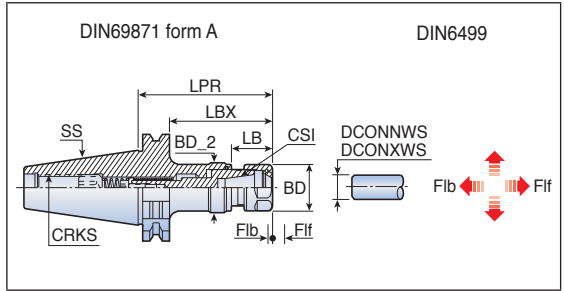
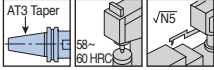


- Add B for coolant through flange
- <sup>(1)</sup> Balance to G6.3 at 12,000RPM



# GTI DIN69871-ER

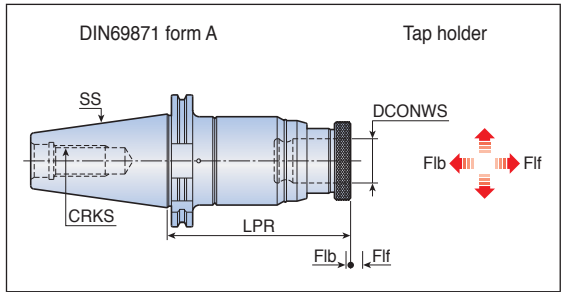
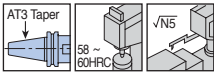
## GTI tap attachments



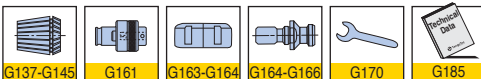
Designation	Dimension (mm)														
	SS	CSI	Tap <sub>min</sub>	Tap <sub>max</sub>	DCONNWS	DCONXWS	BD_2	BD	LPR	LBX	LB	Flb	FIf	CRKS	
<b>GTI DIN69871 40 ER 16</b>	40	ER16	M3	M10	0.5	10.0	29.5	28	81.2	62.1	24.6	3	8	M16	
	<b>ER 32</b>	40	ER32	M6	M20	2.0	20.0	56.5	50	112.6	93.5	33.0	4	9	M16
	<b>ER 40</b>	40	ER40	M6	M28	3.0	26.0	56.5	63	130.6	111.5	51.0	4	9	M16
<b>GTI DIN69871 50 ER 16</b>	50	ER16	M3	M10	0.5	10.0	29.5	28	106.8	87.7	24.6	3	8	M24	
	<b>ER 32</b>	50	ER32	M6	M20	2.0	20.0	56.5	50	115.3	96.2	33.0	4	9	M24
	<b>ER 40</b>	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	Flb	FIf	Tap adapter	CRKS	
<b>DIN69871 40 TC 12-90</b>	40	M3	M12	19	90	6.5	12	TA1	M16	
	<b>TC 22-142</b>	40	M6	M24	31	142	14.5	13	TA2	M16
<b>DIN69871 50 TC 12-130</b>	50	M3	M12	19	130	6.5	12	TA1	M24	
	<b>TC 22-142</b>	50	M6	M24	31	142	14.5	13	TA2	M24
	<b>TC 38-190</b>	50	M18	M38	48	190	20.0	20	TA3	M24



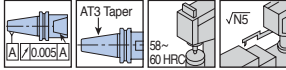
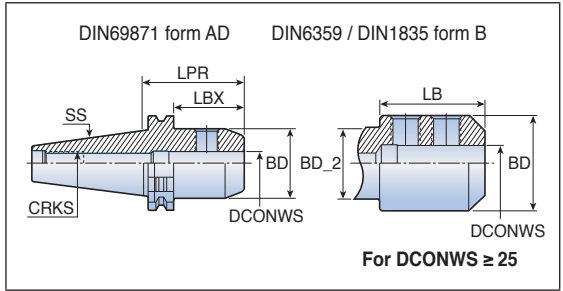
• Torque control system





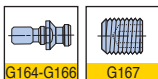
# DIN69871-EM

## End mill holders



Designation	Dimension (mm)							
	SS	DCONWS	BD	BD_2	LPR	LBX	LB	CRKS
<b>DIN69871 30 EM 6x50</b>	30	6	25	-	50	30.9	-	M12
<b>EM 8x50</b>	30	8	28	-	50	30.9	-	M12
<b>EM 10x50</b>	30	10	35	-	50	30.9	-	M12
<b>EM 14x63</b>	30	14	44	-	63	43.9	-	M12
<b>EM 16x63</b>	30	16	48	-	63	43.9	-	M12
<b>EM 18x72</b>	30	18	50	-	72	52.9	-	M12
<b>EM 20x72</b>	30	20	52	-	72	52.9	-	M12
<b>DIN69871 40 EM 6x50</b>	40	6	25	-	50	30.9	-	M16
<b>EM 8x50</b>	40	8	28	-	50	30.9	-	M16
<b>EM 10x50</b>	40	10	35	-	50	30.9	-	M16
<b>EM 12x50</b>	40	12	42	-	50	30.9	-	M16
<b>EM 14x63</b>	40	14	44	-	63	43.9	-	M16
<b>EM 16x63</b>	40	16	48	-	63	43.9	-	M16
<b>EM 18x63</b>	40	18	50	-	63	43.9	-	M16
<b>EM 20x63</b>	40	20	52	-	63	43.9	-	M16
<b>EM 25x100</b>	40	25	65	49.0	100	80.9	65	M16
<b>EM 32x100</b>	40	32	71	49.0	100	80.9	65	M16
<b>DIN69871 50 EM 6x63</b>	50	6	25	-	63	43.9	-	M24
<b>EM 8x63</b>	50	8	28	-	63	43.9	-	M24
<b>EM 10x63</b>	50	10	35	-	63	43.9	-	M24
<b>EM 12x63</b>	50	12	42	-	63	43.9	-	M24
<b>EM 14x63</b>	50	14	44	-	63	43.9	-	M24
<b>EM 16x63</b>	50	16	48	-	63	43.9	-	M24
<b>EM 18x63</b>	50	18	50	-	63	43.9	-	M24
<b>EM 20x63</b>	50	20	52	-	63	43.9	-	M24
<b>EM 25x80</b>	50	25	65	-	80	60.9	-	M24
<b>EM 32x100</b>	50	32	72	-	100	80.9	-	M24
<b>EM 40x100</b>	50	40	90	79.9	100	80.9	43	M24
<b>EM 50x125</b>	50	50	98	79.9	125	105.9	90	M24

• Add B for coolant through flange except DIN69871 30























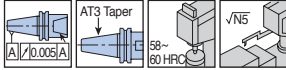
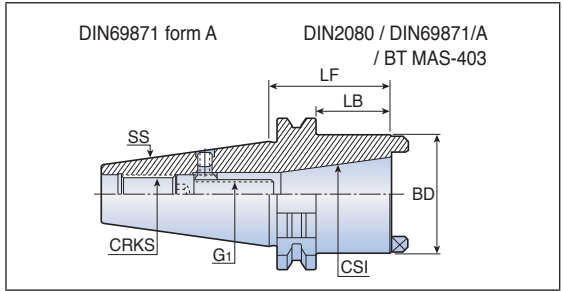






# DIN69871-AD

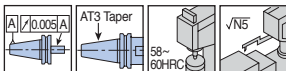
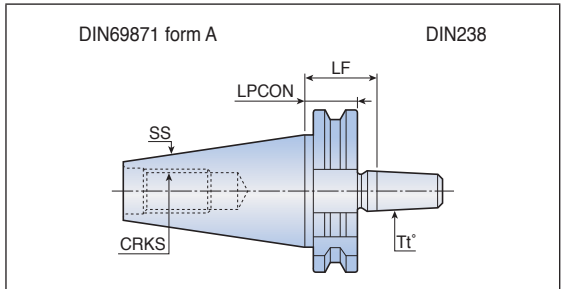
## Adapters



Designation	Dimension (mm)						
	SS	CSI	BD	LF	LB	CRKS	G1
<b>DIN69871 40 AD DIN2080 30</b>	40	DIN2080 30	50	50	30.9	M16	M12
<b>DIN69871 50 AD BT/SK 40</b>	50	BT/SK 40	66	70	50.9	M24	M16

# DIN69871-DC

## Drill chuck arbors



Designation	Dimension (mm)				
	SS	Tt°	LF	LPCON	CRKS
<b>DIN69871 30 DC B12x26</b>	30	B12	26	19.1	M12
<b>DIN69871 40 DC B12x26</b>	40	B12	26	19.1	M16
<b>DC B16x26</b>	40	B16	26	19.1	M16
<b>DC B18x26</b>	40	B18	26	19.1	M16
<b>DIN69871 50 DC B16x26</b>	50	B16	26	19.1	M24
<b>DC B18x26</b>	50	B16	26	19.1	M24



• Without drill chuck

G164-G166

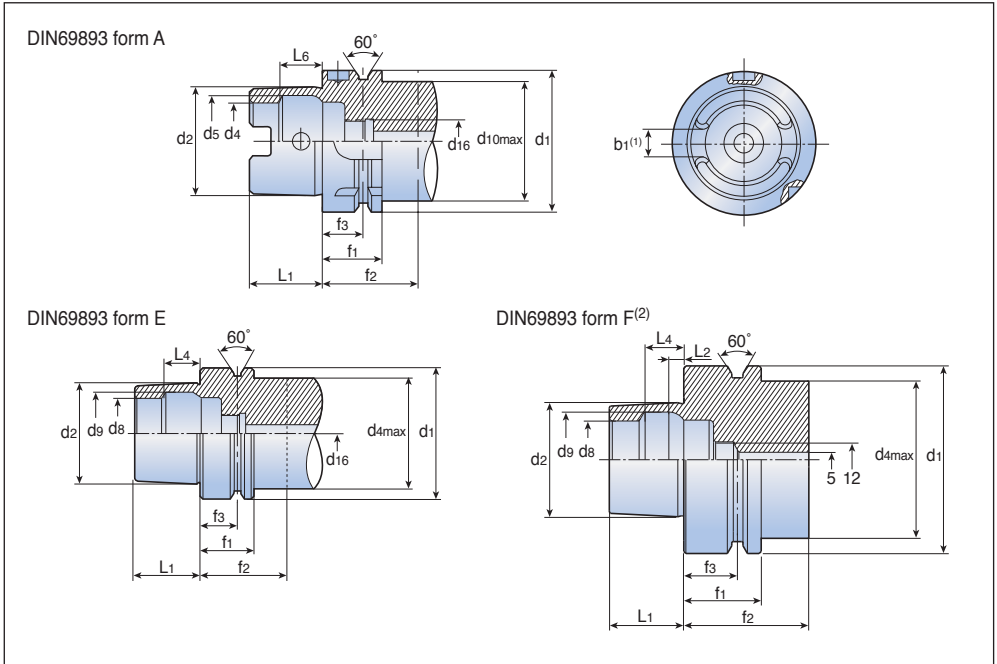


# HSK



# DIN69893 Form A/E/F

## Standard toolholder



### DIN69893 form A

HSK-A	d1 h10	d2	d4 H10	d5 H11	d10max	d16	L1 -0.2	L6 JS10	b1 ±0.04 <sup>(1)</sup>	f1 -0.1	f2min	f3 ±0.1
<b>40</b>	40	30	21	25.5	34	M12x1	20	11.42	8.05	20	35	16
<b>50</b>	50	38	26	32.0	42	M16x1	25	14.13	10.54	26	42	18
<b>63</b>	63	48	34	40.0	53	M18x1	32	18.13	12.54(12.42)	26	42	18
<b>80</b>	80	60	42	50.0	67	M20x1.5	40	22.85	16.04	26	42	18
<b>100</b>	100	75	53	63.0	85	M24x1.5	50	28.56	20.02 (19.9)	29	45	20

• <sup>(1)</sup> The dimensions in parentheses refer to dimension b1 only for HSK A...WH tools.

These tools feature key slot gap and tolerance, set on turning tools for accurate cutting edge height position.  
(According to Japanese ICTM standard and ISO 12164/3 standard)

### 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
<b>32</b>	32	24	26	17	19.0	M10x1	16	8.92	20	35	16
<b>40</b>	40	30	34	21	25.5	M12x1	20	11.42	20	35	16
<b>50</b>	50	38	42	26	32.0	M16x1	25	14.13	26	42	18
<b>63</b>	63	48	53	34	40.0	M18x1	32	18.13	26	42	18

### DIN69893 form F<sup>(2)</sup>

HSK-F	d1 h10	d2	d4max	d8 H10	d9 H11	L1 -0.2	L2	L4 JS10	f1 -0.1	f2min	f3 ±0.1
<b>63</b>	63	38	53	26	32	25	5.0	14.13	26	42	18

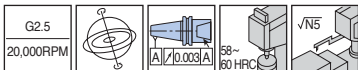
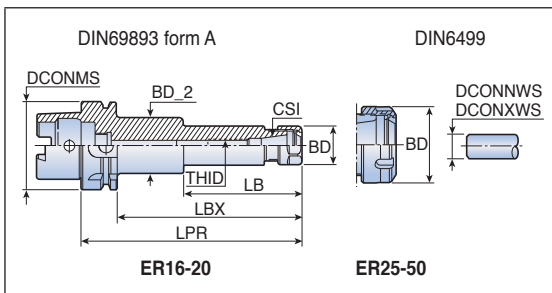
• <sup>(2)</sup> Without crosshole

\* For non-stock items: Supply condition is subject to availability.

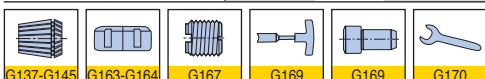
If not available in stock then MOQ (Minimum order qty) will be applicable.

# HSK A-ER

## ER collet chucks



Designation	Dimension (mm)									
	DCONMS	CSI	DCONNWS	DCONXWS	BD	BD_2	LPR	LBX	LB	THID
<b>HSK A 40 ER 16x60</b>	40	ER16	0.5	10.0	28	-	60	40	-	-
<b>ER 16x80</b>	40	ER16	0.5	10.0	28	-	80	60	-	M10
<b>ER 16x100</b>	40	ER16	0.5	10.0	28	-	100	80	-	M10
<b>ER 25x60</b>	40	ER25	1.0	16.0	42	32.4	60	40	28.0	-
<b>ER 25x80</b>	40	ER25	1.0	16.0	42	32.4	80	60	28.0	M18x1.5
<b>ER 25x100</b>	40	ER25	1.0	16.0	42	32.4	100	80	28.0	M16
<b>ER 32x100</b>	40	ER32	2.0	20.0	50	40.4	100	80	31.0	M22x1.5
<b>HSK A 50 ER 16x100</b>	50	ER16	0.5	10.0	28	-	100	74	-	M10
<b>ER 16x120</b>	50	ER16	0.5	10.0	28	-	120	94	-	M10
<b>ER 20x100</b>	50	ER20	1.0	13.0	34	-	100	74	-	M12
<b>ER 20x120</b>	50	ER20	1.0	13.0	34	-	120	94	-	M12
<b>ER 25x80</b>	50	ER25	1.0	16.0	42	32.4	80	54	28.0	M8
<b>ER 25x100</b>	50	ER25	1.0	16.0	42	41.8	100	74	28.5	M16
<b>ER 32x100</b>	50	ER32	2.0	20.0	50	40.4	100	74	31.0	M22x1.5
<b>ER 32x120</b>	50	ER32	2.0	20.0	50	41.8	120	94	35.0	M22x1.5
<b>HSK A 63 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	40.0	160	134	85.6	M10
<b>ER 20x100</b>	63	ER20	1.0	13.0	34	-	100	74	-	M12
<b>ER 20x120</b>	63	ER20	1.0	13.0	34	-	120	94	-	M12
<b>ER 20x160</b>	63	ER20	1.0	13.0	34	45.0	160	134	85.0	M12
<b>ER 25x80</b>	63	ER25	1.0	16.0	42	-	80	54	-	M8
<b>ER 25x100</b>	63	ER25	1.0	16.0	42	-	100	74	-	M16
<b>ER 25x120</b>	63	ER25	1.0	16.0	42	-	120	94	-	M16
<b>ER 25x160</b>	63	ER25	1.0	16.0	42	-	160	134	-	M16
<b>ER 32x80</b>	63	ER32	2.0	20.0	50	40.4	80	54	31.0	-
<b>ER 32x100</b>	63	ER32	2.0	20.0	50	-	100	74	-	M22x1.5
<b>ER 32x120</b>	63	ER32	2.0	20.0	50	-	120	94	-	M22x1.5
<b>ER 32x160</b>	63	ER32	2.0	20.0	50	-	160	134	-	M22x1.5
<b>ER 40x80</b>	63	ER40	3.0	26.0	63	50.4	80	54	34.0	-
<b>ER 40x100</b>	63	ER40	3.0	26.0	63	50.4	100	74	34.0	M28x1.5
<b>ER 40x120</b>	63	ER40	3.0	26.0	63	50.4	120	94	34.0	M28x1.5





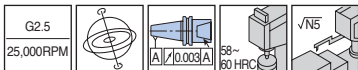
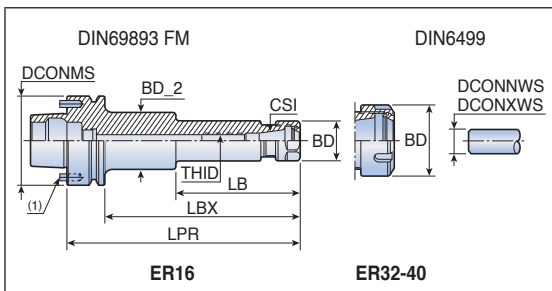






# HSK FM-ER

## ER collet chucks



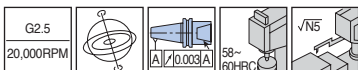
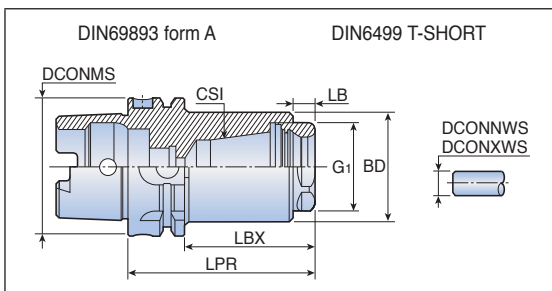
Designation	Dimension (mm)									
	DCONMS	CSI	DCONNWS	DCONXWS	BD	BD_2	LPR	LBX	LB	THID
<b>HSK FM 63 ER 16x80</b>	63	ER16	0.5	10.0	28	-	80	54	-	M10
<b>ER 16x100</b>	63	ER16	0.5	10.0	28	-	100	74	-	M10
<b>ER 16x120</b>	63	ER16	0.5	10.0	28	-	120	94	-	M10
<b>ER 16x160</b>	63	ER16	0.5	10.0	28	40	160	134	85.6	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	G <sub>1</sub>
<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



• <sup>(1)</sup> Equipped with nut ER16 MINI

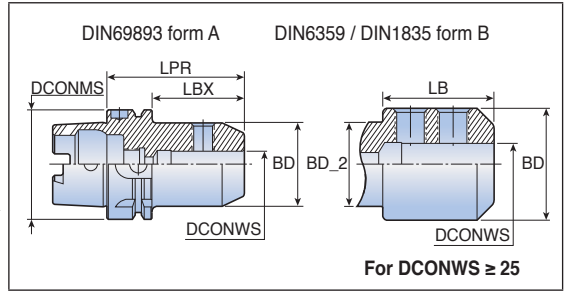
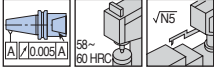






# HSK A-EM

## End mill holders

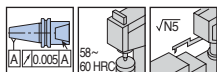
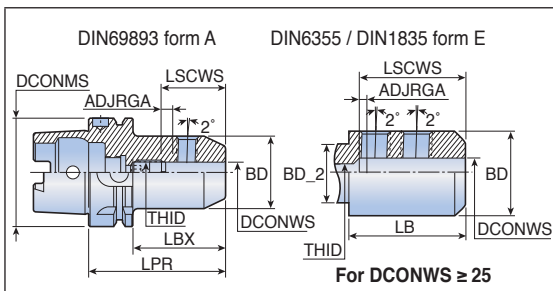


Designation	Dimension (mm)							
	DCONMS	DCONWS	BD	BD_2	LPR	LBX	LB	
<b>HSK A 50</b>	<b>EM 6x65</b>	50	6	25	-	65	39	-
	<b>EM 8x65</b>	50	8	28	-	65	39	-
	<b>EM 10x65</b>	50	10	35	-	65	39	-
	<b>EM 14x80</b>	50	14	44	-	80	54	-
	<b>EM 16x80</b>	50	16	48	-	80	54	-
	<b>EM 18x80</b>	50	18	50	-	80	54	-
	<b>EM 20x80</b>	50	20	52	-	80	54	-
<b>HSK A 63</b>	<b>EM 6x65</b>	63	6	25	-	65	39	-
	<b>EM 8x65</b>	63	8	28	-	65	39	-
	<b>EM 10x65</b>	63	10	35	-	65	39	-
	<b>EM 12x80</b>	63	12	42	-	80	54	-
	<b>EM 14x80</b>	63	14	44	-	80	54	-
	<b>EM 16x80</b>	63	16	48	-	80	54	-
	<b>EM 18x80</b>	63	18	50	-	80	54	-
	<b>EM 20x80</b>	63	20	52	-	80	54	-
	<b>EM 25x110</b>	63	25	65	52	110	84	65.5
<b>EM 32x110</b>	63	32	72	52	110	84	65.5	
<b>HSK A 100</b>	<b>EM 8x80</b>	100	8	28	-	80	51	-
	<b>EM 10x80</b>	100	10	35	-	80	51	-
	<b>EM 12x80</b>	100	12	42	-	80	51	-
	<b>EM 14x80</b>	100	14	44	-	80	51	-
	<b>EM 16x100</b>	100	16	48	-	100	71	-
	<b>EM 18x100</b>	100	18	50	-	100	71	-
	<b>EM 20x100</b>	100	20	52	-	100	71	-
	<b>EM 25x100</b>	100	25	65	-	100	71	-
	<b>EM 32x100</b>	100	32	72	-	100	71	-
	<b>EM 40x110</b>	100	40	85	-	110	81	-

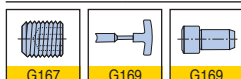


# HSK A-EM-E

End mill holders - Whistle notch

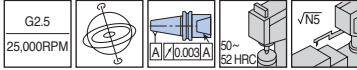
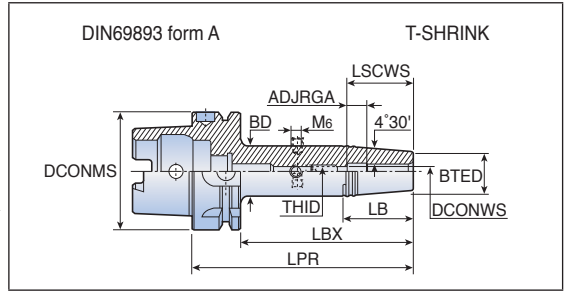


Designation	Dimension (mm)											
	DCONMS	DCONWS	BD	BD_2	LPR	LBX	LB	ADJRGA	LSCWS	THID		
<b>HSK A 50</b>	<b>EM 6x80 E</b>	50	6	25	-	80	54	-	8	38	M5	
	<b>EM 8x80 E</b>	50	8	28	-	80	54	-	5	40	M6	
	<b>EM 10x80 E</b>	50	10	35	-	80	54	-	5	44	M8	
	<b>EM 12x90 E</b>	50	12	42	-	90	64	-	5	49	M10	
	<b>EM 14x90 E</b>	50	14	44	-	90	64	-	5	49	M10	
	<b>EM 16x90 E</b>	50	16	48	-	90	64	-	5	52	M12	
	<b>EM 18x90 E</b>	50	18	50	-	90	64	-	5	52	M12	
	<b>EM 20x100 E</b>	50	20	52	-	100	74	-	5	54	M16	
<b>HSK A 63</b>	<b>EM 6x80 E</b>	63	6	25	-	80	54	-	8	40	M5	
	<b>EM 8x80 E</b>	63	8	28	-	80	54	-	5	40	M6	
	<b>EM 10x80 E</b>	63	10	35	-	80	54	-	5	44	M8	
	<b>EM 12x90 E</b>	63	12	42	-	90	64	-	5	49	M10	
	<b>EM 14x90 E</b>	63	14	44	-	90	64	-	5	49	M10	
	<b>EM 16x100 E</b>	63	16	48	-	100	74	-	5	52	M12	
	<b>EM 18x100 E</b>	63	18	50	-	100	74	-	8	55	M12	
	<b>EM 20x100 E</b>	63	20	52	-	100	74	-	5	54	M16	
	<b>EM 25x110 E</b>	63	25	65	52	110	84	65.5	7	61	M16	
<b>EM 32x110 E</b>	63	32	72	52	110	84	65.5	5	63	M20x1.5		
<b>HSK A 100</b>	<b>EM 6x90 E</b>	100	6	25	-	90	61	-	5	40	M5	
	<b>EM 8x90 E</b>	100	8	28	-	90	61	-	5	40	M6	
	<b>EM 10x90 E</b>	100	10	35	-	90	61	-	5	44	M8	
	<b>EM 12x100 E</b>	100	12	42	-	100	71	-	10	54	M10	
	<b>EM 14x100 E</b>	100	14	44	-	100	71	-	10	54	M10	
	<b>EM 16x100 E</b>	100	16	48	-	100	71	-	5	52	M12	
	<b>EM 18x100 E</b>	100	18	50	-	100	71	-	5	52	M12	
	<b>EM 20x110 E</b>	100	20	52	-	110	81	-	5	54	M16	
	<b>EM 25x120 E</b>	100	25	65	-	120	91	-	7	61	M20x1.5	
	<b>EM 32x120 E</b>	100	32	72	-	120	91	-	5	63	M20x1.5	

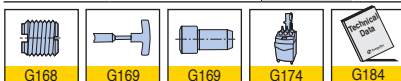




## Thermal shrinking chucks

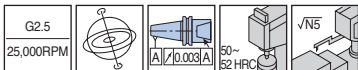
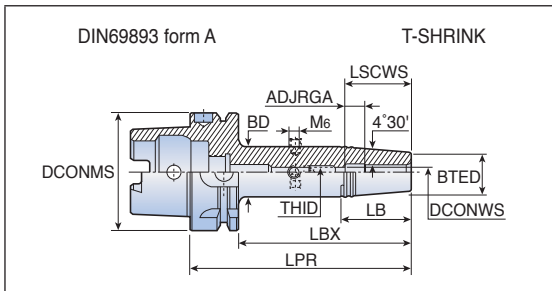


Designation	Dimension (mm)										
	DCONMS	DCONWS	BTED	BD	LPR	LBX	LB	ADJRGA	LSCWS	THID	Hex key
<b>HSK A 50 SRKIN 6x80</b>	50	6	21	27	80	54	38	11	36	M5	2.5
<b>SRKIN 8x80</b>	50	8	21	27	80	54	38	11	36	M6	3.0
<b>SRKIN 10x85</b>	50	10	24	32	85	59	51	11	42	M8	4.0
<b>SRKIN 12x90</b>	50	12	24	32	90	64	51	11	47	M10	5.0
<b>SRKIN 14x90</b>	50	14	27	34	90	64	45	11	47	M10	5.0
<b>SRKIN 16x95</b>	50	16	27	34	95	69	45	11	50	M10	5.0
<b>HSK A 63 SRKIN 6x80</b>	63	6	21	27	80	54	38	11	36	M5	2.5
<b>SRKIN 6x120</b>	63	6	21	27	120	94	38	11	36	M5	2.5
<b>SRKIN 6x160</b>	63	6	21	27	160	134	38	11	36	M5	2.5
<b>SRKIN 8x80</b>	63	8	21	27	80	54	38	11	36	M6	3.0
<b>SRKIN 8x120</b>	63	8	21	27	120	94	38	11	36	M6	3.0
<b>SRKIN 8x160</b>	63	8	21	27	160	134	38	11	36	M6	3.0
<b>SRKIN 10x85</b>	63	10	24	32	85	54	51	11	42	M8	4.0
<b>SRKIN 10x120</b>	63	10	24	32	120	94	51	11	42	M8	4.0
<b>SRKIN 10x160</b>	63	10	24	32	160	134	51	11	42	M8	4.0
<b>SRKIN 12x90</b>	63	12	24	32	90	64	51	6	42	M8	4.0
<b>SRKIN 12x120</b>	63	12	24	32	120	94	51	11	47	M10	5.0
<b>SRKIN 12x160</b>	63	12	24	32	160	134	51	11	47	M10	5.0
<b>SRKIN 14x90</b>	63	14	27	34	90	64	45	11	47	M10	5.0
<b>SRKIN 14x120</b>	63	14	27	34	120	94	45	11	47	M10	5.0
<b>SRKIN 14x160</b>	63	14	27	34	160	134	45	11	47	M10	5.0
<b>SRKIN 16x75</b>	63	16	27	34	75	49	-	11	50	-	-
<b>SRKIN 16x95</b>	63	16	27	34	95	69	44	11	50	M12	6.0
<b>SRKIN 16x120</b>	63	16	27	34	120	94	44	11	50	M12	6.0
<b>SRKIN 16x160</b>	63	16	27	34	160	134	44	11	50	M12	6.0
<b>SRKIN 18x95</b>	63	18	33	42	95	69	57	11	50	M12	6.0
<b>SRKIN 18x120</b>	63	18	33	42	120	94	57	11	50	M12	6.0
<b>SRKIN 18x160</b>	63	18	33	42	160	134	57	11	50	M12	6.0
<b>SRKIN 20x75</b>	63	20	33	41	75	49	-	9	50	-	-
<b>SRKIN 20x100</b>	63	20	33	42	100	74	57	11	52	M16	8.0
<b>SRKIN 20x120</b>	63	20	33	42	120	94	57	11	52	M16	8.0
<b>SRKIN 20x160</b>	63	20	33	42	160	134	57	11	52	M16	8.0
<b>SRKIN 25x85</b>	63	25	44	53	85	59	-	11	58	-	-

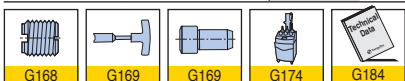


• Use only inductive heating device for T-SHRINK holders

## Thermal shrinking chucks



Designation	Dimension (mm)											
	DCONMS	DCONWS	BTED	BD	LPR	LBX	LB	ADJRGA	LSCWS	THID	Hex key	
<b>HSK A 63 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 SRKIN 6x85</b>	100	6	21	27	85	56	38	11	36	M5	2.5	
<b>SRKIN 6x120</b>	100	6	21	27	120	91	38	11	36	M5	2.5	
<b>SRKIN 6x160</b>	100	6	21	27	160	131	38	11	36	M6	3.0	
<b>SRKIN 8x85</b>	100	8	21	27	85	56	38	11	36	M6	3.0	
<b>SRKIN 8x120</b>	100	8	21	27	120	91	38	11	36	M6	3.0	
<b>SRKIN 8x160</b>	100	8	21	27	160	131	38	11	36	M6	3.0	
<b>SRKIN 10x90</b>	100	10	24	32	90	61	51	11	42	M8	4.0	
<b>SRKIN 10x120</b>	100	10	24	32	120	91	51	11	42	M8	4.0	
<b>SRKIN 10x160</b>	100	10	24	32	160	131	51	11	42	M8	4.0	
<b>SRKIN 12x95</b>	100	12	24	32	95	66	51	11	47	M10	5.0	
<b>SRKIN 12x120</b>	100	12	24	32	120	91	51	11	47	M10	5.0	
<b>SRKIN 12x160</b>	100	12	24	32	160	131	51	11	47	M10	5.0	
<b>SRKIN 14x95</b>	100	14	27	34	95	66	45	11	47	M10	5.0	
<b>SRKIN 14x120</b>	100	14	27	34	120	91	45	11	47	M10	5.0	
<b>SRKIN 14x160</b>	100	14	27	34	160	131	45	11	47	M10	5.0	
<b>SRKIN 16x100</b>	100	16	27	34	100	71	45	11	50	M12	6.0	
<b>SRKIN 16x120</b>	100	16	27	34	120	91	45	11	50	M12	6.0	
<b>SRKIN 16x160</b>	100	16	27	34	160	131	45	11	50	M12	6.0	
<b>SRKIN 18x100</b>	100	18	33	42	100	71	57	11	50	M12	6.0	
<b>SRKIN 18x160</b>	100	18	33	42	160	131	57	11	50	M12	6.0	
<b>SRKIN 20x105</b>	100	20	33	42	105	76	57	11	52	M16	8.0	
<b>SRKIN 20x160</b>	100	20	33	42	160	131	57	11	52	M16	8.0	
<b>SRKIN 25x115</b>	100	25	44	53	115	86	57	11	58	M16	8.0	
<b>SRKIN 32x120</b>	100	32	44	53	120	91	57	11	58	M16	8.0	

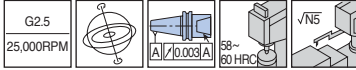
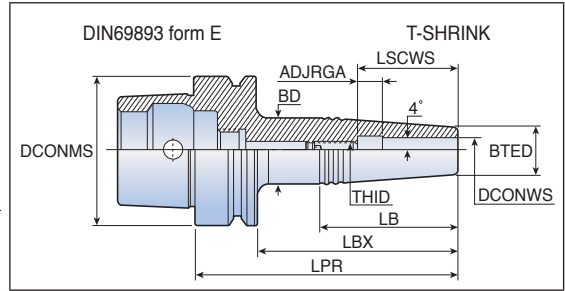


• Use only inductive heating device for T-SHRINK holders

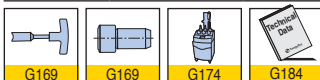




## Thermal shrinking chucks



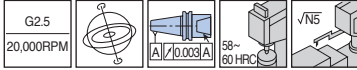
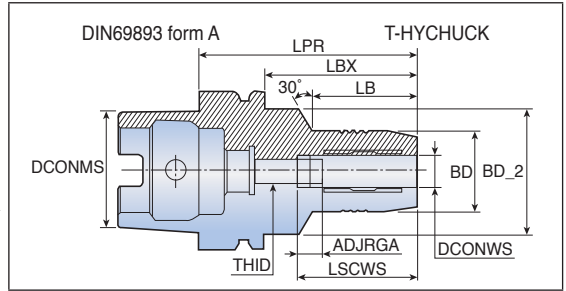
Designation	Dimension (mm)										
	DCONMS	DCONWS	BTED	BD	LPR	LBX	LB	ADJRGA	LSCWS	THID	Hex key
<b>HSK E 32</b>											
SRK 3x45	32	3	10	13	65	45	30.0	6	16	M4	2.0
SRK 4x45	32	4	10	15	65	45	35.0	6	18	M4	2.0
SRK 5x45	32	5	10	15	65	45	35.0	10	25	M4	2.0
SRK 6x45	32	6	11	16	65	45	35.0	10	28	M4	2.0
SRK 8x45	32	8	14	20	65	45	42.0	10	35	M4	2.0
SRK 10x45	32	12	16	22	65	45	42.0	10	40	M4	2.0
SRK 12x45	32	12	20	25	65	45	35.6	8	40	M4	2.0
<b>HSK E 40</b>											
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
<b>HSK E 50</b>											
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 5x45	50	5	10	15	71	45	36.0	6	21	M6	3.0
SRK 5x80	50	5	10	15	106	80	64.0	6	21	M6	3.0
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
SRK 12x80	50	12	20	28	106	80	57.0	10	42	M10	5.0



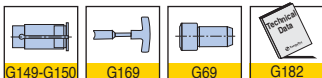


# HSK A-THC

Hydraulic chucks



Designation	Dimension (mm)										
	DCONMS	DCONWS	BD	BD_2	LPR	LBX	LB	ADJRGGA	LSCWS	THID	
<b>HSK A 40</b>	<b>THC 6-70</b>	40	6	28	34	70	50	28	10	37.5	M5
	<b>THC 8-70</b>	40	8	30	34	70	50	28	10	37.5	M6
	<b>THC 10-75</b>	40	10	32	34	75	55	34	10	42.5	M6
	<b>THC 12-85</b>	40	12	34	34	85	60	60	10	47.5	M6
<b>HSK A 50</b>	<b>THC 6-70</b>	50	6	28	40	70	44	28	10	37.5	M5
	<b>THC 8-70</b>	50	8	30	40	70	44	28	10	37.5	M6
	<b>THC 10-75</b>	50	10	32	40	75	49	34	10	42.5	M8x1
	<b>THC 12-80</b>	50	12	34	40	85	59	39	10	47.5	M10x1
	<b>THC 16-90</b>	50	16	38	53	90	64	30	10	52.5	M10x1
	<b>THC 20-90</b>	50	20	43	60	90	64	29	10	52.5	M10x1
	<b>THC 25-120</b>	50	25	48	60	120	94	59	10	61.0	M16x1
<b>HSK A 63</b>	<b>THC 6-70</b>	63	6	28	50	70	44	24	10	37.5	M5
	<b>THC 8-70</b>	63	8	30	50	70	44	24	10	37.5	M6
	<b>THC 10-80</b>	63	10	32	50	80	54	35	10	42.5	M8x1
	<b>THC 12-85</b>	63	12	34	50	85	59	40	10	47.5	M10x1
	<b>THC 14-85</b>	63	14	36	50	85	59	40	10	47.5	M10x1
	<b>THC 16-90</b>	63	16	38	50	90	64	46	10	52.5	M10x1
	<b>THC 20-90</b>	63	20	43	50	90	64	48	10	52.5	M10x1
	<b>THC 25-120</b>	63	25	57	63	120	94	59	10	61.0	M16x1
<b>HSK A 100</b>	<b>THC 6-80<sup>(1)</sup></b>	100	6	28	50	80	46	29	10	37.5	M5
	<b>THC 8-75<sup>(1)</sup></b>	100	8	30	54	75	46	26	10	37.5	M6
	<b>THC 10-90<sup>(1)</sup></b>	100	10	32	50	90	61	42	10	42.5	M8x1
	<b>THC 12-95<sup>(1)</sup></b>	100	12	34	50	95	66	47	10	47.5	M10x1
	<b>THC 16-100<sup>(1)</sup></b>	100	16	38	50	100	71	53	10	52.5	M10x1
	<b>THC 18-100<sup>(1)</sup></b>	100	18	41	50	100	71	53	10	52.5	M10x1
	<b>THC 20-105<sup>(1)</sup></b>	100	20	43	50	105	76	59	10	52.5	M10x1
	<b>THC 25-110<sup>(1)</sup></b>	100	25	57	63	110	81	62	10	61.0	M16x1
<b>THC 32-110<sup>(1)</sup></b>	100	32	63	75	110	81	62	10	65.0	M16x1	



•<sup>(1)</sup> Balance to G2.5 at 15,000RPM







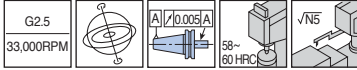
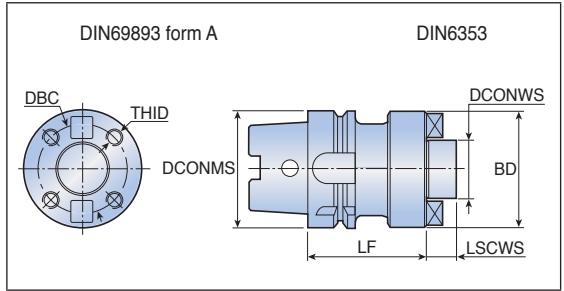






# HSK A-FM

## Face mill arbors

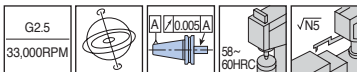
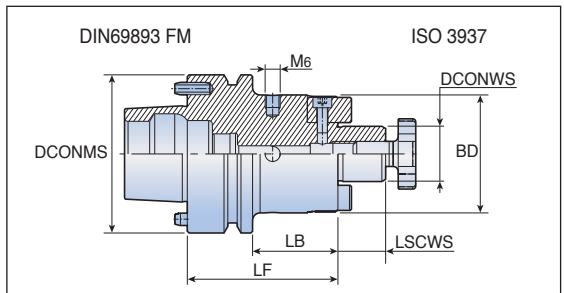


Designation	Dimension (mm)						
	DCONMS	DCONWS	BD	DBC	LF	LSCWS	THID
<b>HSK A 100 FM 60x70</b>	100	60	128	101.6	70	40	M16

