


Milling Cutter - Content structure

- Products are listed by application.
- Please refer the table of contents and the icons.

How to use the page

Method ①

Select the application (①) and the approach angle (②) at the left end of each page and choose a designation you need (⑤) in the dimension table (④). Applicable inserts are shown in (⑧).

The screenshot shows the ADDFEED HXN02 product page. It includes a diagram of the tool with dimensions labeled (APMX, DCK, CICT, DC, LF, LH, LS, KAPR, WTH, Air hole, Insert). Below the diagram is a table with columns for application (APMX, DCK, CICT, DC, LF, LH, LS, KAPR, WTH, Air hole, Insert) and rows for different tool specifications. The table is divided into two sections: 'High feed endmill, shank type, for 4-corner double sided inserts' and 'High feed endmill, modular type (TungFlex)'. The table lists various tool specifications and their corresponding dimensions and applicable inserts.

Method ②

Select the tool series name on **H004 - H005** and check the details on the product page.

The screenshot shows the Application Overview page. It lists various tool series names and their applications. The series names are: Face Milling (H070 page), For general face milling (DOCTMILL, DCPENT, TUNGE MILL), For aluminum milling (TUNGE MILL, TUNGE-ALL MILL), High-Feed Milling (H018 page, ADDFEED, DOFEED, DCFTRI, MILLQFEED), Profile Milling (H024 page, FIXRMILL, ADDFBÄRREL, TUNGE MASTER, BALLFINOSE). Each series name is accompanied by a brief description of its application and a link to the product page.

Method ③

Select the tool series or the tool specification on **H006 - H017** and see the details on each page.

The screenshot shows the High-Feed Milling - Quick Guide page. It provides a quick reference for tool specifications and applications. The table lists various tool specifications and their corresponding dimensions and applicable inserts. The table is divided into two sections: 'High feed endmill, shank type, for 4-corner double sided inserts' and 'High feed endmill, modular type (TungFlex)'. The table lists various tool specifications and their corresponding dimensions and applicable inserts.

Icon

Approach angle

	7° ~ 25°
	41° ~ 45°
	60° ~ 70°
	85° ~ 88°
	90°

Application

	Thin workpiece
	Ramping
	Long overhang
	Axial plunging
	Hole enlarging
	Slot milling

	Deep shoulder milling
	Face milling
	External threading
	Back facing
	Peck milling
	Hollow workpiece
	Deep slot milling

	Shoulder milling
	Internal threading
	Profiling
	Edging / Contouring
	Interrupted surface
	Cutting off
	Chamfering

3 ADDFEED EXN02
High feed endmill, shank type, for 4-corner double sided inserts

6

5

4

8

7

10

SPARE PARTS

EXN02R...
EXN02R...
EXN02R...
EXN02R...

Tool diameter tolerance
Tool diameter 0/-0.015"

INSERT
LNMM02-MM (for general purpose)

Designation

LNMM02022ER-MM

Reference page: Standard cutting conditions → H022 - H023, TungFlex Shanks → H036 - H037
H020 tungaloy.com/us

9 STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness	Priority	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipf)
P	Carbon steels 1045, 1055, etc.	- 300HB	First choice	AH0225	330 - 980	0.008 - 0.047
		- 300HB	For wear resistance	AH0115	330 - 980	0.008 - 0.047
	Alloy steels 4140, etc.	- 300HB	First choice	AH0225	330 - 980	0.008 - 0.047
		- 300HB	For wear resistance	AH0115	330 - 980	0.008 - 0.047
M	Prehardened steels NAAMS, PMS, etc.	- 30 - 49HRC	First choice	AH0115	330 - 660	0.008 - 0.031
		- 30 - 49HRC	For impact resistance	AH0225	330 - 660	0.008 - 0.031
K	Stainless steels 304SS, etc.	- 200HB	First choice	AH1130	330 - 490	0.008 - 0.031
		- 200HB	First choice	AH0115	330 - 980	0.008 - 0.047
	Gray cast irons class25, etc.	150 - 250HB	For impact resistance	AH0225	330 - 980	0.008 - 0.047
		150 - 250HB	First choice	AH0115	260 - 660	0.008 - 0.047
S	Ductile cast irons 80-50-05, etc.	150 - 250HB	For impact resistance	AH0225	260 - 660	0.008 - 0.047
		- 49HRC	First choice	AH1130	100 - 200	0.008 - 0.028
	Titanium alloy Ti-6Al-4V, etc.	- 49HRC	For wear resistance	AH0115	100 - 200	0.008 - 0.028
		- 49HRC	First choice	AH0115	70 - 160	0.004 - 0.012
H	Heat resistant alloy Inconel, Hastelloy, etc.	- 49HRC	For impact resistance	AH0225	70 - 160	0.004 - 0.012
		- 50HRC	First choice	AH0115	260 - 490	0.004 - 0.020
	Hardened steel H13, etc.	- 50HRC	For impact resistance	AH0225	260 - 490	0.004 - 0.020
		- 50 - 62HRC	First choice	AH0115	160 - 230	0.004 - 0.012

APPLICATION RANGE

Shoulder milling, Slotting, Ramping, Small depth plunging, Plunging, Drilling (Helical feed), Enlarged hole

Inch	DCX	APMX	Max. depth of cut	Max. ramping angle	Max. plunging depth	Max. cutting width in plunging	Min. machinable hole dia.	Max. machinable hole dia.	Max. cutting width in enlarged hole
EXN02077LL	0.375	0.020	2.1	0.006	0.078	0.509	0.635	0.289	
EXN02050LL	0.500	0.020	1.78	0.006	0.078	0.760	0.886	0.413	
EXN02062LL	0.625	0.020	1.23	0.006	0.078	1.011	1.137	0.539	
EXN02075LL	0.750	0.020	0.95	0.006	0.078	1.262	1.388	0.664	
EXN02100LL	1.000	0.020	0.64	0.006	0.078	1.756	1.882	0.913	

Please reference the Metric General catalog (H022 page)

H020 tungaloy.com/us

- Application
- Approach angle
- Tool series name
- Dimension table
- Mill designation
- Dimension drawing (conforming to ISO13399)
- Spare parts
- Insert
- Standard cutting conditions
- Reference page



Coolant hole

Workpiece material

P Steel

M Stainless

K Cast iron

N Non-ferrous

S Superalloys

H Hard material

When ordering

- Please specify the designation and quantity for mills.

e.g. **TPW13R200U0075A03** ... 1 (one mill per package)

- Please specify the designation, grade, and quantity for inserts.

e.g. **SWMT1304PDPR-MJ AH120** ... 10 (10 inserts per package)

*You will find a note if the number per package is not 10.

Application Overview

Face Milling

H070 page



For general face milling

DOT^{TRIPLE}MILL

Three times the selection, more than a triple advantage

H095 page

DOPENT

Face milling cutter with low cutting force and low cost per edge

H076 page

TUNG^{EIGHT}MILL

Economical 8 edged inserts with light cutting face milling cutter

H092 page



For aluminum milling

TUNG^{SPEED}MILL

High speed face milling cutter for finishing aluminum

H105 page

TUNG-ALUMILL

Shoulder mill that enables high speed machining of aluminum and non-ferrous materials

H183 page

High-Feed Milling

H018 page



ADD^DFEED

Ultimate high feed milling cutter for maximum productivity

H020 page

DOFEED

High-functional HFM cutter demonstrating ultimate versatility in a broad range of applications

H024 page

DO^{HD}FTRI

High feed milling cutters with six cutting edge inserts, featuring robust cutter design for high productivity

H044 page

MILL^{UAD}QFEED

General-purpose high feed milling cutter providing optimal depths-of-cut in all material groups

H060 page

Profile Milling

H224 page



FIX^RMILL

Unique anti-rotation insert locking for maximum process security

H086 page

ADD^{FORCE}BARREL

Highly efficient profile milling cutter for maximum productivity

H231 page

TUNGMEISTER

Exchangeable-head end mill series with a full lineup of milling heads

I012 page

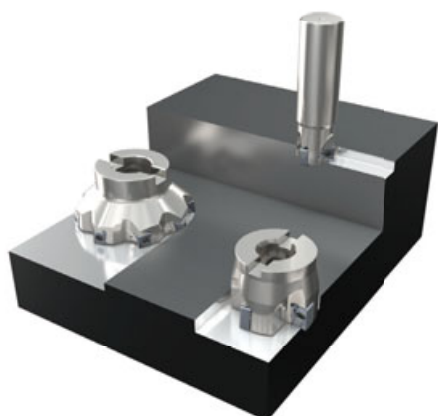
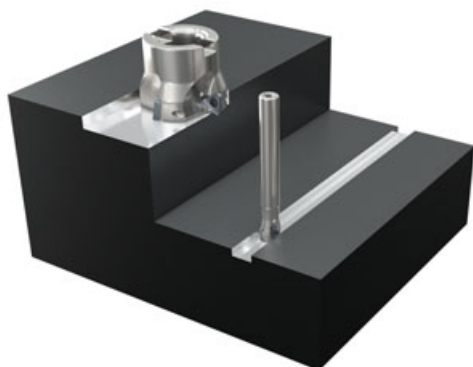
BALL^{FINISH}NOSE

Indexable end mill for high-precision finishing

H225 page

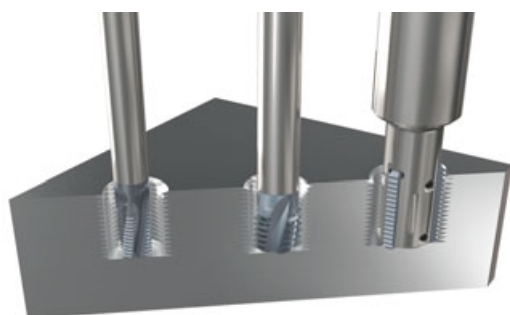
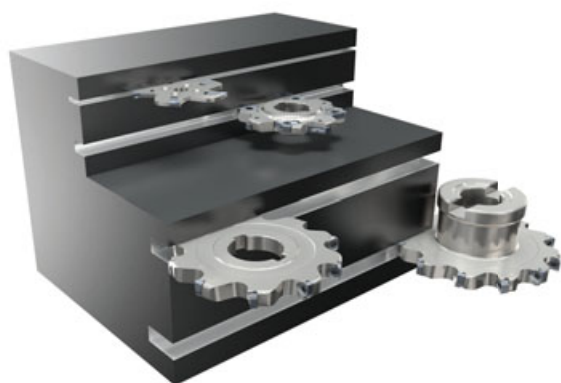
Shoulder Milling

H134 page



Other Applications

H210 page



Shoulder milling cutters (with single-sided inserts)

TUNG-TRI

Offers a vast range of cutter diameters, insert grades and sizes. Insert features three economical cutting edges

H146 page

TUNG^{ORCE}FREC

Unique V shape inserts allow extremely aggressive cutting parameters

H136 page

Shoulder milling cutters (with double-sided inserts)

DO^{ORCE}TRI

Rigid cutter body and double-sided six-edged inserts enable aggressive parameters and cost efficiency

H171 page

DOREC

Double-sided inserts with four cutting edges for maximum tool economy and productivity

H175 page

TECMILL

Exceptionally reliable tangential inserts for aggressive machining

H189 page

Slot Milling

TUNG^MSLIT

Provides stable slot milling operation with excellent chip control

H211 page

TUNG^{THIN}SLIT

Enables deep slot milling with excellent tool economy

H215 page

TUNG^{UNIVERSAL}USLOT

Double-sided insert with six cutting edges for reduced cost per edge

H217 page

TEC^{TANGENTIAL}SLIT

Incorporates tangential inserts for excellent tool reliability

H220 page

Thread Milling

THREADMILLING

Various types of threads can be machined with a single tool simply by changing the inserts

I074 page

TUNGMEISTER

Exchangeable-head end mill series with a full lineup of milling heads

I012 page

Thread milling cutter **SOLIDTHREAD**

Economical indexable thread milling cutter series

I057 page

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index



High-Feed Milling - Quick Guide

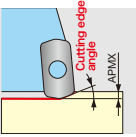


	TUNG ^{FEED}	ADD ^D FEED	DO ^{FEED}	DO ^{FTRI}	DO ^{TBALL}
	Inch Metric	Inch Metric	Inch Metric	Inch Metric	Inch Metric
Cutting edge angle	12°	17°	10° / 12° / 15° / 17°	12°	20° / 25°
Depth of cut (APMX)	0.019" (0.5 mm)	0.019" (0.5 mm)	0.035"/0.039"/0.059" (0.9 mm / 1 mm / 1.5 mm)	0.039" (1 mm)	0.051" / 0.079" (1.3 mm / 2 mm)
Tool diameter	ø0.375" - ø1.000" (ø8 mm - ø25 mm)	ø0.375" - ø1.000" (ø8 mm - ø25 mm)	ø0.625" - ø6.000" (ø16 mm - ø200 mm)	ø0.625" - ø2.000" (ø16 mm - ø50 mm)	ø1.000" - ø1.500" (ø20 mm - ø63 mm)
Workpiece material	P M K S H	P M K S H	P M K S H	P M K S H	P M K S H
No. of corners (insert)	2	4	4	6	4
Face milling	★ ☆ ☆ ☆ ★	★ ☆ ☆ ☆ ★	★ ☆ ☆ ☆ ★	★ ☆ ☆ ☆ ★	★ ☆ ☆ ☆ ☆
Shoulder milling	☆	☆	☆	☆	☆
Profile milling	☆ ☆ ☆	☆ ☆ ☆	☆ ☆ ☆	☆ ☆ ☆	☆ ☆ ☆
Slot milling	☆	☆	☆	☆	☆
Other applications	☆	☆	☆	☆	☆
Reference pages	H040 - H043	H020 - H023	H024 - H037	H044 - H047	H048 - H052

★ : Most suitable
☆ : Suitable
☆ : Usable

Icon

Thin workpiece	Ramping	Long overhang	Axial plunging	Hole enlarging	Slot milling	Deep shoulder milling
Face milling	External threading	Back facing	Peck milling	Hollow workpiece	Deep slot milling	Shoulder milling
Internal threading	Profiling	Edging / Contouring	Interrupted surface	Cutting off	Chamfering	

	MILLFEED TXP	MILLQ^WFEED	DOFEEDQUAD
	 Inch ☒ Metric ☒	 Inch ☒ Metric ☒	 Inch ☒ Metric ☒
Cutting edge angle	10° / 15° / 20°	7° / 10° / 12° / 14°	13°
Depth of cut (APMX)	0.060" / 0.118" (1.5 mm / 3 mm)	0.039" / 0.059" / 0.079" / 0.098" (1 mm / 1.5 mm / 2 mm / 2.5 mm)	0.079" (2 mm)
Tool diameter	ø0.750" - ø2.000" (ø20 mm - ø160 mm)	ø1.000" - ø6.000" (ø25 mm - ø160 mm)	ø2.000" - ø6.000" (ø50 mm - ø125 mm)
Workpiece material	P M K S H	P M K S H	P M K S H
No. of corners (insert)	3	4	8
Face milling	 ★  ☆  ☆  ★  ★	 ★  ☆  ☆  ★  ★	 ★  ☆  ☆  ★  ☆
Shoulder milling	 ☆	 ☆	 ☆
Profile milling	 ☆  ☆  ☆	 ☆  ☆  ☆	
Slot milling	 ☆	 ☆	
Other applications	 ☆	 ☆	
Reference pages	H053 - H059	H060 - H066	H067 - H069

★ : Most suitable

☆ : Suitable

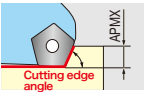
★ : Usable

Icon

 Thin workpiece	 Ramping	 Long overhang	 Axial plunging	 Hole enlarging	 Slot milling	 Deep shoulder milling
 Face milling	 External threading	 Back facing	 Peck milling	 Hollow workpiece	 Deep slot milling	 Shoulder milling
 Internal threading	 Profiling	 Edging / Contouring	 Interrupted surface	 Cutting off	 Chamfering	



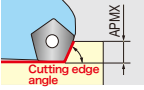
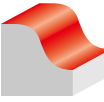
Face Milling - Quick Guide

	TUNG MILL	DOP ENT	ROUND SPLIT	FIX R MILL	TUNG E ^{INT} MILL
					
	Inch Metric	Inch Metric	Inch Metric	Inch Metric	Inch Metric
Cutting edge angle	45°	70°			41°
Depth of cut (APMX)	0.197" / 0.098" / 0.079" (5 mm / 4 mm / 2 mm)	0.252" (6.4 mm)	0.236" / 0.315" (6 mm / 8 mm)	0.197" / 0.236" / 0.315" (5 mm / 6 mm / 8 mm)	0.118" (3 mm)
Tool diameter	ø2.000" - ø6.000" (ø25 mm - ø200 mm)	ø1.250" - ø10.000" (ø32 mm - ø315 mm)	ø1.250" - ø5.000" (ø32 mm - ø125 mm)	ø1.000" - ø2.500" (ø20 mm - ø80 mm)	ø2.000" - ø6.000" (ø50 mm - ø160 mm)
Workpiece material	P M K N	P M K N S H	P M K N S	P M K S H	P M K S H
No. of corners (insert)	4	10	4 / 8	6 / 8	8
 Face milling	 ★  ★  ★  ★	 ★  ★  ★  ★	 ☆  ☆  ☆  ★	 ☆  ☆  ☆  ☆	 ★  ★  ★  ★
 Shoulder milling			 ☆	 ☆	
 Profile milling			 ★  ☆  ☆	 ★  ☆  ☆	
 Slot milling			 ☆	 ☆	
Other applications	 ☆		 ★	 ★	
Reference pages	H071 - H075	H076 - H080	H081 - H085	H086 - H091	H092 - H094

★ : Most suitable
☆ : Suitable
★ : Usable

Icon

 Thin workpiece	 Ramping	 Long overhang	 Axial plunging	 Hole enlarging	 Slot milling	 Deep shoulder milling
 Face milling	 External threading	 Back facing	 Peck milling	 Hollow workpiece	 Deep slot milling	 Shoulder milling
 Internal threading	 Profiling	 Edging / Contouring	 Interrupted surface	 Cutting off	 Chamfering	

	DO T ^{MILL}	DOOCTO	TUNG S ^{MILL}		TFE
			TPYP	T/EPYD	
	 Inch ☒ Metric ☒	 Inch ☒ Metric ☒	 Inch ☐ Metric ☒	 Inch ☒ Metric ☒	 Inch ☒ Metric ☒
Cutting edge angle	45°	45° / 15°	90°	90°	85.5°
Depth of cut (APMX)	0.134" / 0.236" (6 mm / 3.4 mm)	0.059" / 0.138" / 0.187" / 0.295" (4.75 mm / 7.5 mm / 3.5 mm / 1.5 mm)	4 mm / 11 mm	0.177" / 0.295" (4.5 mm / 7.5 mm)	0.315" / 0.138" / 0.059" (8 mm / 3.5 mm / 1.5 mm)
Tool diameter	ø2.000" - ø6.000" (ø50 mm - ø160 mm)	ø2.300" - ø8.000" (ø63 mm - ø315 mm)	ø50 mm - ø125 mm	ø2.000" - ø6.000" (ø50 mm - ø160 mm)	ø2.000" - ø4.000" (ø50 mm - ø25 mm)
Workpiece material	P M K S H	P M K S H	N	N	P M K N
No. of corners (insert)	8 / 16	8 / 16	1 / 2	1	4 / 1 / 2
 Face milling					
 Shoulder milling					
 Profile milling					
 Slot milling					
Other applications					
Reference pages	H095 - H098	H099 - H104	H108 - H109	H105 - H107	H110 - H113

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Icon



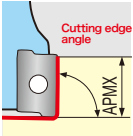
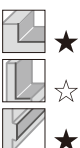
Shoulder milling - Quick Guide

	TUNG-FRECE	TUNG-TRI		TUNGREC	
	 Inch Metric	 Inch Metric	Roughing Inch Metric	 Inch Metric	Roughing Inch Metric
Cutting edge angle	90°	90°	90°	90°	90°
Depth of cut (APMX)	0.016" / 0.031" / 0.079" (4 mm / 6 mm / 11.5 mm)	0.236" / 0.394" / 0.590" (3.5 mm / 6 mm / 10 mm / 15 mm)	2.126" - 3.268" (54 mm - 97 mm / -139 mm)	0.276" / 0.657" / 0.417" (7 mm / 10.6 mm / 16.7 mm)	1.197" - 1.921" (30.4 mm - 48.8 mm)
Tool diameter	ø0.313" - ø2.000" (ø6 mm - ø63 mm)	ø0.500" - ø6.000" (ø8 mm - ø160 mm)	ø2.000" - ø4.000" (ø50 mm - ø100 mm)	ø0.500" - ø6.000" (ø12 mm - ø160 mm)	ø1.000" - ø2.000" (ø25 mm - ø50 mm)
Workpiece material	P M K N S H	P M K N S H	P M K N S	P M K N S H	P M K N S H
No. of corners (insert)	2	3	3	2	2
 Face milling	 	 	 	 	
 Shoulder milling	 	 	 	 	
 Profile milling	 	 	 	 	
 Slot milling	 	 		 	
Other applications 					
Reference pages	H136 - H144	H146 - H156		H157 - H168	