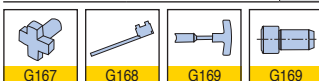
• Wrench not included

# HSK FM-SEM

## Face mill arbors - HSK high torque



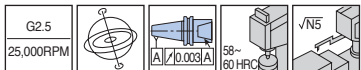
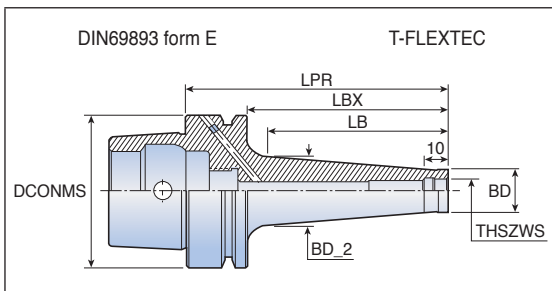
Designation	Dimension (mm)					
	DCONMS	DCONWS	BD	LF	LB	LSCWS
<b>HSK FM 63 SEM 22x60</b>	63	22	47	60	34	19
<b>SEM 27x60</b>	63	27	58	60	34	21



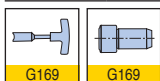
• <sup>(1)</sup> The driving pins can be removed to turn the toolholder into a standard HSK F 63 type







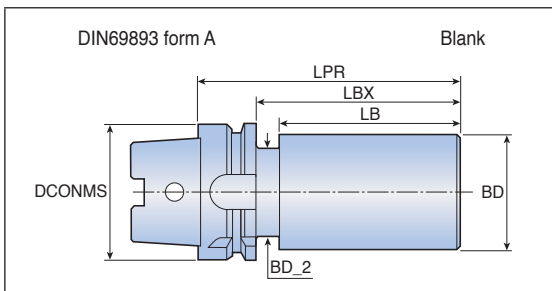
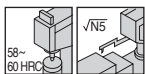
Designation	Dimension (mm)						
	DCONMS	THSZWS	BD	BD_2	LPR	LBX	LB
<b>HSK E 40 ODP 10x53</b>	40	M10	18	20	53	33	25
<b>ODP 10x103</b>	40	M10	18	28	103	83	75
<b>ODP 12x53</b>	40	M12	21	24	53	33	25
<b>ODP 12x103</b>	40	M12	21	31	103	83	75
<b>HSK E 50 ODP 10x59</b>	50	M10	18	20	59	33	25
<b>ODP 10x109</b>	50	M10	18	28	109	83	75
<b>ODP 12x59</b>	50	M12	21	24	59	33	25
<b>ODP 12x109</b>	50	M12	21	31	109	83	75
<b>ODP 16x59</b>	50	M16	29	34	59	33	25
<b>ODP 16x109</b>	50	M16	29	34	109	83	75
<b>HSK E 63 ODP 10x59</b>	63	M10	18	20	59	33	25
<b>ODP 10x109</b>	63	M10	18	28	109	83	75
<b>ODP 12x59</b>	63	M12	21	24	59	33	25
<b>ODP 12x109</b>	63	M12	21	31	109	83	75
<b>ODP 16x59</b>	63	M16	29	34	59	33	25
<b>ODP 16x109</b>	63	M16	29	34	109	83	75



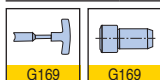


# HSK A-B16MN

## HSK blanks



Designation	Dimension (mm)					
	DCONMS	BD	BD <sub>2</sub>	LPR	LBX	LB
<b>HSK A 50 B16MN 100</b>	50	53	41.8	100	74	58.0
<b>B16MN 200</b>	50	53	41.8	200	174	158.0
<b>HSK A 100 B16MN 200</b>	100	102	85.0	200	171	154.8
	100	102	85.0	200	171	154.8



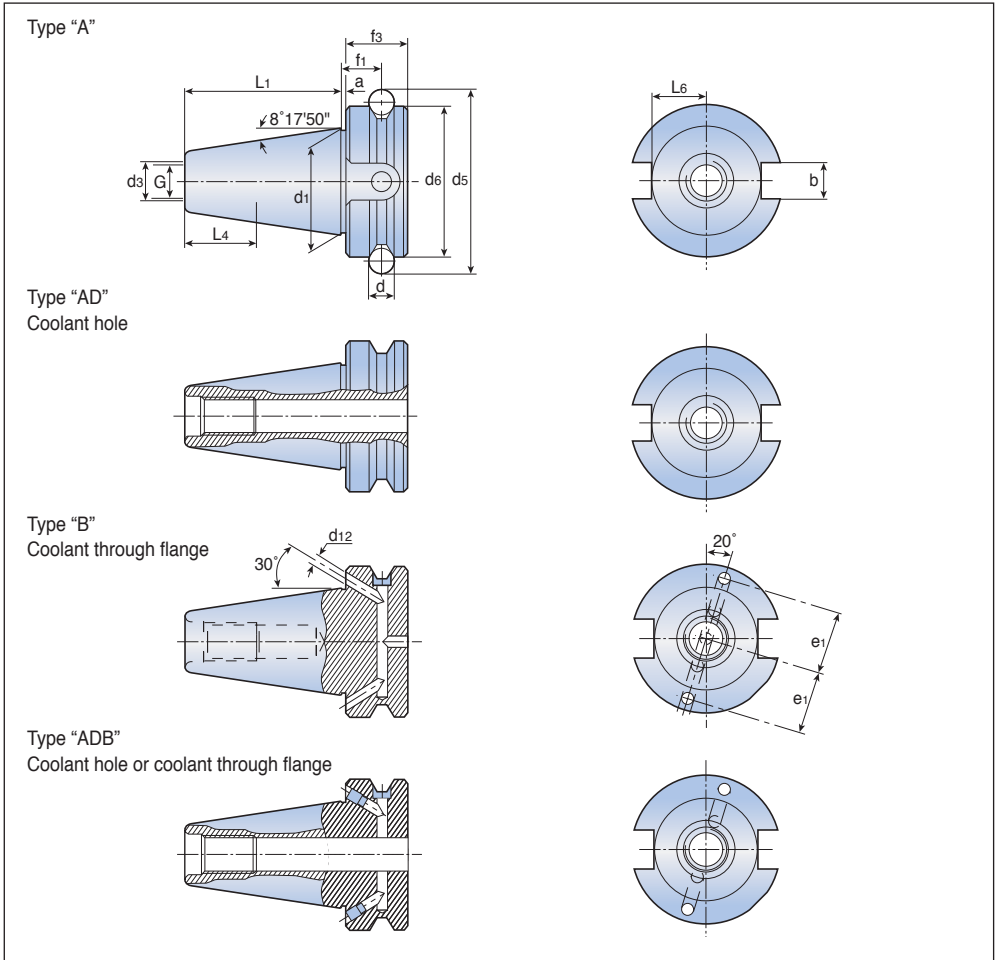
- Material: Case hardened alloy steel
- Shank hardness 58 HRC minimum
- Nose hardness 35-37 HRC

# BT MAS



# BT MAS 403 Form A/AD/B/ADB

## Standard toolholder



Shank	a $\pm 0.1$	b (H12)	d	d1	G	d3 (H8)	d5	d6 (H8)
<b>30</b>	2	16.1	8	31.75	M12	12.5	56.144	46
<b>40</b>	2	16.1	10	44.45	M16	17.0	75.679	63
<b>50</b>	3	25.7	15	69.85	M24	25.0	119.020	100

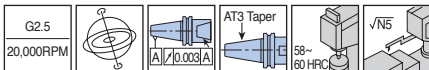
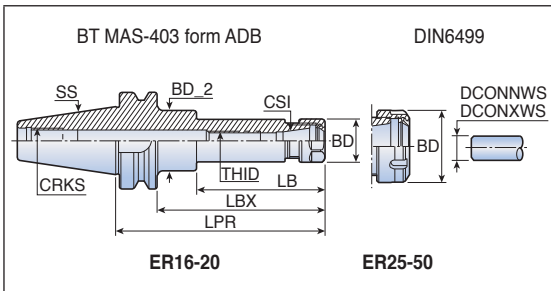
Shank	f1 $\pm 0.1$	f3	L1 $\pm 0.2$	L4min	L6 -0.2	e1 $\pm 0.1$	d12	Taper AT3
<b>30</b>	13.6	20	48.4	24	16.3	21	4	0.002
<b>40</b>	16.6	25	65.4	30	22.6	27	4	0.003
<b>50</b>	23.2	35	101.8	45	35.4	42	6	0.004

\* For non-stock items: Supply condition is subject to availability.

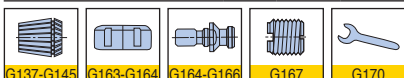
If not available in stock then MOQ (Minimum order qty) will be applicable.

# BT-ER

## ER collet chucks



Designation	Dimension (mm)											
	SS	CSI	DCONNWS	DCONXWS	BD	BD_2	LPR	LBX	LB	CRKS	THID	
<b>BT30</b> ER 16x70 <sup>(1)</sup>	30	ER16	0.5	10.0	28	-	70	48	-	M12	M10	
ER 16x100 <sup>(1)</sup>	30	ER16	0.5	10.0	28	-	100	73	-	M12	M10	
ER 20x70 <sup>(1)</sup>	30	ER20	1.0	13.0	34	-	70	48	-	M12	M12	
ER 25x60 <sup>(1)</sup>	30	ER25	1.0	16.0	42	-	60	38	-	M12	M16	
ER 32x60 <sup>(1)</sup>	30	ER32	2.0	20.0	50	-	60	38	-	M12	M18x1.5	
<b>BT40</b> ER 16x70	40	ER16	0.5	10.0	28	-	70	43	-	M16	M12	
ER 16x100	40	ER16	0.5	10.0	28	-	100	73	-	M16	M12	
ER 16x150 <sup>(1)</sup>	40	ER16	0.5	10.0	28	40	150	123	85	M16	M12	
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 <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(1)</sup>	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	-	M17	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 <sup>(1)</sup>	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	
<b>BT50</b> ER 16x100 <sup>(1)</sup>	50	ER16	0.5	10.0	28	-	100	62	-	M24	M12	
ER 16x125 <sup>(1)</sup>	50	ER16	0.5	10.0	28	-	125	87	-	M24	M12	
ER 16x150 <sup>(1)</sup>	50	ER16	0.5	10.0	28	-	150	112	-	M24	M12	
ER 16x200 <sup>(1)</sup>	50	ER16	0.5	10.0	28	40	200	162	85	M24	M10	
ER 20x100 <sup>(1)</sup>	50	ER20	1.0	10.0	34	-	100	62	-	M24	M12	
ER 20x125 <sup>(1)</sup>	50	ER20	1.0	13.0	34	-	125	87	-	M24	M12	
ER 20x150 <sup>(1)</sup>	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	85	M24	M12	



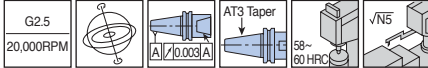
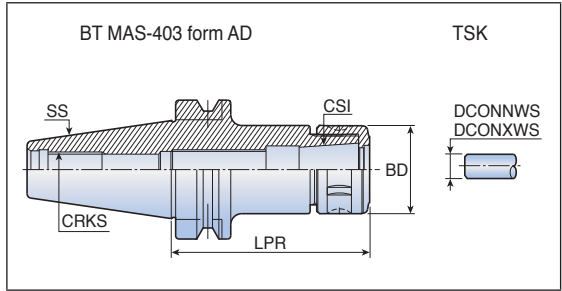
•<sup>(1)</sup> Balance to G6.3 at 12,000RPM



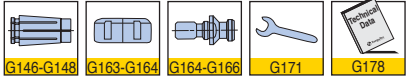


# BT-TSK

## TSK collet chucks



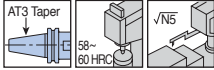
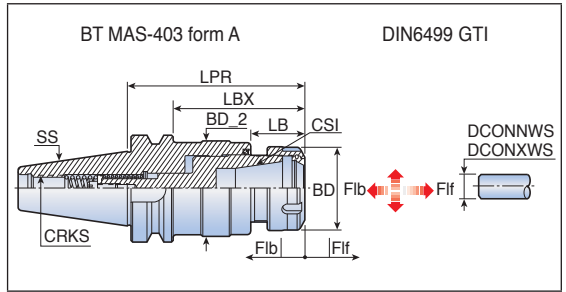
Designation	Dimension (mm)						
	SS	CSI	DCONNWS	DCONXWS	BD	LPR	CRKS
<b>BT30 TSK 6-90<sup>(1)</sup></b>	30	TSK6	1.5	6.0	19.5	90	M12
<b>TSK 10-90<sup>(1)</sup></b>	30	TSK10	1.5	10.0	27.5	90	M12
<b>BT40 TSK 6-90</b>	40	TSK6	1.5	6.0	19.5	90	M16
<b>TSK 6-120</b>	40	TSK6	1.5	6.0	19.5	120	M16
<b>TSK 10-90</b>	40	TSK10	1.5	10.0	27.5	90	M16
<b>TSK 10-120</b>	40	TSK10	1.5	10.0	27.5	120	M16
<b>TSK 16-90</b>	40	TSK16	2.5	16.0	40.0	90	M16
<b>TSK 16-120</b>	40	TSK16	2.5	16.0	40.0	120	M16
<b>TSK 25-90</b>	40	TSK25	7.5	25.0	55.0	90	M16
<b>TSK 25-120</b>	40	TSK25	7.5	25.0	55.0	120	M16
<b>BT50 TSK 6-120<sup>(1)</sup></b>	50	TSK6	1.5	6.0	19.5	120	M24
<b>TSK 6-165<sup>(1)</sup></b>	50	TSK6	1.5	6.0	19.5	165	M24
<b>TSK 6-195<sup>(1)</sup></b>	50	TSK6	1.5	6.0	19.5	195	M24
<b>TSK 10-120<sup>(1)</sup></b>	50	TSK10	1.5	10.0	27.5	120	M24
<b>TSK 10-165<sup>(1)</sup></b>	50	TSK10	1.5	10.0	27.5	165	M24
<b>TSK 10-195<sup>(1)</sup></b>	50	TSK10	1.5	10.0	27.5	195	M24
<b>TSK 16-120<sup>(1)</sup></b>	50	TSK16	2.5	16.0	40.0	120	M24
<b>TSK 16-165<sup>(1)</sup></b>	50	TSK16	2.5	16.0	40.0	165	M24
<b>TSK 16-195<sup>(1)</sup></b>	50	TSK16	2.5	16.0	40.0	195	M24
<b>TSK 25-120<sup>(1)</sup></b>	50	TSK25	7.5	25.0	55.0	120	M24
<b>TSK 25-165<sup>(1)</sup></b>	50	TSK25	7.5	25.0	55.0	165	M24
<b>TSK 25-195<sup>(1)</sup></b>	50	TSK25	7.5	25.0	55.0	195	M24



• Add B for coolant through flange  
 •<sup>(1)</sup> Balance to G6.3 at 20,000RPM

# GTI BT-ER

## GTI tap attachments

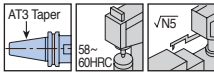
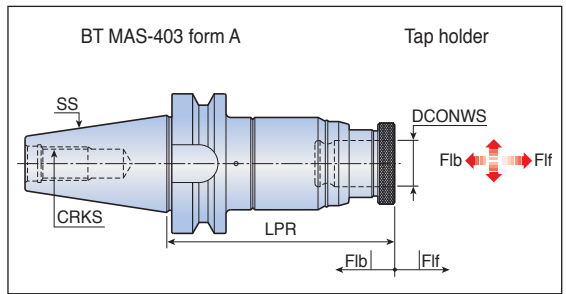


Designation	Dimension (mm)													
	SS	CSI	Tap <sub>min</sub>	Tap <sub>max</sub>	DCONNWS	DCONXWS	BD	BD_2	LPR	LBX	LB	F1f	F1b	CRKS
<b>GTI BT40 ER16</b>	40	ER16	M3	M10	0.5	10.0	28	29.5	84.2	52.7	24.6	8	3	M16
	40	ER32	M6	M20	2.0	20.0	50	56.5	106.8	79.8	33.0	9	4	M16
	40	ER40	M6	M28	3.0	26.0	63	56.5	124.8	97.8	51.0	9	4	M16
<b>GTI BT50 ER16</b>	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

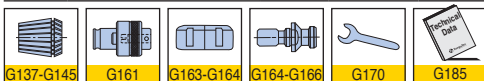
- No coolant should be induced through the tap chuck as it will cause malfunctioning of the mechanism

# BT-TC

## Tap holders



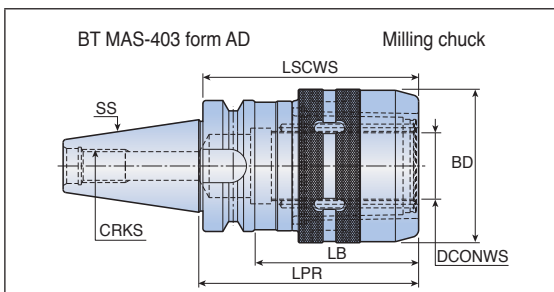
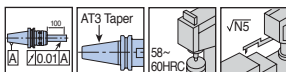
Designation	Dimension (mm)									
	SS	Tap <sub>min</sub>	Tap <sub>max</sub>	DCONNWS	LPR	F1b	F1f	Tap adapter	CRKS	
<b>BT30 TC 12-105</b>	30	M3	M12	19	105	6.5	12	TA1	M12	
<b>BT40 TC 12-95</b>	40	M3	M12	19	95	6.5	12	TA1	M16	
	40	M3	M12	19	110	6.5	12	TA1	M16	
	40	M6	M24	31	127	14.5	13	TA2	M16	
<b>BT50 TC 12-125</b>	50	M6	M12	19	125	6.5	12	TA1	M24	
	50	M6	M24	31	142	14.5	13	TA2	M24	
	50	M18	M38	48	195	20.0	20	TA3	M24	



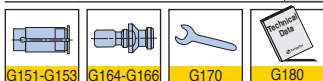


# BT-NTMC

## Milling chucks



Designation	Dimension (mm)						
	SS	DCONWS	BD	LPR	LB	LSCWS	CRKS
<b>BT30 NTMC 20-75</b>	30	20	53	75	51.4	70	M12
<b>NTMC 25-80</b>	30	25	62	80	58.3	70	M12
<b>BT40 NTMC 20-80</b>	40	20	53	80	53	82	M16
<b>NTMC 20-90</b>	40	20	53	90	63	82	M16
<b>NTMC 25-90</b>	40	25	62	90	63	85	M16
<b>NTMC 25-105</b>	40	25	62	105	78	95	M16
<b>NTMC 32-85</b>	40	32	72	85	56	80	M16
<b>NTMC 32-105</b>	40	32	72	105	78.5	90	M16
<b>NTMC 32-120</b>	40	32	72	120	93.5	105	M16
<b>BT50 NTMC 20-105</b>	50	20	53	105	67	82	M24
<b>NTMC 20-135</b>	50	20	53	135	97	82	M24
<b>NTMC 20-165</b>	50	20	53	165	127	82	M24
<b>NTMC 25-105</b>	50	25	62	105	67	90	M24
<b>NTMC 25-135</b>	50	25	62	135	97	90	M24
<b>NTMC 25-165</b>	50	25	62	165	127	90	M24
<b>NTMC 32-105</b>	50	32	74	105	67	110	M24
<b>NTMC 32-120</b>	50	32	74	120	82	125	M24
<b>NTMC 32-135</b>	50	32	74	135	97	125	M24
<b>NTMC 32-165</b>	50	32	74	165	127	125	M24
<b>NTMC 42-120</b>	50	42	94	120	82	125	M24
<b>NTMC 42-135</b>	50	42	94	135	97	130	M24
<b>NTMC 42-165</b>	50	42	94	165	127	135	M24

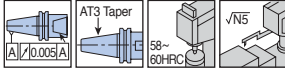


• Spanner not included



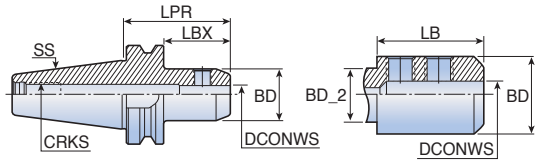
# BT-EM

## End mill holders



BT MAS-403 form ADB

DIN6359 / DIN1835 form B



For DCONWS ≥ 25

Designation	Dimension (mm)							
	SS	DCONWS	BD	BD_2	LPR	LBX	LB	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 14x60</b>	30	14	44	-	60	38	-	M12
<b>EM 16x60</b>	30	16	46	-	60	38	-	M12
<b>EM 18x60</b>	30	18	50	-	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 18x65</b>	40	18	50	-	65	38	-	M16
<b>EM 20x75</b>	40	20	52	-	75	48	-	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



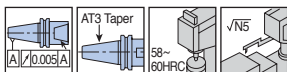
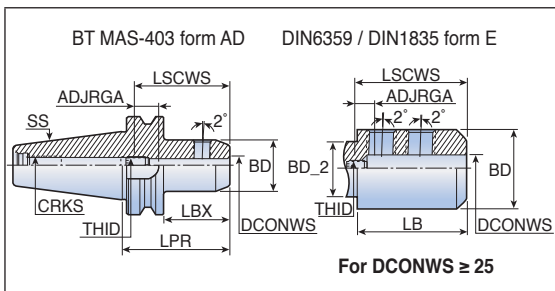
G164-G166



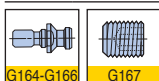
G167

# BT-EM-E

## End mill holders - Whistle notch



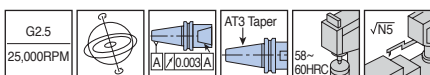
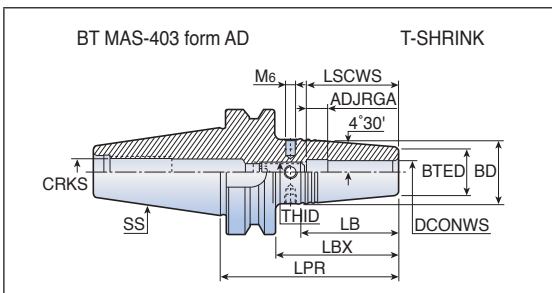
Designation	Dimension (mm)												
	SS	DCONWS	BD	BD_2	LPR	LBX	LB	ADJRGA	LSCWS	CRKS	THID	Hex key	
<b>BT40 EM 6x50E</b>	40	6	25	-	50	23	-	10	45	M16	M5	2.5	
<b>EM 10x65E</b>	40	10	35	-	65	38	-	10	49	M16	M8	4.0	
<b>EM 12x65E</b>	40	12	42	-	65	38	-	10	54	M16	M10	5.0	
<b>EM 14x65E</b>	40	14	44	-	65	38	-	10	54	M16	M10	5.0	
<b>EM 16x65E</b>	40	16	48	-	65	38	-	10	57	M16	M12	6.0	
<b>EM 18x65E</b>	40	18	50	-	65	38	-	10	57	M16	M12	6.0	
<b>EM 20x75E</b>	40	20	52	-	75	48	-	10	59	M16	M16	8.0	
<b>EM 25x105E</b>	40	25	65	61	105	78	68	10	64	M16	M20x1.5	10.0	
<b>EM 32x110E</b>	40	32	72	61	110	83	73	10	68	M16	M20x1.5	10.0	
<b>BT50 EM 6x70E</b>	50	6	25	-	70	32	-	10	45	M24	M5	2.5	
<b>EM 10x70E</b>	50	10	35	-	70	32	-	10	49	M24	M8	4.0	
<b>EM 12x100E</b>	50	12	42	-	100	62	-	10	54	M24	M10	5.0	
<b>EM 14x100E</b>	50	14	44	-	100	62	-	10	54	M24	M10	5.0	
<b>EM 16x100E</b>	50	16	48	-	100	62	-	10	57	M24	M12	6.0	
<b>EM 18x100E</b>	50	18	50	-	100	62	-	10	57	M24	M12	6.0	
<b>EM 20x100E</b>	50	20	52	-	100	62	-	10	59	M24	M16	8.0	
<b>EM 25x115E</b>	50	25	65	-	115	77	-	10	64	M24	M20x1.5	10.0	
<b>EM 32x115E</b>	50	32	72	-	115	77	-	10	68	M24	M20x1.5	10.0	
<b>EM 40x115E</b>	50	40	90	-	115	77	-	10	78	M24	M20x1.5	10.0	
<b>EM 50x125E</b>	50	50	98	-	125	67	-	10	88	M24	M20x1.5	10.0	



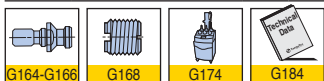
• Add B for coolant through flange



## Thermal shrinking chucks



Designation	Dimension (mm)											
	SS	DCONWS	BTED	BD	LPR	LBX	LB	ADJRGA	LSCWS	CRKS	THID	Hex key
<b>BT40 SRKIN 6x90</b>	40	6	21	27	90	63	38.0	10	36	M16	M5	2.5
<b>SRKIN 8x90</b>	40	8	21	27	90	63	38.0	10	36	M16	M6	3.0
<b>SRKIN 10x90</b>	40	10	24	32	90	63	50.5	10	42	M16	M8	4.0
<b>SRKIN 12x90</b>	40	12	24	32	90	63	50.5	10	47	M16	M10	5.0
<b>SRKIN 14x90</b>	40	14	27	34	90	63	44.5	10	47	M16	M10	5.0
<b>SRKIN 16x90</b>	40	16	27	34	90	63	44.5	10	50	M16	M12	6.0
<b>SRKIN 18x90</b>	40	18	33	42	90	63	57.0	10	50	M16	M12	6.0
<b>SRKIN 20x90</b>	40	20	33	42	90	63	57.0	10	52	M16	M16	8.0
<b>SRKIN 25x110</b>	40	25	44	53	110	83	57.0	10	58	M16	M16	8.0
<b>BT50 SRKIN 6x100<sup>(1)</sup></b>	50	6	21	26	100	62	32.0	10	36	M24	M5	2.5
<b>SRKIN 8x100<sup>(1)</sup></b>	50	8	21	27	100	62	38.0	10	36	M24	M6	3.0
<b>SRKIN 10x100<sup>(1)</sup></b>	50	10	24	32	100	62	51.0	10	42	M24	M8	4.0
<b>SRKIN 12x100<sup>(1)</sup></b>	50	12	24	32	100	62	51.0	10	47	M24	M10	5.0
<b>SRKIN 14x100<sup>(1)</sup></b>	50	14	27	34	100	62	44.5	10	47	M24	M10	5.0
<b>SRKIN 16x100<sup>(1)</sup></b>	50	16	27	34	100	62	44.5	10	50	M24	M12	6.0
<b>SRKIN 18x100<sup>(1)</sup></b>	50	18	33	42	100	62	57.0	10	50	M24	M12	6.0
<b>SRKIN 20x100<sup>(1)</sup></b>	50	20	33	42	100	62	57.0	10	52	M24	M16	8.0
<b>SRKIN 25x120<sup>(1)</sup></b>	50	25	44	53	120	82	57.0	10	58	M24	M16	8.0
<b>SRKIN 32x120<sup>(1)</sup></b>	50	32	44	53	120	82	57.0	10	58	M24	M16	8.0



• <sup>(1)</sup> Balance to G2.5 at 20,000RPM

















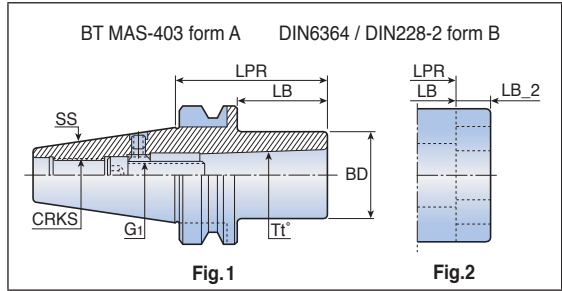
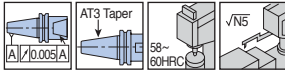






# BT-MT-DRW

## Morse taper adapters

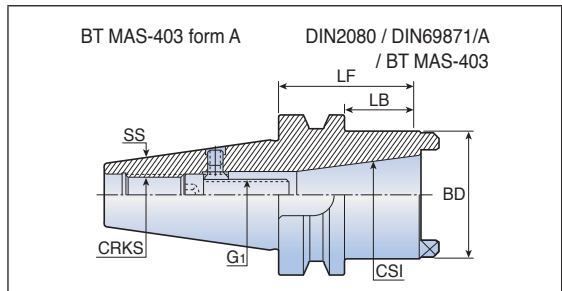
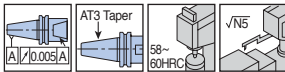


Designation	Dimension (mm)								Fig.
	SS	Tt°	BD	LPR	LB	LB_2	CRKS	G1	
<b>BT40 MT1 DRW</b>	40	MT1	25	50	23	-	M16	M6	1
<b>MT2 DRW</b>	40	MT2	32	50	23	-	M16	M10	1
<b>MT3 DRW</b>	40	MT3	40	70	43	-	M16	M12	1
<b>MT4 DRW<sup>(1)</sup></b>	40	MT4	63	95	68	15	M16	M16	2
<b>BT50 MT1 DRW</b>	50	MT1	25	45	7	-	M24	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









# DIN2080



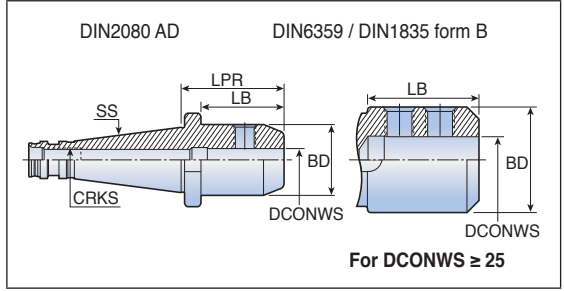
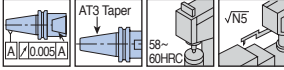






# DIN2080-EM

## End mill holders



Designation	Dimension (mm)					
	SS	DCONWS	BD	LPR	LB	CRKS
<b>DIN2080 30 EM 6x40</b>	30	6	25	40	30.4	M12
<b>EM 8x40</b>	30	8	28	40	30.4	M12
<b>EM 10x40</b>	30	10	35	40	30.4	M12
<b>EM 16x50</b>	30	16	48	50	40.4	M12
<b>EM 20x63</b>	30	20	52	63	53.4	M12
<b>DIN2080 40 EM 6x50</b>	40	6	25	50	38.4	M16
<b>EM 8x50</b>	40	8	28	50	38.4	M16
<b>EM 10x50</b>	40	10	35	50	38.4	M16
<b>EM 12x50</b>	40	12	42	50	38.4	M16
<b>EM 16x63</b>	40	16	48	63	51.4	M16
<b>EM 20x63</b>	40	20	52	63	51.4	M16
<b>EM 25x80</b>	40	25	65	80	68.4	M16
<b>EM 32x80</b>	40	32	72	80	68.4	M16
<b>DIN2080 50 EM 6x63</b>	50	6	25	63	47.8	M24
<b>EM 8x63</b>	50	8	28	63	47.8	M24
<b>EM 10x63</b>	50	10	35	63	47.8	M24
<b>EM 12x63</b>	50	12	42	63	47.8	M24
<b>EM 16x63</b>	50	16	48	63	47.8	M24
<b>EM 20x63</b>	50	20	52	63	47.8	M24
<b>EM 25x80</b>	50	25	65	80	64.8	M24
<b>EM 32x80</b>	50	32	72	80	64.8	M24
<b>EM 40x90</b>	50	40	90	90	74.8	M24
<b>EM 50x100</b>	50	50	100	100	84.8	M24









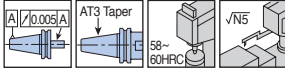
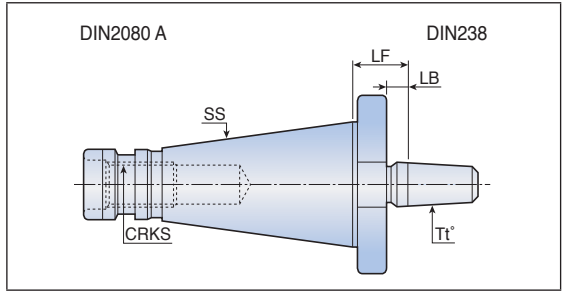






# DIN2080-DC

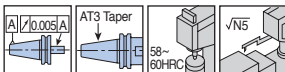
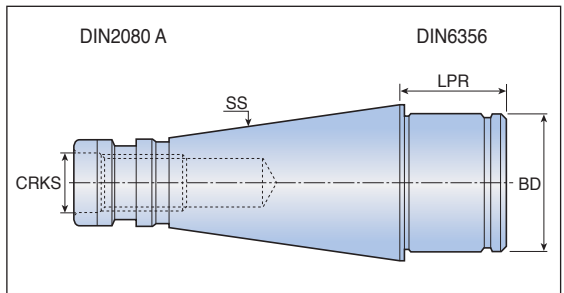
## Drill chuck arbors



Designation	Dimension (mm)				
	SS	Tt°	LF	LB	CRKS
<b>DIN2080 30 DC B16x20</b>	30	B16	20	5.4	M12
<b>DIN2080 40 DC B16x22</b>	40	B16	22	10.4	M16
<b>DC B18x25</b>	40	B18	25	13.4	M16
<b>DIN2080 50 DC B16x25</b>	50	B16	25	9.8	M24
<b>DC B18x25</b>	50	B18	25	9.8	M24

# DIN2080-CP

## Centering plug



Designation	Dimension (mm)			
	SS	BD	LPR	CRKS
<b>DIN2080 40 CP 40</b>	40	40	29	M16
<b>DIN2080 50 CP 60</b>	50	60	39	M24

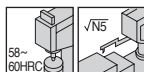
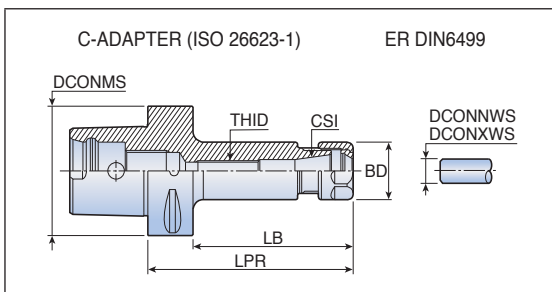
# *CADAPTER*



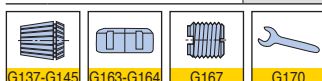


# C-ER

## 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

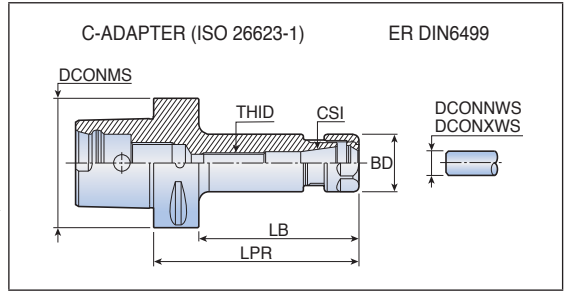
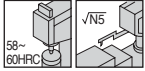


• <sup>(1)</sup> Without V grooves, for manual use only



# C-ER

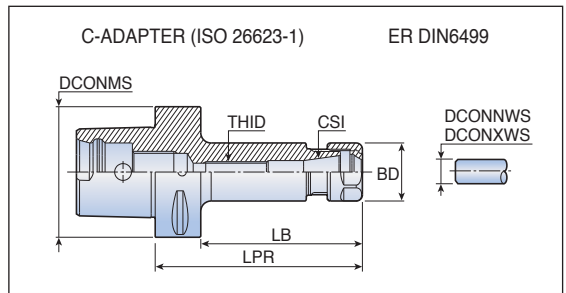
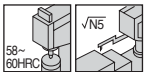
## ER collet chucks



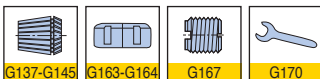
Designation	Dimension (mm)							
	DCONMS	CSI	DCONNWS	DCONXWS	BD	LPR	LB	THID
<b>C8 ER 32x70</b>	80	ER32	2.0	20.0	50	70	40	-
<b>ER 32x100</b>	80	ER32	2.0	20.0	50	100	70	M22x1.5
<b>ER 32x160</b>	80	ER32	2.0	20.0	50	160	130	M22x1.5
<b>ER 40x70</b>	80	ER40	3.0	26.0	63	70	40	-
<b>ER 40x100</b>	80	ER40	3.0	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

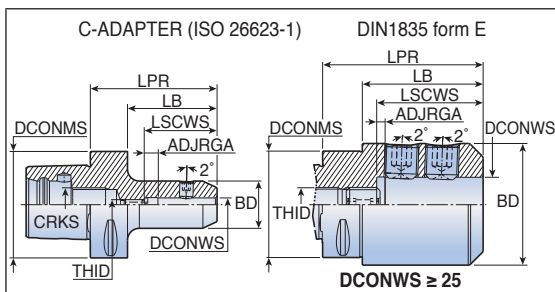
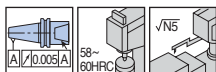






# C-EM-E

## End mill holders - Whistle notch type



Designation	Dimension (mm)								
	DCONMS	DCONWS	BD	LPR	LB	ADJRGA	LSCWS	CRKS	THID
<b>C4 EM 6x70 E</b>	40	6	25	70	50	5	35	M14	M5
<b>EM 8x70 E</b>	40	8	28	70	50	8	43	M14	M6
<b>EM 10x70 E</b>	40	10	35	70	50	6	45	M14	M8
<b>EM 12x75 E</b>	40	12	42	75	55	5	49	M14	M10
<b>EM 14x75 E</b>	40	14	44	75	55	5	49	M14	M10
<b>C5 EM 6x70 E</b>	50	6	25	70	50	5	35	M16	M5
<b>EM 8x70 E</b>	50	8	28	70	50	8	43	M16	M6
<b>EM 10x70 E</b>	50	10	35	70	50	6	45	M16	M8
<b>EM 12x75 E</b>	50	12	42	75	55	5	49	M16	M10
<b>EM 14x75 E</b>	50	14	44	75	55	5	49	M16	M10
<b>EM 16x80 E</b>	50	16	48	80	60	5	52	M16	M12
<b>EM 18x80 E</b>	50	18	50	80	60	5	52	M16	M12
<b>EM 20x85 E</b>	50	20	52	85	65	6	55	M16	M16
<b>C6 EM 6x75 E</b>	63	6	25	75	53	6	36	M20	M5
<b>EM 8x75 E</b>	63	8	28	75	53	8	43	M20	M6
<b>EM 10x75 E</b>	63	10	35	75	53	7	46	M20	M8
<b>EM 12x80 E</b>	63	12	42	80	58	5	49	M20	M10
<b>EM 14x80 E</b>	63	14	44	80	58	5	49	M20	M10
<b>EM 16x85 E</b>	63	16	48	85	63	5	52	M20	M12
<b>EM 18x85 E</b>	63	18	50	85	63	5	52	M20	M12
<b>EM 20x85 E</b>	63	20	52	85	63	6	55	M20	M16
<b>EM 25x90 E</b>	63	25	65	90	68	6	60	M20	M20
<b>EM 32x95 E</b>	63	32	72	95	73	5	63	M20	M20
<b>C8 EM 6x65 E</b>	80	6	25	65	35	6	36	M20	M5
<b>EM 8x65 E</b>	80	8	28	65	35	8	43	M20	M6
<b>EM 10x65 E</b>	80	10	35	65	35	7	46	M20	M8
<b>EM 12x70 E</b>	80	12	42	70	40	5	49	M20	M10
<b>EM 14x70 E</b>	80	14	44	70	40	5	49	M20	M10
<b>EM 16x75 E</b>	80	16	48	75	45	5	52	M20	M12
<b>EM 18x75 E</b>	80	18	50	75	45	5	52	M20	M12
<b>EM 20x80 E</b>	80	20	52	80	50	8	57	M20	M16
<b>EM 25x90 E</b>	80	25	65	90	60	6	60	M20	M20
<b>EM 32x95 E</b>	80	32	72	95	65	6	64	M20	M20



G167

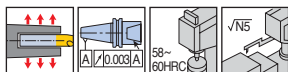
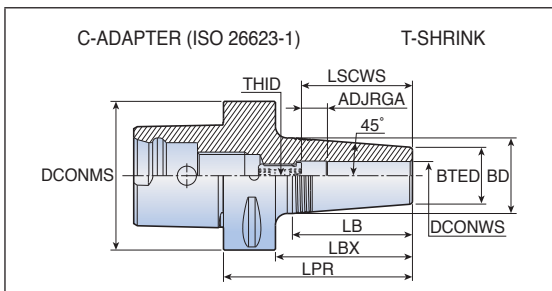








## Thermal shrinking chucks



Designation	Dimension (mm)										
	DCONMS	DCONWS	BTED	BD	LPR	LBX	LB	ADJRGA	LSCWS	THID	Hex key
<b>C4 SRKIN 6x75</b>	40	6	21	27	75	55	38.1	11	36	M5	2.5
<b>SRKIN 8x75</b>	40	8	21	27	75	55	38.1	11	36	M6	3.0
<b>SRKIN 10x75</b>	40	10	24	32	75	55	50.8	11	42	M8	4.0
<b>SRKIN 12x75</b>	40	12	24	32	75	55	50.8	11	47	M10	5.0
<b>SRKIN 14x80</b>	40	14	27	34	80	60	44.5	11	47	M10	5.0
<b>SRKIN 16x80</b>	40	16	27	34	80	60	44.5	11	50	M12	6.0
<b>SRKIN 18x80</b>	40	18	33	42	80	60	57.2	11	50	M12	6.0
<b>SRKIN 20x85</b>	40	20	33	42	85	65	57.2	11	52	M16	8.0
<b>C5 SRKIN 6x75</b>	50	6	21	27	75	55	38.1	11	36	M5	2.5
<b>SRKIN 8x75</b>	50	8	21	27	75	55	38.1	11	36	M6	3.0
<b>SRKIN 10x75</b>	50	10	24	32	75	55	50.8	11	42	M8	4.0
<b>SRKIN 12x75</b>	50	12	24	32	75	55	50.8	11	47	M10	5.0
<b>SRKIN 14x80</b>	50	14	27	34	80	60	44.5	11	47	M10	5.0
<b>SRKIN 16x80</b>	50	16	27	34	80	60	44.5	11	50	M12	6.0
<b>SRKIN 18x80</b>	50	18	33	42	80	60	57.2	11	50	M12	6.0
<b>SRKIN 20x85</b>	50	20	33	42	85	65	57.2	11	52	M16	8.0
<b>SRKIN 25x90</b>	50	25	44	53	90	70	57.2	11	58	M16	8.0
<b>C6 SRKIN 6x80</b>	63	6	21	27	80	58	38.1	11	36	M5	2.5
<b>SRKIN 8x80</b>	63	8	21	27	80	58	38.1	11	36	M6	3.0
<b>SRKIN 10x80</b>	63	10	24	32	80	58	50.8	11	42	M8	4.0
<b>SRKIN 12x80</b>	63	12	24	32	80	58	50.8	11	47	M10	5.0
<b>SRKIN 14x85</b>	63	14	27	34	85	63	44.5	11	47	M10	5.0
<b>SRKIN 16x85</b>	63	16	27	34	85	63	44.5	11	50	M12	6.0
<b>SRKIN 18x85</b>	63	18	33	42	85	63	57.2	11	50	M12	6.0
<b>SRKIN 20x85</b>	63	20	33	42	85	63	57.2	11	52	M16	8.0
<b>SRKIN 25x90</b>	63	25	44	53	90	68	57.2	11	58	M16	8.0
<b>SRKIN 32x95</b>	63	32	44	53	95	73	57.2	11	58	M16	8.0









# Straight & Morse Taper Shank





# ST-ER-F

## ER collet chucks

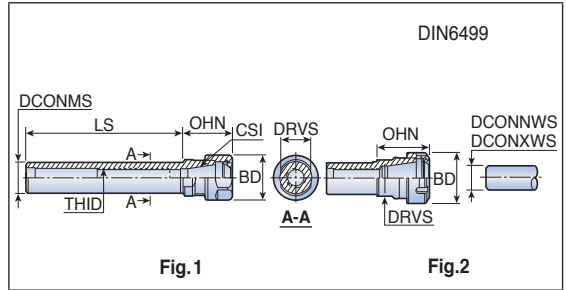
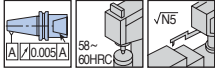
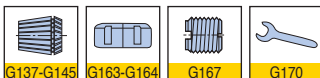


Fig. 1

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>20x100 ER11 F</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	28	2
<b>20x100 ER25</b>	20	ER25	1.0	16.0	42	46.0	100	M12	28	2
<b>20x100 ER25 F</b>	20	ER25	1.0	16.0	42	46.0	100	M12	28	2
<b>25x50 ER25 F</b>	25	ER25	1.0	16.0	42	46.0	50	M16	28	2
<b>25x100 ER25</b>	25	ER25	1.0	16.0	42	46.0	100	M16	28	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>20x100 ER32 F</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	45	2
<b>30x50 ER40 F</b>	32	ER40	3.0	26.0	63	60.0	50	M18x1.5	45	2
<b>32x50 ER40 F</b>	32	ER40	3.0	26.0	63	60.0	50	M18x1.5	45	2
<b>40x75 ER40 F</b>	40	ER40	3.0	26.0	63	55.0	75	M22x1.5	45	2
<b>50x80 ER40 F</b>	50	ER40	3.0	26.0	63	60.0	80	M28x1.5	54	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











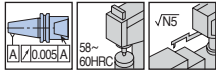
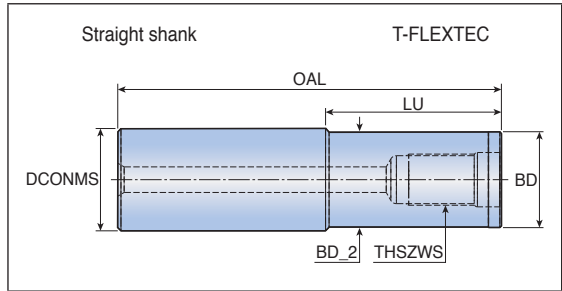




# S M12/16-CT-L



Carbide T-FLEXTEC shanks with internal coolant hole

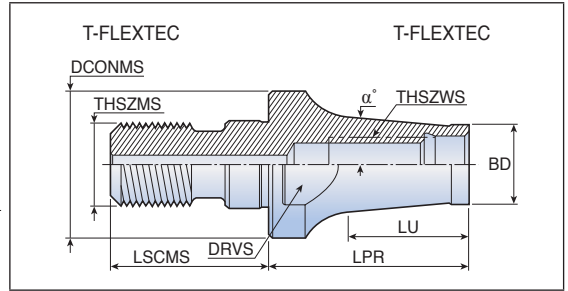
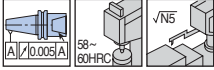


Designation	Dimension (mm)					
	THSZWS	DCONMS	BD	BD_2	OAL	LU
<b>S M12-CT25 - 40-L100</b>	M12	25	24	24.0	100	40
<b>80-L150</b>	M12	25	21	20.5	150	80
<b>80-L150-N</b>	M12	25	24	24.0	150	80
<b>100-L200</b>	M12	25	21	20.5	200	100
<b>100-L200-N</b>	M12	25	24	24.0	200	100
<b>130-L250</b>	M12	25	21	20.5	250	130
<b>140-L200</b>	M12	25	21	20.5	200	140
<b>180-L250</b>	M12	25	24	24.0	250	180
<b>180-L250-B</b>	M12	25	21	20.5	250	180
<b>180-L300</b>	M12	25	21	20.5	300	180
<b>180-L300-N</b>	M12	25	24	24.0	300	180
<b>230-L300</b>	M12	25	21	20.5	300	230
<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

• All shanks have coolant holes



## Reducers

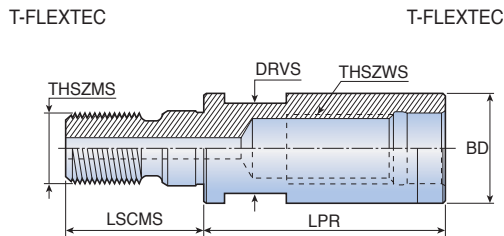
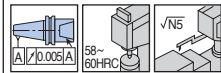


Designation	Dimension (mm)								
	THSZWS	THSZMS	BD	DCONMS	LPR	LSCMS	LU	DRVS	$\alpha^\circ$
<b>CAB M06M08</b>	M06	M08	9.7	13	30	17.5	24.8	9.5	5.7
<b>M08M10</b>	M08	M10	13.0	18	40	20.0	33.4	15.0	5.2
<b>M10M12</b>	M10	M12	18.0	21	45	22.0	36.4	17.0	2.5
<b>M12M16</b>	M12	M16	21.0	29	50	25.0	42.5	25.0	6.3

- 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

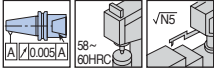
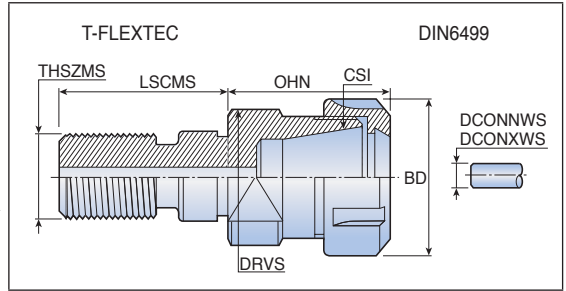
- With coolant holes



# CDP ER-M



Adapters with ER collet chuck



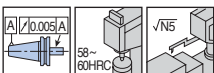
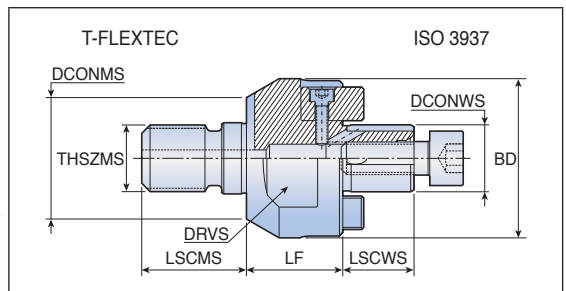
Designation	Dimension (mm)							
	CSI	THSZMS	DCONNWS	DCONXWS	BD	OHN	LSCMS	DRVS
<b>CDP ER11 M10 M</b>	ER11	M10	0.5	7.0	16	27.0	20	15
<b>ER11 M12 M</b>	ER11	M12	0.5	7.0	16	27.0	22	17
<b>ER16 M10 M</b>	ER16	M10	0.5	10.0	22	38.1	20	17
<b>ER16 M12 M</b>	ER16	M12	0.5	10.0	22	37.1	22	17
<b>ER16 M16</b>	ER16	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

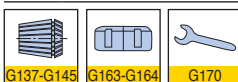
# CAB M-SEM-C



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

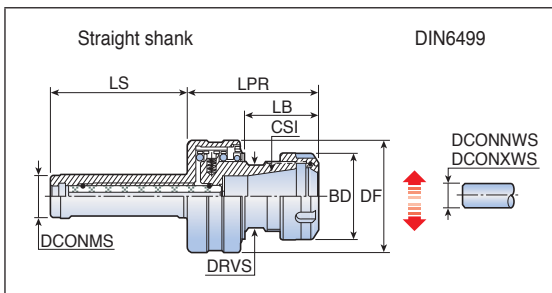
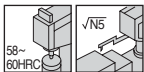






# GFI ST-ER

## GFI floating reamer ER collet chucks

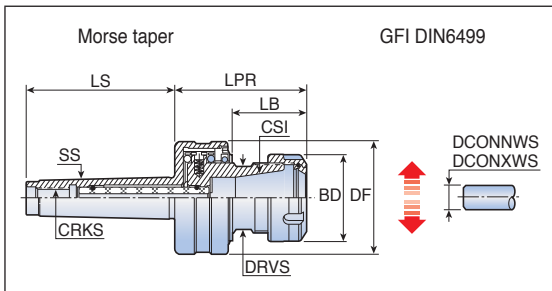
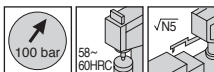


Designation	Dimension (mm)										
	DCONMS	CSI	DCONNWS	DCONXWS	DF	BD	LPR	LB	LS	Radial float	DRVS
<b>GFI ST20 ER20</b>	20	ER20	1.0	13.0	50	34	55.5	34.5	65	1.0	22
<b>ST25 ER32</b>	25	ER32	2.0	20.0	65	50	76.9	45.9	80	1.6	36

• Max. 2,000RPM

# GFI MT-ER

## Morse taper GFI reamer holders



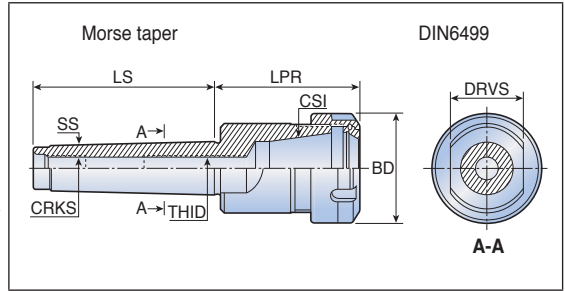
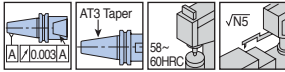
Designation	Dimension (mm)											
	SS	CSI	DCONNWS	DCONXWS	DF	BD	LPR	LB	LS	CRKS	Radial float	DRVS
<b>GFI MT2 ER20</b>	2	ER20	1.0	13.0	50	34	60.5	34.5	64	M10	1.0	22
<b>MT3 ER32</b>	3	ER32	2.0	20.0	65	50	81.9	45.9	81	M12	1.6	36

• Max. 2,000RPM



# MT-ER

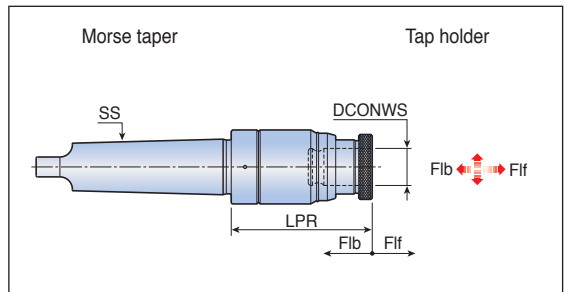
## Morse taper collet chucks



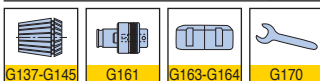
Designation	Dimension (mm)									
	SS	CSI	DCONWS	DCONXWS	BD	LPR	LS	CRKS	THID	DRVS
<b>MT2 ER 20x48.5</b>	2	ER20	1.0	13.0	34	48.5	64.0	M10	M10	22
<b>ER 25x52</b>	2	ER25	1.0	16.0	42	52.0	64.0	M10	M10	28
<b>MT3 ER 32x69</b>	3	ER32	2.0	20.0	50	69.0	81.0	M12	M12	24
<b>ER 40x79</b>	3	ER40	3.0	26.0	63	79.0	81.0	M12	M12	24
<b>MT4 ER 32x61</b>	4	ER32	2.0	20.0	50	60.5	102.5	M16	M16	32
<b>ER 40x82</b>	4	ER40	3.0	26.0	63	81.5	102.5	M16	M16	32
<b>ER 50x108</b>	4	ER50	10.0	34.0	78	107.5	102.5	M16	M16	32
<b>MT5 ER 40x82</b>	5	ER40	3.0	26.0	63	82.0	129.5	M20	M28x1.5	45
<b>ER 50x85</b>	5	ER50	10.0	34.0	78	85.0	129.5	M20	M28x1.5	45

# MTA-TC

## Tap holders - MTA



Designation	Dimension (mm)							
	SS	Tapmin	Tapmax	DCONWS	LPR	Flb	Flf	Tap adapter
<b>MTA3 TC12-90</b>	12	M3	M12	19	90	6.5	12	TA1
<b>TC22-115</b>	22	M6	M24	31	115	14.5	13	TA2
<b>MTA4 TC12-105</b>	12	M3	M12	19	105	6.5	12	TA1
<b>TC22-115</b>	22	M6	M24	31	115	14.5	13	TA2
<b>MTA5 TC12-145</b>	12	M3	M12	19	145	6.5	12	TA1

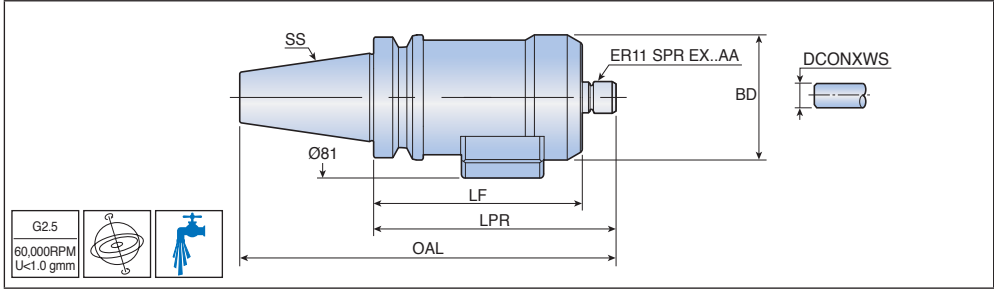


# TYPHOON





## Coolant driven high-speed compact spindles with BT shank



Designation	Dimension (mm)						
	SS	DCONXWS	LF	LPR	BD	OAL	
<b>TJS GJET BT30</b>	30	7.0	124.0	141.0	63.0	189.4	1.6
<b>GJET BT40</b>	40	7.0	107.0	124.0	63.0	189.5	1.8

- 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

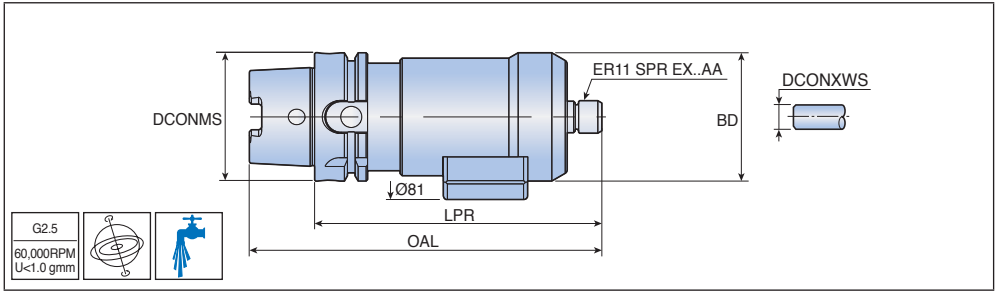
### Spare parts

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

\* Optional, sold separately

# TJS GJET HSK

Coolant driven high-speed compact spindles with HSK shank



Designation	Dimension (mm)					Kg
	DCONMS	DCONXWS	LPR	OAL	BD	
<b>TJS GJET HSK A63</b>	63.0	7.0	141.0	173.0	63.0	1.8

- 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

## Spare parts

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

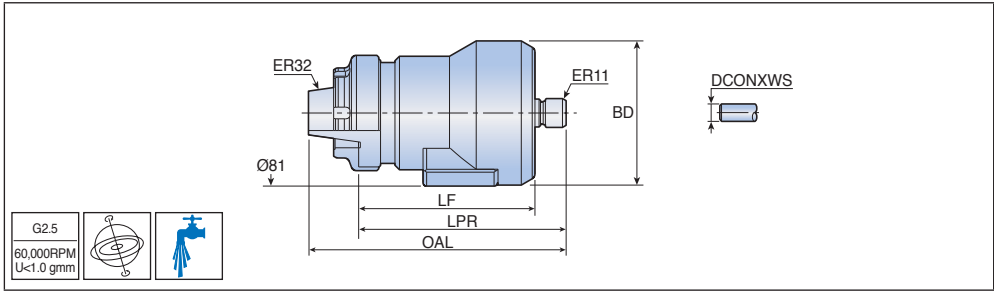
\* Optional, sold separately







## High-pressure coolant driven spindle with ER32 shank for small diameter cutting tools



Designation	Dimension (mm)					Kg
	DCONXWS	LF	LPR	OAL	BD	
<b>TJS HPC ER32</b>	7.0	99.0	116.0	114.0	80	2.0

- 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

### Spare parts

Designation	Mini ER nut	ER wrench	Key	Locking pin	Display*
<b>TJS HPC ER32</b>	NUT ER11 GHS	WRENCH ER11 SMS	HW 2.0	TJS SHAFT LOCK KEY	TJS TSD DISPLAY

\* Optional, sold separately



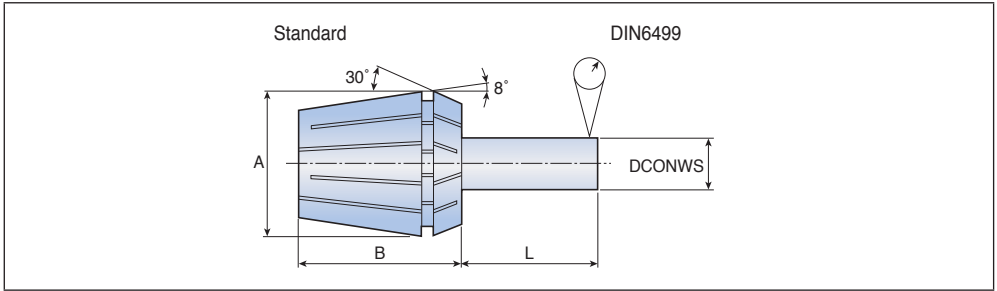




# Collet



# Collet



## Precision

(mm)

DCONWS <sub>range</sub>	L	Run-out		
		Standard precision	Ultra precision	DIN6499
<b>1.0-1.6</b>	<b>6</b>	0.01	0.005	-
<b>1.6-3.0</b>	<b>10</b>	0.01	0.005	0.015
<b>3.0-6.0</b>	<b>16</b>	0.01	0.005	0.015
<b>6.0-10.0</b>	<b>25</b>	0.01	0.005	0.015
<b>10.0-18.0</b>	<b>40</b>	0.01	0.005	0.020
<b>18.0-26.0</b>	<b>50</b>	0.01	0.005	0.020
<b>26.0-34</b>	<b>60</b>	-	-	0.025

## Dimension

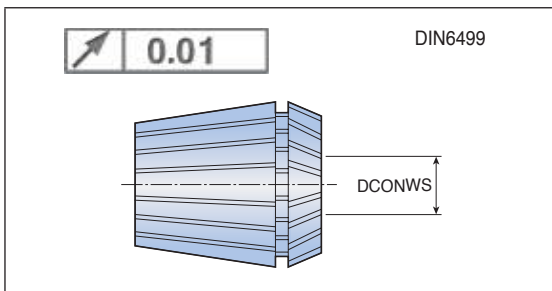
(mm)

Type	A	B
<b>ER11</b>	11.5	18
<b>ER16</b>	17.0	27
<b>ER20</b>	21.0	31
<b>ER25</b>	26.0	35
<b>ER32</b>	33.0	40
<b>ER40</b>	41.0	46
<b>ER50</b>	52.0	60



# ER-SPR

## ER spring collets - Precision

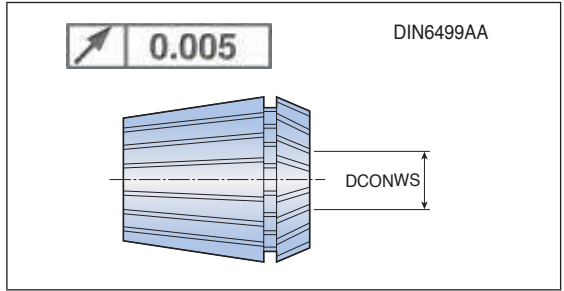


DCONWS <sub>range</sub>	ER11	ER16	ER20	ER25	ER32	ER40	ER50
<b>0.5-1</b>	ER11 SPR 0.5-1.0	ER16 SPR 0.5-1					
<b>1-2</b>	<b>1-1.5</b>	1.0-1.5					
	<b>1.5-2</b>	1.5-2.0	1-2 ER20 SPR 1-2	ER25 SPR 1-2			
<b>2-3</b>	<b>2-2.5</b>	2.0-2.5					
	<b>2.5-3</b>	2.5-3.0	2-3	2-3	2-3 ER32 SPR 2-3		
<b>3-4</b>	<b>3-3.5</b>	3.0-3.5					
	<b>3.5-4</b>	3.5-4.0	3-4	3-4	3-4	3-4 ER40 SPR 3-4	
<b>4-5</b>	<b>4-4.5</b>	4.0-4.5					
	<b>4.5-5</b>	4.5-5.0	4-5	4-5	4-5	4-5	4-5
<b>5-6</b>	<b>5-5.5</b>	5.0-5.5					
	<b>5.5-6</b>	5.5-6.0	5-6	5-6	5-6	5-6	5-6
<b>6-7</b>	<b>6-6.5</b>	6.0-6.5					
	<b>6.5-7</b>	6.5-7.0	6-7	6-7	6-7	6-7	6-7
<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		1-2AA	ER20 SPR 1-2AA	ER25 SPR 1-2AA	
	<b>1.5-2</b>	1.5-2.0AA					
<b>2-3</b>	<b>2-2.5</b>	2.0-2.5AA		2-3AA			
	<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		3-4AA			
	<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		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		5-6AA			
	<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		6-7AA			
	<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



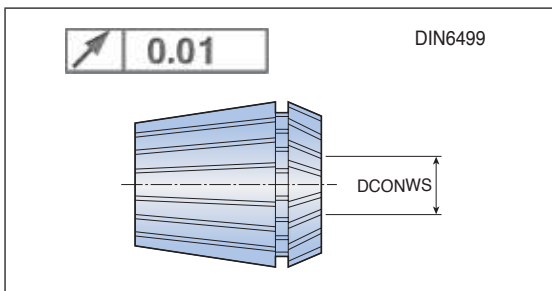






# SET ER-SPR

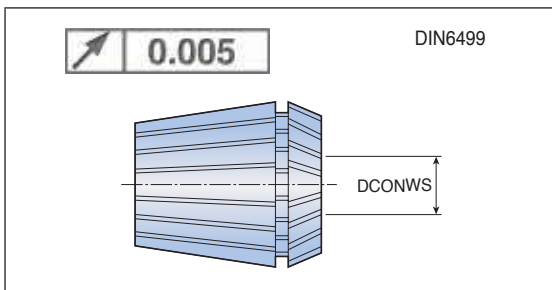
ER spring collet sets - Precision



Designation	Pieces / set	DCONWS <sub>range</sub>
<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”

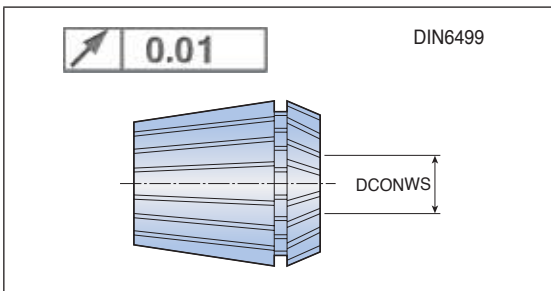


Designation	Pieces / set	DCONWS <sub>range</sub>
<b>SET ER11 SPR 13AA</b>	13	0.5-7
<b>ER16 SPR 10AA</b>	10	0.5-10
<b>ER20 SPR 12AA</b>	12	1-13
<b>ER25 SPR 15AA</b>	15	1-16
<b>ER32 SPR 18AA</b>	18	2-20
<b>ER40 SPR 23AA</b>	23	3-26



# SET ER-SPR-EM

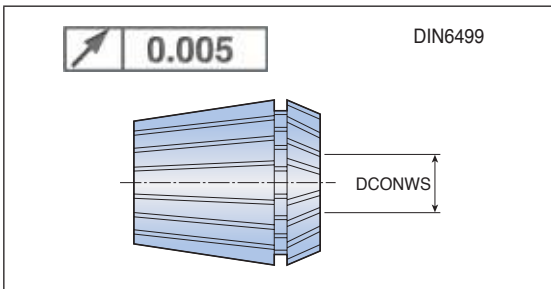
ER spring collet sets - Precision



Designation	Pieces / set	DCONWSrange
<b>SET ER16 SPR 7 EM</b>	7	1,2,3,4,5,6,7
<b>ER16 SPR 8 EM</b>	8	3, 4, 5, 6, 7, 8, 9, 10
<b>ER20 SPR 5 EM</b>	5	4, 6, 8, 10, 12
<b>ER25 SPR 6 EM</b>	6	4, 6, 8, 10, 12, 16
<b>ER32 SPR 6 EM</b>	6	6, 8, 10, 12, 16, 20
<b>ER40 SPR 7 EM</b>	7	6, 8, 10, 12, 16, 20, 25

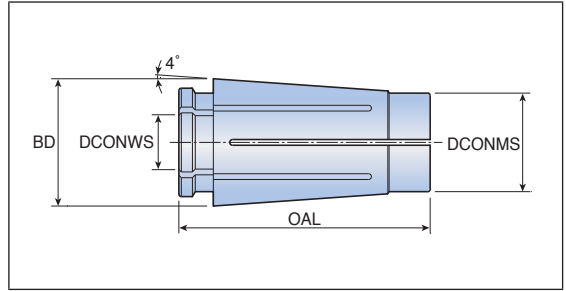
# SET ER-SPR-EM AA

ER spring collet sets – Ultra precision “AA”



Designation	Pieces / set	DCONWSrange
<b>SET ER11 SPR 7 EM AA</b>	7	1,2,3,4,5,6,7





Designation	Dimension (mm)		
	BD	DCONMS	OAL
<b>TSK 06</b>	10.4	7.5	25.0
<b>TSK 10</b>	15.5	12.0	30.6
<b>TSK 16</b>	24.6	18.8	45.0
<b>TSK 25</b>	35.7	28.8	57.0

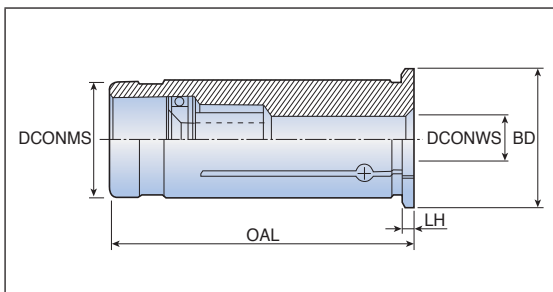
DCONWS <sub>range</sub>	TSK 06	TSK 10	TSK 16	TSK 25
<b>1.5-2.0</b>	TSK 06-2.0	TSK 10-2.0		
<b>2.0-2.5</b>	TSK 06-2.5	TSK 10-2.5		
<b>2.5-3.0</b>	TSK 06-3.0	TSK 10-3.0	TSK 16-3.0	
<b>3.0-3.5</b>	TSK 06-3.5	TSK 10-3.5	TSK 16-3.5	
<b>3.5-4.0</b>	TSK 06-4.0	TSK 10-4.0	TSK 16-4.0	
<b>4.0-4.5</b>	TSK 06-4.5	TSK 10-4.5	TSK 16-4.5	
<b>4.5-5.0</b>	TSK 06-5.0	TSK 10-5.0	TSK 16-5.0	
<b>5.0-5.5</b>	TSK 06-5.5	TSK 10-5.5	TSK 16-5.5	
<b>5.5-6.0</b>	TSK 06-6.0	TSK 10-6.0	TSK 16-6.0	
<b>6.0-6.5</b>		TSK 10-6.5	TSK 16-6.5	
<b>6.5-7.0</b>		TSK 10-7.0	TSK 16-7.0	
<b>7.0-7.5</b>		TSK 10-7.5	TSK 16-7.5	
<b>7.5-8.0</b>		TSK 10-8.0	TSK 16-8.0	TSK 25-8.0
<b>8.0-8.5</b>		TSK 10-8.5	TSK 16-8.5	TSK 25-8.5
<b>8.5-9.0</b>		TSK 10-9.0	TSK 16-9.0	TSK 25-9.0
<b>9.0-9.5</b>		TSK 10-9.5	TSK 16-9.5	TSK 25-9.5
<b>9.5-10.0</b>		TSK 10-10.0	TSK 16-10.0	TSK 25-10.0
<b>10.0-10.5</b>			TSK 16-10.5	TSK 25-10.5
<b>10.5-11.0</b>			TSK 16-11.0	TSK 25-11.0
<b>11.0-11.5</b>			TSK 16-11.5	TSK 25-11.5
<b>11.5-12.0</b>			TSK 16-12.0	TSK 25-12.0
<b>12.0-12.5</b>			TSK 16-12.5	TSK 25-12.5
<b>12.5-13.0</b>			TSK 16-13.0	TSK 25-13.0
<b>13.0-13.5</b>			TSK 16-13.5	TSK 25-13.5
<b>13.5-14.0</b>			TSK 16-14.0	TSK 25-14.0
<b>14.0-14.5</b>			TSK 16-14.5	TSK 25-14.5
<b>14.5-15.0</b>			TSK 16-15.0	TSK 25-15.0
<b>15.0-15.5</b>			TSK 16-15.5	TSK 25-15.5
<b>15.5-16.0</b>			TSK 16-16.0	TSK 25-16.0
<b>16.0-16.5</b>				TSK 25-16.5
<b>16.5-17.0</b>				TSK 25-17.0





# THC

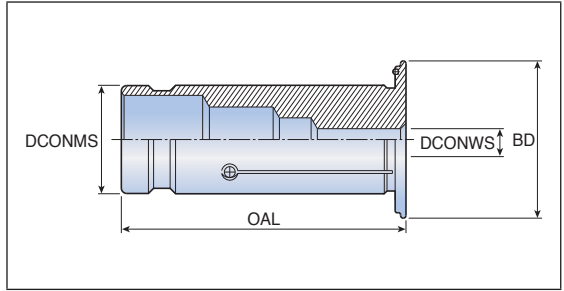
## Straight collets for hydraulic chucks



Designation	Dimension (mm)				
	DCONMS	DCONWS	BD	OAL	LH
<b>THC 12-3</b>	12	3	16	46.5	2
<b>12-4</b>	12	4	16	46.5	2
<b>12-5</b>	12	5	16	46.5	2
<b>12-6</b>	12	6	16	46.5	2
<b>12-7</b>	12	7	16	46.5	2
<b>12-8</b>	12	8	16	46.5	2
<b>12-9</b>	12	9	16	46.5	2
<b>20-3</b>	20	3	24	50.5	2
<b>20-4</b>	20	4	24	50.5	2
<b>20-5</b>	20	5	24	50.5	2
<b>20-6</b>	20	6	24	50.5	2
<b>20-7</b>	20	7	24	50.5	2
<b>20-8</b>	20	8	24	50.5	2
<b>20-9</b>	20	9	24	50.5	2
<b>20-10</b>	20	10	24	50.5	2
<b>20-11</b>	20	11	24	50.5	2
<b>20-12</b>	20	12	24	50.5	2
<b>20-13</b>	20	13	24	50.5	2
<b>20-14</b>	20	14	24	50.5	2
<b>20-15</b>	20	15	24	50.5	2
<b>20-16</b>	20	16	24	50.5	2
<b>20-17</b>	20	17	24	50.5	2
<b>32-6</b>	32	6	36	60.5	3
<b>32-8</b>	32	8	36	60.5	3
<b>32-10</b>	32	10	36	60.5	3
<b>32-12</b>	32	12	36	60.5	3
<b>32-14</b>	32	14	36	60.5	3
<b>32-16</b>	32	16	36	60.5	3
<b>32-18</b>	32	18	36	60.5	3
<b>32-20</b>	32	20	36	60.5	3
<b>32-25</b>	32	25	36	60.5	3

# THC C

Straight collets of internal coolant type for hydraulic chucks



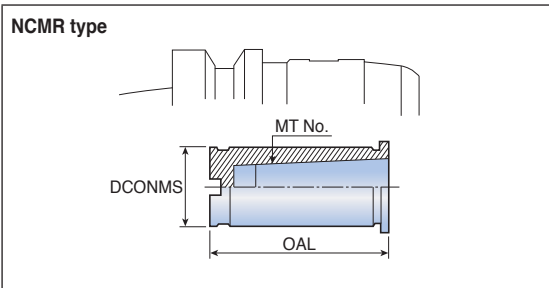
Designation	Dimension (mm)			
	DCONMS	DCONWS	BD	OAL
<b>THC C12-3</b>	12	3	19	47.0
<b>C12-4</b>	12	4	19	47.0
<b>C12-5</b>	12	5	19	47.0
<b>C12-6</b>	12	6	19	47.0
<b>C12-7</b>	12	7	19	47.0
<b>C12-8</b>	12	8	19	47.0
<b>C20-3</b>	20	3	29	52.5
<b>C20-4</b>	20	4	29	52.5
<b>C20-5</b>	20	5	29	52.5
<b>C20-6</b>	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





# NCMR

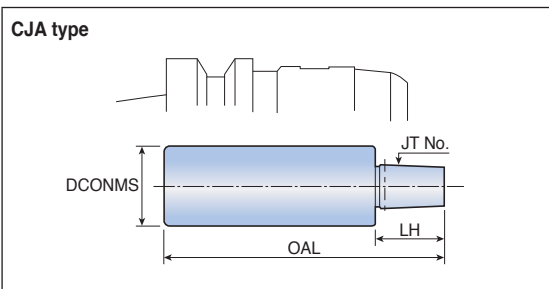
## Collet for milling chucks - Morse taper adapter for milling chuck



Designation	MT No.	Dimension (mm)		Application chuck
		DCONMS	OAL	
<b>NCMR 32-1</b>	1	32	60	NTMC 32
<b>32-2</b>	2	32	72	NTMC 32
<b>32-3</b>	3	32	90	NTMC 32
<b>42-1</b>	1	42	60	NTMC 42
<b>42-2</b>	2	42	72	NTMC 42
<b>42-3</b>	3	42	90	NTMC 42
<b>42-4</b>	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	
<b>CJA 32-6</b>	6	32	118	28	NTMC 32
<b>42-6</b>	6	42	128	28	NTMC 42



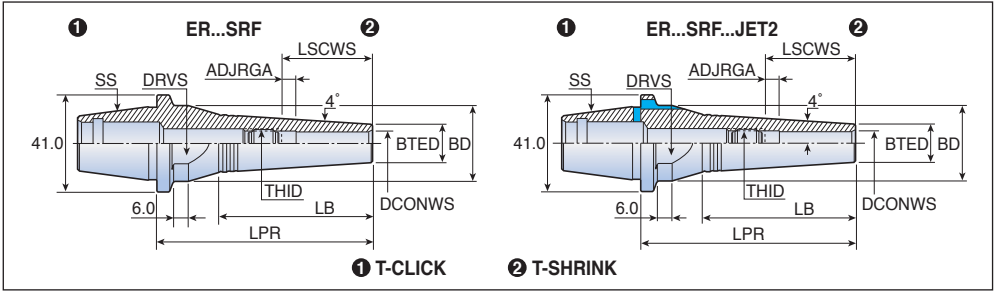








## ER collets

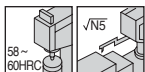
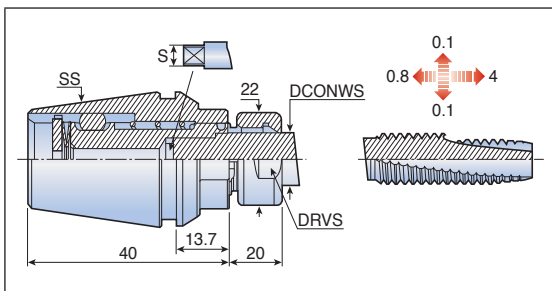


Designation	Dimension (mm)									
	SS	DCONWS	BTED	BD	LPR	LB	ADJRGA	LSCWS	THID	DRVS
<b>ER32 SRF 3x50</b>	32 SRF	3	10	32	50	31.0	6	16	M6	27
<b>SRF 3x85</b>	32 SRF	3	10	32	85	60.5	6	16	M6	27
<b>SRF 4x50</b>	32 SRF	4	10	32	50	31.0	6	18	M6	27
<b>SRF 4x85</b>	32 SRF	4	10	32	85	60.5	6	18	M6	27
<b>SRF 5x50</b>	32 SRF	5	10	32	50	31.0	6	21	M6	27
<b>SRF 5x85</b>	32 SRF	5	10	32	85	60.5	6	21	M6	27
<b>SRF 6x50</b>	32 SRF	6	11	32	50	31.0	6	24	M8	27
<b>SRF 6x85</b>	32 SRF	6	11	32	85	60.5	6	24	M8	27
<b>SRF 8x50</b>	32 SRF	8	14	32	50	33.0	6	31	M10	27
<b>SRF 8x85</b>	32 SRF	8	14	32	85	60.5	6	31	M10	27
<b>SRF 10x50</b>	32 SRF	10	16	32	50	35.0	5	35	M12	27
<b>SRF 10x85</b>	32 SRF	10	16	32	85	60.5	6	36	M12	27
<b>SRF 12x50</b>	32 SRF	12	20	32	50	35.0	5	37	M14	27
<b>SRF 12x85</b>	32 SRF	12	20	32	85	50.0	6	38	M14	27
<b>ER32 SRF 3x50 JET2</b>	32 SRF	3	10	32	50	31.0	6	16	M6	27
<b>SRF 3x85 JET2</b>	32 SRF	3	10	32	85	60.5	6	16	M6	27
<b>SRF 4x50 JET2</b>	32 SRF	4	10	32	50	31.0	6	18	M6	27
<b>SRF 4x85 JET2</b>	32 SRF	4	10	32	85	60.5	6	18	M6	27
<b>SRF 5x85 JET2</b>	32 SRF	5	10	32	85	60.5	6	21	M6	27
<b>SRF 6x50 JET2</b>	32 SRF	6	11	32	50	31.0	6	24	M8	27
<b>SRF 6x85 JET2</b>	32 SRF	6	11	32	85	60.5	6	24	M8	27
<b>SRF 8x50 JET2</b>	32 SRF	8	14	32	50	33.0	6	31	M10	27
<b>SRF 8x85 JET2</b>	32 SRF	8	14	32	85	60.5	6	31	M10	27
<b>SRF 10x50 JET2</b>	32 SRF	10	16	32	50	35.0	5	35	M12	27
<b>SRF 10x85 JET2</b>	32 SRF	10	16	32	85	60.5	6	36	M12	27
<b>SRF 12x50 JET2</b>	32 SRF	12	20	32	50	35.0	5	37	M14	27
<b>SRF 12x85 JET2</b>	32 SRF	12	20	32	85	50.0	6	38	M14	27