★ : Most suitable
 ☆ : Suitable
 ★ : Usable

Icon

Thin workpiece	Ramping	Long overhang	Axial plunging	Hole enlarging	Slot milling	Deep shoulder milling
Face milling	External threading	Back facing	Peck milling	Hollow workpiece	Deep slot milling	Shoulder milling
Internal threading	Profiling	Edging / Contouring	Interrupted surface	Cutting off	Chamfering	

	TUNGQUAD		DOFTRI	DOREC	TUNGSMILL EPYP
		Roughing 			
	☒ Inch ☒ Metric	☒ Inch ☒ Metric	☒ Inch ☒ Metric	☒ Inch ☒ Metric	☐ Inch ☒ Metric
Cutting edge angle	90°	90°	90°	90°	90°
Depth of cut (APMX)	0.157" (4 mm)	0.799" - 0.953" (20.3 mm - 24.2 mm)	0.256" / 0.433" (6.5 mm / 11 mm)	0.345" / 0.630" (9 mm / 16 mm)	4 mm / 11 mm
Tool diameter	ø0.500" - ø1.000" (ø12 mm - ø40 mm)	ø0.750" - ø1.000" (ø20 mm - ø25 mm)	ø0.750" - ø1.500" (ø18 mm - ø160 mm)	ø1.000" - ø6.000" (ø25 mm - ø160 mm)	ø25 mm - ø32 mm
Workpiece material	P M K N S H	P M K N S H	P M K S	P M K S H	N
No. of corners (insert)	4	4	6	4	1 / 2
Face milling 					
Shoulder milling 					
Profile milling 					
Slot milling 					
Other applications					
Reference pages	H169 - H170		H171 - H174	H175 - H179	H180

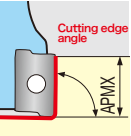
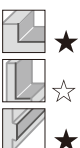
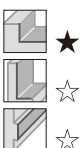
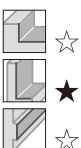
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Icon

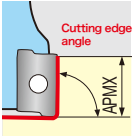


Shoulder milling - Quick Guide

	DOQ [®] MILL	TECMILL		TUNG [®] TSHRED	
	 Inch ☒ Metric ☒	 Inch ☒ Metric ☒	Roughing  Inch ☒ Metric ☒	 Inch ☒ Metric ☒	Roughing  Inch ☒ Metric ☒
Cutting edge angle	88°	90° / 60°	90°	90°	90°
Depth of cut (APMX)	0.375" (9.5 mm)	0.381" / 0.594" (9.7 mm / 15.1 mm / 12.4 mm)	2.303" / 2.634" (58.5 mm / 66.9 mm)	0.630" (16 mm)	2.402" / 2.992" (61 mm / 76 mm)
Tool diameter	ø2.000" - ø4.000" (ø50 mm - ø100 mm)	ø2.000" - ø5.000" (ø32 mm - ø250 mm)	ø2.000" - ø2.500" (ø50 mm - ø63 mm)	ø2.000" - ø4.000" (ø50 mm - ø100 mm)	ø2.500" - ø3.000" (ø63 mm - ø80 mm)
Workpiece material	P M K S H	P M K S H	P M K S H	P M K S H	P M K S H
No. of corners (insert)	8	4	4	3	3
 Face milling					
 Shoulder milling					
 Profile milling					
 Slot milling					
Other applications					
Reference pages	H181 - H182	H189 - H196		H197 - H200	

★ : Most suitable
 ☆ : Suitable
 ☆ : Usable

 Thin workpiece	 Ramping	 Long overhang	 Axial plunging	 Hole enlarging	 Slot milling	 Deep shoulder milling
 Face milling	 External threading	 Back facing	 Peck milling	 Hollow workpiece	 Deep slot milling	 Shoulder milling
 Internal threading	 Profiling	 Edging / Contouring	 Interrupted surface	 Cutting off	 Chamfering	

   Inch Metric ✓ ✓	
Cutting edge angle	90°
Depth of cut (APMX)	0.630" / 0.571" (13 mm / 16 mm)
Tool diameter	ø1.000" - ø5.000" (ø25 mm - ø125 mm)
Workpiece material	N
No. of corners (insert)	2
Face milling	 ★  ★  ★  ★  ☆
Shoulder milling	 ★  ★  ★
Profile milling	 ★  ★  ★
Slot milling	 ★  ★
Other applications	 ☆
Reference pages	H183 - H188

★ : Most suitable
☆ : Suitable
★ : Usable

Icon

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index



Slot milling - Quick Guide

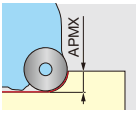
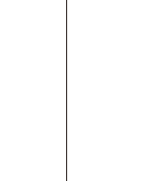
	TUNG M SLIT	TUNG T ^{MIN} SLIT	TUNG U ^{UNIVERSAL} SLOT	TEC T ^{ESSENTIAL} SLOT
 Slot Milling	 Inch ☐ Metric ☒	 Inch ☒ Metric ☒	 Inch ☒ Metric ☒	 Inch ☐ Metric ☒
Depth of cut (APMX)	1.6 mm - 4.1 mm	0.250" - 0.313" (4 mm - 8 mm)	0.375" - 0.625" (9 mm - 16 mm)	16 mm - 25 mm
Tool diameter	ø63 mm - ø12 mm	ø3.000" - ø8.000" (ø80 mm - ø200 mm)	ø3.000" - ø6.000" (ø80 mm - ø160 mm)	ø100 mm - ø250 mm
Workpiece material	P M K	P M K S	P M K S	P M K S
No. of corners (insert)	1	6	6	4
 Face milling				
 Shoulder milling				
 Profile milling				
 Slot milling				
Other applications				
Reference pages	H211 - H214	H215 - H216	H217 - H219	H220 - H222

★ : Most suitable
 ☆ : Suitable
 ★ : Usable

Icon

Thin workpiece	Ramping	Long overhang	Axial plunging	Hole enlarging	Slot milling	Deep shoulder milling
Face milling	External threading	Back facing	Peck milling	Hollow workpiece	Deep slot milling	Shoulder milling
Internal threading	Profiling	Edging / Contouring	Interrupted surface	Cutting off	Chamfering	

Profile milling - Quick Guide

	BALL F ^{INCH} NÖSE	ADD F ^{INCH} BÄRREL	DO M ^{INCH} MILL	BALL R ^{INCH} NÖSE	DO T ^{INCH} WISTBALL
					
	Inch ☒ Metric ☒	Inch ☐ Metric ☒	Inch ☐ Metric ☒	Inch ☒ Metric ☒	Inch ☒ Metric ☒
Depth of cut (APMX)	0.492" (12.5 mm)	-	1	0.470" / 0.510" / 0.690" (11.8 mm / 13.6 mm / 17.7 mm)	0.157" / 0.236" (4 mm / 5 mm / 6 mm)
Tool diameter	ø0.375" - ø1.250" (ø8 mm - ø32 mm)	ø16 mm - ø40 mm	ø16 mm - ø25 mm	ø0.625" - ø1.000" (ø16 mm - ø25 mm)	ø1.000" - ø1.500" (ø20 mm - ø38 mm)
Workpiece material	P M K S H	P M K S H	P H	P M K S H	P M K S H
No. of corners (insert)	1	4	6	2	4
 Face milling					
 Shoulder milling					
 Profile milling					
 Slot milling					
Other applications					
Reference pages	H225 - H230	H231 - H232	H233	H234 - H235	H048 - H052

★ : Most suitable
☆ : Suitable
★ : Usable

Icon



Chamfering and Counterboring - Quick Guide

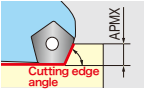
	Chamfering cutter TUNGQUAD	Chamfering cutter ECP	Chamfering cutter ECC	Counterboring endmill TCB	DOM^{ULTI}REC
 	 Inch ☐ Metric ☒	 Inch ☒ Metric ☒	 Inch ☒ Metric ☒	 Inch ☐ Metric ☒	 Inch ☒ Metric ☒
Cutting edge angle	45°	45°	30°, 45°, 60°	90°	90°
Depth of cut (APMX)	3 mm	0.236" (6 mm)	0.571" / 0.807" / 1.004" (14.5 mm / 20.5 mm / 25.5 mm)	4 mm / 5 mm / 6 mm / 8 mm / 10 mm	0.197" / 0.276" / 0.354" / 0.433" / 0.571" / 0.709" (5 mm / 7 mm / 9 mm / 11 mm / 14.5 mm / 18 mm)
Tool diameter	ø12 mm - ø22 mm	ø1.083" - ø2.098" (ø27.5 mm - ø53.3 mm)	ø1.338" - ø2.204" (ø34 mm - ø55 mm)	ø10 mm - ø59 mm	ø0.500" - ø1.500" (ø16 mm - ø26 mm)
Workpiece material	P M K N S	P K	P M K	P M K N S H	P M K S H
No. of corners (insert)	4	4	2	4	4
 Face milling					
 Shoulder milling					
 Profile milling					
 Slot milling					
Other applications	★	★	★	★	★ ★
Reference pages	H244 - H247	H247	H248 - H249	H250 - H254	H255 - H258

★ : Most suitable
☆ : Suitable
★ : Usable

Icon

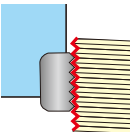
Thin workpiece	Ramping	Long overhang	Axial plunging	Hole enlarging	Slot milling	Deep shoulder milling
Face milling	External threading	Back facing	Peck milling	Hollow workpiece	Deep slot milling	Shoulder milling
Internal threading	Profiling	Edging / Contouring	Interrupted surface	Cutting off	Chamfering	

Face Milling - Quick Guide

	NMS	MS	SFP
			
	Inch ☐ Metric ☒	Inch ☐ Metric ☒	Inch ☐ Metric ☒
Cutting edge angle	-	-	-
Depth of cut (APMX)	0.2 mm	0.1 mm	0.1 mm
Tool diameter	ø80 mm - ø200 mm	ø100 mm - ø300 mm	ø100 mm - ø200 mm
Workpiece material	P M K	P H	P M K N
No. of corners (insert)	4		
 Face milling	 ★  ☆  ☆  ☆	 ★  ☆  ☆  ☆	 ★  ☆  ☆  ☆
Reference pages	H264 - H265	H266 - H267	H267 - H268

★ : Most suitable
 ☆ : Suitable
 ☆ : Usable

Thread milling - Quick Guide

	SOLIDTHREAD	TUNGMEISTER	THREADMILLING ETTL	THREADMILLING Thread milling cutter
				
	Inch ☐ Metric ☒	Inch ☐ Metric ☒	Inch ☐ Metric ☒	Inch ☐ Metric ☒
Pitch	0.25 mm - 3.5 mm	0.5 mm - 4.5 mm	1.5 mm - 3 mm	1.5 mm - 6 mm
Tool diameter	ø0.7 mm - ø20 mm	ø10 mm - ø21.7 mm	ø17 mm - ø30 mm	ø23 mm - ø80 mm
Workpiece material	P M K S	P M K S	P M K S	P M K
No. of corners (insert)	-	-	2	2
Thread milling	 ★  ★	 ★  ★	 ★  ★	 ★  ★
Reference pages	I057 - I073	I012 - I055	I074 - I077	I078 - I079

★ : Most suitable
 ☆ : Suitable
 ☆ : Usable

Icon



ADD DFEED / DO FEED



Ultimate high feed milling cutter series for maximum productivity

ADD DFEED

Insert size 02



Max. depth of cut: 0.020" (0.5 mm)
Tool diameter: ø0.375" - ø1.000", ø8 - ø25 mm

- ✓ Tool diameters as small as **8 mm (0.315")**
- ✓ **Highly reliable design**
- ✓ Perfect option for **replacing solid end mills**

DO FEED

Insert size 03



Max. depth of cut: 0.035" (0.9 mm) (UER),
0.039" (1 mm) (ZER)
Tool diameter: ø0.625" - ø2.000", ø16 - ø50 mm

- ✓ **Close pitch cutter design** for high productivity
- ✓ **Extensive lineup** for various applications
- ✓ **New UER inserts with lower approach angle** for longer tool life and reduced chatter

DO FEED

Insert size 06



Max. depth of cut: 0.059" (1.5 mm)
Tool diameter: ø1.250" - ø6.000", ø32 - ø200 mm

- ✓ **Close pitch cutter design** for high productivity
- ✓ Tool diameters available for up to 200 mm (7.874"), ideal for **rough milling of medium- and large-sized components**
- ✓ **Wiper inserts** for improved surface roughness

Inch

Tool diameters and number of teeth for each insert size

Insert size	Max. depth of cut (in)	Workpiece material	Tool diameter (in), Number of teeth															
			ø0.375"	ø0.500"	ø0.625"	ø0.688"	ø0.750"	ø0.875"	ø1.000"	ø1.125"	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"	ø6.000"
02	0.020"		1	2	3, 4		4, 5		6, 7									
03	0.035" (UER) 0.039" (ZER)				2	2	2, 3	2, 3	4, 5	4, 5	5, 6	5, 6	5, 8, 10					
06	0.059"										2	3	4, 5	4, 6	5, 7	6, 10	8, 12	10, 14

Metric

Tool diameters and number of teeth for each insert size

Insert size	Max. depth of cut (mm)	Workpiece material	Tool diameter (mm), Number of teeth																					
			ø8	ø10	ø12	ø16	ø18	ø20	ø22	ø25	ø28	ø30	ø32	ø35	ø40	ø50	ø52	ø63	ø66	ø80	ø100	ø125	ø160	ø200
02	0.5	P S M H K	1	2	2	4 3		5 4		7 6														
03	0.9 (UER) 1 (ZER)	P S M H K				2	2	4 3	4 3	5 4	5 4	5 4	5 6	5 6	5 6	5 8								
06	1.5	P S M H K										2	2	3	4 5	4 5	4 6	4 6	5 8	6	8	10	12	

Cutter body design for maximum productivity

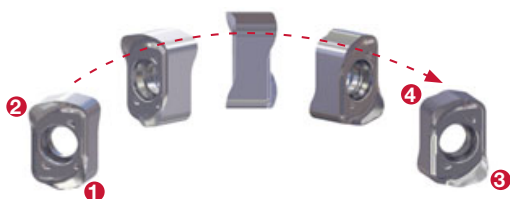
Extremely stiff body design with a large core

DOFEED

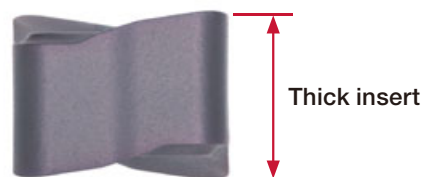


Reliable and economical inserts

Economical double-sided inserts with four cutting edges

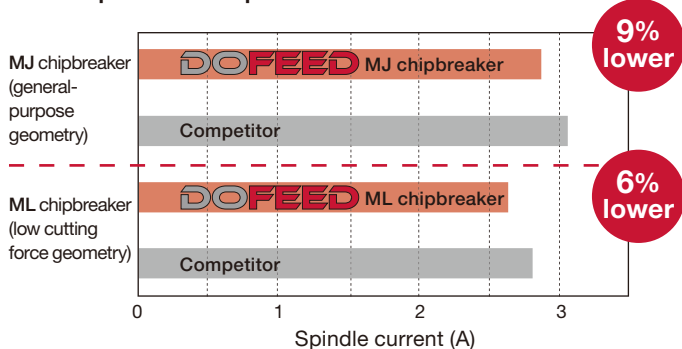


Thick insert design for increased reliability



Soft cutting geometry with superior chip control

Comparison of spindle load



P Cutter : EXN03R100U0100-05 (ø1.000", z = 5)
 Insert : LNMU0303ZER-MJ / ML AH725
 Workpiece material : Carbon steels (1055)
 Cutting speed : $V_c = 820$ sfm
 Feed per tooth : $f_z = 0.020$ ipt (1 insert)
 Depth of cut : $a_p = 0.020$ "
 Width of cut : $a_e = 1.000$ " (Slot milling)
 Coolant : Dry
 Machine : Vertical M/C, CAT40

Note: Test cut using a single insert

Provides stable, high productivity due to the excellent chip evacuation

Forms compact chips



	DOFEED	Competitor
Chip shapes		
Shoulder surfaces after grooving operations		

Reference pages: **H020 - H037**

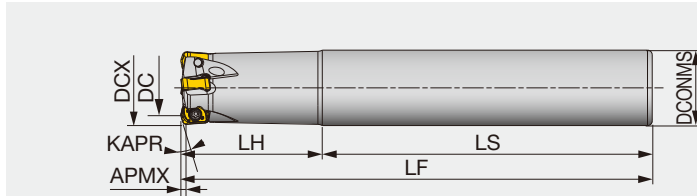


ADD FEED

EXN02

High feed endmill, shank type, for 4-corner double sided inserts

GAMP = +6°, GAMF = +5° ~ +11°



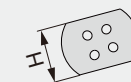
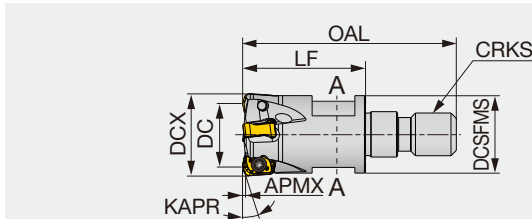
Inch	APMX	DCX	CICT	DC	DCONMS	LF	LH	LS	KAPR	WT(lb)	Air hole	Insert
EXN02R037U0037-01	0.020	0.375	1	0.212	0.375	3.000	0.750	2.250	17°	0.09	With	LNMU02...
EXN02R037U0037-01L	0.020	0.375	1	0.212	0.375	3.500	1.250	2.250	17°	0.09	With	LNMU02...
EXN02R050U0050-02	0.020	0.500	2	0.335	0.500	3.000	0.750	2.250	17°	0.15	With	LNMU02...
EXN02R050U0050-02L	0.020	0.500	2	0.335	0.500	4.250	2.000	2.250	17°	0.20	With	LNMU02...
EXN02R062U0062-03L	0.020	0.625	3	0.460	0.625	4.500	2.000	2.500	17°	0.33	With	LNMU02...
EXN02R062U0062-04	0.020	0.625	4	0.460	0.625	4.000	1.500	2.500	17°	0.31	With	LNMU02...
EXN02R075U0075-04L	0.020	0.750	4	0.585	0.750	6.500	3.500	3.000	17°	0.64	With	LNMU02...
EXN02R075U0075-05	0.020	0.750	5	0.585	0.750	5.000	2.000	3.000	17°	0.51	With	LNMU02...
EXN02R100U0100-06L	0.020	1.000	6	0.835	1.000	7.000	4.000	3.000	17°	1.28	With	LNMU02...
EXN02R100U0100-07	0.020	1.000	7	0.835	1.000	5.500	2.500	3.000	17°	1.04	With	LNMU02...

Metric	APMX	DCX	CICT	DC	DCONMS	LF	LH	LS	KAPR	WT(kg)	Air hole	Insert
EXN02R008M08.0-01	0.5	8	1	3.95	8	75	16	59	17°	0.02	With	LNMU02...
EXN02R008M08.0-01L	0.5	8	1	3.95	8	90	31	59	17°	0.03	With	LNMU02...
EXN02R010M10.0-02	0.5	10	2	5.85	10	80	20	60	17°	0.04	With	LNMU02...
EXN02R010M10.0-02L	0.5	10	2	5.85	10	100	40	60	17°	0.05	With	LNMU02...
EXN02R012M12.0-02	0.5	12	2	7.8	12	80	20	60	17°	0.06	With	LNMU02...
EXN02R012M12.0-02L	0.5	12	2	7.8	12	110	50	60	17°	0.08	With	LNMU02...
EXN02R016M16.0-04	0.5	16	4	11.8	16	100	30	70	17°	0.14	With	LNMU02...
EXN02R016M16.0-03L	0.5	16	3	11.8	16	120	50	70	17°	0.17	With	LNMU02...
EXN02R020M20.0-04L	0.5	20	4	15.8	20	160	80	80	17°	0.32	With	LNMU02...
EXN02R020M20.0-05	0.5	20	5	15.8	20	130	50	80	17°	0.27	With	LNMU02...
EXN02R025M25.0-07	0.5	25	7	20.8	25	140	60	80	17°	0.46	With	LNMU02...
EXN02R025M25.0-06L	0.5	25	6	20.8	25	180	100	80	17°	0.57	With	LNMU02...

HXN02

High feed endmill, modular type (TungFlex)

GAMP = +6°, GAMF = +5° ~ +11°



A-A cross section



Metric	APMX	DCX	CICT	DC	DCSFMS	OAL	LF	H	KAPR	CRKS	WT(kg)	Air hole	Insert
HXN02R008MM06-01	0.5	8	1	3.95	9.5	33.5	19	7	17°	M6	0.01	With	LNMU02...
HXN02R010MM06-02	0.5	10	2	5.85	9.5	31.5	17	7	17°	M6	0.01	With	LNMU02...
HXN02R012MM06-02	0.5	12	2	7.8	10	31.5	17	7	17°	M6	0.01	With	LNMU02...
HXN02R016MM08-04	0.5	16	4	11.8	14.5	40	23	10	17°	M8	0.03	With	LNMU02...
HXN02R020MM10-05	0.5	20	5	15.8	17.8	49	30	15	17°	M10	0.06	With	LNMU02...
HXN02R025MM12-07	0.5	25	7	20.8	23	52	30	17	17°	M12	0.1	With	LNMU02...