• Tightening torque: 24 kg × m

# GTIN ER

## GTIN ER collets



## GTIN ER 32 - DIN 371 / 352

Designation	Dimension (mm)					
	SS	DCONWS	Tap <sub>min</sub>	Tap <sub>max</sub>	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	Tap <sub>min</sub>	Tap <sub>max</sub>	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





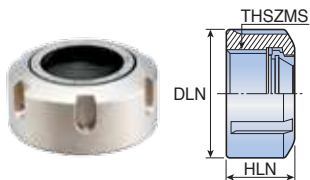


# Accessories



# NUT ER TOP

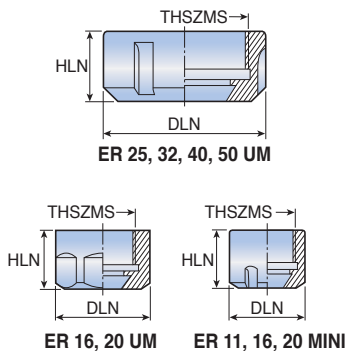
## ER - Top™ clamping nuts



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

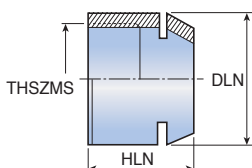
## ER clamping nuts



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


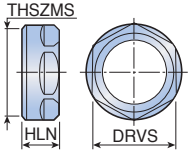
## Tightening nuts



Designation	Dimension (mm)			
	DLN	HLN	THSZMS	Wrench
<b>NUT ER11 GHS</b>	16	11.5	M13x0.75	WRENCH ER11 SMS

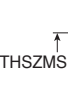
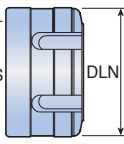
# NUT ER SHORT

## 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		

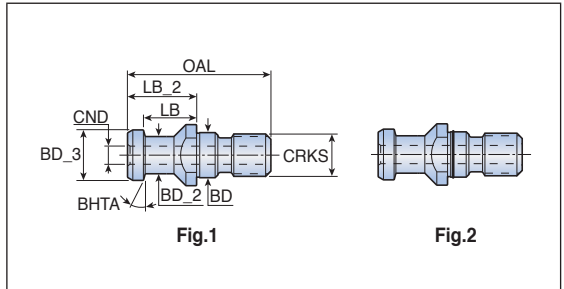
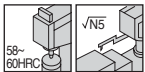
# TSKN

## TSK clamping nuts

 <p>Fig.1</p>	 <p>Fig.2</p>	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

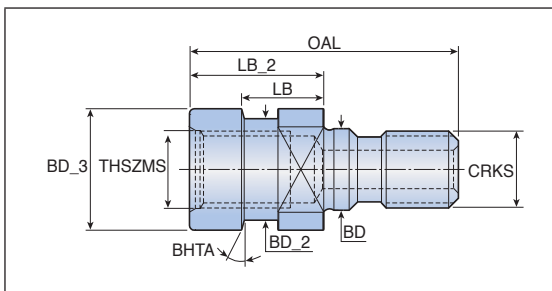


Designation	Dimension (mm)									Fig.
	CRKS	BD	BD_2	BD_3	CND	LB	LB_2	OAL	BHTA	
<b>PS SK30 15° M12 DIN</b>	M12	13	9.0	13.00	-	19.00	24.00	44.0	15	1
<b>PS SK40 15° M16 DIN</b>	M16	17	14.0	19.00	-	20.00	26.00	54.0	15	1
<b>15° M16 DIN O</b>	M16	17	14.0	19.00	-	20.00	26.00	54.0	15	2
<b>15° M16 DIN B</b>	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

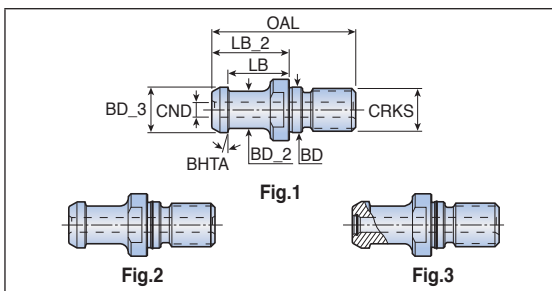
## Pull studs OTT system



Designation	Dimension (mm)								
	CRKS	THSZMS	BD	BD_2	BD_3	LB	LB_2	OAL	BHTA
<b>PS OTT BT40 M16</b>	M16	M16	17	21.1	25.0	16.60	28	56	15
<b>BT50 M24</b>	M24	M24	24	32.0	39.3	13.35	25	65	15
<b>SK40 M16</b>	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



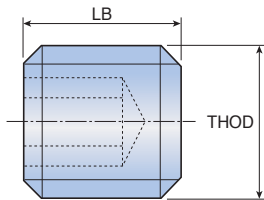
Designation	Dimension (mm)									Fig.
	CRKS	BD	BD_2	BD_3	CND	LB	LB_2	OAL	BHTA	
<b>PS BT30 15° M12 JIS B</b>	M12	13	8.00	12.00	4.0	18.40	23.4	43.0	15	1
<b>BT40 15° M16 JIS B</b>	M16	17	14.00	19.00	5.5	23.00	29.0	54.0	15	1
<b>BT40 15° M16 JIS O B</b>	M16	17	14.00	19.00	5.5	23.00	29.0	54.0	15	2
<b>BT40 15° M16 JIS O B O</b>	M16	17	14.00	19.00	5.5	23.00	29.0	54.0	15	3
<b>BT50 15° M24 JIS B</b>	M24	25	21.00	28.00	8.0	25.00	34.0	74.0	15	1
<b>BT50 15° M24 JIS O B</b>	M24	25	21.00	28.00	8.0	25.00	34.0	74.0	15	2
<b>BT50 15° M24 JIS O B O</b>	M24	25	21.00	28.00	8.0	25.00	34.0	74.0	15	3
<b>BT40 45° M16 MAZAK B</b>	M16	17	12.45	18.79	7.0	14.02	19.1	44.1	45	1
<b>BT50 45° M24 MAZAK B</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



# 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

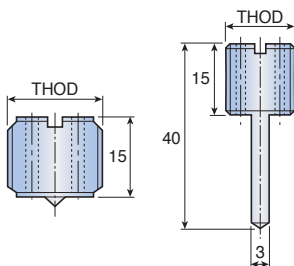


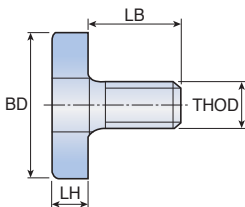
Fig.1

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

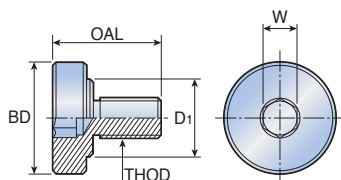
Lock screw DIN6367 for face mill arbors



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

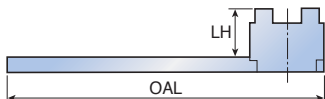


Designation	Dimension (mm)				
	THOD	BD	D1	OAL	W
<b>MBA M8</b>	M8x1.25	20	15	24	6
<b>M10</b>	M10x1.5	28	18	28	8
<b>M12</b>	M12x1.75	33	23	32	10
<b>M16</b>	M16x2.0	40	23	40	14
<b>M20</b>	M20x2.5	50	27	50	17
<b>M24</b>	M24x3.0	65	37	60	19

• Wrench for MBA screw: L-W □□

# WRENCH M-SEMC

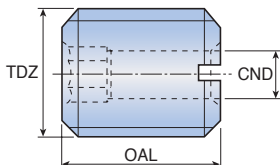
## Wrench DIN6368 for combi shell end mill holders



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

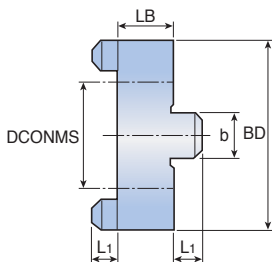
## SRKIN thermal shrink collets



Designation	Dimension (mm)				
	TDZ	OAL	CND	Used for shanks	Hex key
<b>PRESET SCREW M5x18 B</b>	M5	18	2.1	EM E / SRKIN	2.5
<b>M6x20 B</b>	M6	20	2.5	EM E / SRKIN	3.0
<b>M8x20 B</b>	M8	20	3.5	EM E / SRKIN	4.0
<b>M10x18 B</b>	M10	18	4.5	EM E / SRKIN	5.0
<b>M12x18 B</b>	M12	18	5.5	EM E / SRKIN	6.0
<b>M16x20 B</b>	M16	20	7.5	EM E / SRKIN	6.0
<b>M16x25 B</b>	M16	25	7.5	SRKIN	6.0
<b>M20x20 B</b>	M20	20	6.0	EM E	6.0

# D-RING SEMC

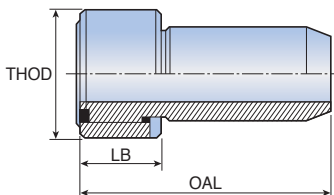
Driving ring DIN6366/1 for combi shell end mill holders



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

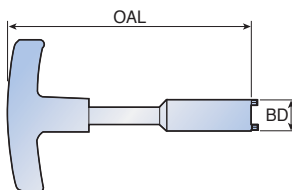
HSK A cooling tube



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

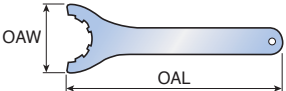




Designation	Dimension (mm)	
	BD	OAL
<b>WRENCH COOL TUBE HSK A 50</b>	15.0	120
<b>HSK A 63</b>	17.0	122
<b>HSK A 83</b>	18.5	186
<b>HSK A 100</b>	22.0	141



# WRENCH ER-MINI/SHORT/CLICKIN

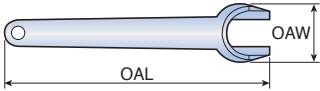
## ER wrench

DIN6499	Designation	Dimension (mm)		
		OAW	DRVS	OAL
 <p>Wrench ER 25, 32, 40, 50</p>	<b>WRENCH ER11 MINI</b>	16.8	-	95
	<b>ER11</b>	32.0	17	95
 <p>Wrench ER 11, 16, 20, 25 MINI</p>	<b>ER16 MINI</b>	22.5	-	117
	<b>ER16</b>	42.8	25	143
 <p>Wrench ER 11, 16, 20, SHORT, CLICKIN</p>	<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
	<b>ER32 CLICKIN 32</b>	67.0	32	273

# WRENCH ER11 SMS

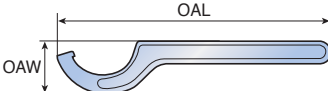


## ER11 Tightening wrench

	Designation	Dimension (mm)	
		OAW	OAL
	<b>WRENCH ER11 SMS</b>	22	100


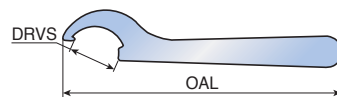
# SPANNER TMC

## 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

# TSKS

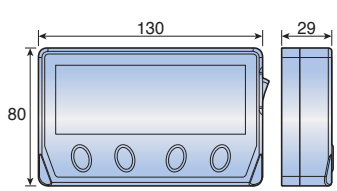
## TSK slim chuck wrench

	Designation	Dimension (mm)		Fig.
		DRVS	OAL	
 <p>Fig.1</p>	<b>TSKS - 6</b>	18.0	174	1
	<b>10</b>	25.4	177	1
	<b>16</b>	36.0	189	2
	<b>25</b>	52.0	228	2
 <p>Fig.2</p>				

# TJS TSD DISPLAY

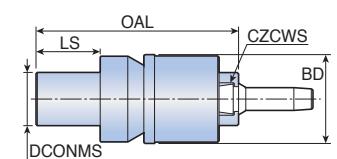


## RPM speed display for TYPHOON high-speed spindles

	Designation	Machines
	<b>TJS TSD DISPLAY</b>	TTS spindles

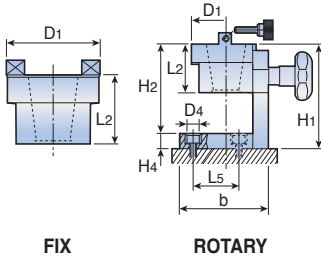
# IND ER11 TOOL ADAPTER

## ER 11 shrink collet adapter for induction heating device

	Designation	Dimension (mm)				
		CZCWS	BD	DCONMS	OAL	LS
	<b>IND ER11 TOOL ADAPTER</b>	ER11	33.2	19.9	75.7	24

# TOOL CLAMP-ROTARY/FIX

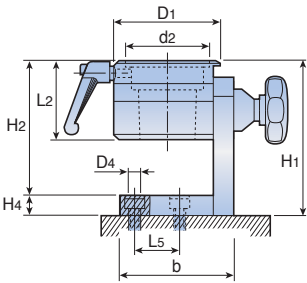
Tool clamp fixture - ISO, DIN69871, BT MAS-403



Designation	Dimension (mm)									
	CSI	b	D1	D4	L2	H1	H2	H4	L5	
<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>50 FIX</b>	FIX	-	103	-	71	-	-	-	-	

# MULTI CLAMP-A/C

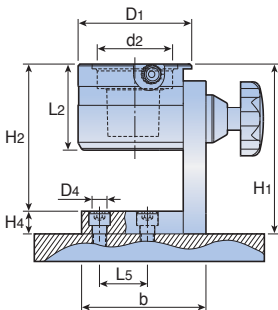
Tool clamp fixture rotary - For HSK shanks



Designation	Dimension (mm)										
	CSI	b	d2	D1	D4	L2	L5	H1	H2	H4	
<b>MULTI CLAMP 50 A/C</b>	50	104	50	82.0	12.5	72	40	142	123	19	
<b>63 A/C</b>	63	104	63	95.0	12.5	72	40	142	123	19	
<b>100 A/C</b>	100	144	100	130.0	12.5	90	85	178	159	19	

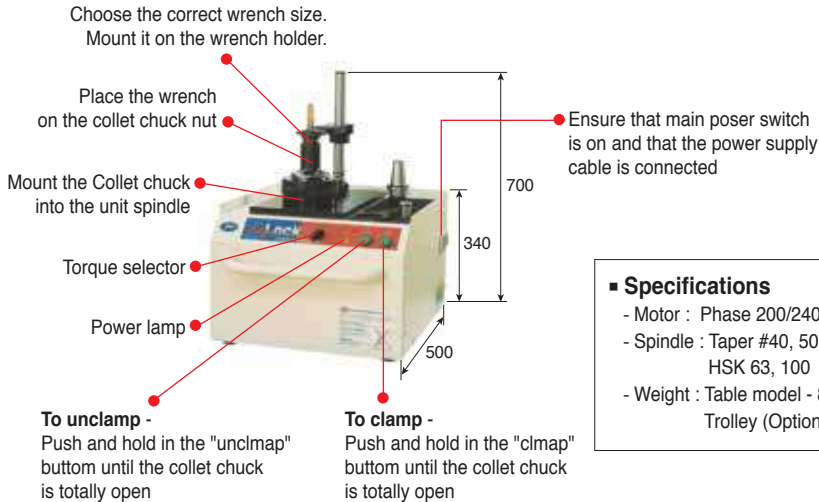
# MULTI CLAMP C

C-ADAPTER rotary clamp



Designation	Dimension (mm)									
	SS	b	d2	D1	D4	L2	L5	H1	H2	H4
<b>MULTI CLAMP C6</b>	63	104	63	95	12.5	72	40	142	123	19

# EASYLOCK T.C EU

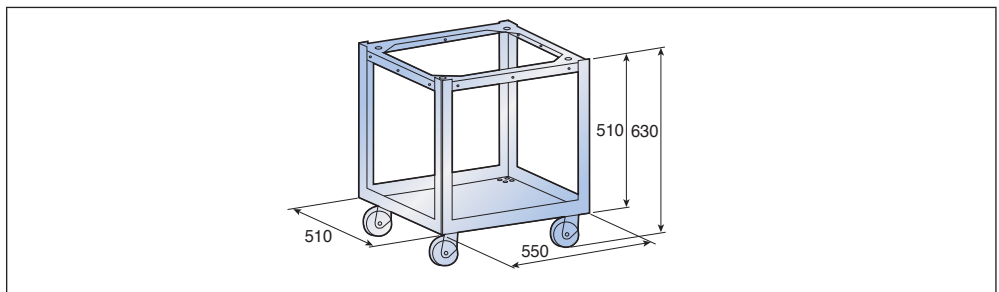


■ Specifications	
- Motor :	Phase 200/240V, 50/60HZ(1HP)
- Spindle :	Taper #40, 50 HSK 63, 100
- Weight :	Table model - 85kg Trolley (Optional) - 15kg

**Note:** Assemble the collet and cutting tools. By hand, place the nut onto the collet chuck.

Designation	TaeguTec No.	Accessories	
		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

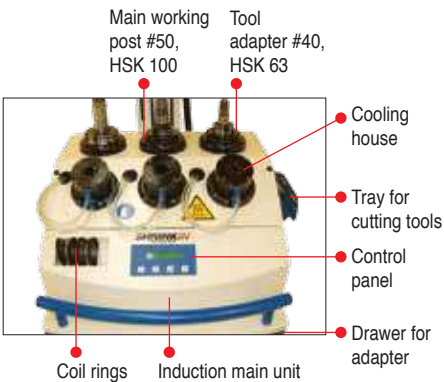


Designation	TaeguTec No.
<b>EASYLOCK TROLLEY</b>	4651109

## Induction heating units



Technical specifications		
Clamping range	3-32mm	Carbide tool shank
Clamping range	6-32mm	
Main power supply	3x380 - 500V 50/60Hz	
Nominal power	13kW	
Nominal current	16 AMP	
Cooling unit power supply	220V 50Hz	
Nominal power	0.5kW	
Max. tool length	440mm (From gauge line)	
Max. dia. clamping chuck	52mm	
Effective induction field length	45mm	
Expansion time	5-12 seconds	
Cooling time	50-90 seconds	
Weight	150kg	
Overall dimensions	170x73x60cm	



INDUCTION starter unit  
4654106 IND SHRINK START UNIT EUR  
• One working post without cooling unit

TaeguTec No.	Designation	Includes
<b>4652264</b>	<b>IND SHRINKIN UNIT EUR</b>	Induction unit, cooling unit, trolley, three tool adapters

Cooling sleeves		Used for
<b>IND COOLING COLLET</b>	<b>6-8</b>	SRKIN
	<b>10-12</b>	SRKIN
	<b>14-16</b>	SRKIN
	<b>18-20</b>	SRKIN
	<b>ER 3-5</b>	SRK
	<b>ER 6</b>	SRK
	<b>ER 8</b>	SRK
	<b>ER 10</b>	SRK
	<b>ER 12</b>	SRK

Optional tool adapter for HSK	
<b>IND 32 HSK TOOL ADAPTER</b>	
<b>40 HSK TOOL ADAPTER</b>	
<b>50 HSK TOOL ADAPTER<sup>(1)</sup></b>	
<b>63 HSK TOOL ADAPTER</b>	
<b>80 HSK TOOL ADAPTER</b>	

• <sup>(1)</sup> For taper #30

# Technical Data

## ► Sealed 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
- In sealed collet JET2 the nozzle must be adjusted directly to the flute of the cutting tool
- Suitable for all shank standards

## ► TaeguTec ER coolant sealed collet

### ■ Two types:



Sealed collet JET

For straight shank cutting tools with internal coolant supply



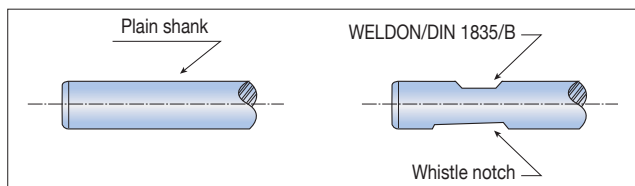
Sealed collet JET 2

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

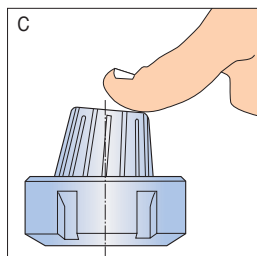
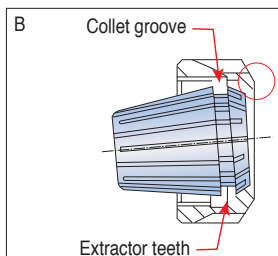
To insert collet: Always assemble the collet into the nut before mounting onto the collet chuck.

### ■ 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.

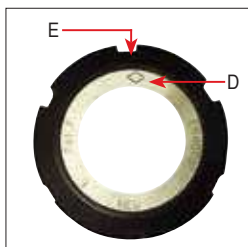
When unclamping the nut, the collet will self release from the chuck by means of the extractor teeth.

# Technical Data

## ► ER - Top clamping nut DIN6499

### ■ Extracting procedure

- 1 Align the diamond-shaped engraved logo which is on the silver ring (D) to any of the key slots (E) of the nut.
- 2 Place the nut with the collet facing down on a clean and horizontal work surface.
- 3 Insert a screwdriver vertically between the nut slots and the collet - on the reverse side of the diamond shaped engraved logo (D).
- 4 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  
(Provided with the set)



b. Nut



c. Collet

❶ Insert the back end of the collet (c) into the assembly device (a)



❷ Insert the combined part (a+c) in the nut (b)



❸ Pluck out the assembly device (a) from the remaining part (b+c)



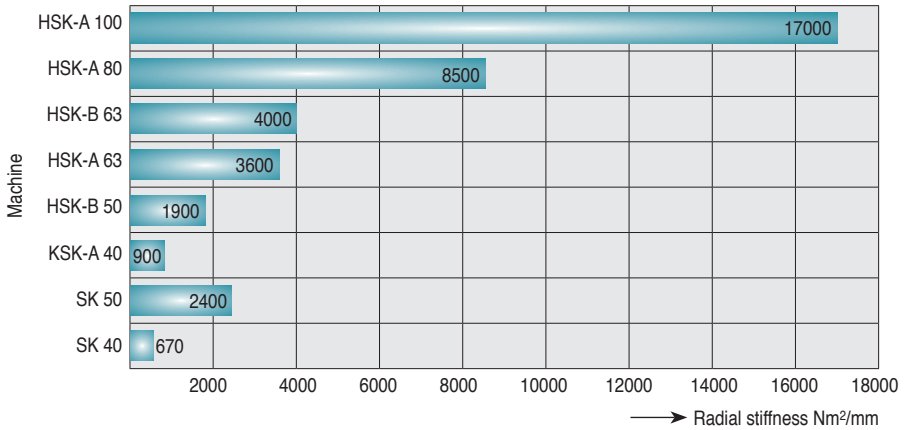
# Technical Data

## ▶ 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

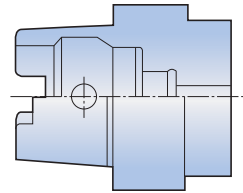
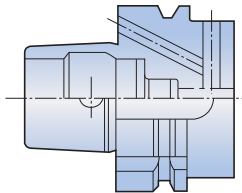
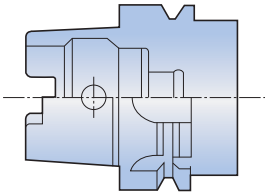


## ▶ Type

■ A type: Automatic tool change

■ B type: With coolant through face

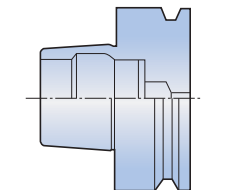
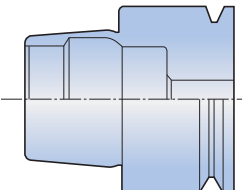
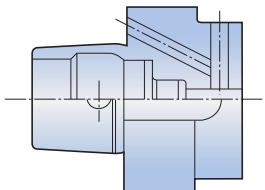
■ C type: Manual clamp



■ D type: With coolant through face

■ E type: Super high speed

■ F type: Ultra high speed

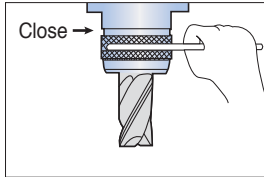
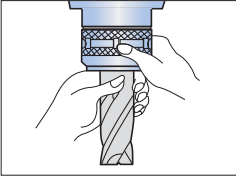


# Technical Data

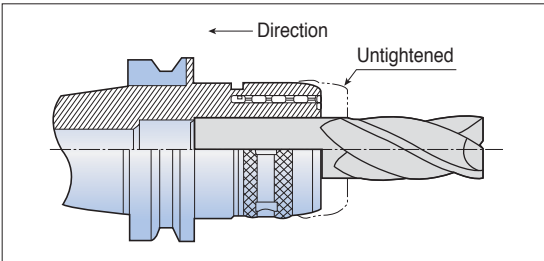
## ► Milling chuck

- Exceptional gripping power and simple operation
- Torque

Type	Torque (kgf•m)
NTMC 25	180
NTMC 32	360
NTMC 42	520

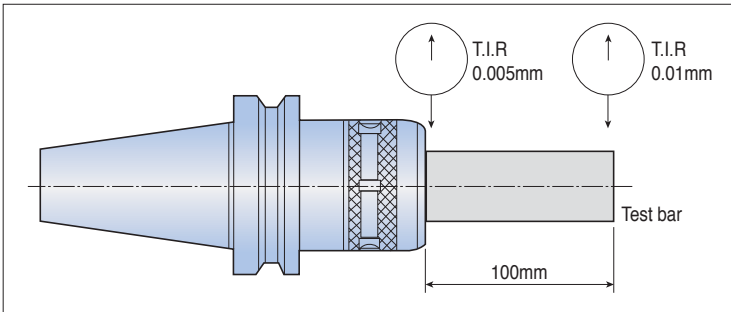


Tighten slightly when collar is close to body (Avoid hammering)



- 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.



## Quick-change system

- DIN 69871

- HSK

- BT MAS 403

- T-CLICK advantages

- Taper and face contact
- Ideal for high speed machining
- High precision: Low run-out
- Excellent rigidity
- Quick and easy clamping

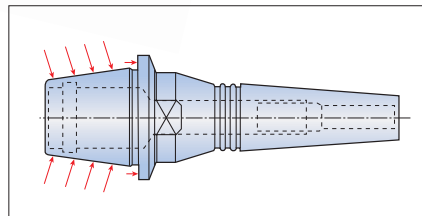
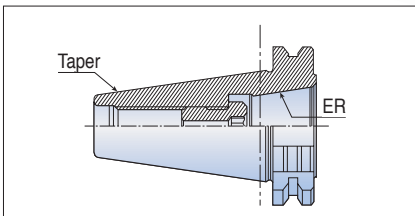


- Quick-change advantages

- Quick tool change: The taper shank and the holder connect in a quick half turn
- No thermal shock on holder taper
- Flexibility in diameter and length
- Eliminates the use of extension chuck
- No spare parts required
- T-CLICK blanks available to provide custom made tooling
- Shrink clamping for solid carbide tooling

Tightening torque: 235N•m

G2.5
20,000 RPM



## ► Hydraulic chuck

### ■ Features & advantages

- Consistent gripping force
- Excellent accuracy (Run-out : within  $5\mu\text{m}$ )
- Convenient and safe tool change using a clamping screw
- Can use THC straight collets (Normal & coolant type)

### ■ Application

- Accurate machining
  - a) Fine milling, reaming, fine boring
- Drilling: Small diameter using carbide drill
  - a) For Al or Cast iron

### ■ Operation

- Tool mounting
  - a) Insert the tool shank between  $L_{\text{max}}$  and  $L_{\text{min}}$  (Fig 1.) and then, turn the clamping screw clockwise until it can no longer rotate.
- Tool releasing
  - a) To release the tool from the hydraulic chuck, turn the clamping screw in a counter clock-wise direction approximately 5 or 6 evolutions and remove the tool shank.

### - Notice

- a) **Eliminate grease, coolant oil and any dirt** from the internal bore of the hydraulic chuck and tool shank prior to mounting.
- b) **Ensure the minimum chucking length ( $L_{\text{min}}$ )** is maintained. (see Fig 1. & Table 1.)
- c) Cylindrical tool shanks available in accordance with  **$h6$  tolerance** (Table 2.) and  **$Ra \text{ min} = 0.3\mu\text{m}$  (ground)** and weldon shanks should be used in collet only.
- d) Remove the end tool from the hydraulic chuck when not in use for long periods of time.
- e) Do not turn the clamping screw prior to tool mounting in the hydraulic chuck.

\* Please refer to the backface for information tables.

Figure 1. Tool structure

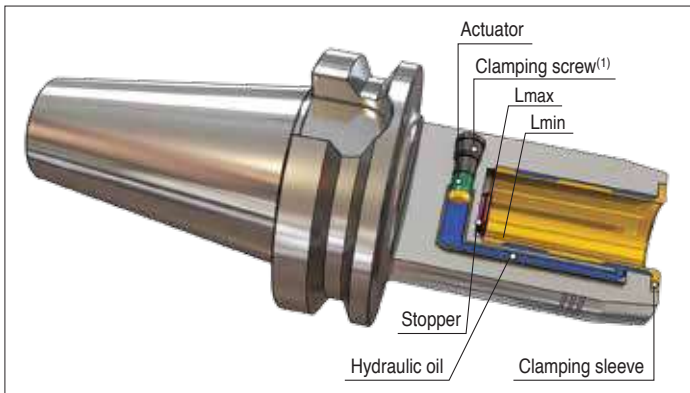


Table 1. Recommended minimum & maximum depth (L) of end tool insertion

Inner bore 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
20	42.5	52.5
25	51.0	61.0
32	55.0	65.0

Table 2. h6 tolerance range

Shank size Ø (mm)		h6 tolerance range (µm)
	3	0
		-6
3	6	0
		-8
6	10	0
		-9
10	18	0
		-11
18	30	0
		-13
30	50	0
		-16

Table 3. Clamping torque

Inner bore diameter Ø (mm)	Clamping torque (N·m)
6	10
8	25
10	40
12	65
14	90
16	120
20	240
25	260
32	450

## ► Thermal T-SHRINK chucking system



## ► T-SHRINK chucking system

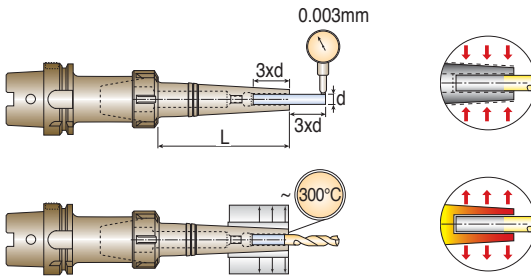
The thermal T-SHRINK ER collet chucking system is an enhancement to the existing popular ER system. The T-SHRINK collets utilize the thermal shrink phenomena for rigid clamping of solid carbide cutters. This new system provides higher torque, precision runout and better repeatability. The T-SHRINK collets 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 $\mu\text{m}$
60	9 $\mu\text{m}$
85	10 $\mu\text{m}$



## ▶ GTI-Tap attachment

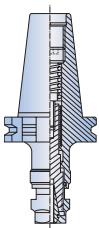
### ■ Description

Short tap chucks for ER collets

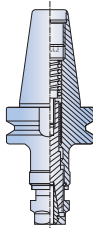


### ■ Application

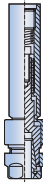
Axial-float/tension/compression type for CNC milling machines and lathes with reversing motors and rigid tapping



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-hand tapping

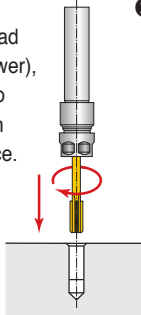
### ■ Advantages

- 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

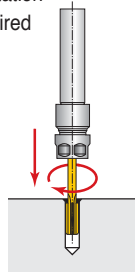
### ■ Operation

For through and blind hole tapping

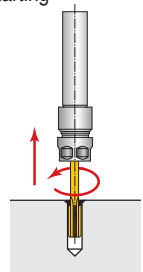
- 1** Enter feed rate according to thread pitch (or 1-2% lower), and set spindle to starting point with 0.08mm clearance.



- 2** Start spindle forward with right hand rotation until reaching desired depth.



- 3** Stop feed and rotation and reverse to starting point.

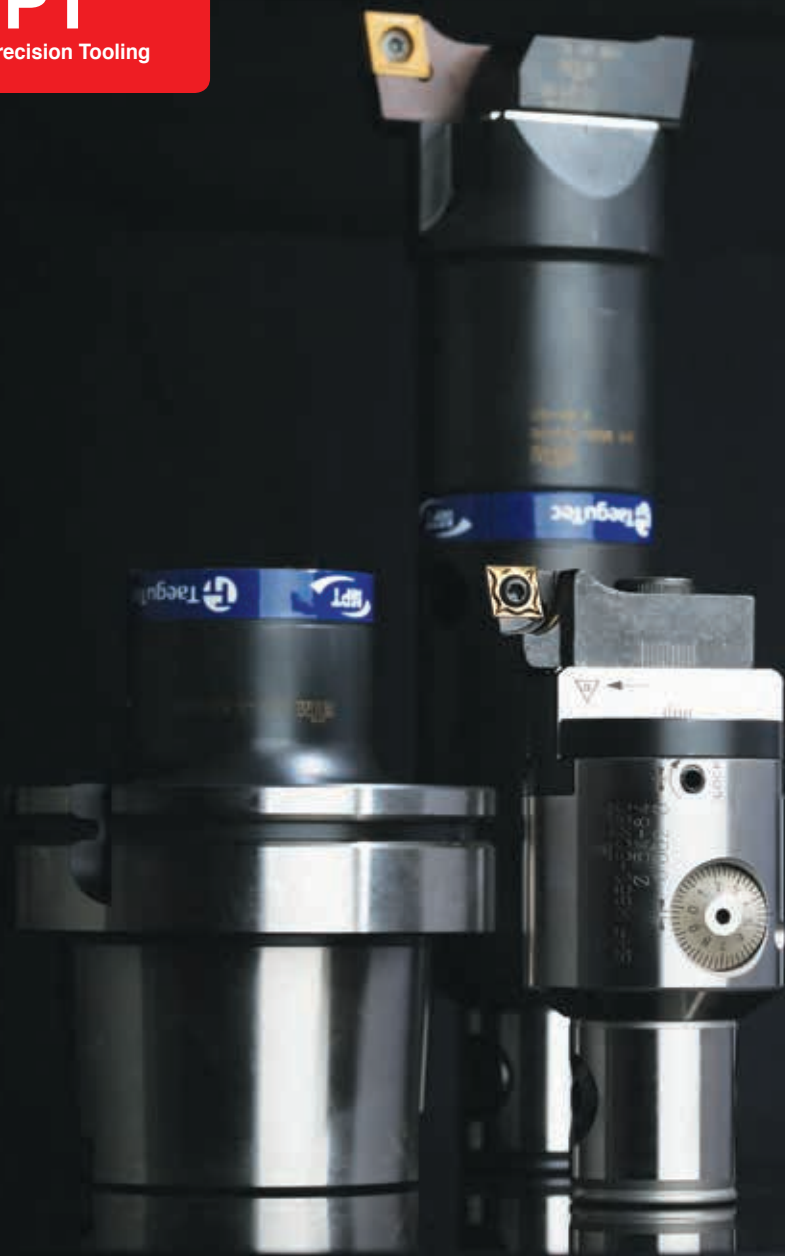






# MPT

Modular Precision Tooling





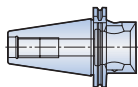



# Tool Selection Guide

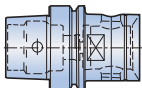
## MPT system

### Shanks

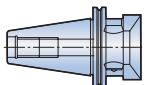
SKA/SKB  
 H6-H7



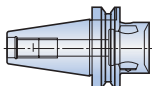
HSK  
 H9-H10



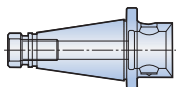
CATM  
 H8



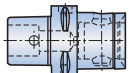
BT/BTB  
 H12



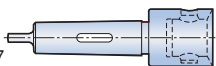
ISOM/ISO  
 H13




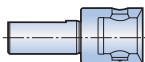
C MB  
 H11



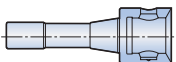
MTT  
 H17



ST  
 H14-H15



R8  
 H17

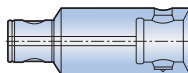


DIN2079  
 H18

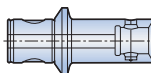


### Extensions and reducers

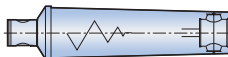
EX  H19



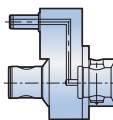
RE  H20



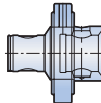
RE AVI  H21



CHS  H21



CHR  H21

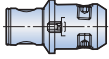


# Tool Selection Guide

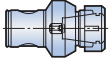
MPT system

## Toolholders

EMH  H22



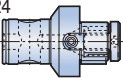
CC  H23



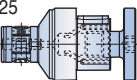
DC  H23



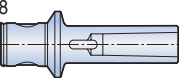
SMH  H24



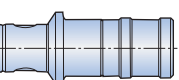
STUB  H25



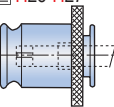
AMT  H28



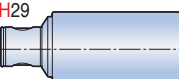
TP  H25



TCS/TCC  H26-H27



BLANK  H29

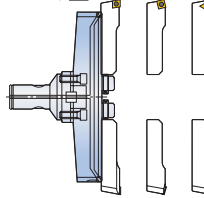


## Rough boring heads

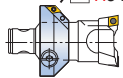
BHR  H30



TCH  H31

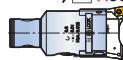


CHA  H34



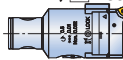
## Combi boring heads

BHC  H36

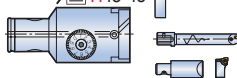


## Fine boring heads

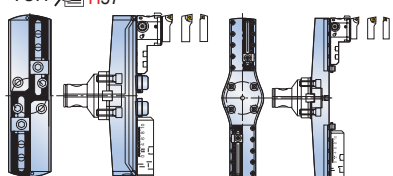
BHE  H38-H39



BHF  H43-45

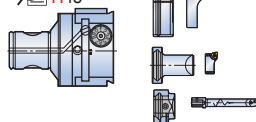


TCH  H57



BHF 50, 63, 80

 H45









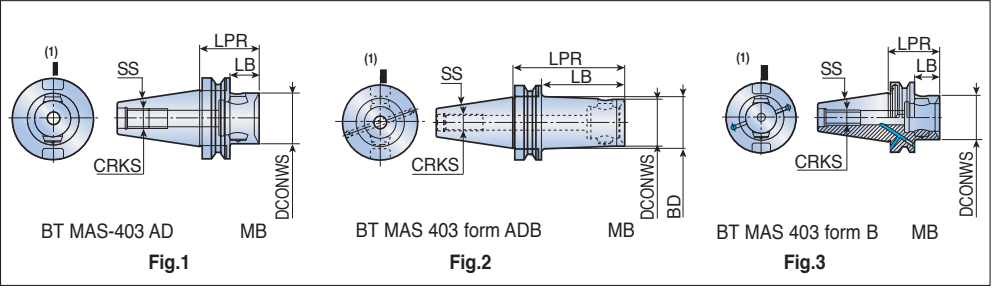








## BT form taper shanks with MB connection



Designation	Dimension (mm)					CRKS	Kg	Fig.
	SS	DCONWS	LPR	LB	BD			
<b>BT 30-MB32</b>	30	MB32	32	10.6	-	M12	0.5	1
<b>30-MB50</b>	30	MB50	60	38.6	-	M12	0.7	1
<b>35-MB50</b>	35	MB50	60	36	-	M12	0.8	1
<b>40-MB40</b>	40	MB40	45	18	-	M16	0.6	1
<b>40-MB50</b>	40	MB50	48	21	-	M16	0.9	1
<b>40-MB63</b>	40	MB63	66	39	-	M16	1.2	1
<b>45-MB50</b>	45	MB50	62	29	-	M20	1.7	1
<b>45-MB63</b>	45	MB63	70	37	-	M20	2.3	1
<b>45-MB80</b>	45	MB80	70	37	-	M20	2.7	1
<b>50-MB50</b>	50	MB50	66	28	-	M24	3.5	1
<b>50-MB63</b>	50	MB63	75	37	-	M24	3.7	1
<b>50-MB80</b>	50	MB80	75	37	-	M24	4.0	1
<b>40-MB40x120 A/B</b>	40	MB40	120	93	44.5	M16	0.9	2
<b>40-MB50x120 A/B</b>	40	MB50	120	93	-	M16	1.9	2
<b>50-MB50x120 A/B</b>	50	MB50	120	82	60	M24	4.2	2
<b>50-MB63x150 A/B</b>	50	MB63	150	112	70	M24	5.8	2
<b>50-MB80x180 A/B</b>	50	MB80	180	142	-	M24	7.5	2
<b>50-MB110x140</b>	50	MB110	140	102	-	M24	6.8	2
<b>60-MB110x110</b>	60	MB110	110	63	-	M30	11.5	2
<b>60-MB110x200</b>	60	MB110	200	152	-	M30	18.1	2
<b>BTB 40-MB50</b>	40	MB50	48	21	-	M16	0.9	3
<b>40-MB63</b>	40	MB63	66	39	-	M16	1.2	3
<b>50-MB50x66</b>	50	MB50	66	28	-	M24	3.5	3
<b>50-MB63x75</b>	50	MB63	75	37	-	M24	3.7	3
<b>50-MB80</b>	50	MB80	75	37	-	M24	4.0	3

• (1)Cutting edge position



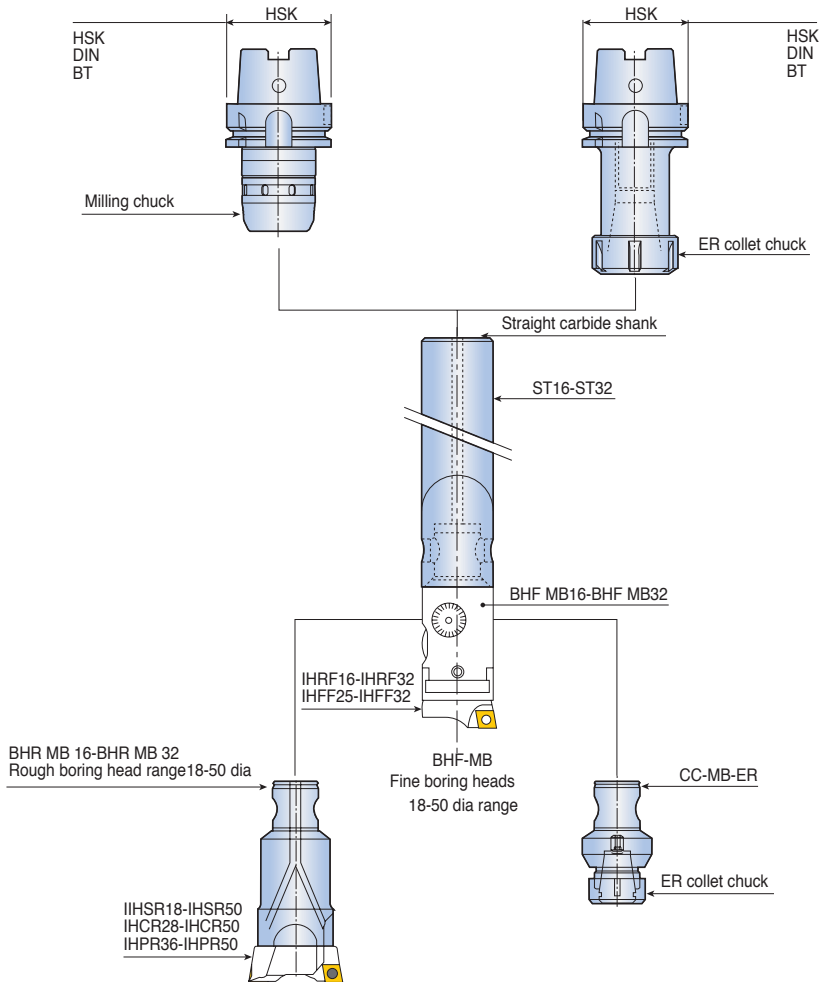




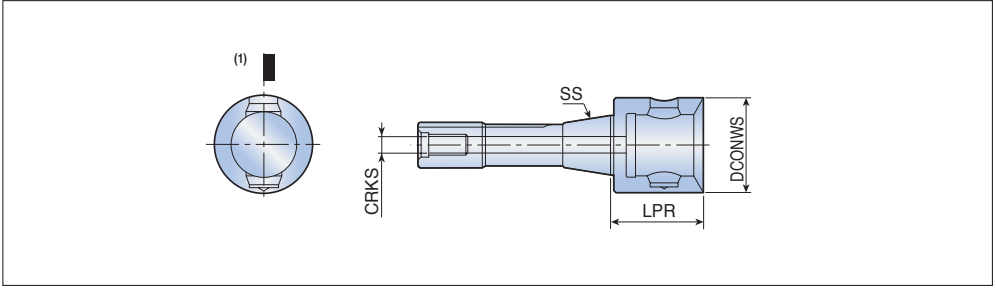


## ST-MB straight carbide shank with MB connection assembly options

**ST16-ST32 MB16-MB32**  
**Diameter range: 18-50 mm**



## Bridgeport shanks with MB connection

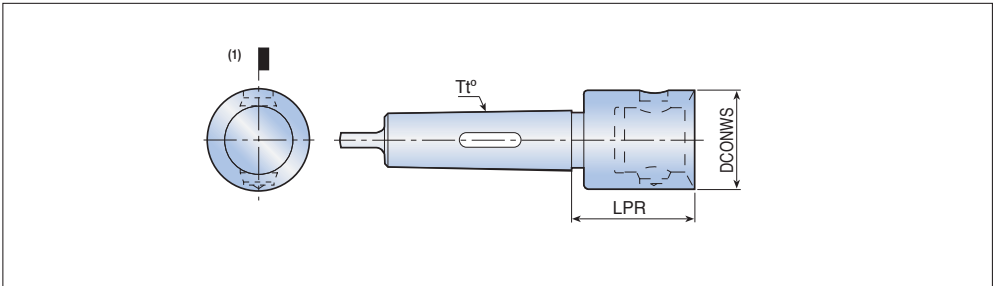


Designation	Dimension (mm)			CRKS	Kg
	SS	DCONWS	LPR		
<b>R8 MB50</b>	R8	MB50	50	UNF 7/16-20	0.8

• (1)Cutting edge position

# MTT 5-MB63

## Morse taper shanks with MB connection



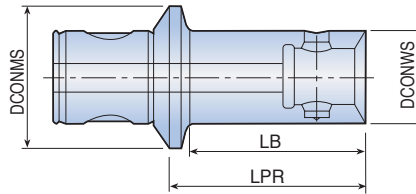
Designation	Dimension (mm)			Kg
	Tt°	DCONWS	LPR	
<b>MTT 5- MB63</b>	MT5	MB63	65	2.1

• (1)Cutting edge position





## Reducers for MB connection

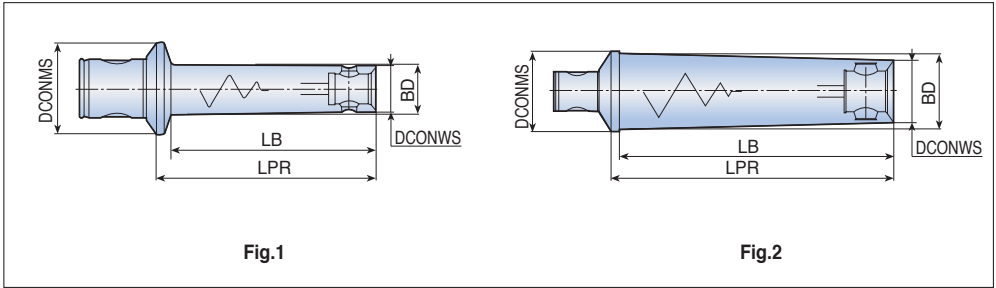


Designation	Dimension (mm)				Kg
	DCONMS	DCONWS	LPR	LB	
<b>RE MB16-MB14x24</b>	MB16	MB14	24	19.5	0.3
<b>MB20-MB14x19</b>	MB20	MB14	19	13.5	0.4
<b>MB20-MB16x20</b>	MB20	MB16	20	16	0.5
<b>MB25-MB14x19</b>	MB25	MB14	19	13.5	0.6
<b>MB25-MB16x20</b>	MB25	MB16	20	15	0.8
<b>MB25-MB20x25</b>	MB25	MB20	25	20	0.9
<b>MB32-MB14x25</b>	MB32	MB14	25	17	1.0
<b>MB32-MB16x24</b>	MB32	MB16	24	18	1.3
<b>MB32-MB20x25</b>	MB32	MB20	25	20	1.6
<b>MB32-MB25x28</b>	MB32	MB25	28	23	2.1
<b>MB40-MB14x23</b>	MB40	MB14	23	16	2.8
<b>MB40-MB16x24</b>	MB40	MB16	24	17	3.5
<b>MB40-MB20x26</b>	MB40	MB20	26	20	0.4
<b>MB40-MB25x28</b>	MB40	MB25	28	22	0.5
<b>MB40-MB32x32</b>	MB40	MB32	32	27	0.6
<b>MB50-MB14x23</b>	MB50	MB14	23	14.5	0.8
<b>MB50-MB14x39</b>	MB50	MB14	39	30.5	0.9
<b>MB50-MB16x24</b>	MB50	MB16	24	15	1.0
<b>MB50-MB16x40</b>	MB50	MB16	40	31	1.3
<b>MB50-MB16x74</b>	MB50	MB16	74	65	1.6
<b>MB50-MB20x26</b>	MB50	MB20	26	18	3.5
<b>MB50-MB20x70</b>	MB50	MB20	70	62	0.4
<b>MB50-MB20x93</b>	MB50	MB20	93	85	0.5
<b>MB50-MB25x28</b>	MB50	MB25	28	21	0.6
<b>MB50-MB25x87</b>	MB50	MB25	87	80	0.8
<b>MB50-MB25x117</b>	MB50	MB25	117	110	3.5
<b>MB50-MB32x32</b>	MB50	MB32	32	25	0.4
<b>MB50-MB32x87</b>	MB50	MB32	87	80	0.5
<b>MB50-MB32x144</b>	MB50	MB32	144	137	0.6
<b>MB50-MB40x36</b>	MB50	MB40	36	30	0.8
<b>MB50-MB40x87</b>	MB50	MB40	87	80	0.9
<b>MB50-MB40x176</b>	MB50	MB40	176	170	1.0
<b>MB63-MB50x40</b>	MB63	MB50	40	34	1.3
<b>MB80-MB50x45</b>	MB80	MB50	45	36	1.6
<b>MB80-MB63x60</b>	MB80	MB63	60	52	1.6
<b>MB110-MB80x70</b>	MB110	MB80	70	52	6.0

# RE MB-AVI

# Extensions and Reducers

## Vibration dampening reducers

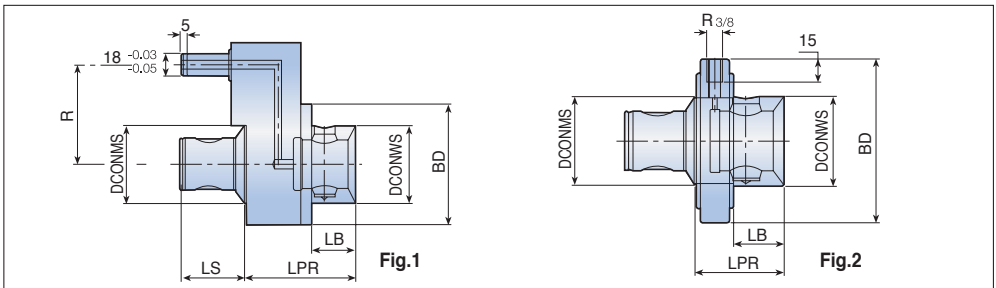


Designation	Dimension (mm)					Kg	Fig.
	DCONMS	DCONWS	BD	LPR	LB		
<b>RE MB50-MB16x74-AVI</b>	MB50	MB16	17.5	74	65	0.4	1
<b>MB50-MB20x93-AVI</b>	MB50	MB20	21.5	93	85	0.5	1
<b>MB50-MB25x117-AVI</b>	MB50	MB25	27	117	110	0.8	1
<b>MB50-MB32x144-AVI</b>	MB50	MB32	35	144	138	1.4	1
<b>MB50-MB40x176-AVI</b>	MB50	MB40	47	176	170	2.5	1
<b>MB63-MB50x220-AVI</b>	MB63	MB50	60	220	214	5.6	1
<b>MB80-MB63x280-AVI</b>	MB80	MB63	77	280	272	10.6	2

# CHS MB-R/CHR MB

# Extensions and Reducers

## Coolant extensions for MB connection

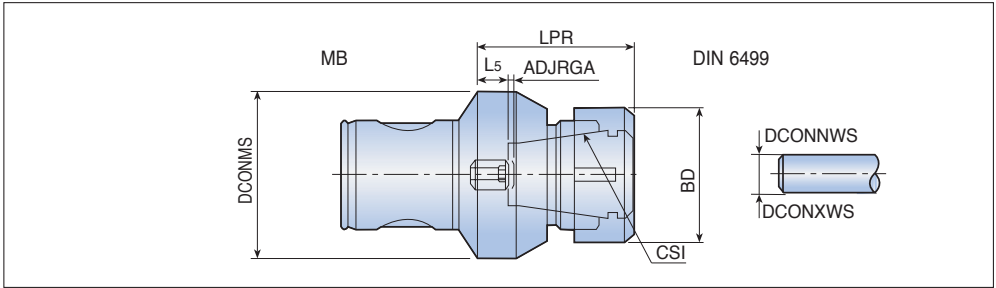


Designation	Dimension (mm)									Kg	Fig.
	DCONMS	DCONWS	R	BD	LPR	LB	LS	RPM <sub>Max</sub>	Bar		
<b>CHS MB50-R65</b>	MB50	MB50	65	80	72	28.5	43	7000	10	1.9	1
<b>MB50-R80</b>	MB50	MB50	80	80	72	28.5	43	7000	10	2.5	1
<b>MB63-R80</b>	MB63	MB63	80	100	88	37.0	51	5600	10	5.0	1
<b>CHR MB63</b>	MB63	MB63	-	115	63	35	-	3500	10	5.0	2

- Important: Start coolant flow prior to rotating the spindle to avoid damage of the O rings.
- Use with stop block. (not included)



## ER Collet chucks with MB connection

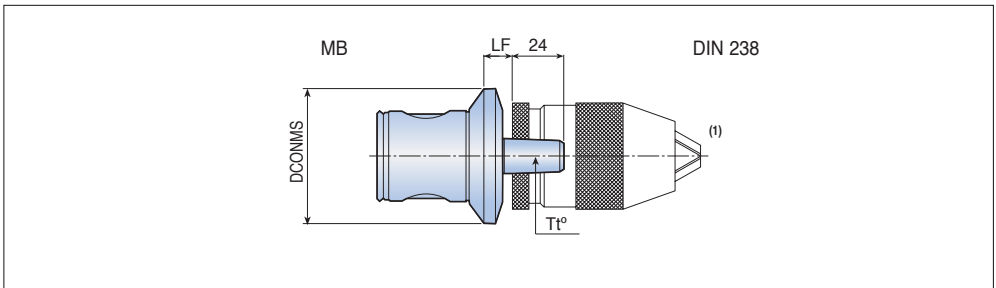


Designation	Dimension (mm)							Kg
	DCONMS	CSI	DCONWS	DCONXWS	BD	LPR	ADJRGA	
<b>CC MB16 ER11M</b>	MB16	ER11	0.5	7.0	16	25	2.5	0.03
<b>MB20 ER16M</b>	MB20	ER16	0.5	10.0	22	32	1.0	0.06
<b>MB25 ER20M</b>	MB25	ER20	1.0	13.0	28	40	2.5	0.15
<b>MB32 ER25M</b>	MB32	ER25	1.0	16.0	35	42	1.5	0.25
<b>MB40 ER25</b>	MB40	ER25	1.0	16.0	42	45	5.0	0.25
<b>MB50 ER25</b>	MB50	ER25	1.0	16.0	42	48	7.0	0.70
<b>MB50 ER32</b>	MB50	ER32	2.0	20.0	50	59	7.0	1.00
<b>MB63 ER32</b>	MB63	ER32	2.0	20.0	50	59	12	1.30
<b>MB63 ER40</b>	MB63	ER40	3.0	26.0	63	64	12	1.50

# DC MB

# Toolholders

## 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

Spare Parts • <sup>(1)</sup>Without drill chuck



H71-H83

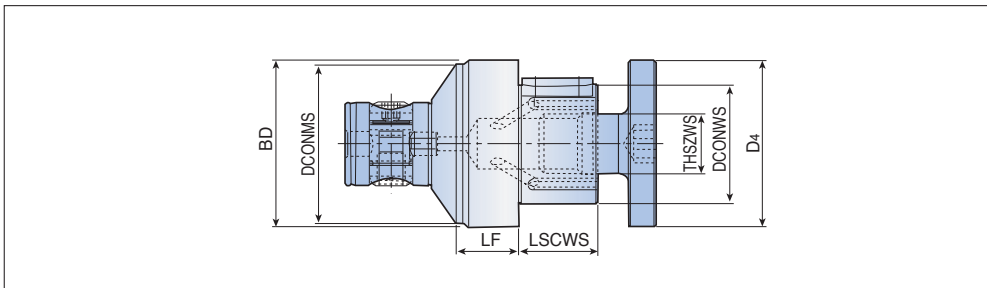




# STUB MB80-60

## Toolholders

### STUB 60 Holder with an MB80 connection

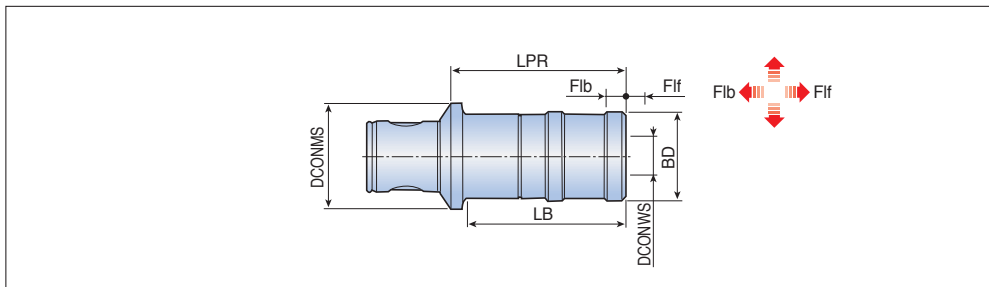


Designation	Dimension (mm)							
	DCONMS	DCONWS	BD	D4	THSZWS	LF	LSCWS	
<b>STUB MB80-60</b>	MB80	60	84	84	M30	31.5	40	6.3

# TP MB-M

## Toolholders

### Tapping chucks with MB modular system connection



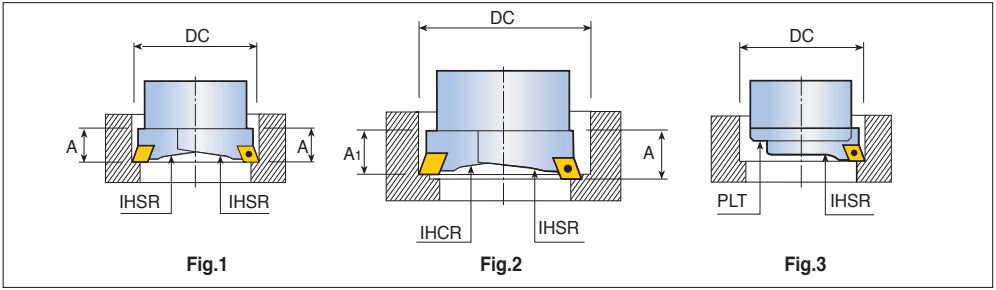
Designation	Dimension (mm)									
	DCONMS	TAP <sub>min</sub>	TAP <sub>max</sub>	LB	LPR	BD	DCONWS	Flf	Flb	
<b>TP MB50-M 3-12</b>	MB50	M1	M14	60	72	36	19	7.5	7.5	0.8
<b>MB50-M 8-20</b>	MB50	M4.5	M20	-	106	53	31	12.5	12.5	1.6
<b>MB63-M 3-12</b>	MB63	M1	M14	58	70	36	19	7.5	7.5	1.2
<b>MB63-M 8-20</b>	MB63	M4.5	M20	93	104	53	31	12.5	12.5	1.9









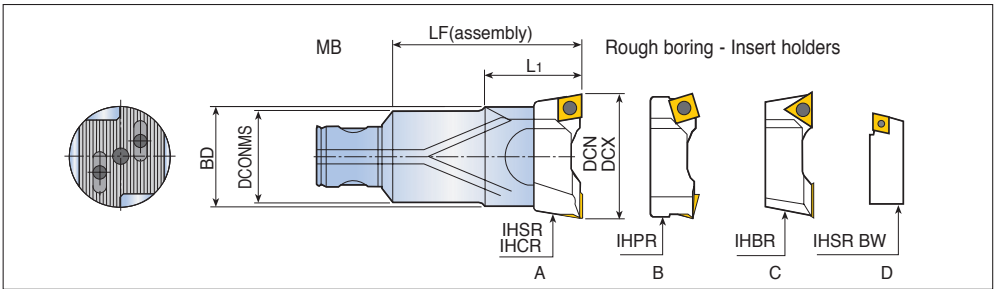


- When using the MPT system, it is strongly recommended that the user utilizes the tool pre-setting equipment provided to set the radial cutting edges. The boring bars that are equipped with two inserts holders are for rough machining and heavy stock removal.
- The bars are applicable to three types 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).

## BHR MB

## Rough Boring Heads

Rough boring heads 18-200mm range with MB connection



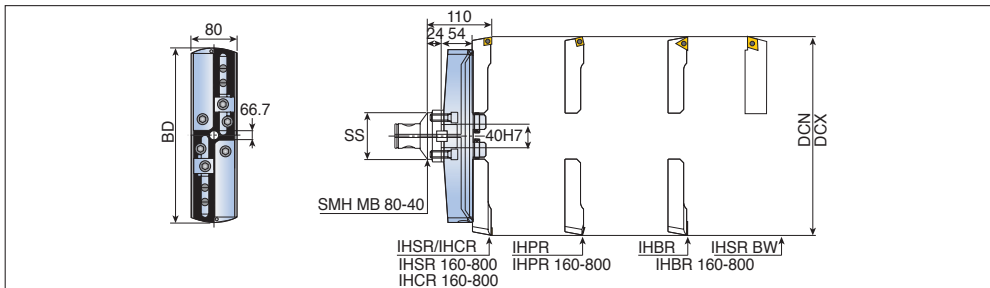
Designation	Dimension (mm)						Insert holders				Kg	
	DCONMS	DCN	DCX	BD	LF	L1	Insert holders	A	B	C		D
<b>BHR MB16-16x34</b>	MB16	18	22	16	34	-	IH...18-22	●			●	0.05
<b>MB20-20x40</b>	MB20	22	28	20	40	-	IH...22-28	●			●	0.09
<b>MB25-25x50</b>	MB25	28	38	25	50	-	IH...28-38	●			●	0.20
<b>MB32-32x63</b>	MB32	36	50	32	63	-	IH...36-50	●	●		●	0.35
<b>MB40-40x80</b>	MB40	50	68	40	80	-	IH...50-68	●	●		●	0.70
<b>MB50-50x100</b>	MB50	68	90	55	100	50	IH...68-90	●	●		●	1.50
<b>MB50-63x80</b>	MB50	90	120	72	80	60	IH...90-120	●	●	●	●	2.00
<b>MB63-63x125</b>	MB63	90	120	72	125	63	IH...90-120	●	●	●	●	3.00
<b>MB80-80x140</b>	MB80	120	200	95	140	75	IH...120-800	●	●	●	●	5.30



# TCH

# Rough Boring Heads

Rough boring aluminum body range: 200-500mm with MB connection

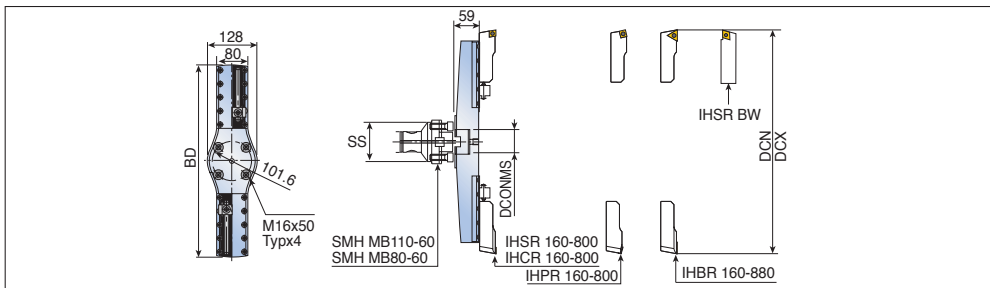


Designation	Dimension (mm)					Kg
	SS	DCN	DCX	BD	IH...160-800	
<b>TCH 200</b>	80	200	300	194	IHSR 160-800 IHCR 160-800	3.4
<b>300</b>	80	300	400	298	IHPR 160-800	4.3
<b>400</b>	80	400	500	398	IHBR 160-800	6.7

# TCH A.L

# Rough Boring Heads

Rough boring aluminum body range: 500-800mm with MB connection



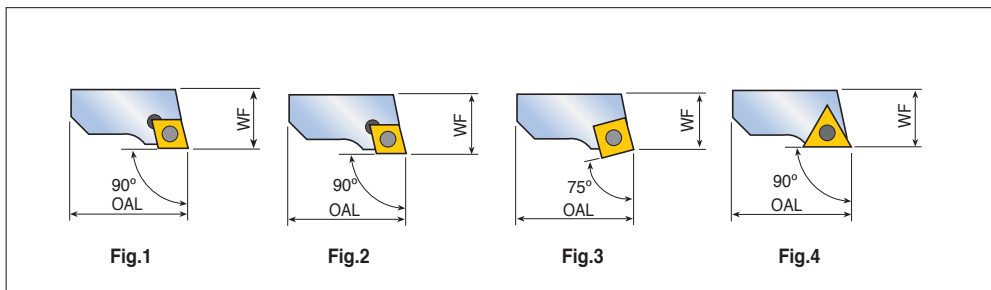
Designation	Dimension (mm)					Kg
	SS	DCN	DCX	BD	DCONMS	
<b>TCH A.L 500</b>	80,110	500	600	494	60	8.7
<b>600</b>	80,110	600	700	594	60	8.34
<b>700</b>	80,110	700	800	694	60	8.34

Spare Parts

Cutting Condition

• Aluminum body with steel serrated seats





Designation	Dimension (mm)				Spare parts			Fig.
	DCN	DCX	WF	OAL	Insert	Insert screw	Torx key	
<b>IHSR 18-22</b>	18	22	8.0	15.0	CCMT 0602...	SR 14-548	T7/5	1
<b>22-28</b>	22	28	9.5	19.0	CCMT 0602...	SR 14-548	T7/5	1
<b>28-38</b>	28	38	12.5	23.0	CCMT 0602...	SR 14-548	T7/5	1
<b>36-50</b>	36	50	15.0	32.0	CCMT 0602...	SR 14-548	T7/5	1
<b>50-68</b>	50	68	19.0	40.0	CCMT 09T3...	TS 400971	T15/5	1
<b>50-68-12</b>	50	68	19.0	40.0	CCMT 1204..	SR 16-212	T20/5	1
<b>68-90</b>	68	90	22.0	54.0	CCMT 1204..	SR 16-212	T20/5	1
<b>90-120</b>	90	120	27.0	70.5	CCMT 1204...	SR 16-212	T20/5	1
<b>120-160</b>	120	160	32.0	94.5	CCMT 1204..	SR 16-212	T20/5	1
<b>160-800</b>	160	800	32.0	130.0	CCMT 1204..	SR 16-212	T20/5	1
<b>IHCR 28-38</b>	28	38	12.3	23.0	CCMT 0602..	SR 14-548	T7/5	2
<b>36-50</b>	36	50	14.8	32.0	CCMT 0602...	SR 14-548	T7/5	2
<b>36-50-09</b>	36	50	14.8	32.0	CCMT 09T3..	TS 400971	T15/5	2
<b>50-68</b>	50	68	18.7	40.0	CCMT 09T3..	TS 400971	T15/5	2
<b>50-68-12</b>	50	68	18.7	40.0	CCMT 1204..	SR 16-212	T20/5	2
<b>68-90</b>	68	90	21.7	54.0	CCMT 1204..	SR 16-212	T20/5	2
<b>90-120</b>	90	120	26.7	70.5	CCMT 1204..	SR 16-212	T20/5	2
<b>120-160</b>	120	160	31.7	94.5	CCMT 1204..	SR 16-212	T20/5	2
<b>160-800</b>	160	800	31.7	130.0	CCMT 1204..	SR 16-212	T20/5	2
<b>IHPR 36-50</b>	36	50	15	32.0	SCMT 09T3..	TS 400971	T15/5	3
<b>50-68</b>	50	68	19	40.0	SCMT 09T3...	TS 400971	T15/5	3
<b>68-90</b>	68	90	22	54.0	SCMT 1204..	SR 16-212	T20/5	3
<b>90-120</b>	90	120	27	70.5	SCMT 1204..	SR 16-212	T20/5	3
<b>120-160</b>	120	160	32	94.5	SCMT 1204..	SR 16-212	T20/5	3
<b>160-800</b>	160	800	32	130.0	SCMT 1204..	SR 16-212	T20/5	3
<b>IHBR 90-120</b>	90	120	27	70.5	TCMT 2205..	SR 16-212	T20/5	4
<b>120-160</b>	120	160	32	94.5	TCMT 2205..	SR 16-212	T20/5	4
<b>160-800</b>	160	800	32	130.0	TCMT 2205..	SR 16-212	T20/5	4

















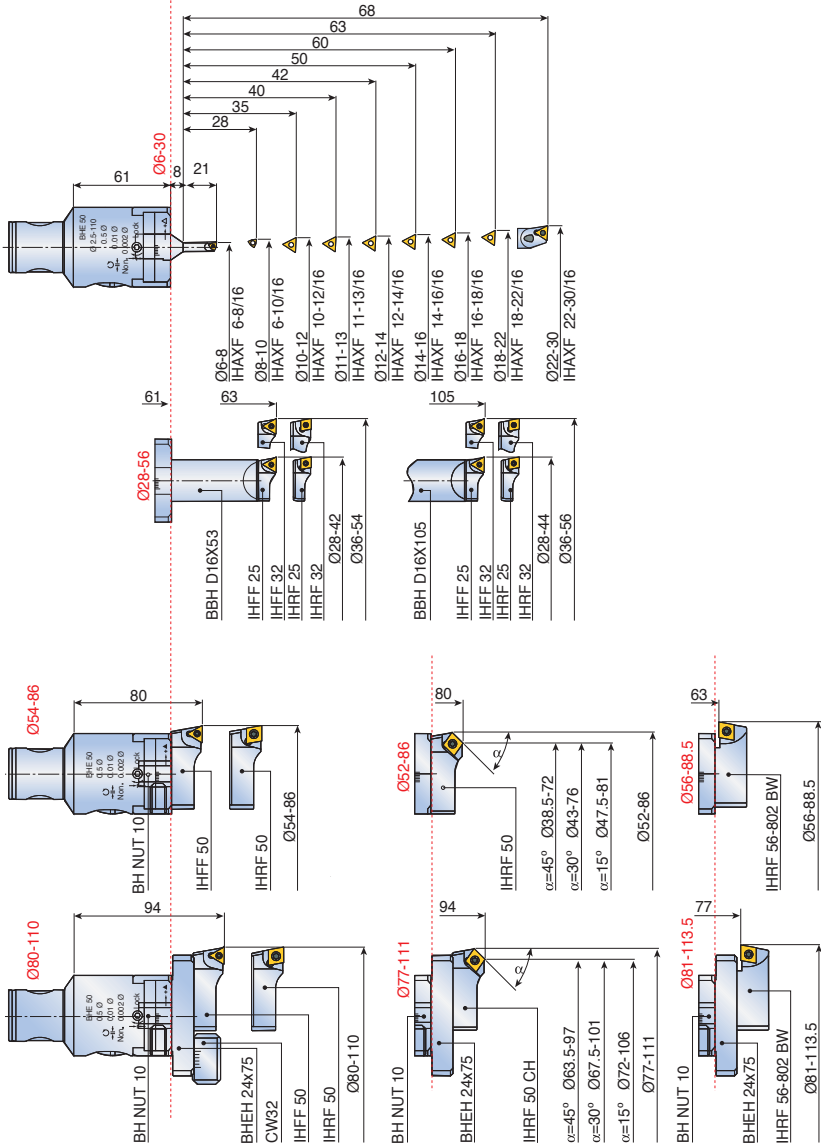


# Fine Boring Range

Fine boring head range: 10 $\mu$ m direct diametric adjustment and 2 $\mu$ m with the vernier scale

10 $\mu$ m  
2 $\mu$ m

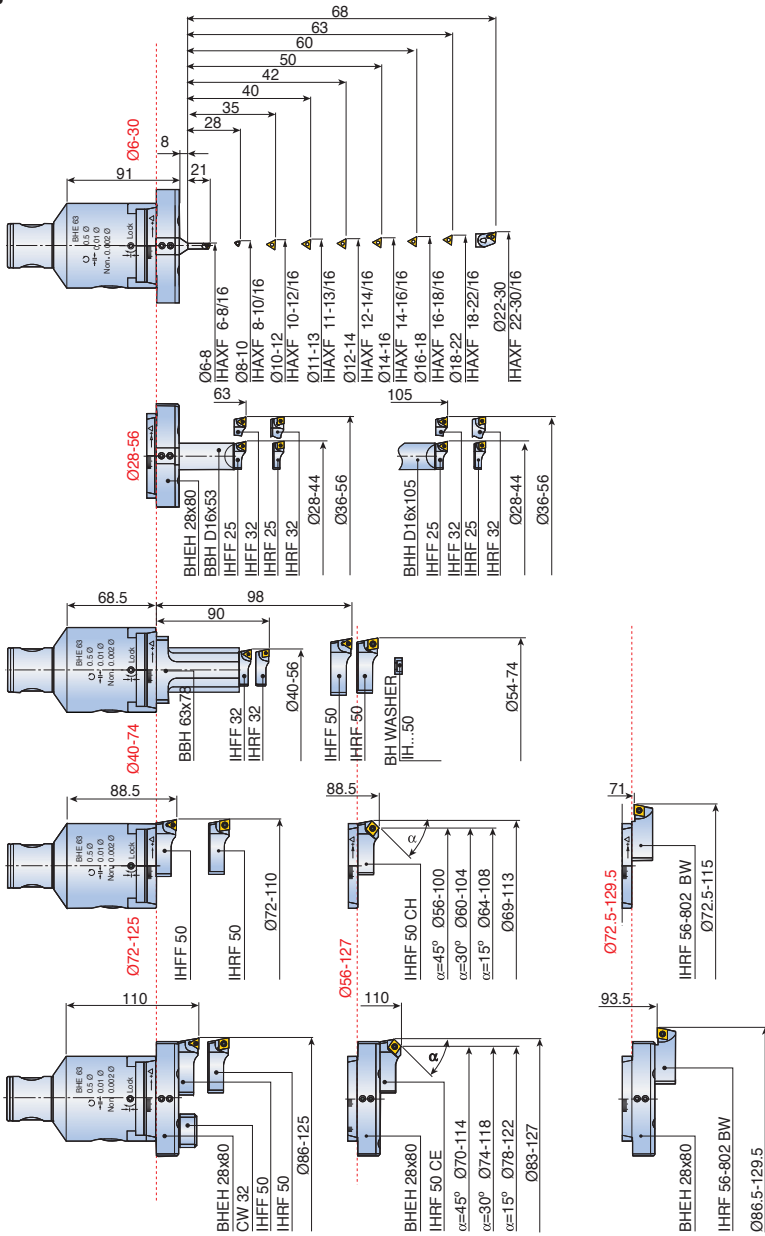
**BHE MB50-50x80**  
**Ø6-113.5**



Fine boring head range: 10µm direct diametric adjustment and 2µm with the vernier scale

**BHE MB63-63x89**  
ø6-129.5

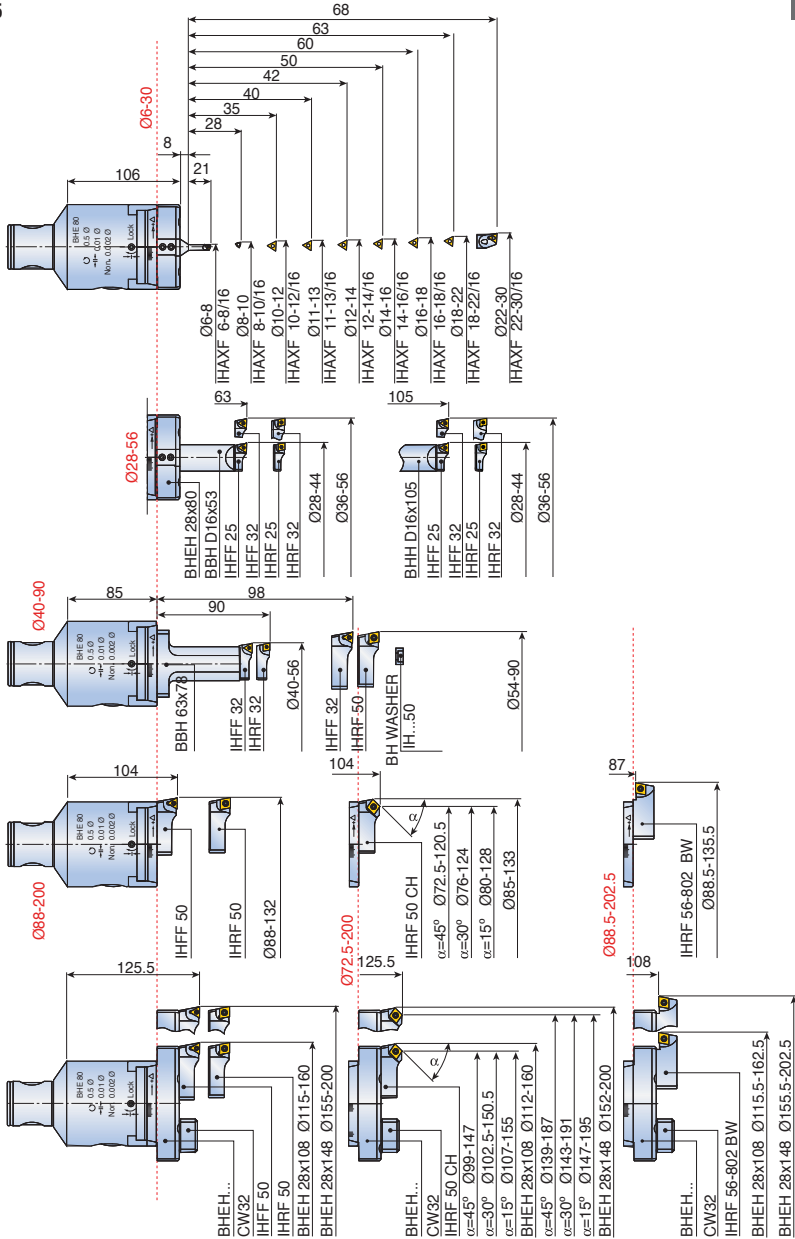
10µm  
2µm



Fine boring head range: 10 $\mu$ m direct diametric adjustment and 2 $\mu$ m with the vernier scale