SPARE PARTS



Designation	Clamping screw	Wrench
EXN02R**U...	CSPB-1.8FL4.3	IP-6DB
EXN02R008..., HXN02R008...	CSPB-1.8FL3.6	IP-6DB
EXN02R010... - EXN02R025... HXN02R010... - HXN02R025...	CSPB-1.8FL4.3	IP-6DB

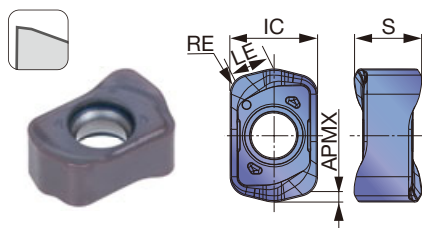
Tool diameter tolerance	
Tool diameter	0 / -0.016"

Recommended clamping torque: 0.37 lbs-ft, 0.5 N-m

Reference pages: Standard cutting conditions → **H022 - H023**, TungFlex Shanks → **H038 - H039**

■ INSERT

LNMU02-MM (for general purpose)



P M K N S H	Steel		★	☆														
	Stainless	★	☆															
	Cast iron		☆	★														
	Non-ferrous																	
	Superalloy	★		★														
	Hard materials		☆	★														

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated										LE	IC	S		
			AH130	AH3225	AH8015												
LNMU0202ZER-MM	0.035	0.020	●	●	●										0.070	0.157	0.122

● : Line up

Reference pages: Standard cutting conditions → **H022 - H023**



High Feed
Milling

STANDARD CUTTING CONDITIONS



Face Milling



Shoulder Milling



Slot Milling



Profile Milling



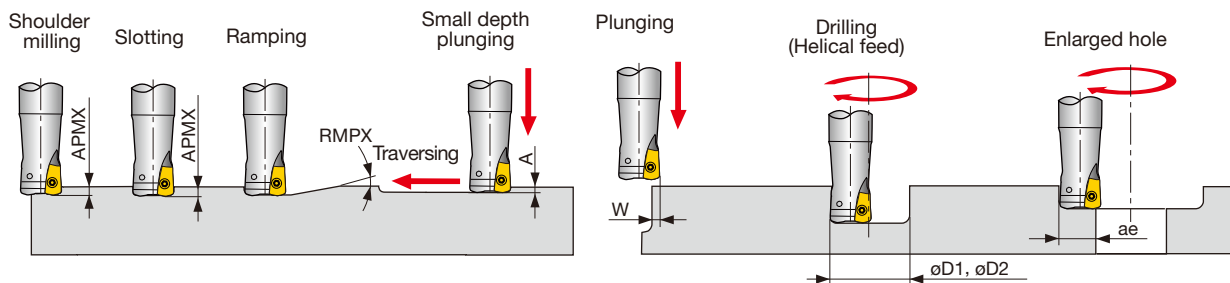
Chamfering,
Counterbore



Finish
Face Milling

ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Carbon steels 1045, 1055, etc.		- 300HB	First choice	AH3225	330 - 980	0.008 - 0.047
			- 300HB	For wear resistance	AH8015	330 - 980	0.008 - 0.047
	Alloy steels 4140, etc.		- 300HB	First choice	AH3225	330 - 980	0.008 - 0.047
			- 300HB	For wear resistance	AH8015	330 - 980	0.008 - 0.047
	Prehardened steels NAK80, PX5, etc.		30 - 40HRC	First choice	AH8015	330 - 660	0.008 - 0.031
			30 - 40HRC	For impact resistance	AH3225	330 - 660	0.008 - 0.031
M	Stainless steels 304SS, etc.		- 200HB	First choice	AH130	330 - 490	0.008 - 0.031
K	Gray cast irons class25, etc.		150 - 250HB	First choice	AH8015	330 - 980	0.008 - 0.047
			150 - 250HB	For impact resistance	AH3225	330 - 980	0.008 - 0.047
	Ductile cast irons 80-50-06, etc.		150 - 250HB	First choice	AH8015	260 - 660	0.008 - 0.047
			150 - 250HB	For impact resistance	AH3225	260 - 660	0.008 - 0.047
S	Titanium alloy Ti-6Al-4V, etc.		- 40HRC	First choice	AH130	100 - 200	0.008 - 0.028
			- 40HRC	For wear resistance	AH8015	100 - 200	0.008 - 0.028
	Heat resistant alloy Inconel, Hastelloy, etc.		- 40HRC	First choice	AH8015	70 - 160	0.004 - 0.012
			- 40HRC	For impact resistance	AH3225	70 - 160	0.004 - 0.012
H	Hardened steel	H13, etc.	40 - 50HRC	First choice	AH8015	260 - 490	0.004 - 0.020
			40 - 50HRC	For impact resistance	AH3225	260 - 490	0.004 - 0.020
		D2, etc.	50 - 60HRC	First choice	AH8015	160 - 230	0.004 - 0.012

APPLICATION RANGE



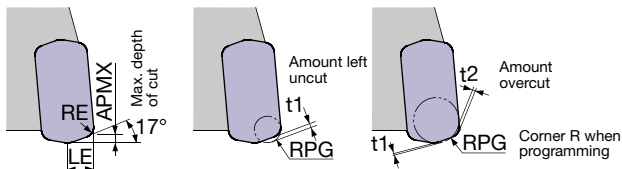
Inch	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Max. cutting width in plunging W	Min. machinable hole dia. øD1	Max. machinable hole dia. øD2	Max. cutting width in enlarged hole ae
EXN02R037U...	0.375	0.020	3.1	0.006	0.079	0.509	0.635	0.289
EXN02R050U...	0.500	0.020	1.78	0.006	0.079	0.760	0.886	0.413
EXN02R062U...	0.625	0.020	1.23	0.006	0.079	1.011	1.137	0.539
EXN02R075U...	0.750	0.020	0.95	0.006	0.079	1.262	1.388	0.664
EXN02R100U...	1.000	0.020	0.64	0.006	0.079	1.756	1.882	0.913

Please reference the Metric General catalog (H022 page)

Tool dia.: DCX (in), Number of revolutions: n (rpm), Feed speed: V_f (ipm), Max. depth of cut: $ap = 0.002"$, Number of teeth: CICT												
$\phi 0.375"$, CICT = 1		$\phi 0.500"$, CICT = 2		$\phi 0.625"$			$\phi 0.750"$			$\phi 1.000"$		
n	V_f	n	V_f	n	V_f		n	V_f		n	V_f	
					CICT = 3	CICT = 4		CICT = 4	CICT = 5		CICT = 6	CICT = 7
6,720	190	5,040	290	4,030	340	460	3,360	380	480	2,520	430	500
$V_c = 660 \text{ sfm}, f_z = 0.028 \text{ ipt}$												
6,720	190	5,040	290	4,030	340	460	3,360	380	480	2,520	430	500
$V_c = 660 \text{ sfm}, f_z = 0.028 \text{ ipt}$												
4,990	100	3,740	150	3,000	180	240	2,500	200	250	1,870	230	270
$V_c = 490 \text{ sfm}, f_z = 0.020 \text{ ipt}$												
4,180	90	3,130	130	2,510	160	210	2,090	170	210	1,570	190	220
$V_c = 410 \text{ sfm}, f_z = 0.020 \text{ ipt}$												
6,720	190	5,040	290	4,030	340	460	3,360	380	480	2,520	430	500
$V_c = 660 \text{ sfm}, f_z = 0.028 \text{ ipt}$												
4,990	140	3,740	210	3,000	260	340	2,500	280	350	1,870	320	370
$V_c = 490 \text{ sfm}, f_z = 0.028 \text{ ipt}$												
1,530	40	1,150	50	920	60	80	760	70	80	570	70	80
$V_c = 150 \text{ sfm}, f_z = 0.020 \text{ ipt}$												
1,220	10	920	20	730	20	30	610	20	30	460	30	30
$V_c = 120 \text{ sfm}, f_z = 0.008 \text{ ipt}$												
3,870	50	2,900	70	2,320	90	120	1,940	100	120	1,450	110	130
$V_c = 380 \text{ sfm}, f_z = 0.012 \text{ ipt}$												
2,040	20	1,530	30	1,220	30	40	1,020	40	50	760	40	50
$V_c = 200 \text{ sfm}, f_z = 0.008 \text{ ipt}$												

TOOL GEOMETRY ON PROGRAMMING

When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set as $R = 0.030"$. If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t_1) and overcut (t_2).



Max. depth of cut APMX (in)	Corner radius RE (in)	LE (in)	Corner R when programming RPG	Amount left uncut t_1 (in)	Amount overcut t_2 (in)
0.020	0.035	0.079	0.030	0.014	0
0.020	0.035	0.079	0.050	0.008	0.001
0.020	0.035	0.079	0.075	0.001	0.010

*Recommended



High Feed
Milling

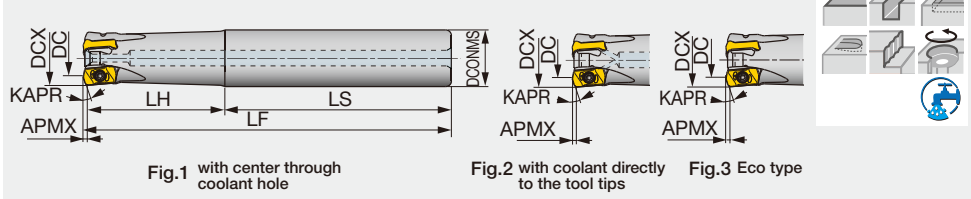
DOFEED
EXN03

High feed endmill, shank type

GAMP = +6°, GAMF = +5° ~ +11°



with LNMU0303ZER



Inch	APMX	APMX2	APMX3	DCX	CICT	DC	DC2	DC3	DCONMS	LF	LH	LS	KAPR*	KAPR2*	KAPR3*	WT(lb)	Air hole	Insert	Fig.
EXN03R062U0062-02 ⁽¹⁾	0.039	0.035	0.039	0.625	2	0.373	0.342	0.381	0.625	4.000	1.250	2.750	15°	10°	15°	0.31	With	LN*U03...	1
EXN03R062U0062-02L ⁽¹⁾	0.039	0.035	0.039	0.625	2	0.373	0.342	0.381	0.625	6.000	2.000	4.000	15°	10°	15°	0.46	With	LN*U03...	1
EXN03R068U0062-02 ⁽¹⁾	0.039	0.035	0.039	0.688	2	0.432	0.401	0.436	0.625	4.000	1.250	2.750	17°	12°	17°	0.31	With	LN*U03...	1
EXN03R068U0062-02L ⁽¹⁾	0.039	0.035	0.039	0.688	2	0.432	0.401	0.436	0.625	6.000	1.000	5.000	17°	12°	17°	0.49	With	LN*U03...	1
EXN03R075U0075-02 ⁽²⁾	0.039	0.035	0.039	0.750	2	0.494	0.463	0.498	0.750	5.000	2.000	3.000	17°	12°	17°	0.55	With	LN*U03...	1
EXN03R075U0075-03 ⁽²⁾	0.039	0.035	0.039	0.750	3	0.494	0.463	0.498	0.750	5.000	2.000	3.000	17°	12°	17°	0.55	With	LN*U03...	1
EXN03R075U0075-03L ⁽²⁾	0.039	0.035	0.039	0.750	3	0.494	0.463	0.498	0.750	6.500	3.500	3.000	17°	12°	17°	0.71	With	LN*U03...	1
EXN03R075U0075-03-C ⁽²⁾	0.039	0.035	0.039	0.750	3	0.495	0.464	0.498	0.750	5.000	2.000	3.000	17°	12°	17°	0.66	With	LN*U03...	2
EXN03R087U0075-02 ⁽²⁾	0.039	0.035	0.039	0.875	2	0.619	0.588	0.623	0.750	5.000	2.000	3.000	17°	12°	17°	0.57	With	LN*U03...	1
EXN03R087U0075-03 ⁽²⁾	0.039	0.035	0.039	0.875	3	0.619	0.588	0.623	0.750	5.000	2.000	3.000	17°	12°	17°	0.57	With	LN*U03...	1
EXN03R087U0075-03L ⁽²⁾	0.039	0.035	0.039	0.875	3	0.619	0.588	0.623	0.750	6.500	1.250	5.250	17°	12°	17°	0.75	With	LN*U03...	1
EXN03R087U0075-03-C ⁽²⁾	0.039	0.035	0.039	0.875	3	0.621	0.590	0.623	0.750	5.000	2.000	3.000	17°	12°	17°	0.66	With	LN*U03...	2
EXN03R100U0100-04 ⁽²⁾	0.039	0.035	0.039	1.000	4	0.744	0.713	0.748	1.000	5.500	2.500	3.000	17°	12°	17°	1.08	With	LN*U03...	1
EXN03R100U0100-04L ⁽²⁾	0.039	0.035	0.039	1.000	4	0.744	0.713	0.748	1.000	7.000	4.000	3.000	17°	12°	17°	1.34	With	LN*U03...	1
EXN03R100U0100-05 ⁽¹⁾	0.039	0.035	0.039	1.000	5	0.744	0.713	0.748	1.000	5.500	2.500	3.000	17°	12°	17°	1.08	With	LN*U03...	1
EXN03R100U0100-05-C ⁽¹⁾	0.039	0.035	0.039	1.000	5	0.746	0.715	0.748	1.000	5.500	2.500	3.000	17°	12°	17°	1.10	With	LN*U03...	2
EXN03R112U0100-04 ⁽²⁾	0.039	0.035	0.039	1.125	4	0.869	0.838	0.873	1.000	5.500	2.500	3.000	17°	12°	17°	1.12	With	LN*U03...	1
EXN03R112U0100-04L ⁽²⁾	0.039	0.035	0.039	1.125	4	0.869	0.838	0.873	1.000	7.000	1.500	5.500	17°	12°	17°	1.46	With	LN*U03...	1
EXN03R112U0100-05 ⁽²⁾	0.039	0.035	0.039	1.125	5	0.869	0.838	0.873	1.000	5.500	2.500	3.000	17°	12°	17°	1.12	With	LN*U03...	1
EXN03R125U0125-05 ⁽²⁾	0.039	0.035	0.039	1.250	5	0.994	0.963	0.998	1.250	6.000	3.000	3.000	17°	12°	17°	1.87	With	LN*U03...	1
EXN03R125U0125-05L ⁽²⁾	0.039	0.035	0.039	1.250	5	0.994	0.963	0.998	1.250	8.000	5.000	3.000	17°	12°	17°	2.43	With	LN*U03...	1
EXN03R125U0125-06 ⁽¹⁾	0.039	0.035	0.039	1.250	6	0.994	0.963	0.998	1.250	6.000	3.000	3.000	17°	12°	17°	1.85	With	LN*U03...	1
EXN03R125U0125-06-C ⁽¹⁾	0.039	0.035	0.039	1.250	6	0.997	0.966	0.997	1.250	6.000	3.000	3.000	17°	12°	17°	1.76	With	LN*U03...	2
EXN03R150U0125-06-C ⁽²⁾	0.039	0.035	0.039	1.500	6	1.248	1.217	1.247	1.250	6.000	3.000	3.000	17°	12°	17°	1.96	With	LN*U03...	2

Metric	APMX	APMX2	APMX3	DCX	CICT	DC	DC2	DC3	DCONMS	LF	LH	LS	KAPR*	KAPR2*	KAPR3*	WT(kg)	Air hole	Insert	Fig.
EXN03R016M16.0-02 ⁽¹⁾	1	0.9	1	16	2	9.6	8.8	9.8	16	100	30	70	15°	10°	15°	0.2	With	LN*U03...	1
EXN03R016M16.0-02L ⁽¹⁾	1	0.9	1	16	2	9.6	8.8	9.8	16	150	50	100	15°	10°	15°	0.2	With	LN*U03...	1
EXN03R016M16.0-02-C ⁽¹⁾	1	0.9	1	16	2	9.6	8.8	9.8	16	100	30	70	15°	10°	15°	0.2	With	LN*U03...	2
EXN03R016M16.0-02L-C ⁽¹⁾	1	0.9	1	16	2	9.6	8.8	9.8	16	150	50	100	15°	10°	15°	0.2	With	LN*U03...	2
EXN03R016M16.0-02N ⁽¹⁾	1	0.9	1	16	2	9.6	8.8	9.8	16	100	30	70	15°	10°	15°	0.2	Without	LN*U03...	3
EXN03R018M16.0-02 ⁽¹⁾	1	0.9	1	18	2	11.5	10.7	11.7	16	100	30	70	17°	12°	17°	0.2	With	LN*U03...	1
EXN03R018M16.0-02L ⁽¹⁾	1	0.9	1	18	2	11.5	10.7	11.7	16	150	25	125	17°	12°	17°	0.2	With	LN*U03...	1
EXN03R020M20.0-03 ⁽²⁾	1	0.9	1	20	3	13.5	12.7	13.6	20	130	50	80	17°	12°	17°	0.3	With	LN*U03...	1
EXN03R020M20.0-03L ⁽²⁾	1	0.9	1	20	3	13.5	12.7	13.6	20	160	80	80	17°	12°	17°	0.3	With	LN*U03...	1
EXN03R020M20.0-03-C ⁽²⁾	1	0.9	1	20	3	13.5	12.7	13.6	20	130	50	80	17°	12°	17°	0.3	With	LN*U03...	2
EXN03R020M20.0-03L-C ⁽²⁾	1	0.9	1	20	3	13.5	12.7	13.6	20	160	80	80	17°	12°	17°	0.3	With	LN*U03...	2
EXN03R020M20.0-03N ⁽²⁾	1	0.9	1	20	3	13.5	12.7	13.6	20	130	50	80	17°	12°	17°	0.3	Without	LN*U03...	3
EXN03R020M20.0-04 ⁽¹⁾	1	0.9	1	20	4	13.5	12.7	13.6	20	130	50	80	17°	12°	17°	0.3	With	LN*U03...	1
EXN03R020M20.0-04-C ⁽¹⁾	1	0.9	1	20	4	13.5	12.7	13.6	20	130	50	80	17°	12°	17°	0.3	With	LN*U03...	2
EXN03R022M20.0-03 ⁽²⁾	1	0.9	1	22	3	15.5	14.7	15.6	20	130	50	80	17°	12°	17°	0.3	With	LN*U03...	1
EXN03R022M20.0-03L ⁽²⁾	1	0.9	1	22	3	15.5	14.7	15.6	20	160	30	130	17°	12°	17°	0.4	With	LN*U03...	1
EXN03R022M20.0-04 ⁽¹⁾	1	0.9	1	22	4	15.5	14.7	15.6	20	130	50	80	17°	12°	17°	0.3	With	LN*U03...	1
EXN03R025M25.0-04 ⁽²⁾	1	0.9	1	25	4	18.5	17.7	18.6	25	140	60	80	17°	12°	17°	0.5	With	LN*U03...	1
EXN03R025M25.0-04L ⁽²⁾	1	0.9	1	25	4	18.5	17.7	18.6	25	180	100	80	17°	12°	17°	0.6	With	LN*U03...	1
EXN03R025M25.0-04-C ⁽²⁾	1	0.9	1	25	4	18.5	17.7	18.6	25	140	60	80	17°	12°	17°	0.5	With	LN*U03...	2
EXN03R025M25.0-04L-C ⁽²⁾	1	0.9	1	25	4	18.5	17.7	18.6	25	180	100	80	17°	12°	17°	0.6	With	LN*U03...	2
EXN03R025M25.0-04N ⁽²⁾	1	0.9	1	25	4	18.5	17.7	18.6	25	140	60	80	17°	12°	17°	0.5	Without	LN*U03...	3
EXN03R025M25.0-05 ⁽¹⁾	1	0.9	1	25	5	18.5	17.7	18.6	25	140	60	80	17°	12°	17°	0.5	With	LN*U03...	1
EXN03R025M25.0-05-C ⁽¹⁾	1	0.9	1	25	5	18.5	17.7	18.6	25	140	60	80	17°	12°	17°	0.5	With	LN*U03...	2
EXN03R028M25.0-04 ⁽²⁾	1	0.9	1	28	4	21.5	20.7	21.6	25	140	60	80	17°	12°	17°	0.5	With	LN*U03...	1
EXN03R028M25.0-04L ⁽²⁾	1	0.9	1	28	4	21.5	20.7	21.6	25	180	35	145	17°	12°	17°	0.7	With	LN*U03...	1
EXN03R028M25.0-05 ⁽¹⁾	1	0.9	1	28	5	21.5	20.7	21.6	25	140	60	80	17°	12°	17°	0.5	With	LN*U03...	1
EXN03R030M32.0-04 ⁽²⁾	1	0.9	1	30	4	23.5	22.7	23.6	32	150	70	80	17°	12°	17°	0.8	With	LN*U03...	1

Metric	APMX	APMX2	APMX3	DCX	CICT	DC	DC2	DC3	DCONMS	LF	LH	LS	KAPR*	KAPR2*	KAPR3*	WT(kg)	Air hole	Insert	Fig.
EXN03R030M32.0-04L ⁽²⁾	1	0.9	1	30	4	23.5	22.7	23.6	32	200	120	80	17°	12°	17°	0.9	With	LN*U03...	1
EXN03R030M32.0-05 ⁽²⁾	1	0.9	1	30	5	23.5	22.7	23.6	32	150	70	80	17°	12°	17°	0.8	With	LN*U03...	1
EXN03R032M32.0-05L ⁽²⁾	1	0.9	1	32	5	25.5	24.7	25.6	32	150	70	80	17°	12°	17°	0.8	With	LN*U03...	1
EXN03R032M32.0-05L ⁽²⁾	1	0.9	1	32	5	25.5	24.7	25.6	32	200	120	80	17°	12°	17°	1.1	With	LN*U03...	1
EXN03R032M32.0-05-C ⁽²⁾	1	0.9	1	32	5	25.5	24.7	25.6	32	150	70	80	17°	12°	17°	0.8	With	LN*U03...	2
EXN03R032M32.0-05L-C ⁽²⁾	1	0.9	1	32	5	25.5	24.7	25.6	32	200	120	80	17°	12°	17°	1.1	With	LN*U03...	2
EXN03R032M32.0-05N ⁽²⁾	1	0.9	1	32	5	25.5	24.7	25.6	32	150	70	80	17°	12°	17°	0.8	Without	LN*U03...	3
EXN03R032M32.0-06 ⁽¹⁾	1	0.9	1	32	6	25.5	24.7	25.6	32	150	70	80	17°	12°	17°	0.9	With	LN*U03...	1
EXN03R032M32.0-06-C ⁽¹⁾	1	0.9	1	32	6	25.5	24.7	25.6	32	150	70	80	17°	12°	17°	0.8	With	LN*U03...	2
EXN03R035M32.0-05 ⁽²⁾	1	0.9	1	35	5	28.5	27.7	28.6	32	150	35	115	17°	12°	17°	0.9	With	LN*U03...	1
EXN03R035M32.0-05L ⁽²⁾	1	0.9	1	35	5	28.5	27.7	28.6	32	200	35	165	17°	12°	17°	1.2	With	LN*U03...	1
EXN03R035M32.0-06 ⁽²⁾	1	0.9	1	35	6	28.5	27.7	28.6	32	150	35	115	17°	12°	17°	0.9	With	LN*U03...	1
EXN03R040M32.0-06-C ⁽²⁾	1	0.9	1	40	6	33.6	32.8	33.7	32	150	45	105	17°	12°	17°	1	With	LN*U03...	2
EXN03R040M32.0-06L-C ⁽²⁾	1	0.9	1	40	6	33.6	32.8	33.7	32	220	45	175	17°	12°	17°	1.4	With	LN*U03...	2

*APMX, DC, KAPR: with LNMU0303ZER

*APMX2, KAPR2: with LNMU0303UER

*APMX3, KAPR3: with LNU0303ZER

Clamping screws used for (1) and (2) above are different. See below for the part codes.