10 $\mu$ m  
2 $\mu$ m

**BHE MB80-80x104**  
**Ø6-202.5**



## 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.

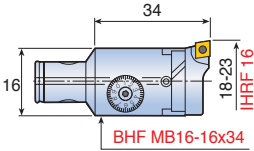
2µm



## BHF MB16-MB40 Diameter range: 18-63

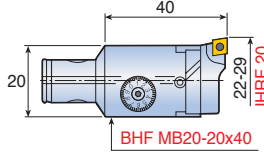
### BHF MB16-16x34 RV

18-23



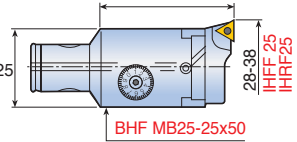
### BHF MB20-20x40 RV

22-29



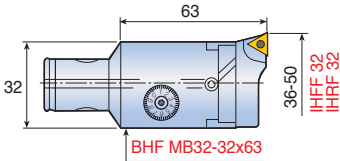
### BHF MB25-25x50

28-38



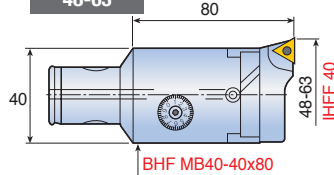
### BHF MB32-32x63

36-50



### BHF MB40-40x80

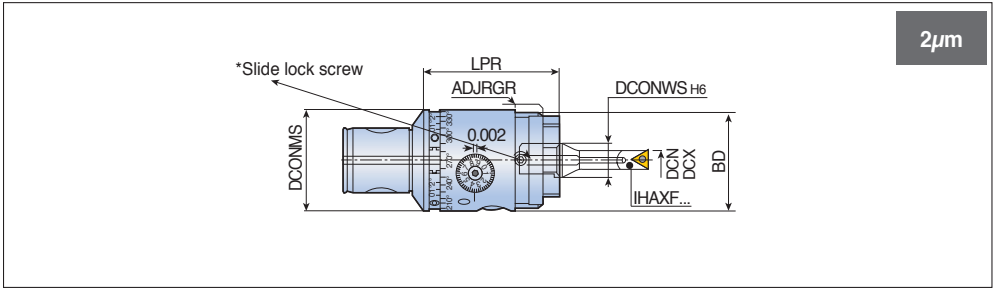
48-63



## 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	
<b>BHF MB 50-32x60 BL</b>			2.5-12																			
<b>50-50x68 BL</b>			2.5-20																			
<b>50-50x60</b>												2.5-84										
<b>50-63x87</b>																	2.5-160					
<b>80-80x94</b>																	2.5-220					
<b>16-16x34 RV</b>				18-23																		
<b>20-20x40 RV</b>					22-29																	
<b>25-25x50</b>						28-38																
<b>32-32x63</b>							36-50															
<b>40-40x80</b>								48-63														
<b>80-125x114</b>																						36-500
<b>TCH 200</b>																						200-300
<b>300</b>																						300-400
<b>400</b>																						400-500
<b>A.L 500</b>																						500-600
<b>A.L 600</b>																						600-700
<b>A.L 700</b>																						700-800

## Fine boring heads with balancing rings

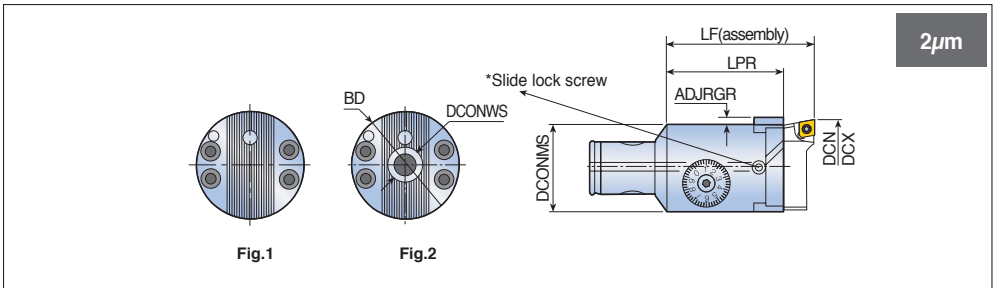


Designation	Dimension (mm)							Kg
	DCONMS	DCN	DCX	DCONWS	BD	LPR	ADJRGR	
<b>BHF MB50-32x60 BL</b>	MB50	2.5	12.0	8	32	60.0	3	0.8
<b>MB50-50x68 BL</b>	MB50	6.0	22.0	16	50	68.5	4	1.1

# BHF MB16-MB50, Dia.2.5-108

# Fine Boring Heads

## BHF MB: Fine boring heads



Designation	Dimension (mm)								Insert holder	Kg	Fig
	DCONMS	DCN	DCX	BD	LPR	LF	ADJRGA	DCONWS			
<b>BHF MB16-16x34 RV</b>	MB16	18	23	16	26.0	34	1	-	IH..16	0.05	1
<b>MB20-20x40 RV</b>	MB20	22	29	20	32.5	40	2	-	IH..20	0.1	1
<b>MB25-25x50</b>	MB25	28	38	25	40.0	50	2	-	IH..25	0.2	1
<b>MB32-32x63</b>	MB32	36	50	32	51.5	63	3	-	IH..32	0.35	1
<b>MB40-40x80</b>	MB40	48	63	40	66.0	80	4	-	IH..40	0.7	1
<b>MB50-50x60</b>	MB50	2.5	108	50	60.0	79	4	16	IH..50	1.0	2



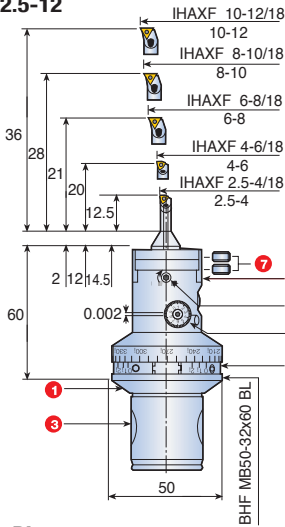
• Important: Loosen the \*slide lock screw before making any slide adjustment



## Fine boring heads with balancing rings

2 $\mu$ m

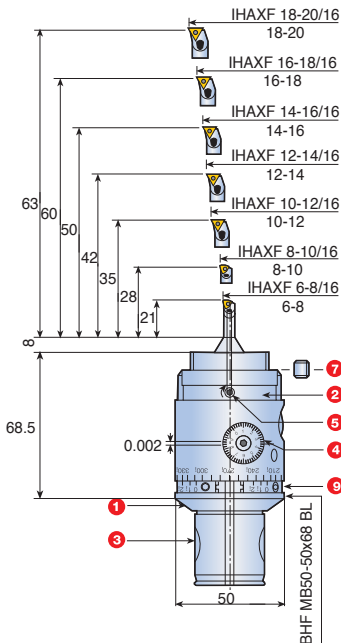
### BHF MB50-32x60 BL Diameter range: 2.5-12



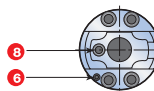
- 1 Body
- 2 Tool slide
- 3 Expanding pin
- 4 Graduated dial
- 5 Slide locking screw
- 6 Coolant nozzle
- 7 Boring bar locking screws
- 8 Balancing rings



### BHF MB50-50x68 BL Diameter range: 6-12



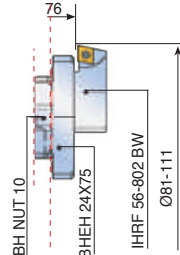
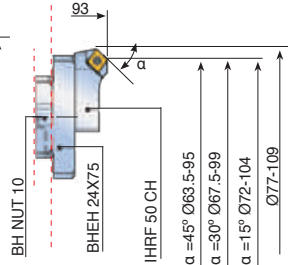
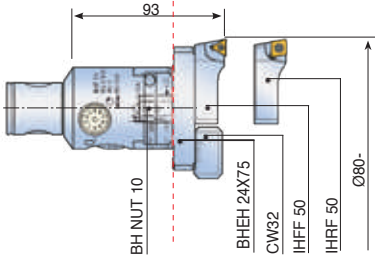
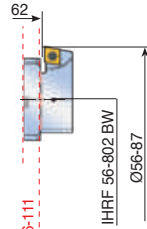
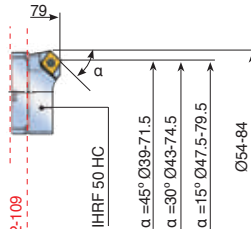
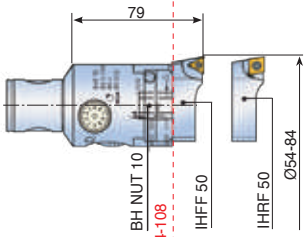
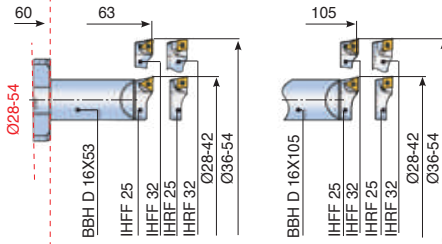
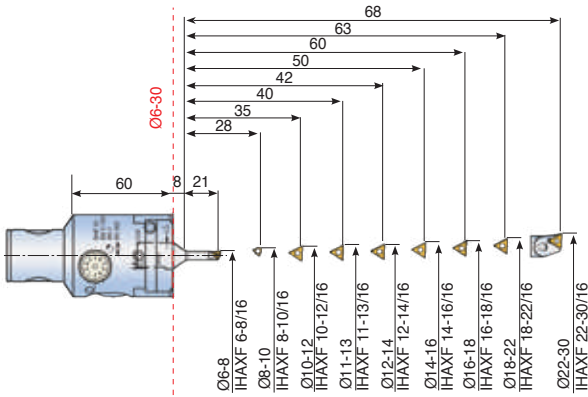
- 1 Body
- 2 Tool slide
- 3 Expanding pin
- 4 Graduated dial
- 5 Slide locking screw
- 6 Coolant nozzle
- 7 Boring bar locking screws
- 8 Oiling nipple
- 9 Balancing rings



## Fine boring head range: 2 $\mu$ m direct diametric adjustment

**BHF MB50-50x60**  
Diameter range: 6-111

2 $\mu$ m

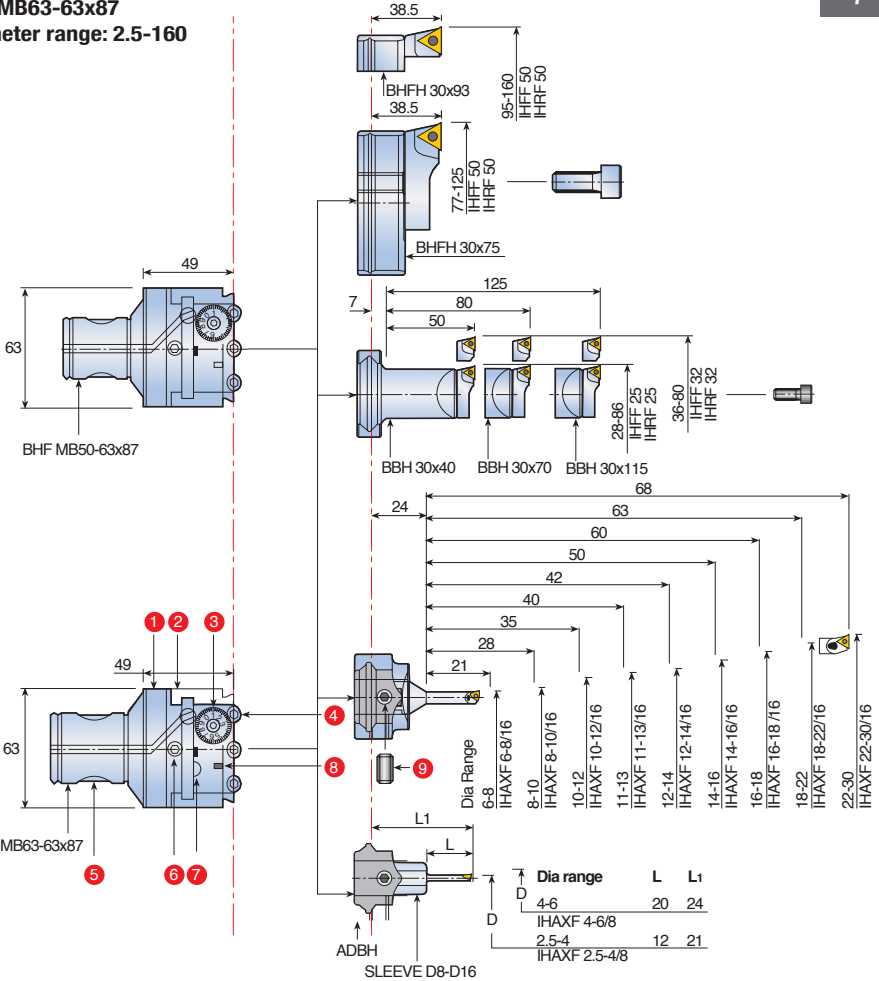




## Fine boring head range: 2 $\mu$ m direct diametric adjustment

2 $\mu$ m

**BHF MB50-63x87**  
**BHF MB63-63x87**  
 Diameter range: 2.5-160



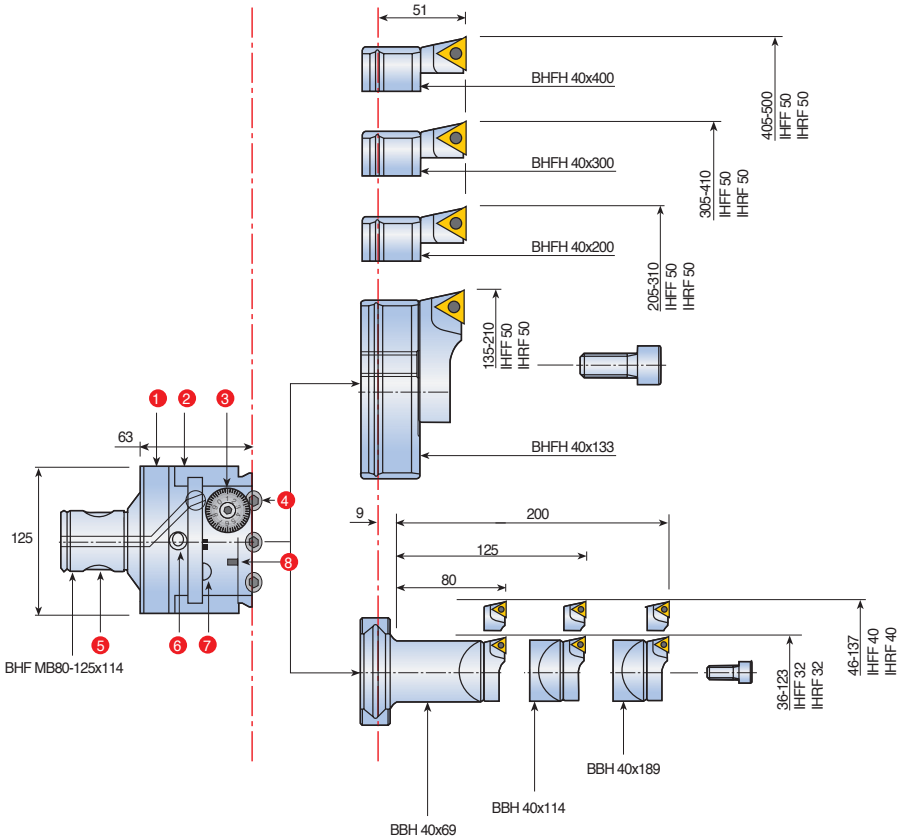
- 1 Body
- 2 Tool slide
- 3 Graduated dial
- 4 Toolholder locking screw
- 5 Expanding pin
- 6 Slide locking screw
- 7 Coolant nozzle
- 8 Oiling nipple
- 9 Toolholder locking screw



## Fine boring head range: 2 $\mu$ m direct diametric adjustment

2 $\mu$ m

**BHF MB80-125x114**  
Diameter range:36-500



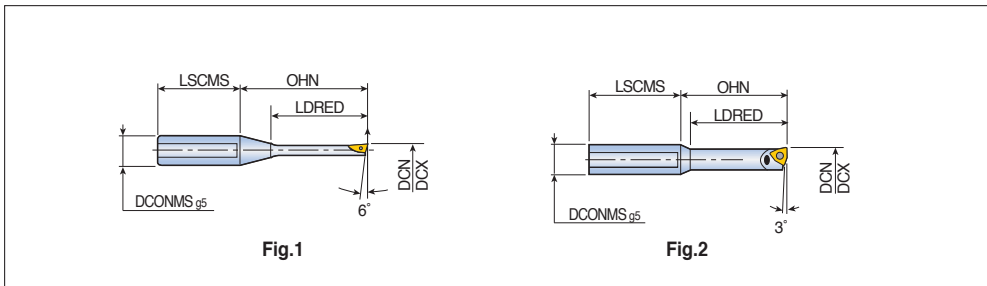
BHF MB80-125x114

BBH 40x189

BBH 40x69

BBH 40x114

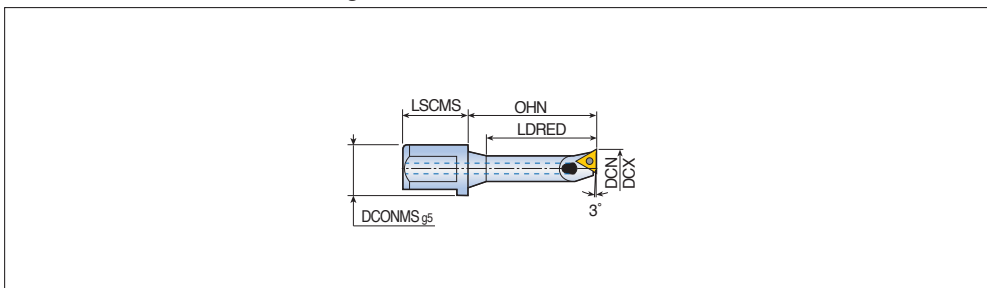
## 8mm boring bar for 2.5-12mm fine boring heads



Designation	Dimension (mm)						Spare parts			Fig.
	DCN	DCX	LDRED	OHN	LSCMS	DCONMS	Insert	Screw	Key	
<b>IHAXF 2.5-4/8<sup>(1)</sup></b>	2.5	4	12.5	21	22	8	Solid	-	-	1
<b>4-6/8<sup>(1)</sup></b>	4	6	20.0	24	24	8	Solid	-	-	1
<b>6-8/8</b>	6	8	21.0	21	16	8	WCGT 0201	SR 14-299	T-6/5	2
<b>8-10/8</b>	8	10	-	28	16	8	WCGT 0201	SR 14-299	T-6/5	2
<b>10-12/8</b>	10	12	-	36	16	8	TPGX 0902	SR 14-299	T-6/5	2

• <sup>(1)</sup> Brazed tool

## 16mm bars for 6-30mm fine boring heads



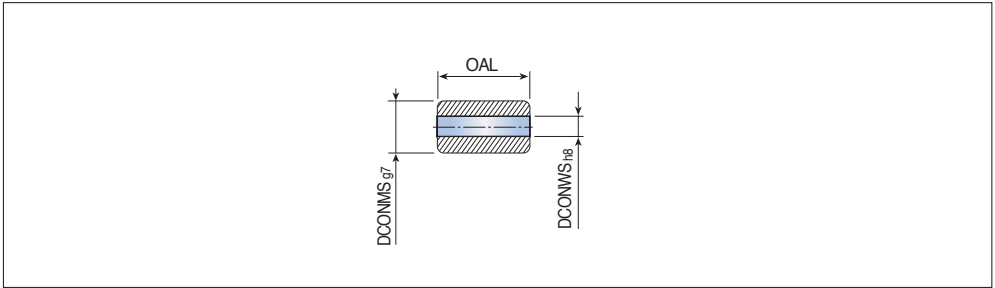
Designation	Dimension (mm)						Spare parts		
	DCN	DCX	LDRED	OHN	LSCMS	DCONMS	Insert	Screw	Key
<b>IHAXF 6-8/16</b>	6	8	21.0	29	22	16	WCGT 0201	SR 14-299	T-6/5
<b>8-10/16</b>	8	10	28.0	36	22	16	WCGT 0201	SR 14-299	T-6/5
<b>10-12/16</b>	10	12	35.0	43	22	16	TPGX 0902	SO 250611	T-8/5
<b>11-13/16</b>	11	13	40.0	48	22	16	TPGX 0902	SO 250611	T-8/5
<b>12-14/16</b>	12	14	42.0	48	22	16	TPGX 0902	SO 250611	T-8/5
<b>14-16/16</b>	14	16	50.0	52	22	16	TPGX 0902	SO 250611	T-8/5
<b>16-18/16</b>	16	18	50.0	58	22	16	TPGX 0902	SO 250611	T-8/5
<b>18-22/16</b>	18	22	60.0	63	22	16	TPGX 0902	SO 250611	T-8/5
<b>22-30/16</b>	22	30	60.0	68	22	16	TPGX 0902	SO 250611	T-8/5



# SLEEVE

## Fine Boring Bar

Reducers for fine boring heads

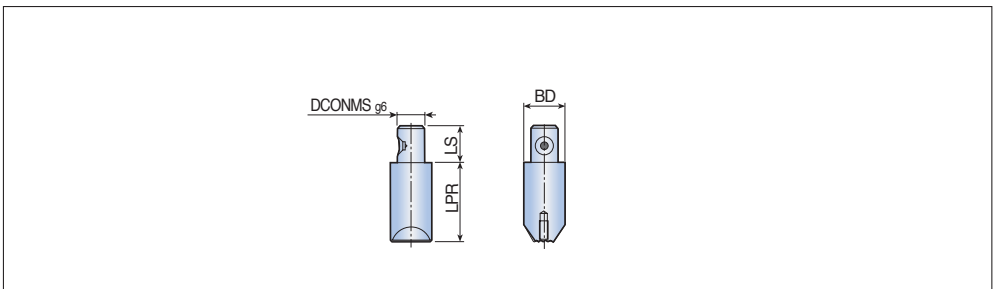


Designation	Dimension (mm)		
	DCONMS	DCONWS	OAL
<b>SLEEVE D8-D16</b>	16	8	23

# BBH D16

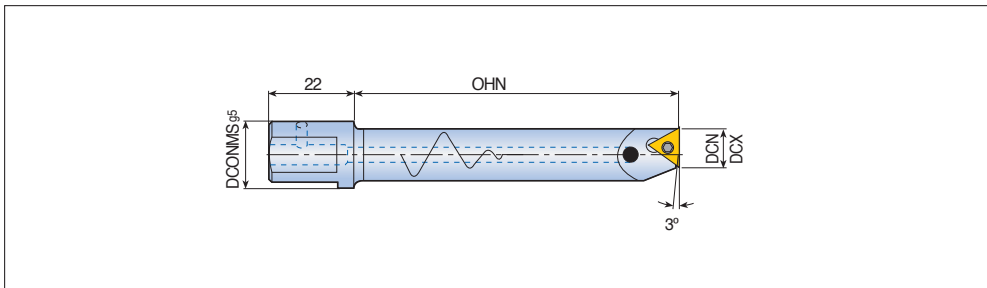
## Fine Boring Bar

Extension for BHF 50x50x63



Designation	Dimension (mm)				Kg
	BD	LPR	DCONMS	LS	
<b>BBH D16x53</b>	25	53	16	21.5	0.3

## Vibration dampening for fine boring bars – Heavy metal shank



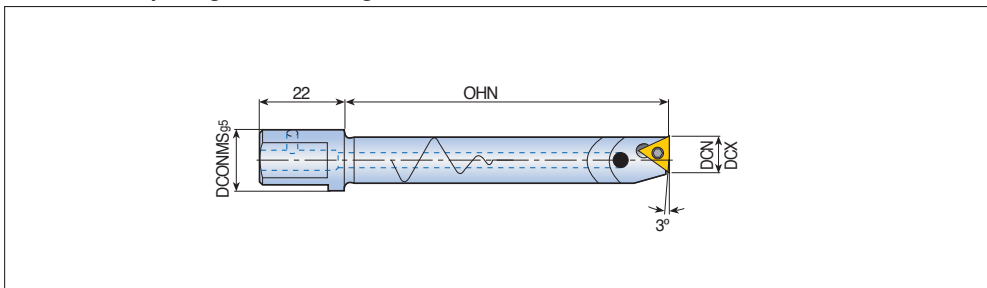
Designation	Dimension (mm)				Spare parts		
	DCN	DCX	OHN	DCONMS	Insert	Screw	Key
<b>IHAXF 6-8-AVI</b>	6	8	36	16	WCGT 0201..	SR 14-299	T-6/5
<b>8-10-AVI</b>	8	10	48	16	WCGT 0201..	SR 14-299	T-6/5
<b>10-12-AVI</b>	10	12	60	16	TPGX 0902..	SO 250611	T-8/5
<b>12-14-AVI</b>	12	14	72	16	TPGX 0902..	SO 250611	T-8/5
<b>14-16-AVI</b>	14	16	84	16	TPGX 0902..	SO 250611	T-8/5
<b>16-18-AVI</b>	16	18	96	16	TPGX 0902..	SO 250611	T-8/5

• Note: Not recommended to be used on balanceable BHF-BL fine boring head

# IHAXF-E

# Fine Boring Bar

## Vibration dampening for fine boring bars – Carbide shank

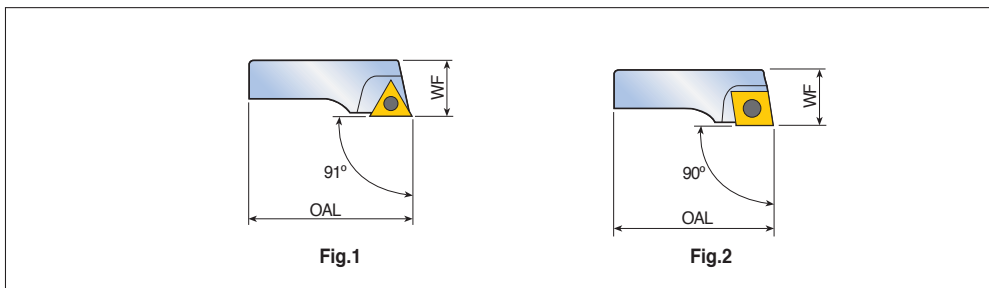


Designation	Dimension (mm)				Spare parts		
	DCN	DCX	OHN	DCONMS	Insert	Screw	Key
<b>IHAXF 6-8-E</b>	6	8	45	16	WCGT 0201..	SR 14-299	T-6/5
<b>8-10-E</b>	8	10	60	16	WCGT 0201..	SR 14-299	T-6/5
<b>10-12-E</b>	10	12	75	16	TPGX 0902..	SO 250611	T-8/5
<b>12-14-E</b>	12	14	90	16	TPGX 0902..	SO 250611	T-8/5
<b>14-16-E</b>	14	16	105	16	TPGX 0902..	SO 250611	T-8/5
<b>16-18-E</b>	16	18	120	16	TPGX 0902..	SO 250611	T-8/5

• Note: Not recommended to be used on balanceable BHF-BL fine boring head



Insert holders for mounting on the MB fine boring heads

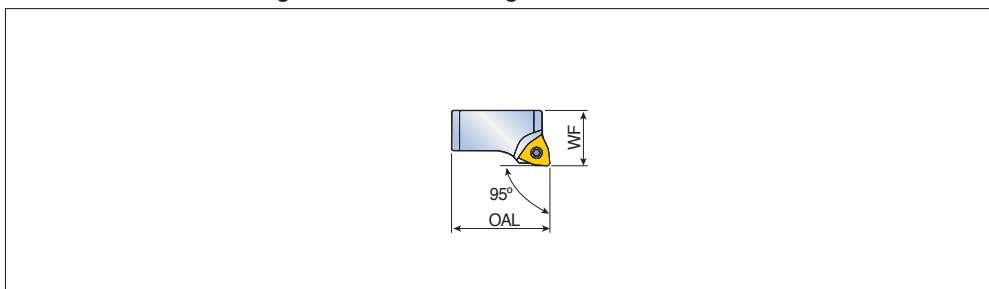


Designation	Dimension (mm)				Spare parts			Fig.
	DCN	DCX	WF	OAL	Insert	Insert screw	Torx key	
<b>IHFF 25</b>	28	40	10.0	26.5	TPGX 0902...	SO 250611	T8/5	1
<b>32</b>	35	53	11.5	34.5	TPGX 0902...	SO 250611	T8/5	1
<b>40</b>	48	66	14.0	44.0	TPGX 1103...	SO 300811	T8/5	1
<b>50</b>	54	86	19.0	52.0	TPGX 1103...	SO 300811	T8/5	1
<b>IHRF 16</b>	18	24	8.0	17	CCGT 0602..	SR 14-548	T-7/5	2
<b>20</b>	22	30	8.5	21.0	CCGT 0602..	SR 14-548	T-7/5	2
<b>25</b>	28	40	10.0	26.5	CCGT 0602..	SR 14-548	T-7/5	2
<b>32</b>	35	53	11.5	34.5	CCGT 0602..	TS 400971	T-7/5	2
<b>40</b>	48	66	14.0	44.0	CCGT 09T3...	TS 400971	T-15/5	2
<b>50</b>	54	86	19.0	52.0	CCGT 09T3...	TS 400971	T-15/5	2

# IHWF

# Fine Boring Insert Holders

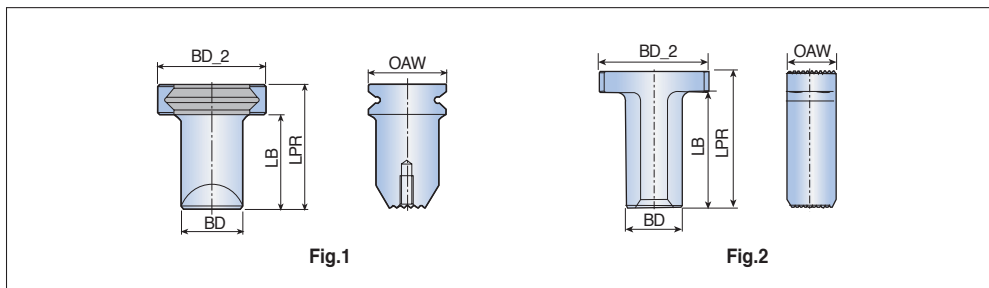
Insert holders for mounting on the MB fine boring heads



Designation	Dimension (mm)				Spare parts		
	DCN	DCX	WF	OAL	Insert	Insert screw	Torx key
<b>IHWF 14E</b>	14.5	18	8.0	14.0	WCGT 0201...	SR 14-299	T6/5

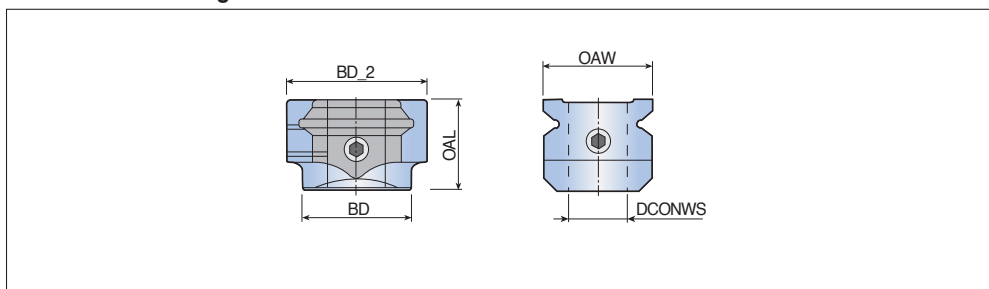


## Slide extensions for fine boring holders



Designation	Dimension (mm)					Kg	Fig.
	BD	LB	LPR	BD_2	OAW		
<b>BBH 30x40</b>	25	40	52.5	43	30.5	0.3	1
<b>30x70</b>	25	70	82.5	43	30.5	0.4	1
<b>30x115</b>	27	115	127.5	43	30.5	0.7	1
<b>40x69</b>	32	69	86	56	40	0.7	1
<b>40x114</b>	32	114	131	56	40	1.0	1
<b>40x189</b>	38	189	206	56	40	2.0	1
<b>63x78</b>	32	66	78	63	28	0.7	2

## Sleeve for fine boring holders



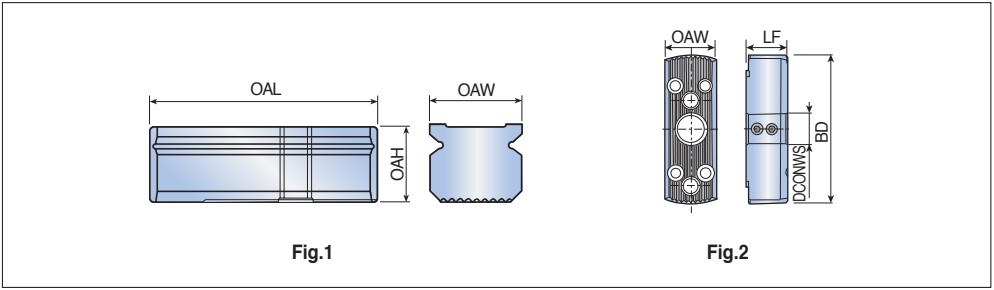
Designation	Dimension (mm)					Kg
	BD	BD_2	OAL	OAW	DCONWS	
<b>ADBH 30xD16</b>	30	39	25	30.5	16	0.2



# BHFH/BHEH

# Fine Boring Insert Holders & Slides

Slide for BHF & BHE fine boring holders

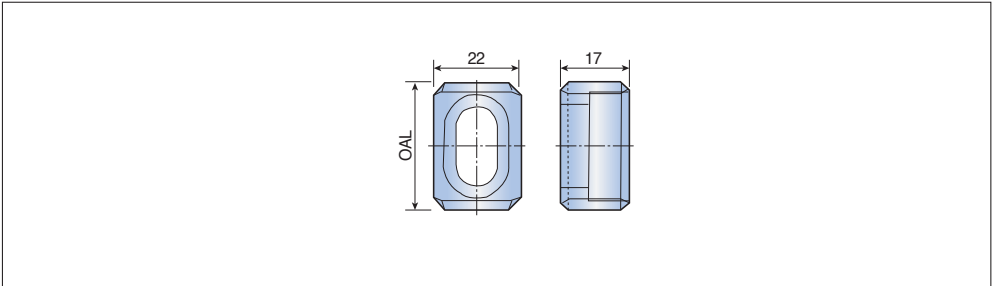


Designation	Dimension (mm)						Kg	Fig.
	OAH	OAL	OAW	BD	LF	DCONWS		
<b>BHFH 30x75</b>	25	75	30.5	-	-	-	0.4	1
<b>30x93</b>	25	93	30.5	-	-	-	0.5	1
<b>30x135</b>	25	135	30.5	-	-	-	0.7	1
<b>40x133</b>	40	133	40	-	-	-	1.5	1
<b>40x200</b>	40	200	40	-	-	-	2.4	1
<b>40x300</b>	40	300	40	-	-	-	3.5	1
<b>40x400</b>	40	400	40	-	-	-	4.6	1
<b>BHEH 24x75</b>	-	-	24	75	14.5	-	0.2	2
<b>28x80</b>	-	-	28	80	22.5	16	0.3	2
<b>28x108</b>	-	-	28	108	22.5	-	0.5	2
<b>28x148</b>	-	-	28	148	22.5	-	0.6	2

# CW32

# Fine Boring Insert Holders & Slides

Counter balancing weight



Designation	Dimension (mm)		Kg
	OAL		
<b>CW 32</b>	31.5		0.5

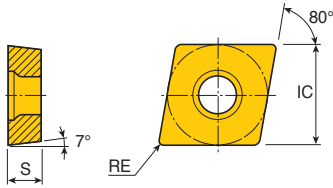








Positive 7° clearance 80° rhombic inserts



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

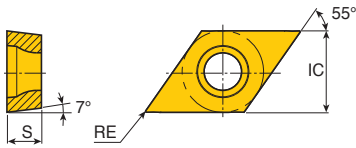
Insert	Designation	Cermet		CVD coated										PVD coated				Uncoated				
		PV3010	CT3000	TT7005	TT7015	TT7025	TT8105B	TT8115B	TT8125B	TT8135B	TT9215	TT9225	TT9235	TT5100	TT5080	TT8020	TT9020	TT9080	P20	K10	K20	
	<b>CCMT 060204 MT</b>	●	●	●	●		●	●	●	●		●	●	●	●	●				●		
	<b>060208 MT</b>	●	●	●	●			●	●	●			●	●	●	●						
	<b>09T304 MT</b>	●	●	●	●	●		●	●	●		●	●	●	●	●						
	<b>09T308 MT</b>		●	●	●	●		●	●	●	●	●	●	●	●	●						
	<b>120404 MT</b>	●	●	●	●			●	●	●			●	●	●	●						
	<b>120408 MT</b>		●	●	●	●		●	●	●		●	●	●	●	●						
	<b>120412 MT</b>				●			●	●	●			●	●	●							
	<b>CCGT 060201 SA</b>													●		●						
	<b>060202 SA</b>													●		●						
	<b>060204 SA</b>													●		●						
	<b>09T301 SA</b>													●		●						
	<b>09T302 SA</b>													●		●						
	<b>09T304 SA</b>													●		●	●					
	<b>09T308 SA</b>													●		●						
	<b>CCGT 060202 FL</b>																				●	
	<b>060204 FL</b>																					●
	<b>09T302 FL</b>																					●
	<b>09T304 FL</b>																					●
	<b>09T308 FL</b>																					●
	<b>120402 FL</b>																					●
	<b>120404 FL</b>																					●
	<b>120408 FL</b>																					●

●: Standard items

# DCMT

# Boring Inserts

Positive 7° clearance 55° rhombic inserts



Size	Dimension (mm)		
	IC	S	RE
<b>07</b>	6.35	2.38	0.4-0.8
<b>11</b>	9.52	3.97	0.4-1.2

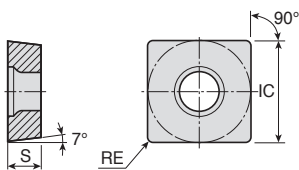
Insert	Designation	Cermet		CVD coated								PVD coated				Uncoated					
		PV3010	CT3000	TT7005	TT7015	TT8105B	TT8115B	TT8125B	TT8135B	TT9215	TT9225	TT9235	TT5100	TT7100	TT5080	TT8020	TT9020	TT9080	P20	K10	K20
	<b>DCMT 070204 PC</b>						●	●		●	●						●				
	<b>070208 PC</b>						●	●		●	●						●				
	<b>11T304 PC</b>					●	●	●		●	●						●				
	<b>11T308 PC</b>					●	●	●		●	●						●				
	<b>11T312 PC</b>					●	●	●		●	●						●				

● : Standard items

# SCGT

# Boring Inserts

Positive 7° clearance inserts for aluminum machining

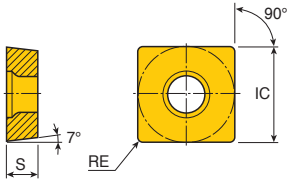


Size	Dimension (mm)		
	IC	S	RE
<b>09</b>	9.52	3.97	0.8
<b>12</b>	12.7	4.76	0.2-0.8

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		
	<b>SCGT 09T308 FL</b>																			●			
	<b>120402 FL</b>																				●		
	<b>120404 FL</b>																				●		
	<b>120408 FL</b>																				●		

● : Standard items

## Positive 7° clearance square inserts



Size	Dimension (mm)		
	IC	S	RE
<b>09</b>	9.52	3.97	0.4-0.8
<b>12</b>	12.7	4.76	0.4-1.2

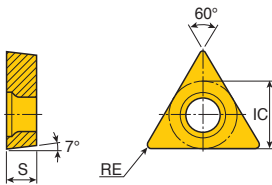
Insert	Designation	Cermet		CVD coated										PVD coated			Uncoated					
		PV3010	CT3000	TT7005	TT7015	TT7025	TT8105B	TT8115B	TT8125B	TT8135B	TT9215	TT9225	TT9235	TT5100	TT7100	TT5080	TT8020	TT9020	P20	K10	K20	
	<b>SCMT 09T304 FG</b>							●			●											
	<b>09T308 FG</b>							●	●		●		●			●	●					
	<b>SCMT 09T304 MT</b>	●	●	●	●		●	●	●		●		●			●						
	<b>09T308 MT</b>		●	●	●	●		●	●	●		●	●	●	●	●	●					
	<b>120404 MT</b>		●	●	●			●	●				●									
	<b>120408 MT</b>		●	●	●	●		●	●	●		●	●	●		●	●					
	<b>120412 MT</b>			●	●		●		●	●						●						

● : Standard items

# TCMT

# Boring Inserts

## Positive 7° clearance triangular inserts



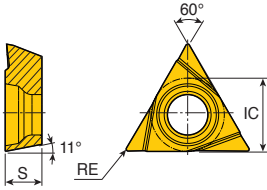
Size	Dimension (mm)		
	IC	S	RE
<b>22</b>	12.7	4.76	0.8

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

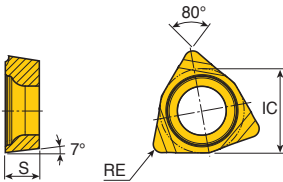
Insert	Designation	Cermet			CVD coated							PVD coated			Uncoated						
		PV3010	CT3000	TT7005	TT7015	TT8105B	TT8115B	TT8125B	TT8135B	TT9215	TT9225	TT9235	TT5100	TT7100	TT5080	TT8020	TT9020	P20	P30	K10	K20
 Left-hand	<b>TPGX 090202 L</b>	●																			
	<b>090204 L</b>	●																		●	
	<b>110302 L</b>	●																			●
	<b>110304 L</b>	●																			●