SPARE PARTS

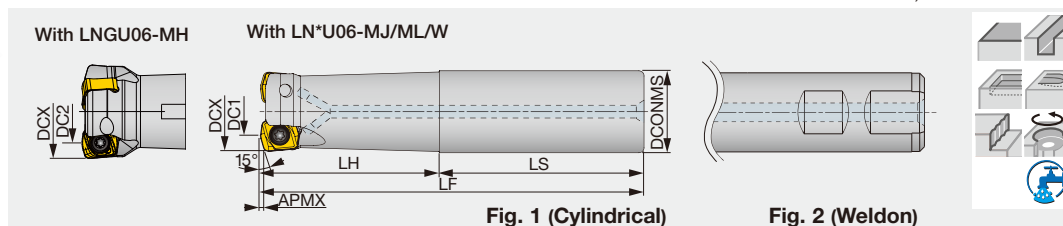
Designation	Clamping screw	Lubricant	Wrench	Tool diameter tolerance	
EXN03...	(1) CSPB-2.5 (2) CSPB-2.5L080	M-1000	IP-8D	Tool diameter	0 / -0.018"

Recommended clamping torque: 0.96 lbs-ft, 1.3 N-m

DOFEED EXN06

High feed mill shank type cutter, with screw clamp system

GAMP = +10°, GAMF = -2° ~ +6°



Inch	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	WT(lb)	Air hole	Insert	Fig.
EXN06R125U0125W02	0.059	1.250	2	0.766	0.745	1.250	5.281	3.000	2.281	1.540	With	LN*U06...	2
EXN06R125U0125-02L	0.059	1.250	2	0.766	0.745	1.250	8.000	5.000	3.000	2.360	With	LN*U06...	1
EXN06R150U0125W03	0.059	1.500	3	1.014	0.989	1.250	5.781	3.500	2.281	1.830	With	LN*U06...	2
EXN06R150U0125-03L	0.059	1.500	3	1.014	0.989	1.250	10.000	2.000	8.000	3.310	With	LN*U06...	1

Metric	APMX	DCX	CICT	DC1	DC2	DCONMS	LF	LH	LS	WT (kg)	Air hole	Insert	Fig.
EXN06R032M32.0-02	1.5	32	2	19.7	19.1	32	150	70	80	0.8	With	LN*U06...	1
EXN06R032M32.0-02L	1.5	32	2	19.7	19.1	32	200	120	80	1.1	With	LN*U06...	1
EXN06R035M32.0-02	1.5	35	2	22.7	22	32	150	45	105	0.9	With	LN*U06...	1
EXN06R035M32.0-02L	1.5	35	2	22.7	22	32	200	45	155	1.2	With	LN*U06...	1
EXN06R040M32.0-03	1.5	40	3	27.7	27	32	150	45	105	0.9	With	LN*U06...	1
EXN06R040M32.0-03L	1.5	40	3	27.7	27	32	220	45	175	1.3	With	LN*U06...	1

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench	Tool diameter tolerance	
EXN06...	CSPB-5	M-1000	IP-20D	Tool diameter	0 / -0.022"

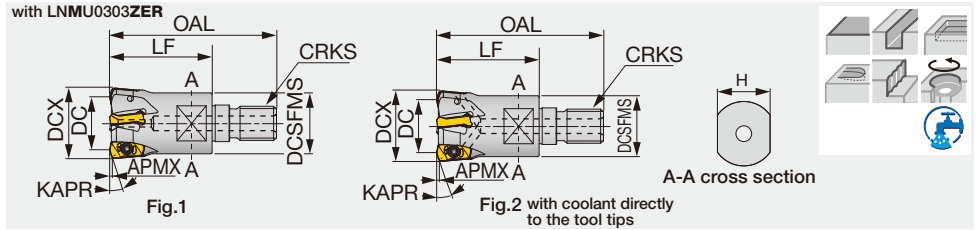
Recommended clamping torque: 3.69 lbs-ft, 5 N-m

Reference pages: Inserts → **H030 - H031**, Standard cutting conditions → **H032 - H037**



High feed endmill, modular type (TungFlex)

GAMP= +6°, GAMF= +5° ~ +11°



Metric	APMX	APMX2	APMX3	DCX	CICT	DC	DC2	DC3	OAL	LF	H	DCSFMS	KAPR+	KAPR2+	KAPR3+	CRKS	WT(kg)	Air hole	Insert	Fig.
HXN03R016MM08-02 ⁽¹⁾	1	0.9	1	16	2	9.6	8.8	9.8	42	25	10	12.8	15°	10°	15°	M8	0.03	With	LN*U03...	1
HXN03R016MM08-02-C ⁽¹⁾	1	0.9	1	16	2	9.6	8.8	9.8	42	25	10	12.8	15°	10°	15°	M8	0.03	With	LN*U03...	2
HXN03R018MM08-02 ⁽¹⁾	1	0.9	1	18	2	11.5	10.7	11.7	42	25	10	14.5	17°	12°	17°	M8	0.04	With	LN*U03...	1
HXN03R020MM10-03 ⁽²⁾	1	0.9	1	20	3	13.5	12.7	13.6	49	30	15	17.8	17°	12°	17°	M10	0.06	With	LN*U03...	1
HXN03R020MM10-03-C ⁽²⁾	1	0.9	1	20	3	13.5	12.7	13.6	49	30	15	17.8	17°	12°	17°	M10	0.06	With	LN*U03...	2
HXN03R020MM10-04 ⁽¹⁾	1	0.9	1	20	4	13.5	12.7	13.6	49	30	15	17.8	17°	12°	17°	M10	0.06	With	LN*U03...	1
HXN03R020MM10-04-C ⁽¹⁾	1	0.9	1	20	4	13.5	12.7	13.6	49	30	15	17.8	17°	12°	17°	M10	0.06	With	LN*U03...	2
HXN03R022MM10-03 ⁽²⁾	1	0.9	1	22	3	15.5	14.7	15.6	49	30	15	17.8	17°	12°	17°	M10	0.06	With	LN*U03...	1
HXN03R022MM10-04 ⁽¹⁾	1	0.9	1	22	4	15.5	14.7	15.6	49	30	15	17.8	17°	12°	17°	M10	0.07	With	LN*U03...	1
HXN03R025MM12-04 ⁽²⁾	1	0.9	1	25	4	18.5	17.7	18.6	57	35	17	20.8	17°	12°	17°	M12	0.1	With	LN*U03...	1
HXN03R025MM12-04-C ⁽²⁾	1	0.9	1	25	4	18.5	17.7	18.6	57	35	17	20.8	17°	12°	17°	M12	0.1	With	LN*U03...	2
HXN03R025MM12-05 ⁽¹⁾	1	0.9	1	25	5	18.5	17.7	18.6	57	35	17	20.8	17°	12°	17°	M12	0.11	With	LN*U03...	1
HXN03R025MM12-05-C ⁽¹⁾	1	0.9	1	25	5	18.5	17.7	18.6	57	35	17	20.8	17°	12°	17°	M12	0.1	With	LN*U03...	2
HXN03R028MM12-04 ⁽²⁾	1	0.9	1	28	4	21.5	20.7	21.6	57	35	17	23	17°	12°	17°	M12	0.12	With	LN*U03...	1
HXN03R028MM12-05 ⁽²⁾	1	0.9	1	28	5	21.5	20.7	21.6	57	35	17	23	17°	12°	17°	M12	0.12	With	LN*U03...	1
HXN03R030MM16-04 ⁽²⁾	1	0.9	1	30	4	23.5	22.7	23.6	63	40	22	28.8	17°	12°	17°	M16	0.19	With	LN*U03...	1
HXN03R030MM16-05 ⁽²⁾	1	0.9	1	30	5	23.5	22.7	23.6	63	40	22	28.8	17°	12°	17°	M16	0.2	With	LN*U03...	1
HXN03R032MM16-05 ⁽²⁾	1	0.9	1	32	5	25.5	24.7	25.6	63	40	22	28.8	17°	12°	17°	M16	0.2	With	LN*U03...	1
HXN03R032MM16-05-C ⁽²⁾	1	0.9	1	32	5	25.5	24.7	25.6	63	40	22	28.8	17°	12°	17°	M16	0.2	With	LN*U03...	2
HXN03R032MM16-06 ⁽¹⁾	1	0.9	1	32	6	25.5	24.7	25.6	63	40	22	28.8	17°	12°	17°	M16	0.21	With	LN*U03...	1
HXN03R032MM16-06-C ⁽¹⁾	1	0.9	1	32	6	25.5	24.7	25.6	63	40	22	28.8	17°	12°	17°	M16	0.2	With	LN*U03...	2
HXN03R040MM16-06-C ⁽²⁾	1	0.9	1	40	6	33.6	32.8	33.7	63	40	22	28.8	17°	12°	17°	M16	0.27	With	LN*U03...	2

*APMX, KAPR: with LNMU0303ZER

*APMX2, KAPR2 : with LNMU0303UER

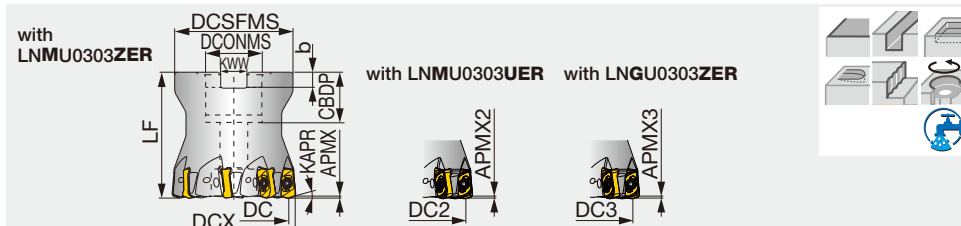
*APMX3, KAPR3 : with LNMU0303ZER

Clamping screws used for (1) and (2) above are different. See below for the part codes.

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench	Tool diameter tolerance	
HXN03...	(1) CSPB-2.5 (2) CSPB-2.5L080	M-1000	IP-8D	Tool diameter	0 / -0.018"

Recommended clamping torque: 1.3 N·m



Inch	APMX	APMX2	APMX3	DCX	CICT	DC	DC2	DC3	DCSFMS	DCONMS	CDBP	LF	b	KWW	KAPR	KAPR2*	KAPR3*	WT(lb)	Air hole	Insert
TXN03R150U0050A05	0.039	0.035	0.039	1.500	5	1.323	1.291	1.327	1.460	0.500	0.750	1.575	0.160	0.252	17°	12°	17°	0.530	With	LN*U03...
TXN03R150U0050A06	0.039	0.035	0.039	1.500	6	1.323	1.291	1.327	1.380	0.500	0.600	1.575	0.160	0.252	17°	12°	17°	0.510	With	LN*U03...
TXN03R200U0075A05	0.039	0.035	0.039	2.000	5	1.717	1.685	1.720	1.693	0.750	0.750	1.969	0.197	0.315	17°	12°	17°	1.100	With	LN*U03...
TXN03R200U0075A08	0.039	0.035	0.039	2.000	8	1.717	1.685	1.720	1.693	0.750	0.750	1.969	0.197	0.315	17°	12°	17°	1.100	With	LN*U03...
TXN03R200U0075A10	0.039	0.035	0.039	2.000	10	1.717	1.685	1.720	1.693	0.750	0.750	1.969	0.197	0.315	17°	12°	17°	1.100	With	LN*U03...

Metric	APMX	APMX2	APMX3	DCX	CICT	DC	DC2	DC3	DCSFMS	DCONMS	CDBP	LF	b	KWW	KAPR	KAPR2*	KAPR3*	WT(kg)	Air hole	Insert
TXN03R040M16.0E05	1	0.9	1	40	5	33.6	32.8	33.7	35	16	18	40	5.6	8.4	17°	12°	17°	0.2	With	LN*U03...
TXN03R040M16.0E06	1	0.9	1	40	6	33.6	32.8	33.7	35	16	18	40	5.6	8.4	17°	12°	17°	0.2	With	LN*U03...
TXN03R050M22.0E05	1	0.9	1	50	5	43.6	42.8	43.7	47	22	20	50	6.3	10.4	17°	12°	17°	0.5	With	LN*U03...
TXN03R050M22.0E08	1	0.9	1	50	8	43.6	42.8	43.7	47	22	20	50	6.3	10.4	17°	12°	17°	0.5	With	LN*U03...
TXN03R050M22.2-08	1	0.9	1	50	8	43.6	42.8	43.7	47	22.225	20	50	5	8	17°	12°	17°	0.5	With	LN*U03...

*APMX2, KAPR2 : with LN*U0303UER

*APMX3, KAPR3 : with LN*U0303ZER

Clamping screws used for (1) and (2) above are different. See below for the part codes.

SPARE PARTS



Designation	Clamping screw	Lubricant	Shell locking bolt	Wrench
TXN03R150U0050A05	CSPB-2.5L080	M-1000	(SR UNF 1/4X3/4 B18.3)	IP-8D
TXN03R150U0050A06	CSPB-2.5	M-1000	(SR UNF 1/4X3/4 B18.3)	IP-8D
TXN03R200U...	CSPB-2.5L080	M-1000	(C0.375X1.125H)	IP-8D
TXN03R040M	CSPB-2.5L080	M-1000	CM8X30H	IP-8D
TXN03R050M	CSPB-2.5L080	M-1000	CM10X30H	IP-8D

Tool diameter tolerance

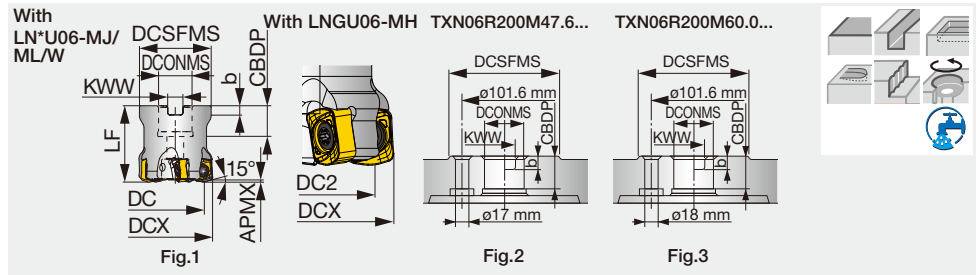
Tool diameter	0 / -0.018"
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Recommended clamping torque: 0.96 lbs·ft, 1.3 N·m



High feed mill bore type cutter, with screw clamp system

GAMP = +10°, GAMF = +2° ~ +6°



Inch	APMX	DCX	CICT	DC1	DC2	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Insert	Fig.
TXN06R200U0075A04	0.059	2.000	4	1.513	1.485	1.850	1.969	0.750	0.750	0.315	0.197	0.970	With	LN*U06...	1
TXN06R200U0075A05	0.059	2.000	5	1.513	1.485	1.850	1.969	0.750	0.750	0.315	0.197	0.990	With	LN*U06...	1
TXN06R250U0075A04	0.059	2.500	4	2.012	1.983	2.323	1.969	0.750	0.750	0.315	0.197	1.740	With	LN*U06...	1
TXN06R250U0075A06	0.059	2.500	6	2.012	1.983	2.323	1.969	0.750	0.750	0.315	0.197	1.760	With	LN*U06...	1
TXN06R300U0100A05	0.059	3.000	5	2.512	2.481	2.835	2.480	1.000	1.049	0.374	0.236	3.130	With	LN*U06...	1
TXN06R300U0100A07	0.059	3.000	7	2.512	2.481	2.835	2.480	1.000	1.049	0.374	0.236	3.280	With	LN*U06...	1
TXN06R400U0150A06	0.059	4.000	6	3.512	3.481	3.819	2.480	1.500	1.610	0.626	0.394	4.850	With	LN*U06...	1
TXN06R400U0150A10	0.059	4.000	10	3.512	3.481	3.819	2.480	1.500	1.610	0.626	0.394	4.850	With	LN*U06...	1
TXN06R500U0150A08	0.059	5.000	8	4.512	4.481	3.819	2.480	1.500	1.610	0.626	0.394	7.050	With	LN*U06...	1
TXN06R500U0150A12	0.059	5.000	12	4.512	4.481	3.819	2.480	1.500	1.610	0.626	0.394	7.280	With	LN*U06...	1
TXN06R600U0200A10	0.059	6.000	10	5.512	5.480	4.331	2.480	2.000	1.496	0.748	0.433	9.480	With	LN*U06...	1
TXN06R600U0200A14	0.059	6.000	14	5.512	5.480	4.331	2.480	2.000	1.496	0.748	0.433	9.260	With	LN*U06...	1
Metric	APMX	DCX	CICT	DC1	DC2	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT (kg)	Air hole	Insert	Fig.
TXN06R050M22.0E04 ⁽¹⁾	1.5	50	4	37.6	36.9	47	50	22	20	10.4	6.3	0.4	With	LN*U06...	1
TXN06R050M22.0E05 ⁽¹⁾	1.5	50	5	37.6	36.9	47	50	22	20	10.4	6.3	0.4	With	LN*U06...	1
TXN06R050M22.2-04 ⁽²⁾	1.5	50	4	37.6	36.9	47	50	22.225	20	8	5	0.4	With	LN*U06...	1
TXN06R050M22.2-05 ⁽¹⁾	1.5	50	5	37.6	36.9	47	50	22.225	20	8	5	0.4	With	LN*U06...	1
TXN06R052M22.0E04 ⁽¹⁾	1.5	52	4	39.6	38.9	49	50	22	20	10.4	6.3	0.5	With	LN*U06...	1
TXN06R052M22.0E05 ⁽¹⁾	1.5	52	5	39.6	38.9	49	50	22	20	10.4	6.3	0.5	With	LN*U06...	1
TXN06R063M22.0E04 ⁽²⁾	1.5	63	4	50.6	49.8	59	50	22	20	10.4	6.3	0.8	With	LN*U06...	1
TXN06R063M22.0E06 ⁽²⁾	1.5	63	6	50.6	49.8	59	50	22	20	10.4	6.3	0.8	With	LN*U06...	1
TXN06R063M22.2-04 ⁽²⁾	1.5	63	4	50.6	49.8	59	50	22.225	20	8	5	0.8	With	LN*U06...	1
TXN06R063M22.2-06 ⁽²⁾	1.5	63	6	50.6	49.8	59	50	22.225	20	8	5	0.8	With	LN*U06...	1
TXN06R066M27.0E04	1.5	66	4	53.6	52.8	63	50	27	22	12.4	7	0.8	With	LN*U06...	1
TXN06R066M27.0E06	1.5	66	6	53.6	52.8	63	50	27	22	12.4	7	0.8	With	LN*U06...	1
TXN06R080M27.0E05	1.5	80	5	67.6	66.8	76	63	27	22	12.4	7	1.6	With	LN*U06...	1
TXN06R080M27.0EE05	1.5	80	5	67.6	66.8	60	63	27	22	12.4	7	1.2	With	LN*U06...	1
TXN06R080M27.0E08	1.5	80	8	67.6	66.8	76	63	27	22	12.4	7	1.6	With	LN*U06...	1
TXN06R080M27.0EE08	1.5	80	8	67.6	66.8	60	63	27	22	12.4	7	1.2	With	LN*U06...	1
TXN06R080M31.7-05	1.5	80	5	67.6	66.8	76	63	31.75	32	12.7	8	1.6	With	LN*U06...	1
TXN06R080M31.7-08	1.5	80	8	67.6	66.8	76	63	31.75	32	12.7	8	1.6	With	LN*U06...	1
TXN06R100M31.7-06	1.5	100	6	87.6	86.8	96	63	31.75	32	12.7	8	2.2	With	LN*U06...	1
TXN06R100M32.0E06	1.5	100	6	87.6	86.8	96	63	32	25	14.4	8	2.2	With	LN*U06...	1
TXN06R125M38.1-08	1.5	125	8	112.6	111.8	100	63	38.1	43	15.9	10	3	With	LN*U06...	1
TXN06R125M40.0E08	1.5	125	8	112.6	111.8	100	63	40	37	16.4	9	3	With	LN*U06...	1
TXN06R160M40.0E10	1.5	160	10	147.6	146.8	100	63	40	37	16.4	9	5	With	LN*U06...	1
TXN06R160M50.8-10	1.5	160	10	147.6	146.8	100	63	50.8	46	19	11	4.6	With	LN*U06...	1
TXN06R200M47.6-12	1.5	200	12	187.6	186.8	130	63	47.625	38	25.4	14	7.7	Without	LN*U06...	2
TXN06R200M60.0E12	1.5	200	12	187.6	186.8	130	63	60	38	25.7	14	7.2	Without	LN*U06...	3

Shell locking bolt used for (1) and (2) above are different. See next page for the part codes.

Tool diameter tolerance	
Tool diameter	0 / -0.022"

Reference pages: Inserts → **H030 - H031**, Standard cutting conditions → **H032 - H037**

SPARE PARTS



Designation	Clamping screw	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Grip	Torx bit
TXN06R200U..., 250U...	CSPB-5	M-1000	-	(C0.375X1.125H)	H-TB2W	BLDIP20/S7
TXN06R300U...	CSPB-5	M-1000	-	(C0.500X1.375H)	H-TB2W	BLDIP20/S7
TXN06R400U..., 500U...	CSPB-5	M-1000	(TMBA-0.750H)	-	H-TB2W	BLDIP20/S7
TXN06R600U...	CSPB-5	M-1000	-	-	H-TB2W	BLDIP20/M7
TXN06R050, 052, 063M...	CSPB-5	M-1000	-	(1) FSHM10-40H (2) CM10-30H	H-TB2W	BLDIP20/S7
TXN06R066,080M27.0...	CSPB-5	M-1000	-	CM12X30H	H-TB2W	BLDIP20/S7
TXN06R080,100M31.7...	CSPB-5	M-1000	-	CM16X40H	H-TB2W	BLDIP20/S7
TXN06R125M...	CSPB-5	M-1000	TMBA-M20H	-	H-TB2W	BLDIP20/S7
TXN06R160M40.0...	CSPB-5	M-1000	TMBA-M20H	-	H-TB2W	BLDIP20/M7
TXN06R160M50.8...	CSPB-5	M-1000	TMBA-M24H	-	H-TB2W	BLDIP20/M7
TXN06R200M...	CSPB-5	M-1000	-	-	H-TB2W	BLDIP20/M7

Recommended clamping torque: 3.69 lbs-ft, 5 N-m

Grade

A

Insert

B

Ext. Toolholder

C

Int. Toolholder

D

Threading

E

Grooving

F

Miniature tool

G

Milling cutter

H

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I

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Tooling System

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User's Guide

L

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M



High Feed
Milling

Face
Milling

Shoulder
Milling

Slot
Milling

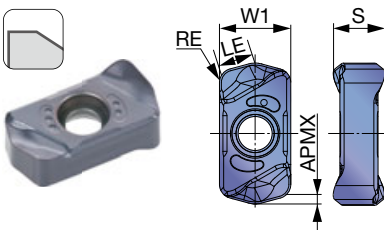
Profile
Milling

Chamfering,
Counterbore

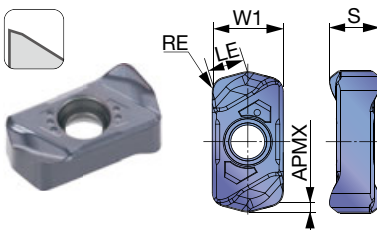
Finish
Face
Milling

INSERT

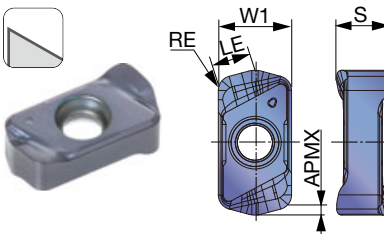
LNMU03ZER-MJ (for general purpose)



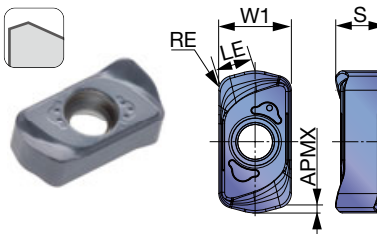
LNMU03ZER-ML (for low cutting force)



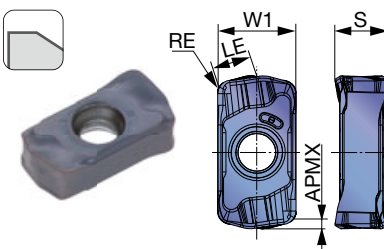
LNMU03ZER-MS (for stainless steel)



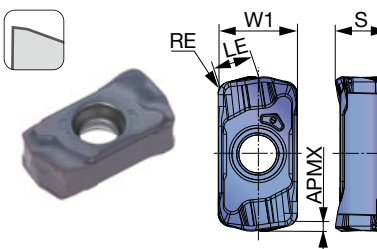
LNGU03ZER-MH (Robust cutting edges)



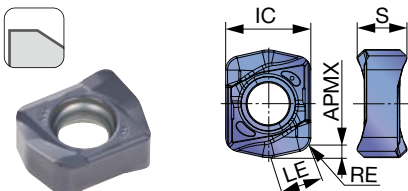
LNMU03UER-MJ (for general purpose, low approach angle)



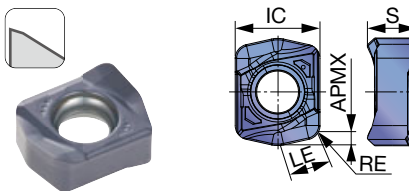
LNMU03UER-ML (for low cutting force, low approach angle)



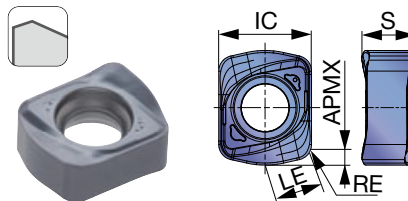
LNMU06-MJ (for general purpose)



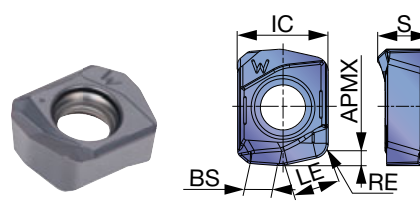
LNMU06-ML (for low cutting force)



LNGU06-MH (Robust cutting edges)



LNGU06-W (Wiper, 2 cutting edge)



Reference pages: Standard cutting conditions → [H032](#) - [H037](#)

High Feed
Milling

Face Milling

Shoulder
Milling

Slot Milling



Profile Milling

Chamfering,
CounterboreFinish
Face Milling

STANDARD CUTTING CONDITIONS

EXN03, HXN03, TXN03

ZER type

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)			Tool dia.: DCX (in)						
							Plunging	ø0.625~ ø0.875		ø1.000~ ø2.000	ø0.625", CICT = 2		ø0.688", CICT = 2		ø0.75", CICT = 2 CICT = 3	
								n	Vf		n	Vf	n	Vf		
P	Carbon steels (S45C / C45, S55C / C55, etc.)	- 300HB	First choice	AH3225	MJ	330 - 980	0.020 - 0.047	0.020 - 0.059	0.004	4,030	250	3,660	227	3,360	208	312
	Alloy steels (SCM440 / 42CrMo4, etc.)	- 300HB	First choice	AH3225	MJ	330 - 980	0.020 - 0.047	0.020 - 0.059	0.004	4,030	250	3,660	227	3,360	208	312
	Prehardened steels (NAK80, PX5, etc.)	30 - 40HRC	First choice	AH3225	MJ	330 - 660	0.020 - 0.039	0.020 - 0.039	0.004	2,990	167	2,720	152	2,500	140	210
		30 - 40HRC	for wear resistance	AH8015	MJ	330 - 660	0.020 - 0.039	0.020 - 0.039	0.004	2,990	167	2,720	152	2,500	140	210
M	Austenitic stainless steels (SUS304 / X5CrNi18-9, etc.)	- 200HB	First choice	AH130	MS	260 - 490	0.012 - 0.031	0.012 - 0.031	0.004	2,380	95	2,170	87	1,990	80	119
	Precipitation hardening stainless steels (SUS630 / X5CrNiCuNb16-4)	28HRC - (H1150)	First choice for wear resistance	AH130	MS	260 - 490	0.008 - 0.020	0.008 - 0.020	0.004	2,380	57	2,170	52	1,990	48	72
		40HRC - (H900)	First choice for impact resistance	AH3225	ML	260 - 390	0.004 - 0.012	0.004 - 0.012	0.004	2,020	32	1,830	29	1,680	27	40
				AH3225	MJ	260 - 390	0.004 - 0.012	0.004 - 0.012	0.004	2,020	32	1,830	29	1,680	27	40
K	Gray cast irons (FC250 / GG25 / 250, etc.)	150 - 250HB	First choice	AH725	MJ	330 - 980	0.020 - 0.047	0.020 - 0.059	0.004	4,030	250	3,660	227	3,360	208	312
	Ductile cast irons (FCD400, etc.)	150 - 250HB	First choice	AH725	MJ	260 - 660	0.020 - 0.047	0.020 - 0.059	0.004	2,990	185	2,720	169	2,500	155	233
S	Titanium alloy (Ti-6Al-4V, etc.)	- 40HRC	First choice for impact resistance	AH130	ML	100 - 200	0.012- 0.028	0.012- 0.028	0.003	790	25	720	23	660	21	32
	Heat-resistant alloy (Inconel, Hastelloy, etc.)	- 40HRC	First choice for impact resistance	AH8015	ML	70 - 160	0.004 - 0.012	0.004 - 0.012	0.002	610	10	560	9	510	8	12
H	Hot mold steel (SKD61 / X40CrMoV5-1, etc.)	40 - 55HRC	First choice Low resistance	AH8015	MH	260 - 490	0.004-0.020 0.004-0.012	0.004-0.020 0.004-0.012	0.002	2,390	57	2,170	52	1,990	48	72
	Hot mold steel of D.T.C materials (DAC*, DH**, DIEVER, etc.)	40 - 55HRC	First choice for impact resistance	AH8015	MJ	160 - 330	0.004-0.012 0.004-0.020	0.004-0.012 0.004-0.020	0.002	1,590	25	1,440	23	1,320	21	32
				AH8015	MH	160 - 330	0.004-0.020 0.004-0.020	0.004-0.020 0.004-0.020	0.002	1,590	25	1,440	23	1,320	21	32
				AH8015	MH	160 - 330	0.004-0.020 0.004-0.020	0.004-0.020 0.004-0.020	0.002	1,590	25	1,440	23	1,320	21	32
H	Cold mold steels (SKD11 / X153CrMoV12, etc.)	55 - 60HRC	First choice	AH8005	MH	160 - 230	0.002 - 0.008	0.001 - 0.004	0.001	1,220	12	1,110	11	1,020	10	15
		55 - 60HRC	for impact resistance	AH8015	MH	160 - 230	0.002 - 0.004	0.002 - 0.008	0.001	1,220	5	1,110	4	1,020	4	6
				AH8015	MH	160 - 230	0.002 - 0.004	0.002 - 0.008	0.001	1,220	5	1,110	4	1,020	4	6
				AH8015	MH	160 - 230	0.002 - 0.004	0.002 - 0.008	0.001	1,220	5	1,110	4	1,020	4	6

- When chips stay in the cutting zone during slotting or pocketing, use air blast to remove chips from the work area.

- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.

Approach
angle

7°-25°

41°-45°

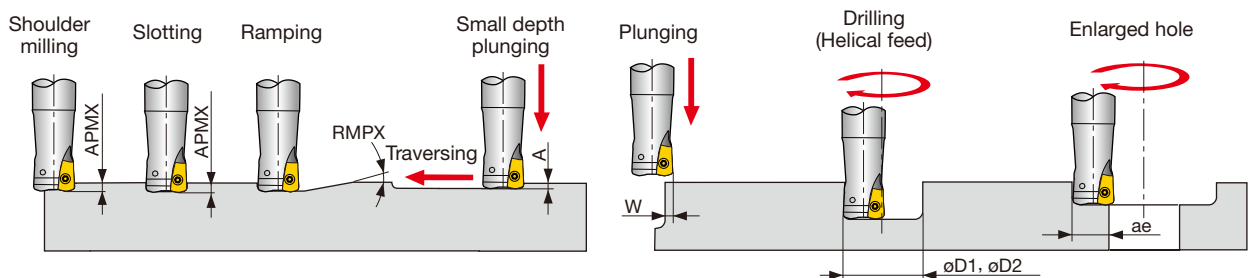
60°-70°

85°-88°

90°

Others

APPLICATION RANGE



		Max. depth of cut	Max. ramping angle		Max. plunging depth	Max. cutting width in plunging		Min. machinable hole dia.		Max. machinable hole dia.	Max. cutting width in enlarged hole
			RMPX			W		øD1			
			APMX	MJ/ML/MS		MH	A	MJ/ML/MS	MH		
Inch	DCX										
EXN03R062U0062-...	0.625	0.039	2.100	1.700	0.012	0.138	0.118	0.856	0.896	1.181	0.492
EXN03R068U0062...	0.688	0.039	1.700	1.700	0.012	0.138	0.118	0.982	1.022	1.339	0.571
EXN03R075U0075-...	0.750	0.039	1.400	1.200	0.012	0.138	0.118	1.106	1.146	1.496	0.650
EXN03R087U0075-...	0.875	0.039	1.200	1.000	0.012	0.138	0.118	1.356	1.396	1.654	0.728
EXN03R100U0100-...	1.000	0.039	1.000	0.900	0.012	0.138	0.118	1.606	1.646	1.890	0.846
EXN03R112U0100-...	1.125	0.039	0.800	0.800	0.012	0.138	0.118	1.856	1.856	2.126	0.965
EXN03R125U0125-...	1.250	0.039	0.700	0.700	0.012	0.138	0.118	2.106	2.106	2.441	1.122
TXN03R150U0075...	1.500	0.039	0.500	0.500	0.012	0.138	0.118	2.606	2.606	3.070	1.437
TXN03R200U0075...	2.000	0.039	0.400	0.400	0.012	0.138	0.118	3.606	3.606	3.858	1.830

Tool dia.: DCX (in), Number of revolutions: n (rpm), Feed speed: V_f (ipm), Max. depth of cut: $ap = 0.004"$

ø0.875			ø1			ø1.125			ø1.25			ø1.5			ø2			
n	Vf		n	Vf		n	Vf		n	Vf		n	Vf		n	Vf		
	CICT = 2	CICT = 3		CICT = 4	CICT = 5		CICT = 4	CICT = 5		CICT = 5	CICT = 6		CICT = 5	CICT = 6		CICT = 5	CICT = 8	CICT = 10
2,880	230	346	2,520	403	504	2,240	358	448	2,020	404	485	1,680	336	403	1,260	252	403	504
Vc = 660 sfm, fz = 0.04 ipt																		
2,880	230	346	2,520	403	504	2,240	358	448	2,020	404	485	1,680	336	403	1,260	252	403	504
Vc = 660 sfm, fz = 0.04 ipt																		
2,140	120	180	1,870	209	262	1,660	186	232	1,500	210	252	1,250	175	210	940	132	211	263
Vc = 490 sfm, fz = 0.028 ipt																		
2,140	120	180	1,870	209	262	1,660	186	232	1,500	210	252	1,250	175	210	940	132	211	263
Vc = 490 sfm, fz = 0.028 ipt																		
1,700	68	102	1,490	119	149	1,320	106	132	1,190	119	143	990	99	119	740	74	118	148
Vc = 390 sfm, fz = 0.02 ipt																		
1,700	41	61	1,490	72	89	1,320	63	79	1,190	71	86	990	59	71	740	44	71	89
Vc = 390 sfm, fz = 0.012 ipt																		
1,440	23	35	1,260	40	50	1,120	36	45	1,010	40	48	840	34	40	630	25	40	50
Vc = 330 sfm, fz = 0.008 ipt																		
2,880	230	346	2,520	403	504	2,240	358	448	2,020	404	485	1,680	336	403	1,260	252	403	504
Vc = 660 sfm, fz = 0.04 ipt																		
2,140	171	257	1,870	299	374	1,660	266	332	1,500	300	360	1,250	250	300	940	188	301	376
Vc = 490 sfm, fz = 0.04 ipt																		
570	23	34	500	40	50	440	35	44	400	40	48	330	33	40	250	25	40	50
Vc = 130 sfm, fz = 0.02 ipt																		
440	7	11	380	12	15	340	11	14	310	12	15	250	10	12	190	8	12	15
Vc = 100 sfm, fz = 0.008 ipt																		
1,700	41	61	1,490	72	89	1,320	63	79	1,190	71	86	990	59	71	740	44	71	89
Vc = 390 sfm, fz = 0.012 ipt																		
1,140	18	27	990	32	40	880	28	35	790	32	38	660	26	32	500	20	32	40
Vc = 260 sfm, fz = 0.008 ipt																		
870	7	10	760	12	15	680	11	14	610	12	15	510	10	12	380	8	12	15
Vc = 200 sfm, fz = 0.004 ipt																		
870	3	5	760	6	8	680	5	7	610	6	7	510	5	6	380	4	6	8
Vc = 200 sfm, fz = 0.002 ipt																		



STANDARD CUTTING CONDITIONS

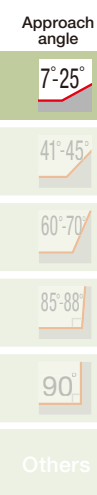
EXN03, HXN03, TXN03

UER type

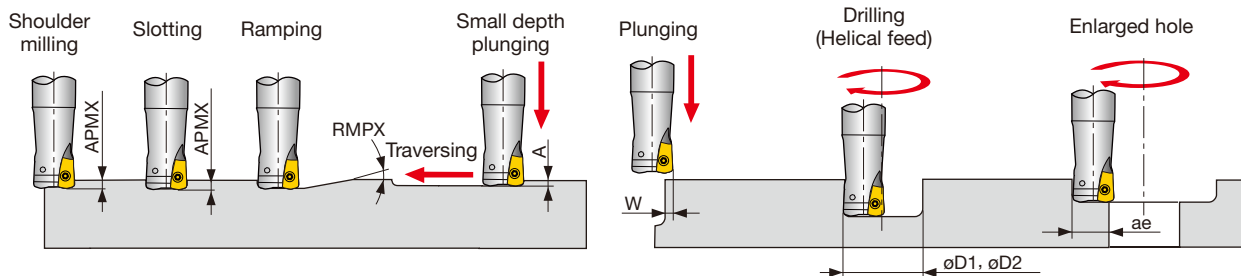
ISO	Workpiece material	Hardness	Priority	Grade	Chip- breaker	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)			Tool dia.: DCX (in)						
							Plunging	ø0.630 ~ ø0.875		ø1.000 ~ ø2.000	ø0.625", CICT = 2		ø0.709", CICT = 2		ø0.787"	
								n	Vf		n	Vf	n	Vf		
P	Carbon steels 1045, 1055, etc.	- 300HB	First choice Low resistance	AH3225	MJ ML	330 - 980	0.020 - 0.046	0.020 - 0.060	0.004	4030	330 Vc = 660 sfm, fz = 0.040 ipt	3670 300	3360 3360	270	410	
	Alloy steels 4140, etc.	- 300HB	First choice Low resistance	AH3225	MJ ML	330 - 980	0.020 - 0.046	0.020 - 0.060	0.004	4030	330 Vc = 660 sfm, fz = 0.040 ipt	3670 300	3360 3360	270	410	
	Prehardened steels NAK80, PX5, etc.	30 - 40HRC	First choice for impact resistance	AH8015 AH3225	MJ MJ	330 - 660	0.020 - 0.040	0.020 - 0.040	0.004	3060	190 Vc = 500 sfm, fz = 0.030 ipt	2780 170	2550 2550	160	230	
M	Austenitic stainless steels 304SS, etc.	- 200HB	First choice for impact resistance	AH130	ML MJ	260 - 490	0.012 - 0.040	0.012 - 0.040	0.004	2320	130 Vc = 380 sfm, fz = 0.026 ipt	2110 110	1940 1940	110	160	
	Precipitation hardening stainless steels 17-4 PH, etc.	28HRC -	First choice for impact resistance	AH130	ML MJ	260 - 490	0.012 - 0.030	0.012 - 0.030	0.004	2320	100 Vc = 380 sfm, fz = 0.020 ipt	2110 90	1940 1940	80	120	
		40HRC -	First choice for impact resistance	AH130	ML MJ	260 - 390	0.012 - 0.020	0.012 - 0.020	0.004	2020	70 Vc = 330 sfm, fz = .0016 ipt	1830 60	1680 1680	60	90	
K	Gray cast irons Class 25, etc.	150 - 250HB	First choice for impact resistance	AH8015 AH3225	MJ MJ	330 - 980	0.012 - 0.046	0.020 - 0.060	0.004	4030	330 Vc = 660 sfm, fz = 0.040 ipt	3670 300	3360 3360	270	410	
	Ductile cast irons 60-40-18, etc.	150 - 250HB	First choice for impact resistance	AH8015 AH3225	MJ MJ	260 - 660	0.012 - 0.046	0.020 - 0.060	0.004	4030	330 Vc = 460 sfm, fz = 0.040 ipt	3670 300	3360 3360	190	290	
S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice for wear resistance	AH130 AH8015	MJ MJ	100 - 200	0.012 - 0.030	0.012 - 0.030	0.003	920	40 Vc = 150 sfm, fz = 0.020 ipt	830 40	760 760	40	50	
	Heat-resistant alloy Inconel, Hastelloy, etc.	- 40HRC	First choice for impact resistance	AH8015	ML MJ	70 - 160	0.012 - 0.020	0.012 - 0.020	0.002	730	30 Vc = 120 sfm, fz = 0.016 ipt	670 30	610 610	20	30	
H	Hot mold steel H-13, etc.	40~50HRC	First choice for impact resistance	AH8015 AH3225	MJ MJ	260 - 490	0.004 - 0.020	0.004 - 0.020	0.002	2320	60 Vc = 380 sfm, fz = 0.012 ipt	2110 60	1940 1940	50	70	
	Hot mold steel of D.T.C materials DAC**, DH**, DIEVER, etc.	40~50HRC	First choice for impact resistance	AH8015	MJ	160 - 330	0.004 - 0.020	0.004 - 0.020	0.002	1530	40 Vc = 250 sfm, fz = 0.012 ipt	1390 40	1270 1270	40	50	
				AH3225	MJ											
	Cold mold steels D2, etc.	50~60HRC	First choice	AH8005	MJ	160 - 230	0.004 - 0.012	0.004 - 0.012	0.001	1220	20 Vc = 200 sfm, fz = 0.008 ipt	1110 20	1020 1020	20	30	