● : Standard items


# WCGT

# Boring Inserts

## Positive 7° clearance 80° trigon inserts



Size	Dimension (mm)		
	IC	S	RE
<b>02</b>	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	K20
	<b>WCGT 020102L</b>															●					
	<b>020104L</b>															●					

● : Standard items



# KIT BHE MB80-80x104

Kits

Boring kit BHE MB80-80 (ø6-200mm) with fine boring head

10µm  
2µm

1 BHE MB80-80x104  
1 IHFF 32  
1 BH 63x78  
1 IHFF 50  
1 IHFF 6-8/16  
1 IHAXF 8-10/16  
1 IHAXF 11-13/16  
1 IHAXF 16-18/16  
1 IHAXF 22-30/16

1 BHEH 28x80  
1 BH 63x78  
1 BHEH 28x108  
1 BHEH 28x148  
1 BH WASHER IH..50  
1 CW 32

Designation	Dimension (mm)	
		SS
<b>KIT BHE MB80-80x104</b>	MB80	6-200

# KIT BHE MB32-32x53 H

Kits

Boring kit BHE MB32-32x53 H (ø2.5-12mm) with fine boring head

G2.5  
12,000 RPM



10µm  
2µm

Boring tools:  
1 BHF MB32-32x53 H  
1 IHAXF 2.5-4/8  
1 IHAXF 4-6/8  
1 IHAXF 6-8/8  
1 IHAXF 8-10/8  
1 IHAXF 10-12/8

Inserts:  
5 TPGX 090202L  
2 WCGT 020102L

Designation	Dimension (mm)	
		SS
<b>KIT BHE MB32-32x53 H</b>	MB32	2.5-12



# KIT BHF MB 50-32 BL

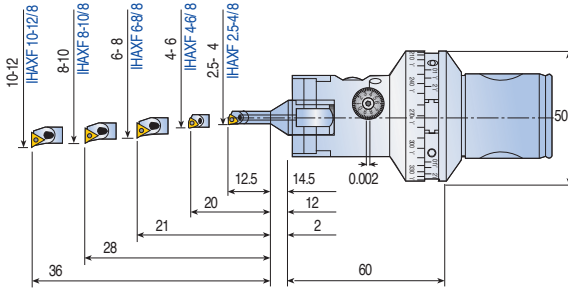
Kits

Boring kit 2.5-12mm diameter range with BHF fine boring balanceable head

G2.5  
20,000 RPM



2µm



- 1 BHF MB50-32X60 BL
- 1 IHAXF 2.5-4/8
- 1 IHAXF 4-6/8
- 1 IHAXF 6-8/8
- 1 IHAXF 8-10/8
- 1 IHAXF 10-12/8
- 5 TPGX 090202L
- 2 WCGT 020102L

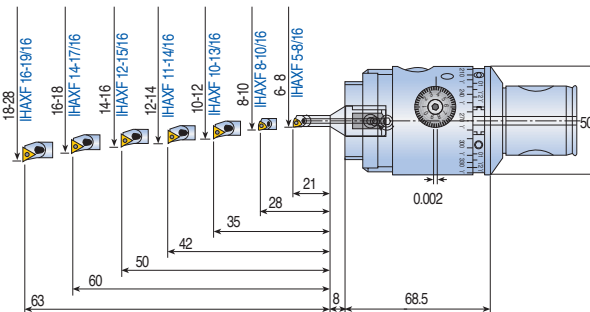
Designation	Dimension (mm)	
	SS	Boring range
<b>KIT BHF MB50-32 BL</b>	MB50	2.5-12

# KIT BHF MB50-50 BL

Kits

Boring Kit 6-20mm diameter range with BHF BL fine boring balanceable head

2µm



- 1 BHF MB50-50X68 BL
- 1 IHAXF 6-8/16
- 1 IHAXF 8-10/16
- 1 IHAXF 10-12/16
- 1 IHAXF 12-14/16
- 1 IHAXF 14-16/16
- 1 IHAXF 16-18/16
- 1 IHAXF 18-22/16
- 5 TPGX 090202L
- 2 WCGT 020102L

Designation	Dimension (mm)	
	SS	Boring range
<b>KIT BHF MB50-50 BL</b>	MB50	6-20

• 10µm direct diametric adjustment and 2µm by a vernier scale

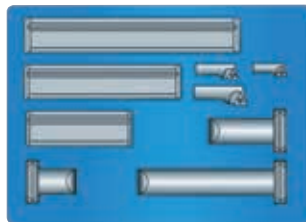
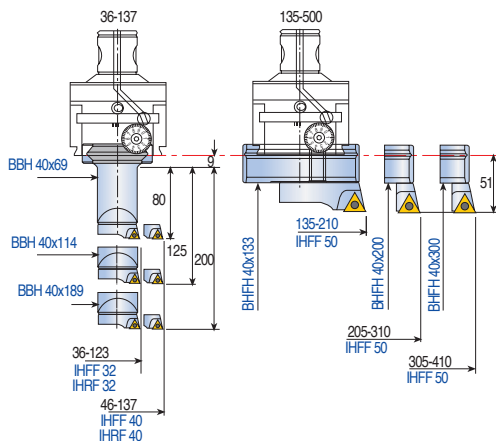


# KIT BHFH MB80-125

Kits

Kit BHFH MB80-125 holder for BHF MB80-125x114,36-410mm diameter range

2μm



- 1 BBH 40x69
- 1 BBH 40x114
- 1 BBH 40x189
- 1 BHFH 40x133
- 1 BHFH 40x200
- 1 BHFH 40x300
- 1 IHFF 25
- 1 IHFF 40
- 1 IHFF 50

Designation	Dimension (mm)	
	SS	Boring range
<b>KIT BHFH MB80-125</b>	MB50	36-410

• 10μm direct diametric adjustment and 2μm by a vernier scale

# KIT IHAXF 6-30

Kits

Kit IHAXF 6-30,6-30mm diameter range

2μm

- 1 IHAXF 6-8/16
- 1 IHAXF 8-10/16
- 1 IHAXF 11-13/16
- 1 IHAXF 16-18/16
- 1 IHAXF 22-30/16
- 5 TPGX 090202L
- 3 WCGT 020102L
- T-8/5
- T-6/5

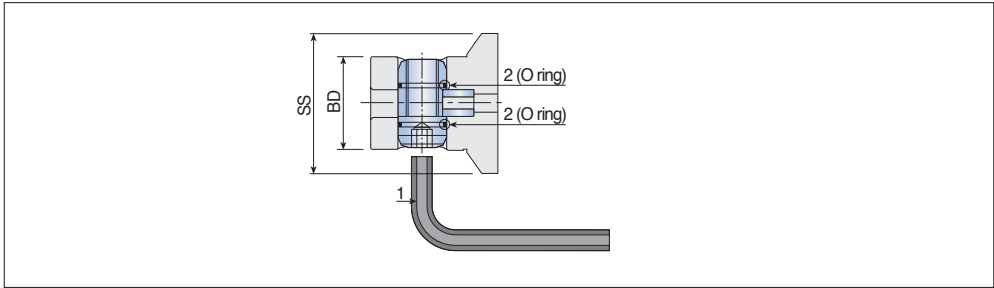


Designation	Dimension (mm)	
	Boring range	
<b>KIT IHAXF 6-30</b>	6-30	

# MB CLAMP

## Spare Parts

### MB system clamp set

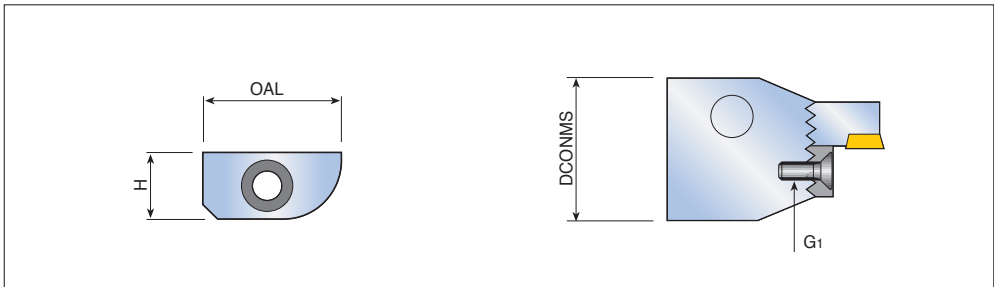


Designation	Dimension (mm)			
	SS	BD	1	2
<b>MB CLAMP 16</b>	MB16	10	2.5	-
<b>20</b>	MB20	13	3	-
<b>25</b>	MB25	16	3	-
<b>32</b>	MB32	20	4	ORM 0100-10
<b>40</b>	MB40	25	5	ORM 0130-10
<b>50</b>	MB50	32	6	ORM 0140-10
<b>63-80</b>	MB63-80	42	8	OR 2075

# PLT

## Spare Parts

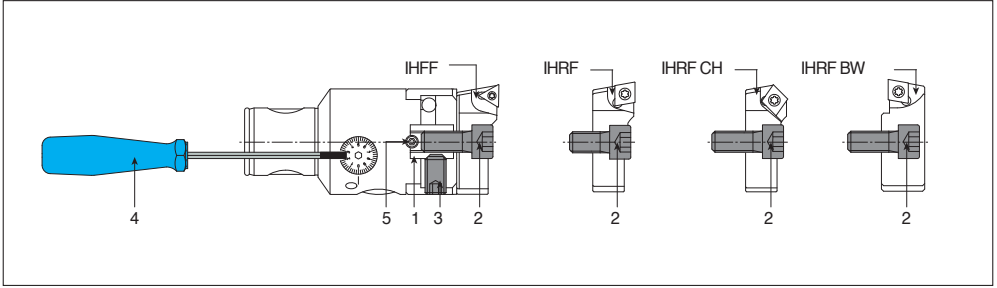
### Cover plate



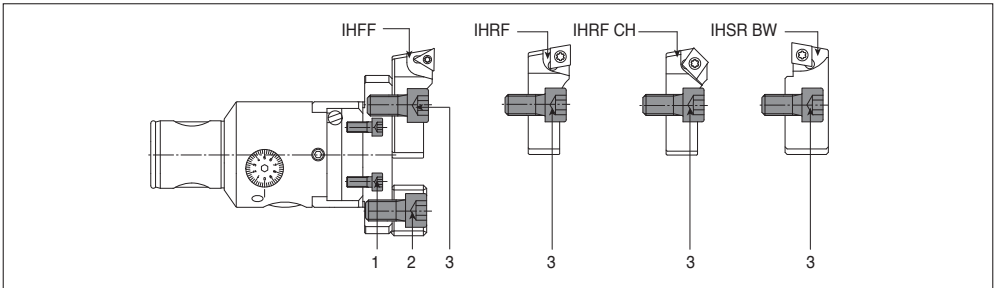
Designation	Dimension (mm)			
	DCONMS	H	OAL	G1
<b>PLT 16</b>	16	7	14	M 3x8
<b>20</b>	20	8.5	17	M 4x10
<b>25</b>	25	10.2	21	M 4x16
<b>32</b>	32	13.9	28	M 5x20
<b>40</b>	40	17.4	35	M 6x25
<b>50</b>	50	21.4	47.5	M 8x25
<b>63</b>	63	26.4	62	M 10x30
<b>80</b>	80	33.9	82.5	M 12x35

- Protects the serrated faces when a single toolholder is being used.

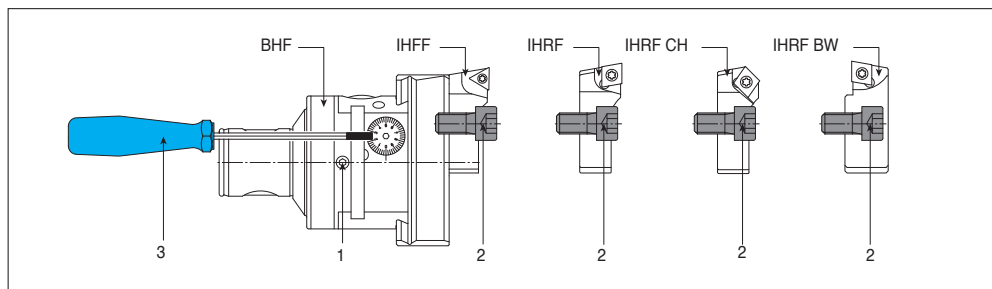




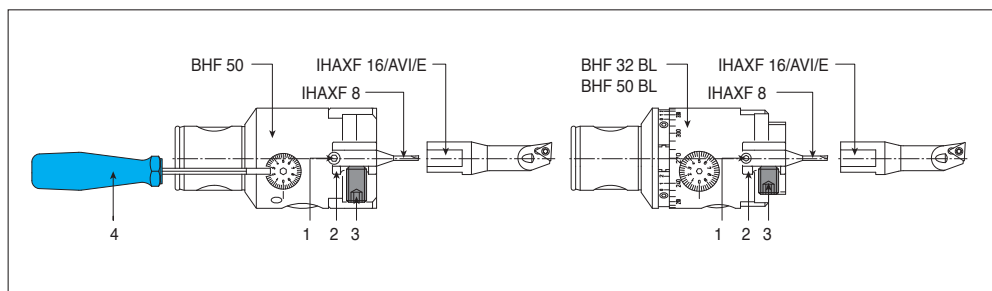
Designation	1	2	3	4	5
<b>BHF...- 16...</b>	-	SR M3x6 DIN 912	-	BH SR 1.5 HANDLE	SR M3x4.5 DIN 913
<b>20...</b>	-	SR M4x8 DIN 912	-	BH SR 1.5 HANDLE	SR M3x4.5 DIN 913
<b>25...</b>	-	SR M5x10 DIN 912	-	BH SR 2.0 HANDLE	SR M4x4 DIN 913
<b>32...</b>	-	SR M6x12 DIN 912	-	BH SR 2.0 HANDLE	SR M4x5 DIN 913
<b>40...</b>	-	SR M8x14 DIN 912	-	BH SR 2.5 HANDLE	SR M5x6 DIN 913 SR
<b>50-60</b>	BH NUT 10	SR M10x25 DIN 912	SR M10x16 DIN 913	BH SR 2.5 HANDLE	SR M5x8 DIN 913



Designation	1	2	3
<b>BHF...- 50...</b>	SR M5x10 DIN 912	SR M10x20 DIN 912	SR M10x25 DIN 912

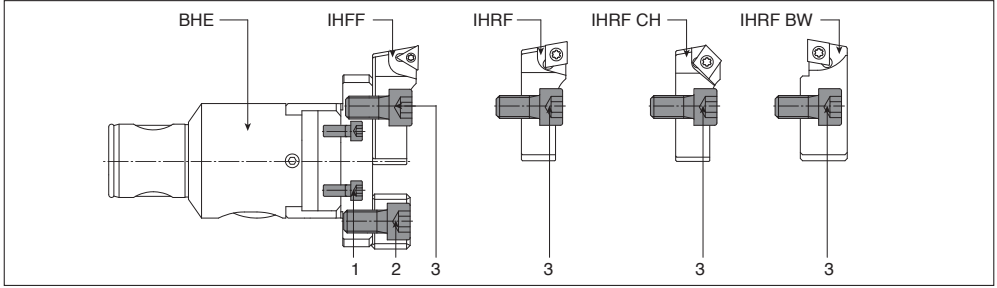


Designation	1	2	3
<b>BHF...- 63...</b>	SR M6x10 DIN 915	SR M10x25 DIN 912	BH SR 3.0 HANDLE
<b>80...</b>	SR M6x14 DIN 915	SR M10x25 DIN 912	BH SR 3.0 HANDLE
<b>125...</b>	SR M6x22 DIN 915	SR M10x25 DIN 912	BH SR 3.0 HANDLE

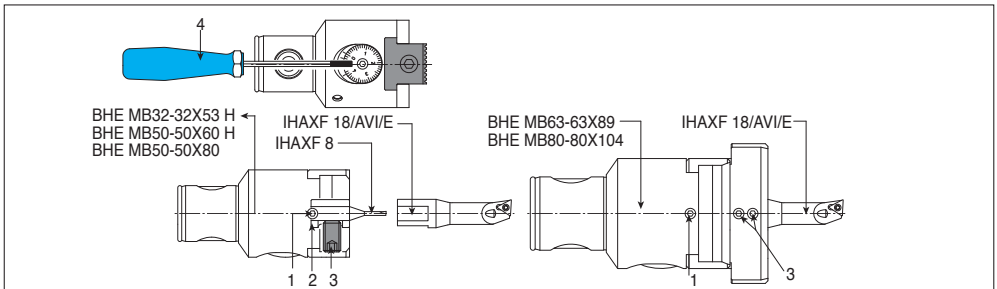


Designation	1	2	3	4
<b>BHF...- 50...</b>	SR M5x8 DIN 913	SLEEVE D 8-D16	SR M10x10 DIN 912	BH SR 2.5 HANDLE
<b>32... BL</b>	SR M4x5 DIN 913	-	SR M5x8 DIN 913 SR M5x12 DIN 913	BH SR 2.0 HANDLE
<b>50... BL</b>	SR M5x8 DIN 913	SLEEVE D 8-D16	SR M10x10 DIN 913 SR	BH SR 2.5 HANDLE

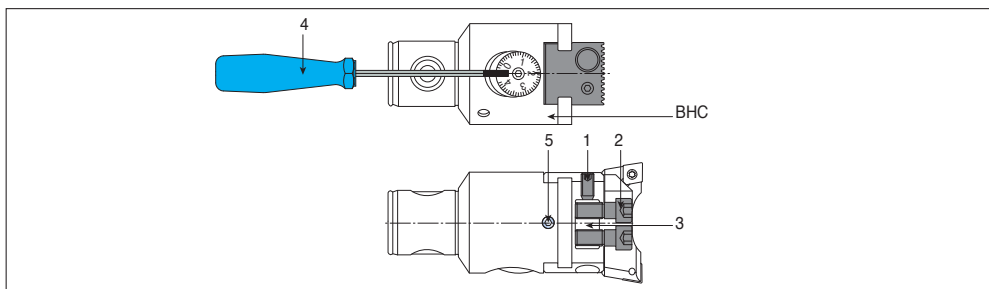




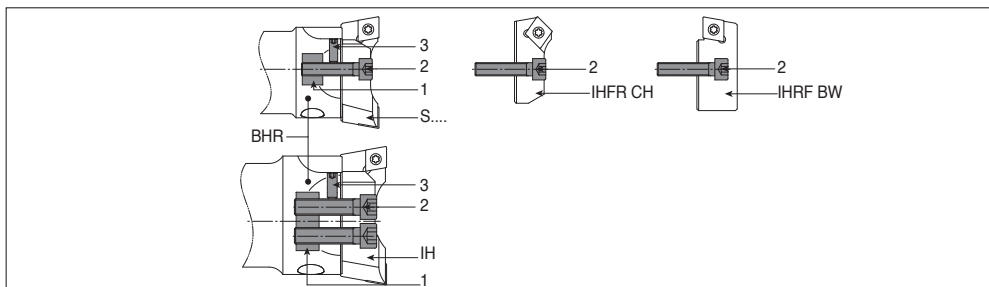
Designation	1	2	3
<b>BHE MB50-50x80</b>	SR M5x12 DIN 912	SR M10x20 DIN 912	SR M10x25 DIN 912
<b>MB63-63x89</b>	SR M5x25 DIN 912	SR M10x20 DIN 912	SR M10x25 DIN 912
<b>MB80-80x104</b>	SR M5x25 DIN 912	SR M10x20 DIN 912	SR M10x25 DIN 912



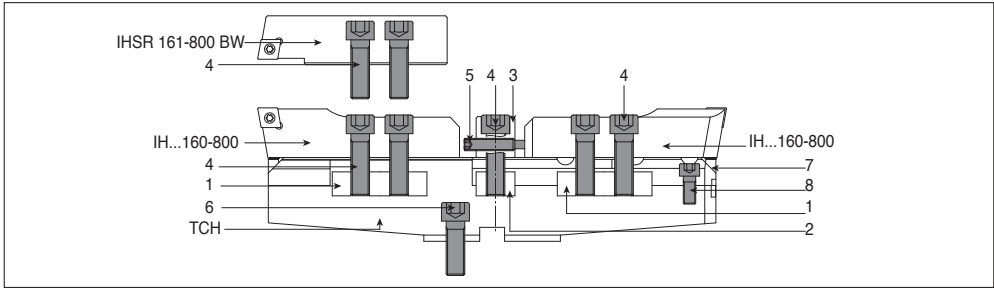
Designation	1	2	3	4
<b>BHE MB32-32x53 H</b>	SR M5x5 DIN 913	-	SR M5x8 DIN 913	BH SR 2.5 HANDLE
	SR M5x5 DIN 913	-	SR M5x12 DIN 913	BH SR 2.5 HANDLE
<b>MB50-50x60 H</b>	SR M6x8 DIN 913	SLEEVE D 8-D16	SR M10x10 DIN 913	BH SR 3.0 HANDLE
<b>MB50-50x8</b>	SR M6x8 DIN 913	-	SR M10x10 DIN 913	BH SR 3.0 HANDLE
<b>MB63-63x89</b>	SR M6x8 DIN 913	-	SR M6x6 DIN 913	BH SR 3.0 HANDLE
<b>MB80-80x104</b>	SR M6x12 DIN 913	-	SR M6x6 DIN 913	BH SR 3.0 HANDLE



Designation	1	2	3	4	5
<b>BHC MB25-25x57</b>	SR M4x8 DIN 913	BH SR M4x11 DIN 912 PT	BH NUT-BHC MB25	BH SR 2.0 HANDLE	SR M4x5 DIN 913
<b>MB32-32x71</b>	SR M5x10 DIN 913	BH SR M5x12.5 DIN 912 PT	BH NUT-BHC MB32	BH SR 2.5 HANDLE	SR M5x5 DIN 913
<b>MB40-40x90</b>	SR M6x12 DIN 913	BH SR M6x16 DIN 912 PT	BH NUT-BHC MB40	BH SR 3.0 HANDLE	SR M6x6 DIN 913
<b>MB50-50x87</b>	SR M6x14 DIN 913	BH SR M8x20 DIN 912 PT	BH NUT-BHC MB50	BH SR 3.0 HANDLE	SR M6x8 DIN 913
<b>MB63-63x109</b>	SR M6x16 DIN 913	BH SR M10x26 DIN 912 PT	BH NUT-BHC MB63	BH SR 3.0 HANDLE	SR M6x8 DIN 913
<b>MB80-80x130</b>	SR M6x20 DIN 913	BH SR M12x30 DIN 912 PT	BH NUT-BHC MB80	BH SR 3.0 HANDLE	SR M6x12 DIN 913

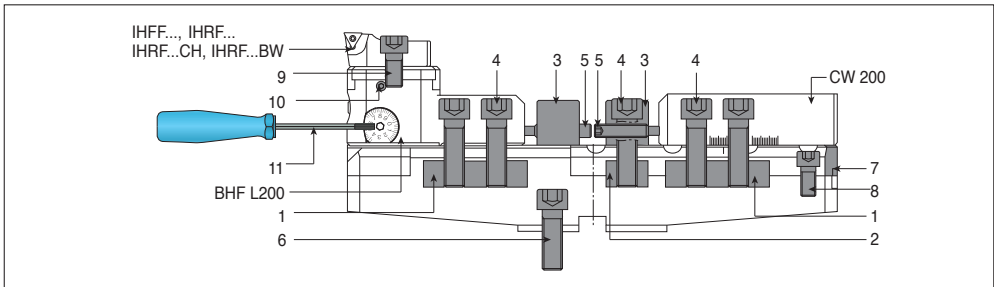


Designation	1	2	3
<b>BHR MB16...16</b>	BH NUT BHR MB16	SR M3x14 DIN 912	SR M3x4 DIN 913
<b>MB20...20</b>	BH NUT BHR MB20	SR M4x15 DIN 912	SR M3x5 DIN 913
<b>MB25...25</b>	BH NUT BHR MB25	SR M4x20 DIN 912	SR M3x8 DIN 913
<b>MB32...32</b>	BH NUT BHR MB32	SR M5x25 DIN 912	SR M4x12 DIN 913
<b>MB40...50</b>	BH NUT BHR MB40	SR M6x30 DIN 912	SR M5x14 DIN 913
<b>MB50...50</b>	BH NUT BHR MB50	SR M8x35 DIN 912	SR M5x12 DIN 913
<b>MB50...63</b>	BH NUT BHR MB63	SR M10x40 DIN 912	SR M6x16 DIN 913
<b>MB63...63</b>	BH NUT BHR MB63	SR M10x40 DIN 912	SR M6x16 DIN 913
<b>MB80...80</b>	BH NUT BHR MB80	SR M12x45 DIN 912	SR M8x25 DIN 913



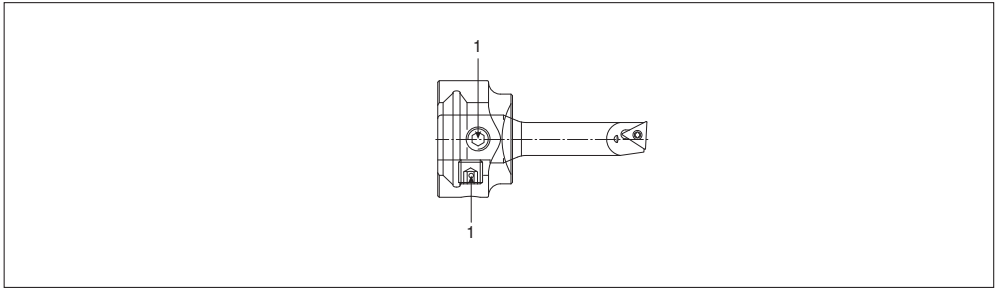
Designation	1	2	3	4
<b>TCH 200-300-400</b>	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12x40 DIN 912
<b>500-600-700</b>	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12x40 DIN 912

Designation	5	6	7	8
<b>TCH 200-300</b>	SR M8x40 DIN 915	SR M12x35 DIN 912	BH SERRATED PLATE 200-300	SR M8x25 DIN 912
<b>400</b>	SR M8x40 DIN 915	SR M12x35 DIN 912	BH SERRATED PLATE 400-700	SR M8x20 DIN 912
<b>500-600-700</b>	SR M8x40 DIN 915	SR M16x50 DIN 912	BH SERRATED PLATE 400-700	SR M8x25 DIN 912



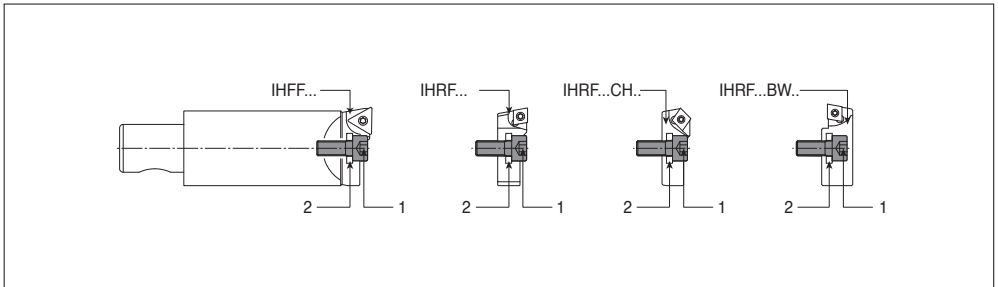
Designation	1	2	3	4	5
<b>TCH 200-300-400</b>	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12x40 DIN 912	SR M8x40 DIN 915
<b>500-600-700</b>	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12x40 DIN 912	SR M8x40 DIN 915

Designation	6	7	8	9	10	11
<b>TCH 200-300</b>	SR M12x35 DIN912	BH SERRATED PLATE 200-300	SR M8x25 DIN912	SR M10x20 DIN912	SR M6x8 DIN915	BH SR 3.0 HANDLE
<b>400</b>	SR M12x35 DIN912	BH SERRATED PLATE 400-700	SR M8x20 DIN912	SR M10x20 DIN912	SR M6x8 DIN915	BH SR 3.0 HANDLE
<b>500-600-700</b>	SR M16x50 DIN912	BH SERRATED PLATE 400-700	SR M8x25 DIN912	SR M10x20 DIN912	SR M6x8 DIN915	BH SR 3.0 HANDLE

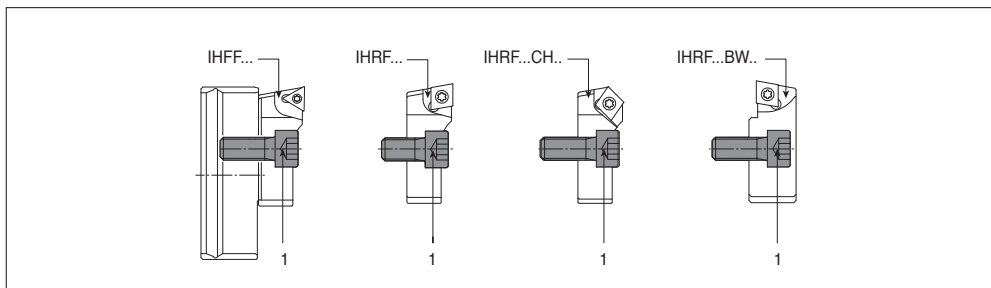


Designation	1
<b>ADBH 30xD16</b>	SR M45x8 DIN 913

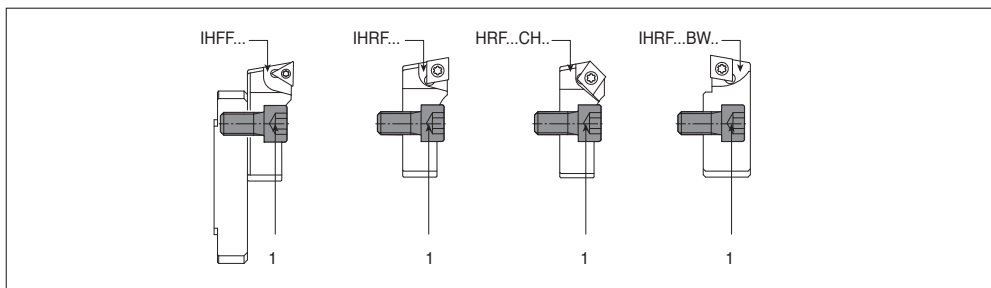
BBH-D



Designation	1	2
<b>BBH D16x63</b>	SR M5x12 DIN 912	WASHER DIN 125A M5
<b>D16x105</b>	SR M5x12 DIN 912	WASHER DIN 125A M5



Designation	1
<b>BHFH 30x75</b>	SR M10x18 DIN 912
<b>40x133</b>	SR M10x18 DIN 912
<b>30x93</b>	SR M10x18 DIN 912
<b>40x200</b>	SR M10x25 DIN 912
<b>30x135</b>	SR M10x25 DIN 912
<b>40x300</b>	SR M10x25 DIN 912
<b>40x400</b>	SR M10x25 DIN 912

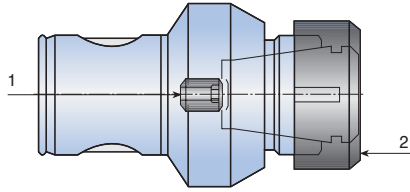


Designation	1
<b>BHEH 24x75</b>	SR M10x20 DIN 912
<b>28x80</b>	SR M10x25 DIN 912
<b>28x108</b>	SR M10x25 DIN 912
<b>28x148</b>	SR M10x25 DIN 912





## Components for CC

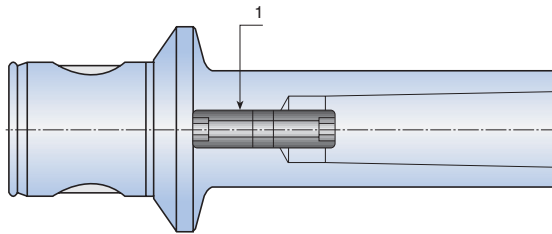


Designation	1	2	Wrench
<b>CC MB16-ER11M</b>	CC MB16 SCREW	NUT ER11 MINI	WRENCH ER11 MINI
<b>MB20-ER16M</b>	CC MB20 SCREW	NUT ER16 MINI	WRENCH ER16 MINI
<b>MB25-ER20M</b>	CC MB25 SCREW	NUT ER20 MINI	WRENCH ER20 MINI
<b>MB32-ER25M</b>	CC MB32 SCREW	NUT ER25 MINI	WRENCH ER25 MINI
<b>MB40-ER25</b>	CC MB40 SCREW	NUT ER25 TOP	WRENCH ER25
<b>MB50-ER25</b>	CC MB50 SCREW	NUT ER25 TOP	WRENCH ER25
<b>MB50-ER32</b>	CC MB50 SCREW	NUT ER32 TOP	WRENCH ER32
<b>MB63-ER32</b>	CC MB63 SCREW	NUT ER32 TOP	WRENCH ER32
<b>MB63-ER40</b>	CC MB63 SCREW	NUT ER40 TOP	WRENCH ER40

# AMT MB...-MT

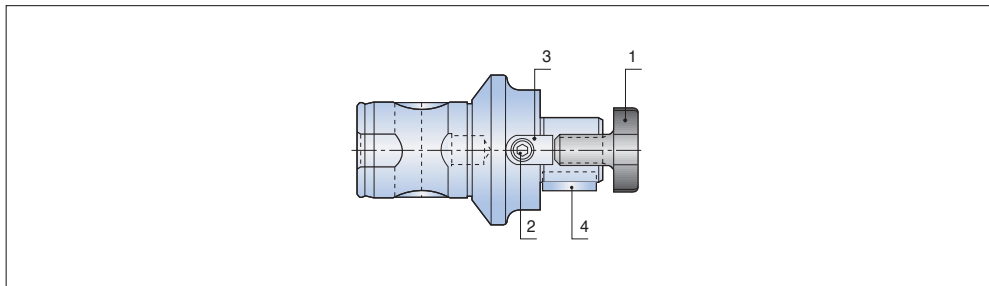
# Spare Parts

## Screw for shanks: Morse taper tang AMT



Designation	1
<b>AMT MB50-MT2</b>	AMT MT2-SCREW
<b>MB50-MT3</b>	AMT MT3-SCREW
<b>MB63-MT3</b>	AMT MT3-SCREW
<b>MB63-MT4</b>	AMT MT4-SCREW

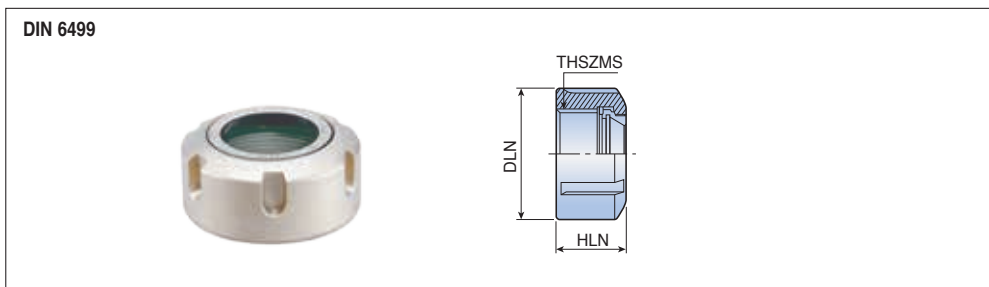
## Screw for shell mill holders SMH



Designation	1	2	3	4
<b>SMH MB40-22</b>	M10 CLAMP SCREW SEM 22	DOG DRIVE SMH 22	KEY SMH 22	M4x10 SMH KEY SCREW
<b>MB50-16</b>	M 8 CLAMP SCREW SEM 16	DOG DRIVE SMH 16	KEY SMH 16	M3x 8 SMH KEY SCREW
<b>MB50-22</b>	M10 CLAMP SCREW SEM 22	DOG DRIVE SMH 22	KEY SMH 22	M4x10 SMH KEY SCREW
<b>MB50-27</b>	M12 CLAMP SCREW SEM 27	DOG DRIVE SMH 27	KEY SMH 27	M5x12 SMH KEY SCREW
<b>MB50-32</b>	M16 CLAMP SCREW SEM 32	DOG DRIVE SMH 32	KEY SMH 32	M6x16 SMH KEY SCREW
<b>MB63-27</b>	M12 CLAMP SCREW SEM 27	DOG DRIVE SMH 27	KEY SMH 27	M5x12 SMH KEY SCREW
<b>MB63-32</b>	M16 CLAMP SCREW SEM 32	DOG DRIVE SMH 32	KEY SMH 32	M6x16 SMH KEY SCREW
<b>MB80-32</b>	M16 CLAMP SCREW SEM 32	DOG DRIVE SMH 32	KEY SMH 32	M6x16 SMH KEY SCREW
<b>MB80-40</b>	M20 CLAMP SCREW SEM 40	DOG DRIVE SMH 40	KEY SMH 40	M6x18 SMH KEY SCREW

# NUT ER ... TOP

## ER - Top™ clamping nut

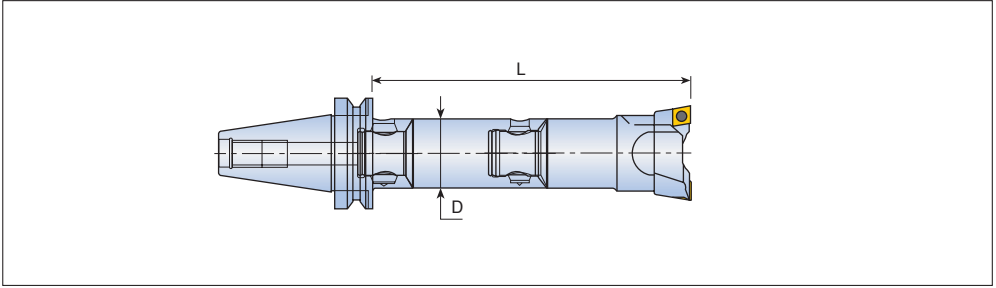


Designation	Dimension (mm)		
	DLN	HLN	THSZMS
<b>NUT ER16 TOP</b>	28	17	M22x1.5
<b>ER20 TOP</b>	34	19	M25x1.5
<b>ER25 TOP</b>	42	20	M32x1.5
<b>ER32 TOP</b>	50	22	M40x1.5
<b>ER40 TOP</b>	63	25	M50x1.5

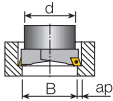


# Recommended Cutting Conditions

## BHR rough boring heads



## Cutting depth



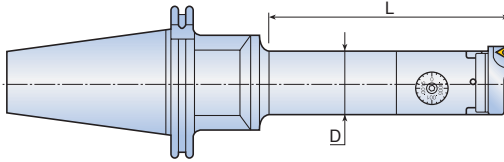
It's advisable to start with  $B \text{ hole} \geq \text{boring bar diameter } d$

B Working range	ap (mm) Steel	ap (mm) Cast iron, Aluminum
18-28	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 (Vc=m/min)	Feed f=mm/rev		Cutting depth (ap)
				Insert radius		
				R=0.2	R=0.4	
Carbon steel 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 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 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

## Boring operations with BHC combi rough and fine

Material	L/D	Stability	Cutting speed (Vc=m/min)	Feed f=mm/rev		Cutting depth (mm)			
				Insert radius					
				R=0.2	R=0.4				
Carbon steel HB<200	L/D=2.5	•••	160-250	0.1-0.2	0.1-0.2	0.15-0.3	1.5	2	2.5
	L/D=4	••	120-180	0.1-0.2	0.1-0.2				
Carbon steel HB>200	L/D=2.5	•••	140-200	0.1-0.2	0.1-0.2	0.15-0.3	1.5	2	2.5
	L/D=4	••	100-160	0.1-0.2	0.1-0.2				
	L/D=6.3	•	70-100	* 0.1-0.15	0.1-0.2				
Stainless steel AISI 304-316	L/D=2.5	•••	100-140	0.1-0.2	0.1-0.2	0.15-0.3	1.5	2	2.5
	L/D=4	••	80-110	0.1-0.2	0.1-0.2				
	L/D=6.3	•	60-90	* 0.1-0.15	0.1-0.2				
Cast iron	L/D=2.5	•••	120-160	0.1-0.2	0.1-0.2	0.15-0.3	2	2.5	3
	L/D=4	••	90-120	0.1-0.2	0.1-0.2				
	L/D=6.3	•	60-90	* 0.1-0.15	0.1-0.2				
Aluminum	L/D=2.5	•••	250-350	0.1-0.2	0.1-0.2	0.15-0.3	2	2.5	3
	L/D=4	••	160-250	0.1-0.2	0.1-0.2				
	L/D=6.3	•	100-150	* 0.1-0.15	0.1-0.2				

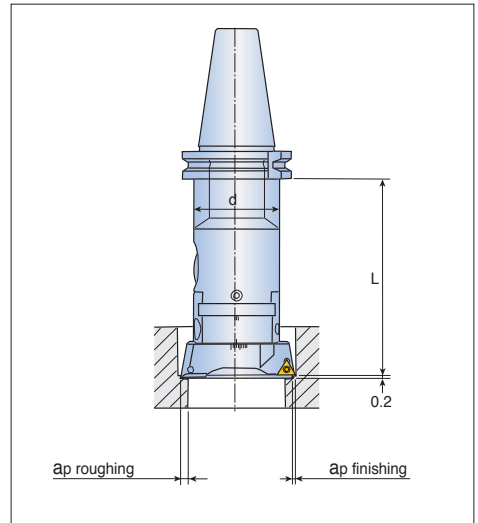
- \*Only for finishing Inserts.
- Use inserts with the same corner radii for both roughing and finishing inserts.