- When chips stay in the cutting zone during slotting or pocketing, use air blast to remove chips from the work area

- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed



APPLICATION RANGE



Inch	DCX	Max. depth of cut	Max. ramping angle	Max. plunging depth	Max. cutting width in plunging	Min. machinable hole dia.	Max. machinable hole dia.	Max. cutting width in enlarged hole
		APMX	RMPX	A	W	øD1	øD2	ae
EXN03R062U0062...	0.625	0.035	Not possible	Not possible	0.15	Not possible	Not possible	0.480
EXN03R068U0062...	0.688	0.035	1.7°	0.011	0.15	0.991	1.339	0.560
EXN03R075U0075...	0.750	0.035	1.4°	0.011	0.15	1.132	1.496	0.638
EXN03R087U0075...	0.875	0.035	1.2°	0.011	0.15	1.371	1.654	0.716
EXN03R100U0100...	1.000	0.035	1°	0.011	0.15	1.610	1.890	0.835
EXN03R112U0100...	1.125	0.035	0.7°	0.011	0.15	1.857	2.126	0.953
EXN03R125U0125...	1.250	0.035	0.7°	0.011	0.15	2.104	2.441	1.110
TXN03R150U0075...	1.500	0.035	0.5°	0.011	0.15	2.750	3.070	1.425
TXN03R200U0075...	2.000	0.035	0.4°	0.011	0.15	3.540	3.858	1.819

For DCX above ø1.300", slot milling, ramping or contouring is not recommended as chips may be re-cut.

High Feed
Milling

STANDARD CUTTING CONDITIONS

EXN06, TXN06

	ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)		Tool dia.: DCX (in)			
										ø1.25" ~ ø6"		ø1.25", CICT = 2	
										Plunging		n	Vf
Face Milling	P	Carbon steels (S45C / C45, S55C / C55, etc.)	- 300HB	First choice	AH3225	MJ	330 - 980	0.020 - 0.059	0.006			2,020	162
												Vc = 660 sfm, fz = 0.040 ipt	202
		Alloy steels (SCM440 / 42CrMo4, etc.)	- 300HB	First choice	AH3225	MJ	330 - 660	0.020 - 0.059	0.006			2,020	162
												Vc = 660 sfm, fz = 0.040 ipt	202
Shoulder Milling	P	Prehardened steels (NAK80, PX5, etc.)	30 - 40HRC	First choice	AH3225	MJ	330 - 660	0.020 - 0.047	0.006			1,500	93
												Vc = 490 sfm, fz = 0.031 ipt	116
			30 - 40HRC	for wear resistance	AH8015	MJ	330 - 660	0.020 - 0.060	0.006			1,500	120
												Vc = 490 sfm, fz = 0.040 ipt	150
Slot Milling	M	Stainless steels (SUS304 / X5CrNi18-9, etc.)	- 200HB	First choice	AH130	ML	260 - 490	0.012 - 0.031	0.004			1,190	57
												Vc = 390 sfm, fz = 0.024 ipt	71
		Precipitation hardening stainless steels (SUS630 / X5CrNi-CuNb16-4)	28HRC - (H1150)	First choice	AH130	ML	260 - 490	0.008 - 0.020	0.004			1,190	29
				for impact resistance	AH130	MJ						Vc = 390 sfm, fz = 0.012 ipt	36
Profile Milling	M		40HRC - (H900)	First choice	AH130	ML	260 - 390	0.004 - 0.012	0.004			1,010	16
				for impact resistance	AH130	MJ						Vc = 330 sfm, fz = 0.008 ipt	20
Chamfering, Counterbore	K	Gray cast irons (FC250 / GG25 / 250, etc.)	150 - 250HB	First choice	AH120	MJ	330 - 980	0.020 - 0.059	0.006			2,020	162
												Vc = 660 sfm, fz = 0.040 ipt	202
			150 - 250HB	First choice	AH120	MJ	260 - 660	0.020 - 0.059	0.006			1,500	120
												Vc = 490 sfm, fz = 0.040 ipt	150
Finish Face Milling	S	Titanium alloy (Ti-6Al-4V, etc.)	- 40HRC	First choice	AH130	ML	100 - 200	0.012 - 0.028	0.003			400	16
				for impact resistance	AH130	MJ						Vc = 130 sfm, fz = 0.020 ipt	20
		Heat-resistant alloy (Inconel, Hastelloy, etc.)	- 40HRC	First choice	AH8015	ML	70 - 160	0.004 - 0.012	0.002			310	5
				for impact resistance	AH725	ML						Vc = 100 sfm, fz = 0.008 ipt	6
	H	Hot mold steel (SKD61 / X40CrMoV5-1, etc.)	40 - 55HRC	First choice	AH8015	MH	260 - 490	0.004 - 0.020	0.002			1,190	29
				Low resistance	AH8015	MJ		0.004 - 0.012				Vc = 390 sfm, fz = 0.012 ipt	36
		Hot mold steel of D.T.C materials (DAC**, DH**, DIEVER, etc.)	40 - 55HRC	First choice	AH8015	MJ	160 - 330	0.004 - 0.012	0.002			790	13
				for impact resistance	AH8015	MH		0.004 - 0.020				Vc = 260 sfm, fz = 0.008 ipt	16
	H	Cold mold steels (SKD11 / X153CrMoV12, etc.)	55 - 60HRC	First choice	AH8005	MH	160 - 230	0.002 - 0.012	0.001			610	5
												Vc = 200 sfm, fz = 0.004 ipt	6
	H		55 - 60HRC	for impact resistance	AH8015	MH	160 - 230	0.002 - 0.012	0.001			610	2
												Vc = 200 sfm, fz = 0.002 ipt	3

- The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: "The usage of standard and long shanks" shown in previous page.

- Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

Approach
angle

7°-25°

41°-45°

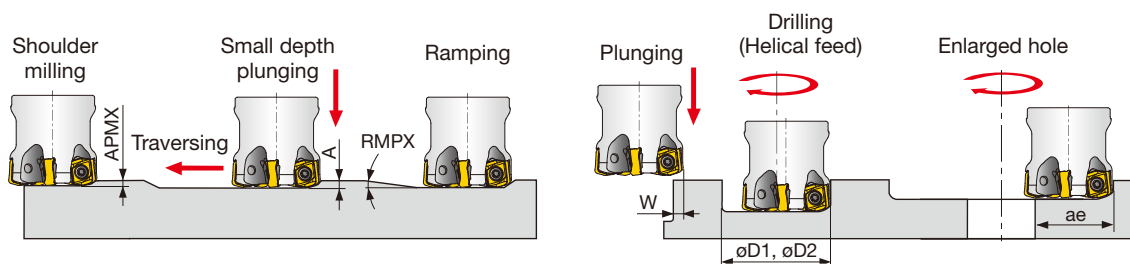
60°-70°

85°-88°

90°

Others

APPLICATION RANGE



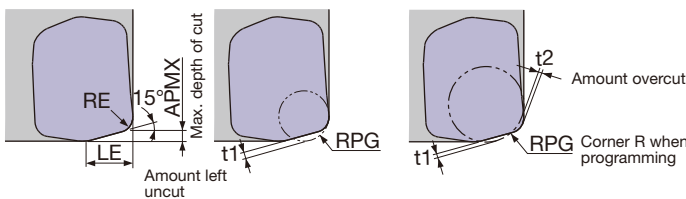
Inch	DCX	Max. depth of cut	Max. ramping angle	Max. plunging depth	Max. cutting width in plunging	Min. machinable hole dia.	Max. machinable hole dia.	Max. cutting width in enlarged hole
		APMX	RMPX	A	W	øD1	øD2	ae
EXN06R125U...	ø1.250	0.059	2°	0.020	0.236	1.830	2.300	0.970
EXN06R150U...	ø1.500	0.059	1.5°	0.020	0.236	2.330	2.800	1.220
TXN06R200U...	ø2.000	0.059	0.9°	0.020	0.236	3.330	3.800	1.720
TXN06R250U...	ø2.500	0.059	0.6°	0.020	0.236	4.330	4.800	2.220
TXN06R300U...	ø3.000	0.059	0.5°	0.020	0.236	5.330	5.800	2.720

Note: For DCX above 4.000", slot milling, ramping or contouring is not recommended as chips may be re-cut.

Tool dia.: DCX (mm), Number of revolutions: n (min ⁻¹), Feed speed: V_f (mm/min), Max. depth of cut: $a_p = 1.5$ mm, Number of teeth: CICT																	
$\phi 2''$			$\phi 2.5''$			$\phi 3''$			$\phi 4''$			$\phi 5''$			$\phi 6''$		
n	V_f		n	V_f		n	V_f		n	V_f		n	V_f		n	V_f	
CICT = 4 CICT = 5			CICT = 4 CICT = 6			CICT = 5 CICT = 7			CICT = 6 CICT = 10			CICT = 8 CICT = 12			CICT = 10 CICT = 14		
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
$V_c = 660$ sfm, $f_z = 0.040$ ipt																	
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
$V_c = 660$ sfm, $f_z = 0.040$ ipt																	
940	117	146	750	93	140	620	96	135	470	87	146	370	92	138	310	96	135
$V_c = 490$ sfm, $f_z = 0.031$ ipt																	
940	150	188	750	120	180	620	124	174	470	113	188	370	118	178	310	124	174
$V_c = 490$ sfm, $f_z = 0.040$ ipt																	
740	71	89	600	58	86	500	60	84	370	53	89	300	58	86	250	60	84
$V_c = 390$ sfm, $f_z = 0.024$ ipt																	
740	36	44	600	29	43	500	30	42	370	27	44	300	29	43	250	30	42
$V_c = 390$ sfm, $f_z = 0.012$ ipt																	
630	20	25	500	16	24	420	17	24	320	15	26	250	16	24	210	17	24
$V_c = 330$ sfm, $f_z = 0.008$ ipt																	
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
$V_c = 660$ sfm, $f_z = 0.040$ ipt																	
940	150	188	750	120	180	620	124	174	470	113	188	370	118	178	310	124	174
$V_c = 490$ sfm, $f_z = 0.040$ ipt																	
250	20	25	200	16	24	170	17	24	120	14	24	100	16	24	80	16	22
$V_c = 130$ sfm, $f_z = 0.020$ ipt																	
190	6	8	150	5	7	130	5	7	100	5	8	80	5	8	60	5	7
$V_c = 100$ sfm, $f_z = 0.008$ ipt																	
740	36	44	600	29	43	500	30	42	370	27	44	300	29	43	250	30	42
$V_c = 390$ sfm, $f_z = 0.012$ ipt																	
500	16	20	400	13	19	330	13	18	250	12	20	200	13	19	170	14	19
$V_c = 260$ sfm, $f_z = 0.008$ ipt																	
380	6	8	310	5	7	250	5	7	190	5	8	150	5	7	130	5	7
$V_c = 200$ sfm, $f_z = 0.004$ ipt																	
380	3	4	310	2	4	250	3	4	190	2	4	150	2	4	130	3	4
$V_c = 200$ sfm, $f_z = 0.002$ ipt																	

TOOL GEOMETRY ON PROGRAMMING

When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set as $R = 0.118''$. If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t_1) and overcut (t_2).



LNMU06...

Max. depth of cut APMX (in)	Corner radius RE (in)	LE (in)	Corner R when programming RPG	Amount left uncut t_1 (in)	Amount overcut t_2 (in)
0.059	0.079	0.236	0.079	0.039	-
			0.118	0.030	-
			0.157	0.021	0.010

LNGU06...MH

Max. depth of cut APMX (in)	Corner radius RE (in)	LE (in)	Corner R when programming RPG	Amount left uncut t_1 (in)	Amount overcut t_2 (in)
0.059	0.079	0.236	0.079	0.035	-
			0.118	0.026	-
			0.157	0.016	0.010

Note: Each value in table is calculated theoretically at the maximum condition.

*Recommended

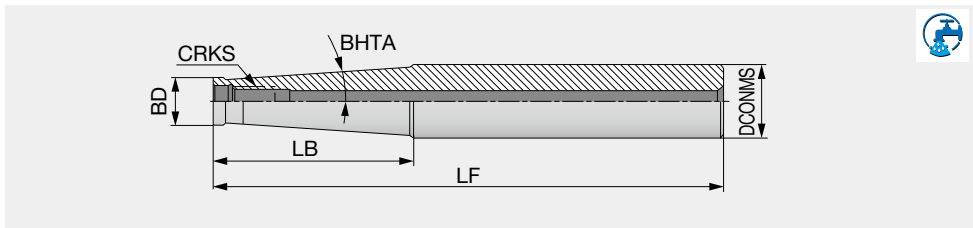


High Feed
Milling

TUNG FLEX

SM

Steel modular shank



Metric	CRKS	DCONMS	LF	LB	BD	BHTA	Shank type
SM06-L60C10	M6	10	60	20	9.7	0°	Cylindrical
SM06-L105-C12	M6	12	105	60	9.7	1.2°	Cylindrical
SM06-L125-C16	M6	16	125	60	9.7	3.3°	Cylindrical
SM08-L73C16	M8	16	73	25	13	0°	Cylindrical
SM08-L128-C16	M8	16	128	80	13	0.9°	Cylindrical
SM08-L170-C20	M8	20	170	66.8	13	3.3°	Cylindrical
SM10-L80C20	M10	20	80	30	18	0°	Cylindrical
SM10-L130-C20	M10	20	130	80	18	0.6°	Cylindrical
SM10-L200-C25	M10	25	200	57.2	19	3.3°	Cylindrical
SM12-L86-C25	M12	25	86	30	21	5.1°	Cylindrical
SM12-L200-C32	M12	32	200	78	21	4.4°	Cylindrical
SM16-L95-C32	M16	32	95	35	29	1.7°	Cylindrical
SM16-L230-C32	M16	32	230	50	29	1.8°	Cylindrical

Approach
angle

7°-25°

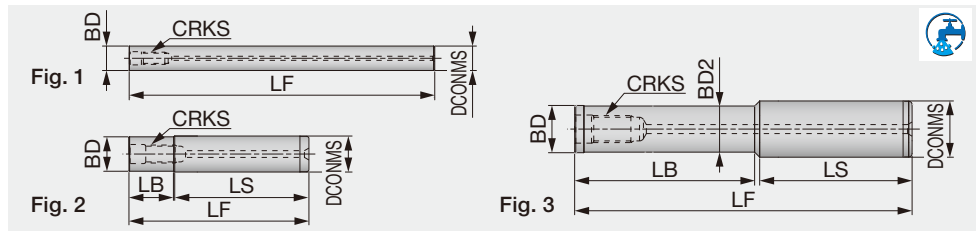
41°-45°

60°-70°

85°-88°

90°

Others



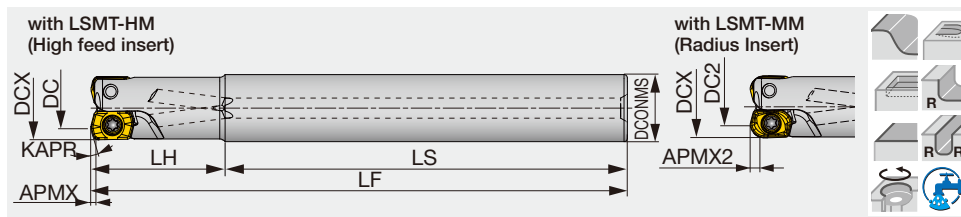
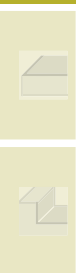
Metric	CRKS	DCONMS	LF	LB	LS	BD	BD2	Fig.
SM06-L100-C10-C-H	M6	10	100	-	-	10	-	1
SM06-L150-C10-C-H	M6	10	150	-	-	10	-	1
SM06-L100-C12-C-H	M6	12	100	-	-	12	-	1
SM06-L150-C12-C-H	M6	12	150	-	-	12	-	1
SM08-L80-20-C16-C-H	M8	16	80	20	59.6	15.3	-	2
SM08-L100-40-C16-C-H	M8	16	100	40	59.6	15.3	-	2
SM08-L150-80-C16-C-H	M8	16	150	80	69.6	15.3	-	2
SM08-L200-100-C16-C-H	M8	16	200	100	98.2	13	12.5	3
SM08-L200-140-C16-C-H	M8	16	200	140	59.6	15.3	-	2
SM08-L250-180-C16-C-H	M8	16	250	180	69.6	15.3	-	2
SM10-L80-20-C20-C-H	M10	20	80	20	59.2	18.5	-	2
SM10-L100-40-C20-C-H	M10	20	100	40	59.2	18.5	-	2
SM10-L150-80-C20-C-H	M10	20	150	80	69.2	18.5	-	2
SM10-L200-100-C20-C-H	M10	20	200	100	99.2	18.5	-	2
SM10-L200-140-C20-C-H	M10	20	200	140	58.7	18	17.5	3
SM10-L200-140-C20-C-H-N	M10	20	200	140	59.2	18.5	-	2
SM10-L250-130-C20-C-H	M10	20	250	130	118.7	18	17.5	3
SM10-L250-180-C20-C-H	M10	20	250	180	68.7	18	17.5	3
SM10-L250-180-C20-C-H-N	M10	20	250	180	69.2	18.5	-	2
SM10-L300-180-C20-C-H	M10	20	300	180	118.7	18	17.5	3
SM10-L300-230-C20-C-H	M10	20	300	230	68.7	18	17.5	3
SM12-L100-40-C25-C-H	M12	25	100	40	59.5	24	-	2
SM12-L150-80-C25-C-H	M12	25	150	80	67.7	21	20.5	3
SM12-L150-80-C25-C-H-N	M12	25	150	80	69.5	24	-	2
SM12-L200-100-C25-C-H	M12	25	200	100	97.7	21	20.5	3
SM12-L200-100-C25-C-H-N	M12	25	200	100	99.5	24	-	2
SM12-L200-140-C25-C-H	M12	25	200	140	57.7	21	20.5	3
SM12-L250-130-C25-C-H	M12	25	250	130	117.7	21	20.5	3
SM12-L250-180-C25-C-H	M12	25	250	180	69.5	24	-	2
SM12-L300-180-C25-C-H	M12	25	300	180	117.7	21	20.5	3
SM12-L300-180-C25-C-H-N	M12	25	300	180	119.5	24	-	2
SM12-L300-230-C25-C-H	M12	25	300	230	67.7	21	20.5	3
SM16-L100-40-C32-C-H	M16	32	100	40	58.5	29	-	2
SM16-L150-80-C32-C-H	M16	32	150	80	68.5	29	-	2
SM16-L200-100-C32-C-H	M16	32	200	100	98.5	29	-	2
SM16-L200-140-C32-C-H	M16	32	200	140	58.5	29	-	2
SM16-L250-130-C32-C-H	M16	32	250	130	118.5	29	-	2
SM16-L250-180-C32-C-H	M16	32	250	180	68.5	29	-	2
SM16-L300-180-C32-C-H	M16	32	300	180	118.5	29	-	2
SM16-L300-230-C32-C-H	M16	32	300	230	68.5	29	-	2
SM16-L350-230-C32-C-H	M16	32	350	230	118.5	29	-	2
SM16-L350-280-C32-C-H	M16	32	350	280	68.5	29	-	2



TUNG FFEED EXLS

Cylindrical type holder for high-feed milling, screw-on

GAMP = +4°, GAMF = -21° ~ -17°



Inch	APMX	APMX2	DCX	CICT	DC	DC2	DCONMS	LS	LH	LF	KAPR	WT (lbs)	Air hole	Insert
EXLS02U0.37C0.31LH0.75R01	0.019	0.079	0.375	1	0.228	0.218	0.312	2.250	0.750	3.000	12°	0.066	With	LSMT02...
EXLS02U0.37C0.37LH0.75R01	0.019	0.079	0.375	1	0.228	0.218	0.375	2.250	0.750	3.000	12°	0.088	With	LSMT02...
EXLS02U0.37C0.37LH1.25R01	0.019	0.079	0.375	1	0.228	0.218	0.375	2.250	1.250	3.500	12°	0.110	With	LSMT02...
EXLS02U0.50C0.37LH0.75R03	0.019	0.079	0.500	3	0.354	0.343	0.375	2.250	0.750	3.000	12°	0.088	With	LSMT02...
EXLS02U0.50C0.50LH0.75R03	0.019	0.079	0.500	3	0.354	0.343	0.500	2.250	0.750	3.000	12°	0.132	With	LSMT02...
EXLS02U0.50C0.50LH2.00R02	0.019	0.079	0.500	2	0.354	0.343	0.500	2.250	2.000	4.250	12°	0.176	With	LSMT02...
EXLS02U0.62C0.62LH1.50R05	0.019	0.079	0.625	5	0.479	0.468	0.625	2.500	1.500	4.000	12°	0.308	With	LSMT02...
EXLS02U0.62C0.62LH2.00R03	0.019	0.079	0.625	3	0.479	0.468	0.625	2.500	2.000	4.500	12°	0.375	With	LSMT02...
EXLS02U0.75C0.75LH2.00R05	0.019	0.079	0.750	5	0.602	0.593	0.750	3.000	2.000	5.000	12°	0.529	With	LSMT02...
EXLS02U0.75C0.75LH2.00R06	0.019	0.079	0.750	6	0.602	0.593	0.750	3.000	2.000	5.000	12°	0.529	With	LSMT02...
EXLS02U0.75C0.75LH3.50R05	0.019	0.079	0.750	5	0.602	0.593	0.750	3.000	3.500	6.500	12°	0.683	With	LSMT02...
EXLS02U1.00C1.00LH2.50R06	0.019	0.079	1.000	6	0.850	0.843	1.000	3.000	2.500	5.500	12°	1.036	With	LSMT02...
EXLS02U1.00C1.00LH2.50R08	0.019	0.079	1.000	8	0.850	0.843	1.000	3.000	2.500	5.500	12°	1.036	With	LSMT02...
EXLS02U1.00C1.00LH4.00R06	0.019	0.079	1.000	6	0.850	0.843	1.000	3.000	4.000	7.000	12°	1.279	With	LSMT02...

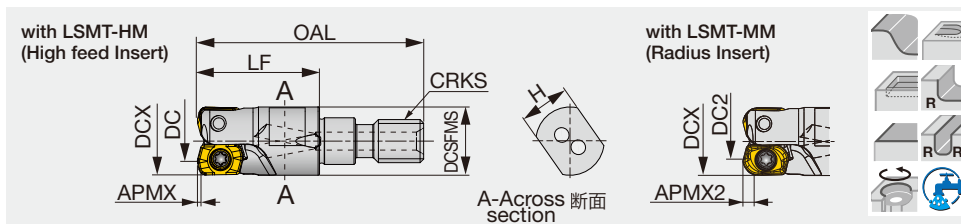
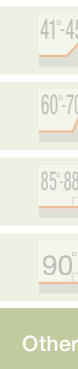


Metric	APMX	APMX2	DCX	CICT	DC	DC2	DCONMS	LS	LH	LF	KAPR	WT (kg)	Air hole	Insert
EXLS02M008C08.0LH16R01	0.5	2	8	1	4.29	4	8	59	16	75	12°	0.02	With	LSMT02...
EXLS02M008C08.0LH30R01	0.5	2	8	1	4.29	4	8	59	31	90	12°	0.03	With	LSMT02...
EXLS02M010C10.0LH20R02	0.5	2	10	2	6.28	6	10	60	20	80	12°	0.04	With	LSMT02...
EXLS02M010C10.0LH40R02	0.5	2	10	2	6.28	6	10	60	40	100	12°	0.05	With	LSMT02...
EXLS02M010C08.0LH20R02	0.5	2	10	2	6.28	6	8	60	20	80	12°	0.03	With	LSMT02...
EXLS02M012C12.0LH20R03	0.5	2	12	3	8.31	8	12	60	20	80	12°	0.06	With	LSMT02...
EXLS02M012C12.0LH50R02	0.5	2	12	2	8.31	8	12	60	50	110	12°	0.08	With	LSMT02...
EXLS02M012C10.0LH20R03	0.5	2	12	3	8.31	8	10	60	20	80	12°	0.04	With	LSMT02...
EXLS02M016C16.0LH30R05	0.5	2	16	5	12.31	12	16	70	30	100	12°	0.14	With	LSMT02...
EXLS02M016C16.0LH50R03	0.5	2	16	3	12.31	12	16	70	50	120	12°	0.17	With	LSMT02...
EXLS02M020C20.0LH50R05	0.5	2	20	5	16.29	16	20	80	50	130	12°	0.27	With	LSMT02...
EXLS02M020C20.0LH50R06	0.5	2	20	6	16.29	16	20	80	50	130	12°	0.27	With	LSMT02...
EXLS02M020C20.0LH80R05	0.5	2	20	5	16.29	16	20	80	80	160	12°	0.33	With	LSMT02...
EXLS02M025C25.0LH60R06	0.5	2	25	6	21.28	21	25	80	60	140	12°	0.45	With	LSMT02...
EXLS02M025C25.0LH60R08	0.5	2	25	8	21.28	21	25	80	60	140	12°	0.47	With	LSMT02...
EXLS02M025C25.0LH100R06	0.5	2	25	6	21.28	21	25	80	100	180	12°	0.57	With	LSMT02...

HXLS

Modular head for high-feed milling, screw-on (TungFlex)

GAMP = +4°, GAMF = -21° ~ -17°



Metric	APMX	APMX2	DCX	CICT	DC	DC2	OAL	LF	H	DCSFMS	CRKS	KAPR	WT (kg)	Air hole	Insert
HXLS02M008M06R01	0.5	2	8	1	4.29	4	33.5	19	7	9.5	M6	12°	0.01	With	LSMT02...
HXLS02M010M06R02	0.5	2	10	2	6.28	6	31.5	17	7	9.5	M6	12°	0.01	With	LSMT02...
HXLS02M012M06R03	0.5	2	12	3	8.31	8	31.5	17	7	10	M6	12°	0.01	With	LSMT02...
HXLS02M012M06R02	0.5	2	12	2	8.31	8	31.5	17	7	10	M6	12°	0.01	With	LSMT02...
HXLS02M016M08R05	0.5	2	16	5	12.31	12	40	23	10	13	M8	12°	0.03	With	LSMT02...
HXLS02M016M08R03	0.5	2	16	3	12.31	12	40	23	10	13	M8	12°	0.03	With	LSMT02...
HXLS02M020M10R05	0.5	2	20	5	16.29	16	49	30	15	17.8	M10	12°	0.05	With	LSMT02...
HXLS02M020M10R06	0.5	2	20	6	16.29	16	49	30	15	17.8	M10	12°	0.05	With	LSMT02...
HXLS02M025M12R06	0.5	2	25	6	21.28	21	52	30	17	20.8	M12	12°	0.08	With	LSMT02...
HXLS02M025M12R08	0.5	2	25	8	21.28	21	52	30	17	20.8	M12	12°	0.08	With	LSMT02...

SPARE PARTS

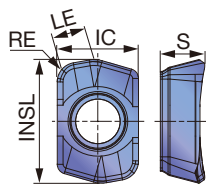
Designation	Clamping screw	Lubricant	Wrench
EXLS02U..., EXLS02M..., HXLS02M...	CSPB-2H	M-1000	IP-6DB

Recommended clamping torque: 0.52 lbs-ft, 0.7 N-m

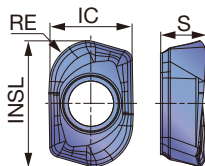
Reference pages: Standard cutting conditions → **H042 - H043**, TungFlex → **H038 - H039**

 INSERT

LSMT-HM (High feed)



LSMT-MM (Radius)



P	Steel	★	☆			
M	Stainless	★				
K	Cast iron	☆	★			
N	Non-ferrous					
S	Superalloys	☆	★			
H	Hard materials		★			

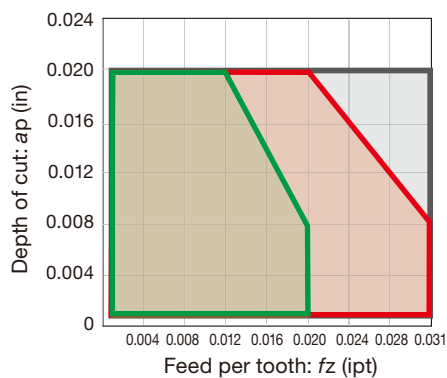
★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated								LE	INSL	IC	S
			AH3225	AH8015										
LSMT0202ZER-HM	0.039	0.019	●	●							0.067	0.252	0.165	0.091
LSMT0202R2-MM	0.079	0.079	●	●							-	0.252	0.169	0.091

●: Line up

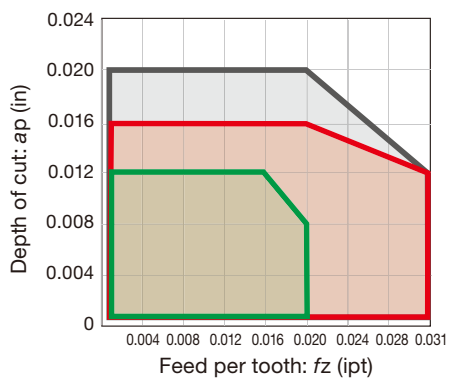
APPLICATION

LSMT-HM



- For standard shanks in $\leq 3 \times D$
- For long-neck shanks in $\geq 4 \times D$
- For modular head shanks in $\geq 7 \times D$

LSMT-MM



-  For standard shanks in $\leq 3xD$
-  For long-neck shanks in $\geq 4xD$
-  For modular head shanks in $\geq 7xD$

* When the DOC is 0.020" or more, the feed less than 0.006 ipt is recommended.

High Feed
Milling

STANDARD CUTTING CONDITIONS

	ISO	Workpiece materials	Hardness	Priority	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
Face Milling	P	Carbon steels 1045, 1055, etc.	- 300HB	First choice	AH3225	330 - 990	0.008 - 0.031
			- 300HB	For wear resistance	AH8015	330 - 990	0.008 - 0.031
		Alloy steels 4140, etc.	- 300HB	First choice	AH3225	330 - 990	0.008 - 0.031
			- 300HB	For wear resistance	AH8015	330 - 990	0.008 - 0.031
		Prehardened steels NAK80, PX5, etc.	30 - 40HRC	First choice	AH8015	330 - 660	0.008 - 0.020
			30 - 40HRC	For impact resistance	AH3225	330 - 660	0.008 - 0.020
Shoulder Milling	M	Stainless steels 304, 316, etc.	- 200HB	First choice	AH3225	330 - 660	0.008 - 0.020
Slot Milling	K	Gray cast irons No.250B, etc.	150 - 250HB	First choice	AH8015	330 - 990	0.008 - 0.031
			150 - 250HB	For impact resistance	AH3225	330 - 990	0.008 - 0.031
		Ductile cast irons 65-45-12, etc.	150 - 250HB	First choice	AH8015	260 - 660	0.008 - 0.031
			150 - 250HB	For impact resistance	AH3225	260 - 660	0.008 - 0.031
Profile Milling	S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice	AH3225	100 - 200	0.004 - 0.012
			- 40HRC	For wear resistance	AH8015	100 - 200	0.004 - 0.012
		Heat resistant alloy Inconel, Hastelloy, etc.	- 40HRC	First choice	AH8015	70 - 170	0.004 - 0.012
			- 40HRC	For impact resistance	AH3225	70 - 170	0.004 - 0.012
Chamfering, Counterbore	H	H13, etc.	40 - 50HRC	First choice	AH8015	260 - 490	0.004 - 0.020
		D2, D3, etc.	50 - 60HRC	First choice	AH8015	160 - 230	0.004 - 0.012
Finish Face Milling	H	Hardened steel					

Approach
angle

7°-25°

41°-45°

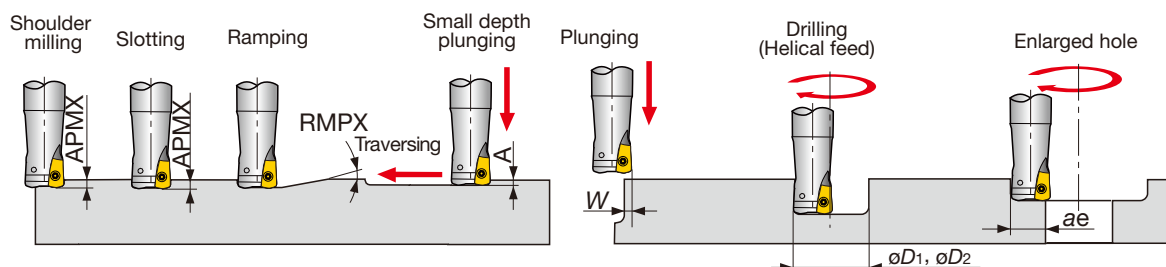
60°-70°

85°-88°

90°

Others

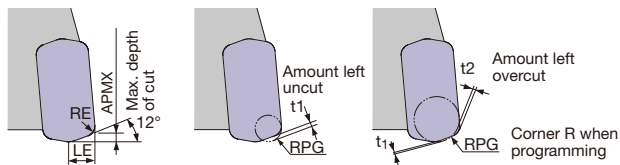
APPLICATION RANGE



Inch	DC	Max. depth of cut		Max. ramping angle	Max. plunging depth	Max. cutting width in plunging	Min. machining	Max. machining	Max. cutting width in enlarged hole
		APMX	APMX2						
EXLS02U0.37...	0.375	0.019	0.079	3.6°	0.007	0.078	0.513	0.730	0.292
EXLS02U0.50...	0.500	0.019	0.079	1.8°	0.007	0.078	0.763	0.980	0.417
EXLS02U0.62...	0.625	0.019	0.079	1.3°	0.007	0.078	1.013	1.230	0.542
EXLS02U0.75...	0.750	0.019	0.079	1.2°	0.007	0.078	1.260	1.460	0.660
EXLS02U1.00...	1.000	0.019	0.079	1.0°	0.007	0.078	1.760	1.960	0.910

APMX: with LSMT-HM, APMX2: with LSMT- MM

Tool geometry on programming



LSMT**-HM

Corner R when programming: RPG	Amount left uncut t1 (in)	Amount left overcut t2 (in)
0.039	0.006	0
0.059	0.003	0.006
0.079	0	0.013

*Recommended

Tool dia.: (in), Number of revolutions: n (rpm), Feed speed: V_f (ipm), Max. depth of cut: $a_p = 0.020"$, Number of teeth: CICT													
$\phi 0.375"$, CICT = 1		$\phi 0.5"$			$\phi 0.625"$			$\phi 0.750"$			$\phi 1.000"$		
n	V_f	n	V_f		n	V_f		n	V_f		n	V_f	
			CICT = 2	CICT = 3		CICT = 3	CICT = 5		CICT = 5	CICT = 6		CICT = 5	CICT = 8
6682	134	5011	200	301	4009	241	401	3341	334	401	2506	301	401
$V_c = 656 \text{ sfm}, f_z = 0.020 \text{ ipt}$													
6682	134	5011	200	301	4009	241	401	3341	334	401	2506	301	401
$V_c = 656 \text{ sfm}, f_z = 0.020 \text{ ipt}$													
5011	80	3759	120	180	3007	144	241	2506	200	241	1879	180	241
$V_c = 492 \text{ sfm}, f_z = 0.016 \text{ ipt}$													
4013	64	3010	96	144	2408	116	193	2007	161	193	1505	144	193
$V_c = 394 \text{ sfm}, f_z = 0.016 \text{ ipt}$													
6682	134	5011	200	301	4009	241	401	3341	334	401	2506	301	401
$V_c = 656 \text{ sfm}, f_z = 0.020 \text{ ipt}$													
5011	100	3759	150	226	3007	180	301	2506	251	301	1879	225	301
$V_c = 492 \text{ sfm}, f_z = 0.020 \text{ ipt}$													
1334	11	1001	16	24	801	19	32	667	27	32	500	24	32
$V_c = 131 \text{ sfm}, f_z = 0.008 \text{ ipt}$													
998	8	749	12	18	599	14	24	499	20	24	374	18	24
$V_c = 98 \text{ sfm}, f_z = 0.008 \text{ ipt}$													
4013	48	3010	72	108	2408	87	144	2007	120	145	1505	108	144
$V_c = 394 \text{ sfm}, f_z = 0.012 \text{ ipt}$													
2007	16	1505	24	36	1204	29	48	1003	40	48	752	36	48
$V_c = 197 \text{ sfm}, f_z = 0.008 \text{ ipt}$													

Grade
Insert
Ext. Toolholder
Int. Toolholder
Threading
Grooving
Miniature tool
Milling cutter
Endmill
Drilling tool
Tooling System
User's Guide
Index





High Feed
Milling

DOFTRI EXWX03

High feed endmill, shank type, with screw clamp system

GAMP = +23°, GAMF = -7.9° ~ -6.2°



Face Milling



Shoulder
Milling



Slot Milling



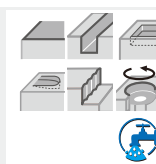
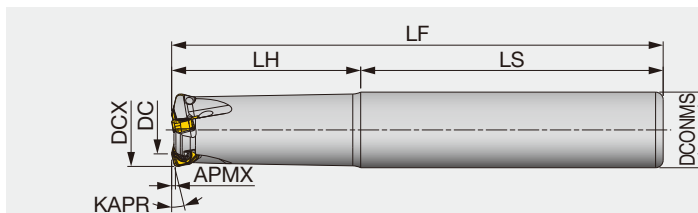
Profile Milling



Chamfering,
Counterbore



Finish
Face Milling



Inch	APMX	DCX	CICT	DC	DCONMS	LS	LH	LF	KAPR	WT(lb)	Air hole	Insert
EXWX03U0.62C0.62R02	0.039	0.625	2	0.3448	0.625	2.750	1.250	4.000	12°	0.31	With	WXMU03...
EXWX03U0.62C0.62R02L	0.039	0.625	2	0.3448	0.625	4.000	2.000	6.000	12°	0.46	With	WXMU03...
EXWX03U0.75C0.75R03	0.039	0.750	3	0.4645	0.750	3.000	2.000	5.000	12°	0.50	With	WXMU03...
EXWX03U0.75C0.75R03L	0.039	0.750	3	0.4645	0.750	3.000	3.500	6.500	12°	0.63	With	WXMU03...
EXWX03U1.00C1.00R04	0.039	1.000	4	0.7125	1.000	3.000	2.500	5.500	12°	1.05	With	WXMU03...
EXWX03U1.00C1.00R04L	0.039	1.000	4	0.7125	1.000	3.000	4.000	7.000	12°	1.31	With	WXMU03...
EXWX03U1.25C1.25R05	0.039	1.250	5	0.9606	1.250	3.000	3.000	6.000	12°	1.85	With	WXMU03...
EXWX03U1.25C1.25R05L	0.039	1.250	5	0.9606	1.250	3.000	5.000	8.000	12°	2.44	With	WXMU03...

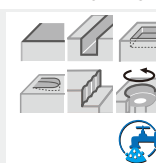
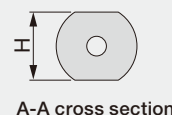
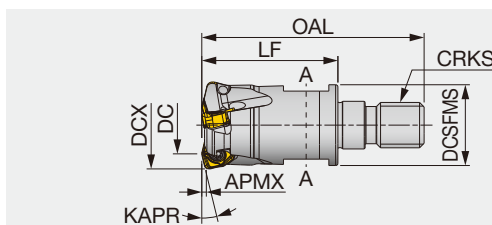
Metric	APMX	DCX	CICT	DC	DCONMS	LS	LH	LF	KAPR	WT(kg)	Air hole	Insert
EXWX03M016C16.0R02	1	16	2	8.9	16	70	30	100	12°	0.14	With	WXMU03...
EXWX03M016C16.0R02L	1	16	2	8.9	16	100	50	150	12°	0.21	With	WXMU03...
EXWX03M020C20.0R03	1	20	3	12.8	20	80	50	130	12°	0.26	With	WXMU03...
EXWX03M020C20.0R03L	1	20	3	12.8	20	80	80	160	12°	0.31	With	WXMU03...
EXWX03M025C25.0R04	1	25	4	17.8	25	80	60	140	12°	0.46	With	WXMU03...
EXWX03M025C25.0R04L	1	25	4	17.8	25	80	100	180	12°	0.58	With	WXMU03...
EXWX03M032C32.0R05	1	32	5	24.7	32	80	70	150	12°	0.84	With	WXMU03...
EXWX03M032C32.0R05L	1	32	5	24.7	32	80	120	200	12°	1.11	With	WXMU03...