VC Cutting speed (m/min)  
D Diameter of workpiece (m/min)  
n Number of revolutions / min' (rev./min)  
Vf Feed rate (mm/min.)  
Fn Feed (mm/rev)  
 $\pi$  3.14

$$VC = \frac{\pi \cdot D \cdot n}{1000}$$

$$n = \frac{VC \cdot 1000}{\pi \cdot D}$$

$$Vf = n \cdot fn$$



# 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 ***	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 ***	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 ***	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 ***	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 ***	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 ***	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 ***	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 ***	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 ***	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 ***	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 ***	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 ***	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)		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	
P	Alloyed steel	HB<200	2.5 •••	Vc	140-160	90-120	150-180	100-130	160-200	140-180	
				f	0.08-0.18	0.08-0.15	0.08-0.2	0.08-0.18	0.1-0.25	0.1-0.15	
			4 ••	Vc	100-130	70-100	110-150	90-120	140-180	100-130	
				f	0.08-0.15	0.06-0.12	0.08-0.18	0.08-0.15	0.8-0.18	0.08-0.12	
			6.3 •	Vc	80-100	60-90	80-100	70-90	100-140	80-120	
				f	0.08-0.15	0.06-0.1	0.06-0.12	0.06-0.12	0.6-0.15	0.08-0.1	
	Alloyed steel	HB>200	2.5 •••	Vc	130-150	120-140	130-150	120-140	140-170	120-150	
				f	0.08-0.18	0.06-0.15	0.08-0.18	0.06-0.15	0.08-0.2	0.08-0.18	
			4 ••	Vc	100-130	100-120	100-130	100-120	120-150	100-120	
				f	0.08-0.15	0.06-0.13	0.08-0.15	0.06-0.13	0.08-0.18	0.08-0.15	
			6.3 •	Vc	80-100	70-90	80-100	70-90	100-120	70-90	
				f	0.08-0.12	0.06-0.11	0.08-0.12	0.06-0.11	0.08-0.12	0.06-0.11	

ISO	Workpiece material	Hardness HB	Overhang L/D			Boring range D68-120		Boring range D120-200		Boring range D200-500	
				ap (mm)		0.8	2.5	0.8-2.0	2.0-3.5	0.8-2.0	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	Alloyed steel	HB<200	2.5 •••	Vc	160-220	140-180	160-220	140-180	160-220	140-180	
				f	0.1-0.3	0.1-0.25	0.1-0.3	0.1-0.25	0.1-0.35	0.1-0.3	
			4 ••	Vc	150-200	120-160	120-160	120-160	N.R.	N.R.	
				f	0.1-0.2	0.08-0.18	0.1-0.2	0.08-0.18			
			6.3 •	Vc	100-140	100-140	N.R.	N.R.	N.R.	N.R.	
				f	0.08-0.18	0.08-0.15					
	Alloyed steel	HB>200	2.5 •••	Vc	160-200	140-180	140-200	140-180	140-200	140-180	
				f	0.1-0.3	0.01-0.25	0.01-0.35	0.01-0.3	0.01-0.35	0.01-0.3	
			4 ••	Vc	140-160	120-140	150-180	120-140	N.R.	N.R.	
				f	0.08-0.2	0.08-0.15	0.08-0.12	0.08-0.12			
			6.3 •	Vc	100-120	70-90	N.R.	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		D28-50		D50-68			
				ap (mm)	R (Radius)	0.5-1.0	1.0-1.8	0.5-1.0	1.0-1.8	0.5-1.2	1.2-2.0
M	Stainless steel	Ferritic & martensitic	2.5 ***	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 **	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 *	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 ***	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 **	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 *	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 ***	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 **	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 *			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 ***	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 **	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 *	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 ***	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 **	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 *	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 ***	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 **	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 *	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 ***	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 **	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 *	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 ***	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 **	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 *	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		D28-50		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
<b>K</b>	Gray cast iron GG 10-25	HB<200	2.5 •••	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 ••	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 •	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 •••	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 ••	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 •	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 •••	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 ••	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 •	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		D28-50		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
<b>K</b>	Gray cast iron GG 10-25	HB<200	2.5 •••	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 ••	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 •	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 •••	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 ••	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 •	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 •••	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 ••	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 •	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/ Cast	>12si	2.5 ***	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 **	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 *	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/ Cast	<12si	2.5 ***	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 **	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 *	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/ Cast	>12si	2.5 ***	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 **	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 *	Vc	60-100	60-100	N.R.	N.R.	N.R.	N.R.
				f	0.06-0.1	0.06-0.1				
	Aluminum/ Cast	<12si	2.5 ***	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 **	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 *	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 ② 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 ⑤ until it completely enters the recess in the sleeve nut or boring bar

### ■ Disassembly

- Loosen the pin ② by turning counter-clockwise

### ■ Positioning

- Loosen the screw ④ before making any slide adjustment
- By turning the graduated dial ③ counterclockwise, set the tool slide ⑦ allowance for a 4mm adjustment
- Lock the tool slide by means of screw ④, to the desired position
- Lock the screw ④
- When making any slide adjustment, firstly loosen the screw ④

### ■ Maintenance

Weekly:

- Lubricate through the oiling nipple ⑧ with ISO UN G220 oil

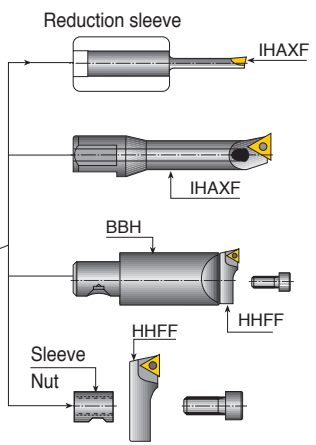
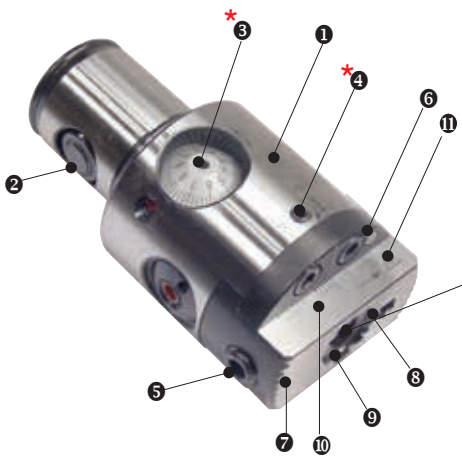
Periodically:

- Clean the conical cylindrical surface and then lubricate
- Grease the expanding pin ② 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 ③ 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                               |

# Technical Data

## ► Fine boring head BHF 63-125 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 ② by turning clockwise

The recommended tightening torque guidelines are as follows:

Recommended Torque	(N·m)
BHF MB50 - 63 x 87	30 - 35
BHF MB50 - 80 x 94	30 - 35
BHF MB63 - 63 x 87	80 - 90
BHF MB80 - 80 x 94	80 - 90
BHF MB80 - 125 x 94	80 - 90
BHF MB50 - 50 x 60	30.0 - 35.0

- Insert screw ⑤ until it completely enters the recess in the sleeve nut or boring bar

### ■ Disassembly

- Loosen the pin ② by turning counter-clockwise

### ■ Positioning

- Loosen the screw ④ before making any slide adjustment
- By turning the graduated dial ③ counterclockwise, set the tool slide ⑦ allowance for a 4mm adjustment
- Lock the tool slide by means of screw ④, to the desired position
- Lock the screw ④
- When making any slide adjustment, firstly loosen the screw ④

### ■ Maintenance

Weekly:

- Lubricate through the oiling nipple ⑥ with ISO UN G220 oil

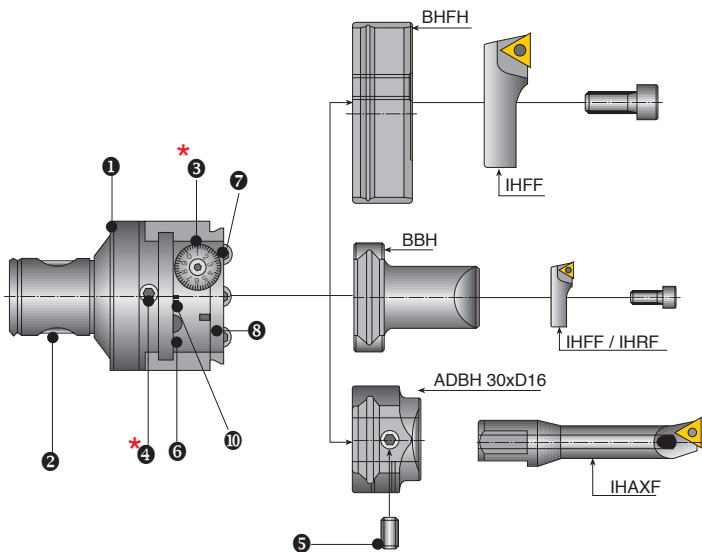
Periodically:

- Clean the conical cylindrical surface and then lubricate
- Grease the expanding pin ② 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 ③ in the reverse direction at least one rotation and then re-adjust in the original direction

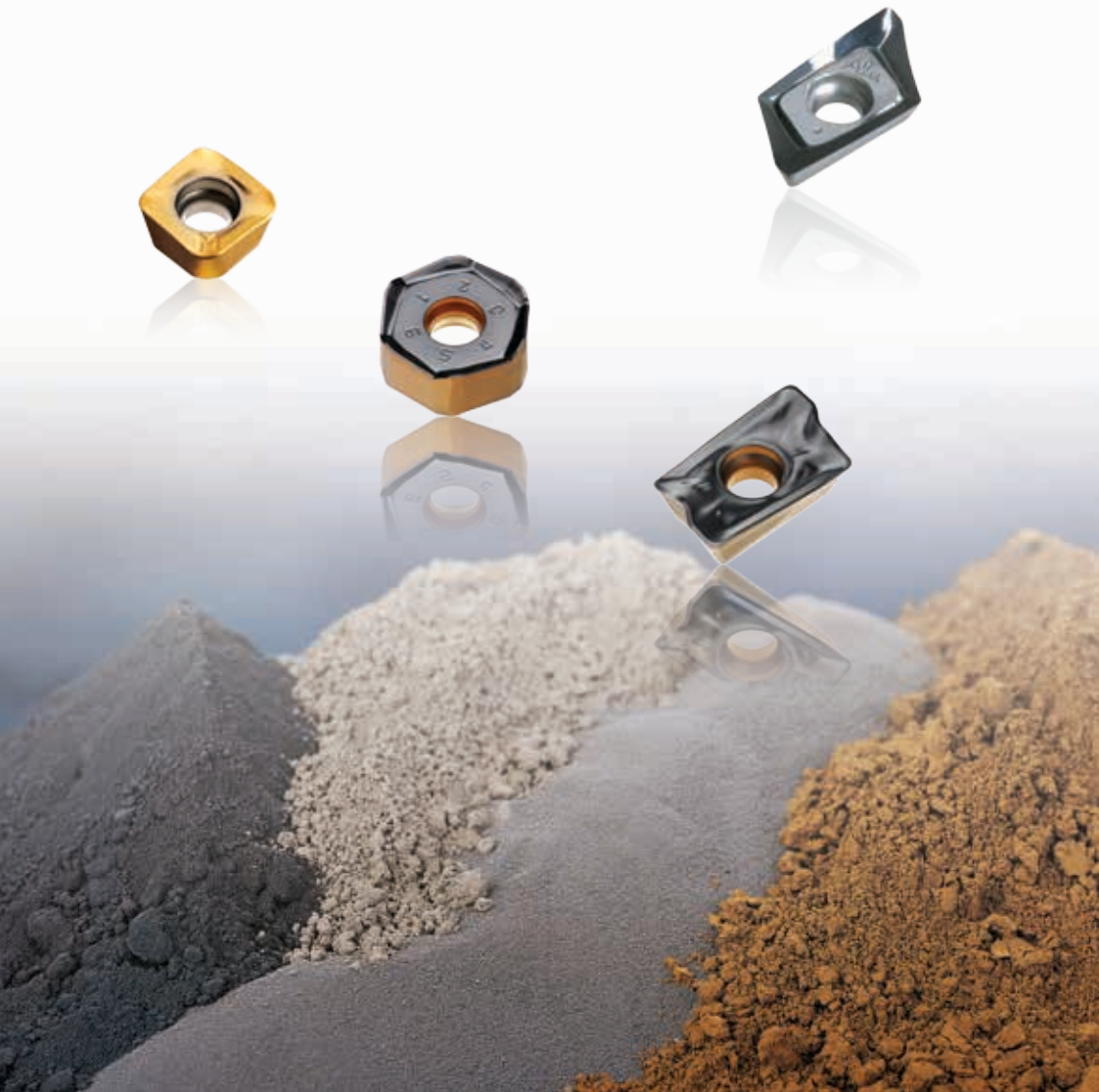


- |                   |                            |                 |  |
|-------------------|----------------------------|-----------------|--|
| ① Body            | *④ Slide locking screw     | ⑦ Slide holder  | ⑨ Toolholder locking screws                                |
| ② Expanding pin   | ⑤ Toolholder 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
<b>P</b>	TT2510 TT7080	GC4330 GC1010 GC4220 GC4230	WKP25S WKP25 WAM10 WAM20	MP1500 MP2500 T250M		MP6120	ACP100	T3130 AH3035 AH710		PC3525 PC3530 NC5330 NC5340	IC5400 IC380 IC902 IC950 IC520M
	TT9080	GC4340 GC1130 GC1030 GC4240	WKP25S WAM30	F25M F30M F32M MP3000	KC522M KC635M	MP9120 MP9130 VP15TF MP6130 VP20RT	ACP3000 ACU2500 ACP200	AH110 AH3225 AH725 AH730 GH330 AH120	PR830 PR1225 PR1230 PR9925	PC3700 PC3500 PC3600 PC5300 PC3535	IC608 IC808 IC908
	TT8525B TT8080	GC4240 GC1040	WKP35G WKP35S WKP45S WSM45X WSP45S WSP45G	F40M T350M T60M MS2050 MP2050	KC725M KC735M KC935M KCPM20 KCPM40	VP30RT FH7020 F7030	ACP300 ACZ350	AH140 T3130 AH130 AH3135 AH9030	PR1525	PC3600 PC5400 NC5350 NCM535	IC830 IC330 IC845 IC928 IC300
<b>M S</b>	TT9080 TT9030	GC1010 GC1130 GC1030 GC2030 S30T GC1025	WAM30 WXM35	MS2050 MP3000 MP2500 F25M F30M F32M	KC635M	MP9120 MP9130 VP15TF VP20RT	XCU2500 ACU2500 ACK300 ACP300 ACM100 ACM20	AH110 AH3225 T3130 AH8015 AH725 AH120 AH4035	PR830 PR1210 PR1025 PR1225 PR905	PC5300 PC9530	IC608 IC808 IC902 IC908
	TT8080 TT8020	GC2040 GC1040 S40T	WSM30 WSM35 WSM35S WSP45S WSM45X WMP45G	F40M MS2500 MM4500 MP2050	KC725M KCPM40	MP9140 MP7130 MP7140 VP30RT MV1020 MC7020	ACM200 ACM300	AH130 AH140 SH730 AH3135	PR1225 PR905	PC5400 NC5350 PC9540	IC840 IC830 IC882 IC330 IC328
<b>K</b>	TT7515 TT2510	GC1010 GC3220 GC3330 GC4220	WAK15	MK1500 MP1500 MH1000	KC915M KCK15	MC5020	ACK3000 ACU2500 ACK200	T1115		PC8110	IC5100 IC4100 IC902 DT7150 IC4050
	TT6080	GC1020 GC4230 GC3040 GC4240	WKP25S WKP35G WKP35S WKK25S	MK2000 MK3000 MK2050 F32M	KCK15 KC520M	MP8010 VP15TF VP20RT F5010	XCK2000 ACK300 ACZ310	AH110 AH725 AH120 AH8015	PR905 PR1210 PR1510	PC6510 NC5330 NC5340 NCM535	IC810 IC910 IC608
<b>H</b>	TT2510 TT6080 TT9080	GC1010 GC1130 GC1030	WHH15 WHH15X	F15M MH1000 MP1500 MP3000 F32M	KC510M KC522M KC635M	MV1020 MP8010 VP15TF VP20RT F5010		AH710 AH750		PC2005 PC2010 PC2015 PC2510 PC2505 PC210F	IC902 IC903 IC900

# Grade Comparison Table

## ► Cermet grades

ISO class	TaeguTec	Sandvik	Kennametal	Sumitomo	Kyocera	Tungaloy	Mitsubishi	Korloy	Seco	NTK	Ceramtec
<b>P</b>	CT7000	CT530	KT1120 KT175	T250A T130A	TN100M TN620M PV90	NS530	VP45N NX99 NX3035	CN20 CN30	TP1020 C15M	N20 Z15 C50 C7X	SC7015 SC60

## ► Ceramic grades

ISO class	Composition	TaeguTec	Sandvik	Kennametal	Ceramtec	NTK	Kyocera	Sumitomo	Tungaloy
<b>K</b>	Al <sub>2</sub> O <sub>3</sub> , ZrO <sub>2</sub>	AW120	CC620		SN60 SN80	HC1 HW2	KA30		TZ120
	Al <sub>2</sub> O <sub>3</sub> , TiC	AB30	CC650	KY1615	SH2 SH4	HC2 HC5 HC6	A65	NB90S NB90M	LX21
	Si <sub>3</sub> N <sub>4</sub> , Al <sub>2</sub> O <sub>3</sub> , Y <sub>2</sub> O <sub>3</sub> , AlN	AS500		KY1310 KY3000	SL506 SL508 SL606 SL608	SX9			
	Si <sub>3</sub> N <sub>4</sub> , ZrO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Y <sub>2</sub> O <sub>3</sub>	AS10	CC6090 CC6190	KY1320 KY3500 KYK10	SL500 SL808	SX1 SX6 SX8	KS6000 KS6050	SN2000K SN2100K NS260	FX105 CX710
	CVD coated	SC10	CC1690	KY3400 KYK25	SL550C SL554C SL654C SL658C SL854C SL858C	SP2 SP9	CS7050	NS260C	CXC73
<b>H</b>	Al <sub>2</sub> O <sub>3</sub> , TiCN	AB20			SH2 SH4	HC2 HC5 HC7			LX10
	PVD coated	AB2010	CC6050	KY4400		ZC4 ZC7	A66N PT600M	NB100C	LX11
<b>S</b>	Al <sub>2</sub> O <sub>3</sub> , SiC whisker	TC430	CC670	KY4300		WA1 WA5		WX2000	
	Si <sub>3</sub> N <sub>4</sub> , TiN	TC3020 TC3030	CC6060 CC6065 CC6160	KY2100 KY1540 KYS30 KYS25 KYS30P		SX3 SX5 SX7 SX9	KS6030 KS6040	SN1000S SN2000S	TS200 TS300

# Grade Comparison Table

## ▶ CBN grades

ISO class	TaeguTec	Iscar	Tungaloy	Sumitomo	Sandvik	Kennametal	Mitsubishi	Kyocera	Seco
H	TB610	IB10H IB50	BX310	BN1000 BNX1	CB7105 CB7015	KB1610	MBC010	KBN510	CBN10
		IB10HC	BXC30 BXA30	BNC80 BNC100 BNC2010		KB5610 KB9610	MB8025 BC8105 BC8210	KBN10M KBN10C KBN25C	CBN050C CH0550
	TB2015 TB650	IB20H IB55	BX330 BX530	BN250 BN2000 BNX20	CB7115 CB7025	KB1625	MB810	KBN525	CBN100
		IB25HA	BXM10 BXC30 BXA40	BNC160 BNC2020		KB5625	MB820 BC8110 BC8220	KBN05M KBN25M	CBN160C CH2540
	TB670	IB25HC	BX360 BX380	BNX25 BN350	CB7125 CB7135 CB50 CB7525 CB7925		MB825 MB8025 BC8120 BC8220		CBN150 CBN170
			BXM20 BXA20 BXA40 BXC50	BNC200 BNC300			MB835 BC8020 BC8130		KBN30M
K	TB7015 TB730	IB90	BX930 BX850 BX950	BN500 BN7500 BN7000	CB50 CB7525	KB1630 KB1345	MB4020 MB710	KBN475 KBN60M KBN65B	CBN200
		IB05S IB10S	BX470 BX480	BN700 BNC500	CB7050	KB5630 KB9640	MB730	KBN65M KBN70M KBN570	CH3515
	KB90A TB7020		BX90S BXC90	BNS800	CB7925		MBS140	KBN900	CBN200 CBN300 CBN300P CBN350 CBN400C

## ▶ PCD grades

ISO class	TaeguTec	Iscar	Tungaloy	Sumitomo	Sandvik	Kennametal	Mitsubishi	Kyocera	Seco	NTK
N01-N10	TD810	ID8	DX180 DX160	DA90		KD1405	MD203	KPD230	PCD30M PCD30	
N05-N20	KP300	ID5	DX140	DA150	CD10	KD1400	MD220	KPD010	PCD20	PD1
N15-N30	TD830		DX120 DX110	DA2200 DA1000		KD1425	MD205	KPD001	PCD10 PCD05	PD2

## ► 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 Range	Insert color
P	TT8525B	P30-P45	<p>All yellow color</p> <p>Special post-coating treatment</p> <p>Upgraded SFEED-RUSH Grade</p> <p>Two colors: yellow and black</p>



# Hardness Conversion Table

Vickers 50kg	Brinell HB10mm ball LOAD 3000kgf		Rockwell				Shore's  HS	Tensile strength N/mm <sup>2</sup> (kgf/mm <sup>2</sup> )
	Standard ball	Tungsten carbide ball	A scale 60kgf diamond brale HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf diamond brale HRC	D scale 100kgf diamond brale HRD		
HV								
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	64.0		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 50kg  HV	Brinell HB10mm ball LOAD 3000kgf		Rockwell				Shore's  HS	Tensile strength N/mm <sup>2</sup> (kgf/mm <sup>2</sup> )
	Standard ball	Tungsten carbide ball	A scale 60kgf diamond brale HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf diamond brale HRC	D scale 100kgf diamond brale 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) 1008	0.0030 C10	040 A 10 045 M 10 1449 10 CS		AF 34 C 10 XC 10
1		1.0028 Ust 34-2 (S250G1T)			A 34-2
1		1.0034 RSt 34-2 (S250G2T)	1449 34/20 HR, HS, CR, CS		A 34-2 NE
1		1.0035 St185 (Fe 310-0) St 33	Fe 310-0 1449 15 HR, HS		A 33
1	A 570 Gr. 33,36	1.0036 S235JRG1 (Fe 360 B) Ust 37-2	Fe 360 B 4360-40 B		
1		1.0037 S235JR (Fe 360 B) St 37-2	Fe 360 B 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) St44-2	Fe 430 B FN 1449 43/25 HR, HS 4360-43 B		E 28-2
1		1.0045 S355JR	4360-50 B		E 36-2
1	A 570 Gr.50 A 572 Gr.50	1.0050 E295 (Fe 490-2) St 50-2	Fe 490-2 FN 4360-50 B		A 50-2
1	A 572 Gr. 65	1.0060 E335 (Fe 590-2) St 60-2	Fe 60-2 4360-55 E; 55 C		A 60-2
1		1.0060 St 60-2			
1		1.0070 E360 (Fe 690-2) 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 A 573 Gr.58 A 570 Gr 36;C A 611 Gr. C	1.0116 S235J2G3 (Fe 360 D 1) St 37-3	Fe 360 D1 FF 1449 37/23 CR 4360-40 D		E 24-3 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 1 C 10	F.1511 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	FE37BFU	AE 235 B			16D, 18Kp
1312		Fe 360 B			St3Kp
1311	Fe 360 B 1449 37/23 HR	AE 235 B Fe 360 B	STKM 12A;C	STKM 12A;C	
1325	Fe 330, Fe 330 B FU		SS 330	SS 330	
1412	Fe 430 B Fe 430 B FN	AE 275 B Fe 430 B FN	SM 400 A;B;C	SM 400 A;B;C	St4ps; sp
2172	Fe 510 B	AE 355 B			
1550	Fe 490	a 490-2	SS 490	SS 490	ST5ps; sp
2172		Fe 490-2 FN			
1650	Fe 60-2 Fe 590	A 590-2 Fe 590-2 FN	SM 570	SM 570	St6ps; sp
	Fe 60-2				
1655	Fe 70-2 Fe 690	A 690-2 Fe 690-2 FN			
	Fe 360 C	AE 235 C			
	Fe 360 C	AE 235 C			
1312	Fe 360 D1 FF				
1313	Fe 360 C FN Fe 360 D FF Fe 37-2	AE 235 D Fe 360 D1 FF			St3kp; ps; sp 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 A 611 Gr.D	1.0144 S275J2G3 (Fe 430 D 1) St 44-3	Fe 430 D1 FF 4360-43 C; 43 D		E 28-3 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 10 045 M 10 1449 10 CS		AF 34 C 10 XC 10
1	A 621 (1008)	1.0330 DC 01 St 2; St 12	1449 4 CR 1449 3 CS		TE
1	A 619 (1008)	1.0333 Ust 3 (DC03G1) Ust 13	1449 2 CR;3 CR		E
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 St4; St 14	1449 1 CR;2 CR		ES
1	A 516 Gr. 65; 55 A 515 Gr. 65;55 A 414 Gr. C A 442 Gr.55	1.0345 P235GH HI	1501 Gr. 141-360 1501 Gr. 161-360; 151-360 1501 Gr. 161-400; 154-360 1501 Gr. 164-360; 161-360		A 37 CP;AP
1	(M) 1020 M 1023	1.0402 C22	055 M 15, 070 M 20 2C/2D 1499 22 HS, CS		AF 42 C 20; 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 1501 Gr. 164-360; 161-400 1501 Gr. 164-400;154-400		A 42 CP; AP
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;TSIE 355	4360-50EE		E 355 FP
1		1.0547 S355JOH	4360-50C		TSE 355-3
1		1.0549 S355 NLH;TSIE 355			
1		1.0553 S355JO;St 52-3U	4360-50C		E 36-3

					
SS	UNI	UNE	JIS	KS	GOST
1411, 1412 1414	Fe 430 B, Fe 430 C (FN) Fe 430 D (FF)	AE 275 D Fe 430 D1 FF	SM 400 A;B;C	SM 400 A;B;C	St4kp> ps; sp
1412-04	Fe 430 C	Fe 430 C			
1151 10	FeP 02 G C 10 1 C 10	FeP 02 G F.1511 F.151.A	S 10C	SM 10C	10
1142	FeP 00 FeP 01 FeP 02	AP 11 AP 02	SPHD SPCD	SPHD SPCD	15kp
	FeP 12 FeP 13	AP 12 AP 13	SPHE SPHE	SPHE SPHE	10kp 08kp
1147	FeP 04	AP 04	SPCE	SPCE	08jU; JUA
1331 1330	FeE235, Fe 360 1 KW;KG Fe 360 2 KW;KG	A 37 RC I RA II	SGV 410, SGV 450, SGV 48, SPV 450;SPV 480	SGV 410, SGV 450, SGV 480, SPPV 450;SPPV 480	
1450	C 20 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; C 21;C 25	1 C 22F.112	S 20 C;S 22 C	SM 20 C;SM 22C	
1431 1430 1432 1305	Fe 410 1 KW; KG; KT Fe 410 2 KW; KG	A 42 RC I A 42 RC II	SPV 315; SPV 355 SG 295; SGV 410 SGV 450; SGV 480	SPPV 315; SPPV 355 SG 295; SGV 410 SGV 450; SGV 480	16K 20K
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 Fe 510 C	FeE 355 KTM			

# Material Conversion Table





## ► According to VDI 3323 standard







Material group	 AISI/SAE	 Material No. DIN	 BS	 EN	AFNOR
1	A 633 Gr.C A 588	1.0562 P355N StE 355	1501 Gr.225-490A LT 20		FeE 355 KG N E 355 R/FP; 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 St 52-3	Fe 510 D1 FF 1449 50/35 HR>HS 4360-50 D		E 36-3 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 (11SMnPb30)			S 250 Pb
1	1108 1109	1.0721 10 S 20	(210 M 15)		10S20 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 (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 (C10E)	040 A 10		XC 10
1		1.1121 St 37-1	4360 40 A		
1	1015	1.1141 CK 15 (C15E)	040 A 15 080 M 15	32C	XC 12 XC 15 XC 18
1	1020 1023	1.1151 C22E CK 22	055 M 15 (070 M 20)		2 C 22 XC 18 XC 25
1	D 3	1.2080 X 210 Cr 12	BD 3		Z 200 C 12

					
SS	UNI	UNE	JIS	KS	GOST
2106	FeE 355 KG;KW	AEE 355 KG;DD	SM 490 A;B;C; 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; YA;YB	SM 490 A;B;C; YA;YB	17GS
2134,	17G1S	Fe 510, D1 FF			17G1S
2174					
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 28	SUM 22 L SUM 23 L, SUM 24 L	SUM 22 L 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 2 C 15	F-1510-C 10 K	S 9 CK S 10 C	S 9 CK S 10 C	08;10
1300					
1370	C 15	C 16 F.1110-C 15 F.1511-C 16 K	S 15 S 15 CK	SM 15C SM 15CK	15
1450	C 20	C 25 F.1120-C 25 K	S 20 C, S 20 CK S 22 C	SM 20 C, SM20 CK 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 A 414 Gr. G A 612	1.0473 P355GH	19 Mn 6		A 52 CP
2	1035	1.0501 C 35	080 A 32, 080 A 35 080 M 36, 1449 40 CS		1 C 35 AF 55 C 35 XC 38
2	1045	1.0503 CF 45 (C45G)	060 A 47 080 M 46		XC 42 H 1 TS
2	1040	1.0511 C 40	080 M 40		1 C 40 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 1501 Gr.224-460 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 1041	1.1157 40Mn4	150 M 36	15	35 M 5 40 M 5
2	1025	1.1158 C25E CK 25	(070 M 25)		2 C 25 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







					
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 AE 355 D			
1957		F.210.G			
1973			S 09CK	SMn 433	
C 25	F.1120 - C 25 K	S 25 C 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 Cm 35	080 A 35		3 C 35 XC 32
2	1035 1038	1.1181 C35E CK 35	080 A 35 (080 M 36)		2 C 35, XC 32 XC 38 H 1
2	1035	1.1181 C35E CK 35	080 A 35 (080 M 36)		
2	1042	1.1191 GS- Ck 45	080 A 46		XC 45
2	1049 1050	1.1206 C50E CK 50	080 M 50		2 C 50 XC 48 H 1; XC 50 H 1
2	1050 1055	1.1213 Cf 53 (C53G)	070 M 55		XC 48 H TS
2	4520	1.5423 22Mo4	1503-245-420		
3		1.0050 St50-2			
3	A 516 Gr.70 A 515 Gr. 70 A 414 Gr.F; G	1.0481 P295GH 17 Mn 4	1501 Gr. 224		a 48 Cp;AP
3	1043	1.0503 C35	060 A 47 080 M 46 1449 50 HS, CS		1 C 45 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 1330	1.1165 30Mn5	120 M 36 (150 M 28)		35 M 5
3	1335	1.1167 30Mn5	150 M 36		40 M 5
3	1040	1.1186 C40E CK 40	060 A 40, 080 A 40 080 M 40		2 C 40 XC 42 H 1
3	1045	1.1191 C45E CK 45	080 M 46 060 A 47		2 C 45 XC 42 H 1 XC 45 XC 48 H 1

 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 Fe 510-2 KG;KT;KW FeE 295	A 47 RC I RA II	SG 365, SGV 410 SGV 450 SGV 480	SG 365, SGV 410 SGV 450 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 f.8311-AM 30 Mn 5	SMn 433 H SCMn 2	SMn 433 H SCMn 2	27ChGSNMDTL 30GSL
2120		F. 1203-36 Mn 6 F. 8212-36 Mn 5	SMn 438 (H) SCMn 3	SMn 438 (H) SCMn 3	35G2 35GL
	C 40		S 40 C	SM 40 C	
1672	C 45 C 46	F.1140-C 45 K F.1142-C48 K	S 45 C S 48 C	S 45 C 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 Cm 45	080 M 46		3 C 45 XC 42 H 1 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 AF 70 C 55
4	1060	1.0601 C60	060 A 62 1449 HS,CS	43D	1 C 60 AF 70 C 55
4	1070	1.0603 C67	080 A 67 1449 70HS		XC65
4	1074 1075	1.0605 C75	1449 80 HS		
4	1055	1.1203 C55E CK 55	060 A 57 070 M 55		2 C 5 XC 55 H 1
4	1055	1.1209 C55R Cm 55	070 M 55		3 C 55 XC 55 H 1
4	1060 1064	1.1221 C60E CK 60	060 A 62	43D	2 C 60 XC 60 H 1
4	1070	1.1231 CK 67 (C67E)	060 A 67		XC 68
4	1074 1075 1078	1.1248 CK 75 (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			

					
SS	UNI	UNE	JIS	KS	GOST
1660	C 45	F.1145-C 45K-1 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 1 C 55		S 55 C	SM 55 C	55
	C 60 1 C 60		S 58 C	SM 58 C	60(G)
	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 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 135 535 A 99	31	100 C 6
6		1.5024 46Si7			45 S 7; Y 46 7;46 SI 7
6	9255	1.5025 51Si7			51 S 7 51 Si 7
6	9255	1.5026 55Si7	251 a 58		55 S 7
6	9260	1.5027 60Si7	251 A 60 251 H 60		60 S 7
6	9260 H	1.5028 65Si7			60 S 7
6		1.5120 38 MnSi 4			

					
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

Material group					
	AISI/SAE	Material No. DIN	BS	EN	AFNOR
6	A 204 Gr.A 4017	1.5415 16Mo3 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 Ni1Cr10			14 NC 11
6	3310; 3314	1.5752 14Ni1Cr14	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) RSt 37-2	Fe 360 B FU 1449 27/23 CR 4360-40 B		E 24-2NE
7	3135	1.5710 36NiCr6	640A35		35NC6


					
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				
	34Cr4(KB)	35Cr4	SCr415(H) SCr430(H)	SCr415(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 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 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 RSt;RRSt 13	1449 3 CR 1449 2 CR		E
10	M 1015 M 1016 M 1017	1.0401 C15	080 M 15 080 M 15 1449 17 CS		AF 37 C12 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

					
SS	UNI	UNE	JIS	KS	GOST
2506	20NiCrMo2 40NiCrMo2(KB)	20NiCrMo2 40NiCrMo2	SNCM220(H) SNCM240	SNCM220(H) SNCM240	
2225	25CrMo4(KB) 21 CrMoV 5 11	55Cr3	SCM420/430	SCM420/430	
	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 36CrMoV12	F.124.A			
			SNC236	SNC236	
2534		f-1270			
1412			SM 400A;B;C	SM 400A;B;C	
	Fep 02	AP 02			08JU
1350	C15 C16 1 C 15	F.111	S 15 C	SM 15 C	
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 15 S 20	210 A 15 210 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 WCv 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	ASTMA353	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 06-05-05-04-02
11		1.3246 S 7-4-2-5			Z110 WKCDV 07-05-04
11		1.3247 S 2-10-1-8	BM 42		Z110 DKCWW 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 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 DCWV 09-04-02-

 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			
	X30WCv 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	XBNiO9			
	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 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 19 409 S 19		Z 3 CT 12
12		1.4720 X20CrMo13			

					
SS	UNI	UNE	JIS	KS	GOST
	X45CrSi8	F322	SUH1	STR1	
2301	X6Cr13	F.3110 F8401	SUS403	STS 403	
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





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 (X5CrNiCuNb 16-4)			
13		1.4544	S. 524 S. 526		
13	348	1.4546 X5CrNiNb 18-10	347 S 31 2 S. 130 2 S. 143/144/145 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







 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	x2cRnI18 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 18- 08-05
14	316	1.4401 X 5 CrNiMo 17 12 2 (X4 CrNiMo 17 -12-2)	316 S 13 316 S 17 316 S 19 316 S 31 316 S 33		Z 3 CND 17 -11-01 Z 6 CND 17-11 Z 6 CND 17-11-02 Z 7 CND 17-11-02 Z 7 CND 17-12-02
14	316L	1.4404 X2 CrNiMo 17 13 2 (X2 CrNiMo 17-12-2) GX 2 CrNiMoN 18-10	316 S 11, 316 S 13 316 S 14, 316 S 31; 316 S 42, S.537,316 C 12, T.75, S. 161		Z 2 CND 17-12 Z 2 CND 18-13 Z 3 CND 17-11-02 Z 3 CND 17-12-02 FF Z 3 CND 18-12-03 Z 3 CND 19.10 M
14	316LN	1.4406 X2 CrNiMoN 17 12 2 (X2CrNiMoN 18-10)	316 S 61 316 S 63		Z2 CND 17-12 AZ
14	CF-8M	1.4408 GX 5 CrNiMoN 7 12 2 G-X 6 CrNiMo 18 10	316 C 16 (LT 196) 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 13 316 S 14;316 S 31 LW 22 LWCF 22		Z 3 CND 17-12-03 Z 3 CND 18-14-03
14	316	1.4436 X 5 CrNiMo 17 13 3 (X4CRNIMO 17-13-3)	316 S 19; 316 S 31 316 S 33 LW 23 LWCF 23		Z 6 CND 18-12-03 Z 7 CND 18-12-03

					
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 17 12 2	SUS 316	STS 316	
2348	X 2 CrNiMo 17 12  G-X 2 CrNiMo 19 11	F.3533 - X 2 CrNiMo 17 13 2  F.3537 - X 2 CrNiMo 17 13 3	SUS 316 L	STS 316 L	
	X 2 CrNiMoN 17 12	F.3542-X 2 CrNiMoN 17 12 2	SUS316LN	STS316LN	
2343		F.8414-AM-X 7 CrNiMo 20 10	SCS 14	SSC 14	07 Ch 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 17 13 2	SUS 316 L	STS 316 L	O3 Ch 17N14M3
2343	X 5 CrNiMo 117 13 X 8 cRnImO 17 13	F.3543-X 5 CrNiMo 17 12 2 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 (X2CrNiMo 18-15-4)	317 S 12		Z 2 CND 19-15-04 z 3 cnd 19-15-04
14	(s31726)	1.4439 X2 CrNiMoN 17 13 5			Z 3 CND 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 1.4460 (X3CrNiMo27-5-2)			(Z 3 CND 25-07 Az) 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 (Z 2 CND 24 -08 Az ) (Z 3 CND 25-06-03 Az)
14		1.4500 G-X7NiCrMoCuNb25 20			Z3NCDU25.20M
14	17-7PH	1.4504	316S111		
14	443 444	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 31 321 S 51 (1010;1105) LW 24 LWCF 24		Z 6 CNT 18-10
14	630	1.4542 X5 CrNiCuNb 17 4 (X5 CrNiChNb 16-4)			Z 7 CNU 15-05 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

 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 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 18 10	SUS 321	STS 321	06Ch18N10T 08Ch18N10T 09Ch18N10T 12Ch18N10T
			SCS 24 SUS 630	SSC 24 STS 630	
2378					
2338	X6CrNiNb18 11	F.3552	SUS347	STS347	
	Z8CNA17-07	X2CrNiMo1712			
2350					
	x15cRnIsl2 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

 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







					
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	

 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

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 CNKDWNb
33	Monel 400	2.4360 NiCu30Fe	NA 13		NU 30
33	5390A	2.4603			NC22FeD
33	Hastelloy C-4	2.4610 NiMo16Cr16Ti			
33	Nimonic 75	2.4630 NiCr20Ti	HR 5,203-4		NC 20 T
33		2.4630 NiCr20Ti	HR5,203-4		NC20T
33	Inconel 690	2.4642 NiCr29Fe			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			



# Material Conversion Table

## ► According to VDI 3323 standard

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 CrNMo 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 CrNMo 27 1		

 SS	 UNI	 UNE	 JIS	 KS	 GOST
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			



# ADVANCE CUTTING

TaeguTec



- Cat. no.: 6244067
- English version: CT 02/2023
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