HXWX03-M

High feed endmill, modular type (TungFlex)

GAMP = +23°, GAMF = -7.9° ~ -6.2°

Approach
angle



Metric	APMX	DCX	CICT	DC	OAL	LF	H	DCSFMS	KAPR	CRKS	WT(kg)	Air hole	Insert
HXWX03M016M08R02	1	16	2	8.9	42	25	10	12.8	12°	M8	0.03	With	WXMU03...
HXWX03M020M10R03	1	20	3	12.8	49	30	15	17.8	12°	M10	0.06	With	WXMU03...
HXWX03M025M12R04	1	25	4	17.8	57	35	17	20.8	12°	M12	0.1	With	WXMU03...
HXWX03M032M16R05	1	32	5	24.7	63	40	22	28.8	12°	M16	0.21	With	WXMU03...

SPARE PARTS



Designation	Clamping screw	Wrench
EXWX03..., HXWX03...	CSPB-2.5SH	IP-7D

Recommended clamping torque: 0.81 lbs-ft, 1.1 N·m

Reference pages: Standard cutting conditions → **H046 - H047**, TungFlex → **H038 - H039**

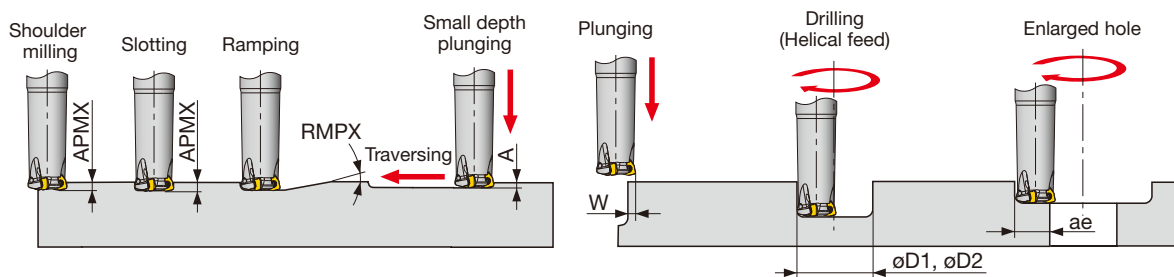


STANDARD CUTTING CONDITIONS

	ISO	Workpiece materials	Hardness	Priority	Grades	Chipbreaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
High Feed Milling	P	Low carbon steel 1018, 1020, etc.	- 300HB	First choice	AH3225	MM	328 - 984	0.020 - 0.059
				For wear resistance	AH8015			
Face Milling	P	Carbon steel, Alloy steel 1045, 1055, etc.	- 300HB	First choice	AH3225	MM	328 - 820	0.020 - 0.059
				For wear resistance	AH8015			
Shoulder Milling	P	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	First choice	AH3225	MM	328 - 656	0.020 - 0.047
				For wear resistance	AH8015			
Slot Milling	M	Austenitic Stainless steel 304SS, 316SS, etc.	- 200HB	First choice	AH3225	MM	262 - 492	0.020 - 0.039
				First choice	AH3225			
Profile Milling	K	Gray cast iron Class 25, Class 30, etc.	150 - 250HB	First choice	AH8015	MM	328 - 984	0.020 - 0.059
				For impact resistance	AH3225			
Chamfering, Counterbore	S	Ductile cast iron 60-40-18, etc.	150 - 250HB	First choice	AH8015	MM	262 - 656	0.020 - 0.059
				For impact resistance	AH3225			
Finish Face Milling	H	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice	AH3225	MM	98 - 197	0.012 - 0.028
				First choice	AH8015			
	H	Superalloys Inconel718, etc.	- 40HRC	First choice	AH8015	MM	66 - 164	0.004 - 0.012
				First choice	AH8015			
	H	H-13, etc.	40 - 50HRC	First choice	AH8015	MM	262 - 492	0.004 - 0.020
				For impact resistance	AH3225			
	H	Hardened steel D2, etc.	50 - 60HRC	First choice	AH8015	MM	164 - 230	0.001 - 0.004
				First choice	AH8015			

Approach angle

APPLICATION RANGE

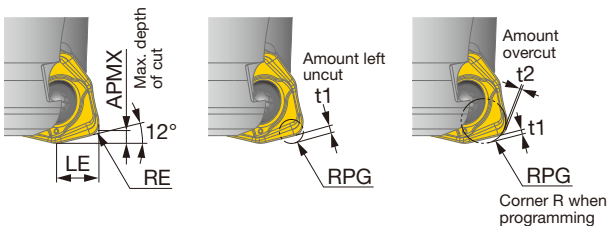


Inch	DCX	Max. depth of cut	Max. ramping angle	Max. plunging depth	Max. cutting width in plunging	Min. machinable hole dia.	Max. machinable hole dia.	Max. cutting width in enlarged hole
		APMX	RMPX	A	W	øD1	øD2	ae
EXWX03U0.62C0.62R02	0.625	0.039	3.6°	0.012	0.157	0.979	1.176	0.468
EXWX03U0.62C0.62R02L	0.625	0.039	3.6°	0.012	0.157	0.979	1.176	0.468
EXWX03U0.75C0.75R03	0.750	0.039	2.3°	0.012	0.157	1.196	1.511	0.593
EXWX03U0.75C0.75R03L	0.750	0.039	2.3°	0.012	0.157	1.196	1.511	0.593
EXWX03U1.00C1.00R04	1.000	0.039	1.4°	0.012	0.157	1.630	1.898	0.843
EXWX03U1.00C1.00R04L	1.000	0.039	1.4°	0.012	0.157	1.630	1.898	0.843
EXWX03U1.25C1.25R05	1.250	0.039	1°	0.012	0.157	2.116	2.392	1.093
EXWX03U1.25C1.25R05L	1.250	0.039	1°	0.012	0.157	2.116	2.392	1.093
TXWS03U150W0.75R06	1.500	0.039	0.7°	0.012	0.157	2.666	2.902	1.343
TXWS03U2.00W0.75R08	2.000	0.039	0.5°	0.012	0.157	3.457	3.850	1.843

Tool dia: DCX (in), Number of revolution: n (min ⁻¹), Feed speed: V_f (ipm), Max. depth of cut: APMX = 0.039", Number of teeth: CICT											
ø0.625", CICT = 2		ø0.750", CICT = 3		ø1.000", CICT = 4		ø1.250", CICT = 5		ø1.500", CICT = 6		ø2.000", CICT = 8	
n	V_f	n	V_f	n	V_f	n	V_f	n	V_f	n	V_f
4034	315	3361	393	2521	393	2017	393	1681	393	1261	393
$V_c = 660$ sfm, $f_z = 0.039$ ipt											
4034	315	3361	393	2521	393	2017	393	1681	393	1261	393
$V_c = 660$ sfm, $f_z = 0.039$ ipt											
2995	168	2496	210	1872	210	1497	210	1248	210	936	210
$V_c = 490$ sfm, $f_z = 0.028$ ipt											
2384	95	1986	119	1490	119	1192	119	993	119	745	119
$V_c = 390$ sfm, $f_z = 0.020$ ipt											
2017	48	1681	61	1261	61	1008	60	840	60	630	60
$V_c = 330$ sfm, $f_z = 0.012$ ipt											
4034	315	3361	393	2521	393	2017	393	1681	393	1261	393
$V_c = 660$ sfm, $f_z = 0.039$ ipt											
2995	234	2496	292	1872	292	1497	292	1248	292	936	292
$V_c = 490$ sfm, $f_z = 0.039$ ipt											
801	26	667	32	500	32	400	32	334	32	250	32
$V_c = 131$ sfm, $f_z = 0.016$ ipt											
599	10	499	12	374	12	299	12	250	12	187	12
$V_c = 98$ sfm, $f_z = 0.008$ ipt											
2384	57	1986	71	1490	72	1192	72	993	71	745	72
$V_c = 390$ sfm, $f_z = 0.012$ ipt											
1204	10	1003	12	752	12	602	12	502	12	376	12
$V_c = 197$ sfm, $f_z = 0.004$ ipt											

TOOL GEOMETRY ON PROGRAMMING

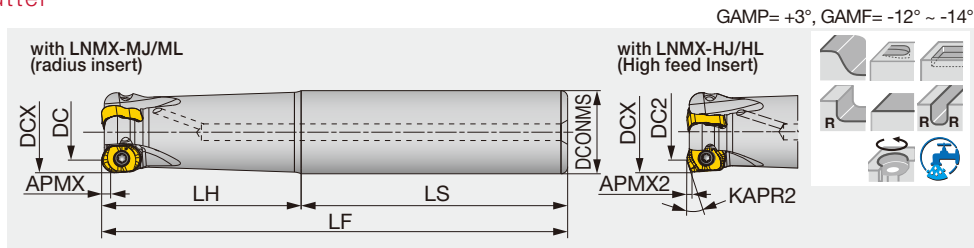
When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set as $R = 0.059"$. If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t_1) and overcut (t_2).



Max. depth of cut APMX (in)	Corner radius RE (in)	LE (in)	Corner R when programming RPG	Amount left uncut t1 (in)	Amount overcut t2 (in)
0.039	0.047	0.138	0.039	0.022	-
0.039	0.047	0.138	0.059	0.018	-
0.039	0.047	0.138	0.079	0.014	0.006
0.039	0.047	0.138	0.098	0.008	0.020

*Recommended

Radius endmill, shank type cutter

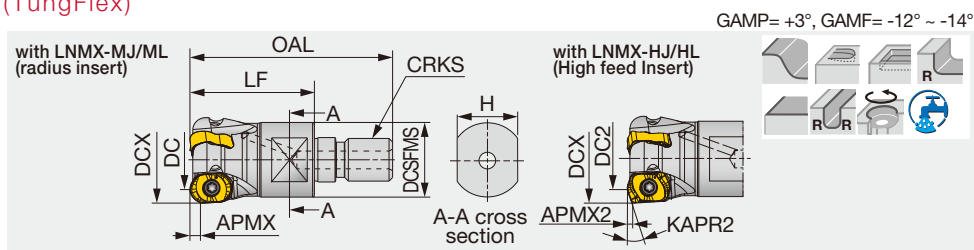


Inch	APMX	APMX2	DCX	CICT	DC	DC2	KAPR2	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EXLN04U1.00C1.00R03	0.157	0.051	1.000	3	0.693	0.669	20°	1.000	3.000	2.500	5.500	1.00	With	LNMX04...
EXLN04U1.00C1.00R03L	0.157	0.051	1.000	3	0.693	0.669	20°	1.000	3.000	4.000	7.000	1.32	With	LNMX04...
EXLN04U1.25C1.25R04	0.157	0.051	1.250	4	0.941	0.917	20°	1.250	3.000	3.000	6.000	1.80	With	LNMX04...
EXLN04U1.25C1.25R05	0.157	0.051	1.250	5	0.941	0.917	20°	1.250	3.000	3.000	6.000	1.80	With	LNMX04...
EXLN04U1.25C1.25R05L	0.157	0.051	1.250	5	0.941	0.917	20°	1.250	3.000	5.000	8.000	2.38	With	LNMX04...
EXLN06U1.25C1.25R02	0.236	0.079	1.250	2	0.758	0.746	25°	1.250	3.000	3.000	6.000	1.90	With	LNMX06...
EXLN06U1.50C1.25R03	0.236	0.079	1.500	3	1.012	1.000	25°	1.250	4.000	2.000	6.000	2.06	With	LNMX06...

Metric	APMX	APMX2	DCX	CICT	DC	DC2	KAPR2	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EXLN04M020C20.0R02	4	1.3	20	2	12.2	11.6	20°	20	80	50	130	0.28	With	LNMX04...
EXLN04M020C20.0R02L	4	1.3	20	2	12.2	11.6	20°	20	80	80	160	0.34	With	LNMX04...
EXLN04M025C25.0R03	4	1.3	25	3	17.2	16.6	20°	25	80	60	140	0.46	With	LNMX04...
EXLN04M025C25.0R03L	4	1.3	25	3	17.2	16.6	20°	25	80	100	180	0.6	With	LNMX04...
EXLN05M025C25.0R02	5	-	25	2	15	-	-	25	90	60	150	0.54	With	LNMX05...
EXLN04M032C32.0R04	4	1.3	32	4	24.2	23.6	20°	32	80	70	150	0.83	With	LNMX04...
EXLN04M032C32.0R05	4	1.3	32	5	24.2	23.6	20°	32	80	70	150	0.83	With	LNMX04...
EXLN04M032C32.0R05L	4	1.3	32	5	24.2	23.6	20°	32	80	120	200	1.09	With	LNMX04...
EXLN05M032C32.0R04	5	-	32	4	21.9	-	-	32	80	70	150	0.87	With	LNMX05...
EXLN06M032C32.0R02	6	2	32	2	19.6	19.3	25°	32	80	70	150	0.9	With	LNMX06...
EXLN06M040C32.0R04	6	2	40	4	27.6	27.3	25°	32	100	50	150	0.95	With	LNMX06...

HXLN04-M

Radius endmill, modular type (TungFlex)



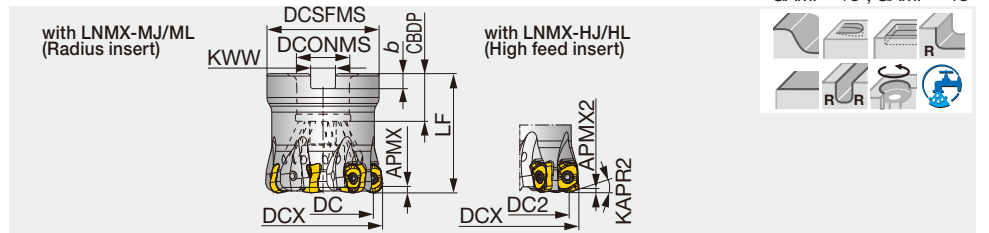
Metric	APMX	APMX2	DCX	CICT	DC	DC2	KAPR2	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HXLN04M020M10R02	4	1.3	20	2	12.2	11.6	20°	49	30	15	18	M10	0.07	With	LNMX04...
HXLN04M025M12R03	4	1.3	25	3	17.2	16.6	20°	57	35	17	21	M12	0.16	With	LNMX04...
HXLN05M025M12R02	5	-	25	2	15	-	-	57	35	17	21	M12	0.1	With	LNMX05...
HXLN04M032M16R04	4	1.3	32	4	24.2	23.6	20°	63	40	22	29	M16	0.2	With	LNMX04...
HXLN04M032M16R05	4	1.3	32	5	24.2	23.6	20°	63	40	22	29	M16	0.2	With	LNMX04...
HXLN05M032M16R04	5	-	32	4	21.9	-	-	63	40	22	28.8	M16	0.2	With	LNMX05...
HXLN06M032M16R02	6	2	32	2	19.6	19.3	25°	63	40	22	28.8	M16	0.24	With	LNMX06...
HXLN04M040M16R06	4	1.3	40	6	32.2	31.6	20°	63	40	22	29	M16	0.24	With	LNMX04...

SPARE PARTS

Designation	Clamping screw	Mono block wrench	Torx bit	Grip
EXLN04..., HXLN04...	CSPD-3	IP-10D	-	-
EXLN05..., HXLN05...	CSPB-4S	-	BLDIP15/S7	H-TB2W
EXLN06..., HXLN06...	CSPB-5	-	BLDIP20/S7	H-TB2W

Recommended clamping torque: CSPD-3 = 1.84 lbs-ft, 2.5 N·m, CSPB-4S = 2.58 lbs-ft, 3.5 N·m, CSPB-5 = 3.69 lbs-ft, 5 N·m

Reference pages: Inserts → **H050**, Standard cutting conditions → **H050 - H051**, TungFlex → **H038 - H039**



Inch	APMX	APMX2	DCX	CICT	DC	DC2	KAPR2	DCSFMS	LF	DCONMS	CBDF	KWW	b	WT(lb)	Air hole	Insert
TXLN04U1.50B0.50R06	0.157	0.051	1.500	6	1.193	1.169	20°	1.378	1.574	0.500	0.610	0.258	0.157	0.84	With	LNMJ04...
TXLN04U2.00B0.75R07	0.157	0.051	2.000	7	1.693	1.669	20°	1.850	1.969	0.750	0.750	0.315	0.197	1.10	With	LNMJ04...
TXLN06U2.00B0.75R05	0.236	0.079	2.000	5	1.511	1.499	25°	1.850	1.969	0.750	0.750	0.315	0.197	1.17	With	LNMJ06...
TXLN06U2.50B0.75R06	0.236	0.079	2.500	6	2.009	1.997	25°	2.323	1.969	0.750	0.750	0.315	0.197	1.90	With	LNMJ06...
TXLN06U3.00B1.00R07	0.236	0.079	3.000	7	2.510	2.498	25°	2.835	2.480	1.000	1.024	0.374	0.236	3.47	With	LNMJ06...

Metric	APMX	APMX2	DCX	CICT	DC	DC2	KAPR2	DCSFMS	LF	DCONMS	CBDF	KWW	b	WT(kg)	Air hole	Insert
TXLN04M040B16.0R06	4	1.3	40	6	32.2	31.6	20	35	40	16	18	8.4	5.6	0.21	With	LNMJ04...
TXLN05M040B16.0R05	5	-	40	5	29.8	-	-	35	40	16	18	8.4	5.6	0.26	With	LNMJ05...
TXLN04M042B16.0R06	4	1.3	42	6	34.2	33.6	20	35	40	16	18	8.4	5.6	0.21	With	LNMJ04...
TXLN04M050B22.0R07	4	1.3	50	7	42.2	41.6	20	47	50	22	20	10.4	6.3	0.45	With	LNMJ04...
TXLN05M050B22.0R06	5	-	50	6	39.8	-	-	47	50	22	20	10.4	6.3	0.5	With	LNMJ05...
TXLN06M050B22.0R05	6	2	50	5	37.6	37.3	25	47	50	22	20	10.4	6.3	0.5	With	LNMJ06...
TXLN04M052B22.0R07	4	1.3	52	7	44.2	43.6	20	47	50	22	20	10.4	6.3	0.47	With	LNMJ04...
TXLN06M052B22.0R05	6	2	52	5	39.6	39.3	25	49	50	22	20	10.4	6.3	0.55	With	LNMJ06...
TXLN04M063B22.0R07	4	1.3	63	7	55.2	54.6	20	59	50	22	20	10.4	6.3	0.76	With	LNMJ04...
TXLN06M063B22.0R06	6	2	63	6	50.6	50.3	25	59	50	22	20	10.4	6.3	0.82	With	LNMJ06...

INCH SPARE PARTS

Designation	Clamping screw	Torx bit	Grip	Lubricant	Shell locking bolt
TXLN04U1.50B0.50R06	CSPD-3	BLD IP10/S7	H-TB2W	M-1000	(SR UNF 1/4X3/4 B18.3)
TXLN04U2.00B0.75R07	CSPD-3	BLD IP10/S7	H-TB2W	M-1000	(C0.375X1.125H)
TXLN06U2...	CSPD-5	BLD IP20/S7	H-TB2W	M-1000	(C0.375X1.125H)
TXLN06U3.00B1.00R07	CSPD-5	BLD IP20/S7	H-TB2W	M-1000	(C0.500X1.375H)

Recommended clamping torque: CSPD-3 = 1.84 lbs-ft, CSPB-5 = 3.69 lbs-ft

METRIC SPARE PARTS

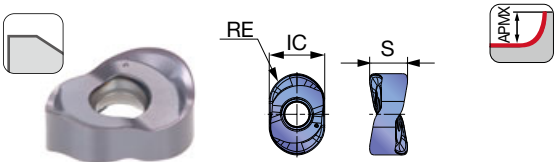
Designation	Clamping screw	Torx bit	Grip	Shell locking bolt
TXLN04M04*B16.0R06	CSPD-3	BLD IP10/S7	SW6-SD	FSHM8-30H
TXLN04M05*B22.0R07	CSPD-3	BLD IP10/S7	SW6-SD	CM10X30H
TXLN04M063B22.0R07	CSPD-3	BLD IP10/S7	SW6-SD	CM10X30H
TXLN05M040B16.0R05	CSPB-4S	BLDIP15/S7	H-TB2W	FSHM8-30H
TXLN05M050B22.0R06	CSPB-4S	BLDIP15/S7	H-TB2W	CM10X30H
TXLN06M050B22.0R05	CSPB-5	BLDIP20/S7	H-TB2W	FSHM10-40H
TXLN06M052..., TXLN06M063...	CSPB-5	BLDIP20/S7	H-TB2W	CM10X30H

Recommended clamping torque: CSPD-3 = 2.5 N·m, CSPB-4S = 3.5 N·m, CSPB-5 = 5 N·m

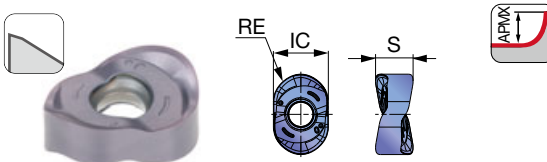


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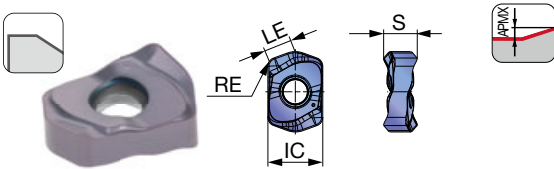
LNMX-MJ (Radius, for general purpose)



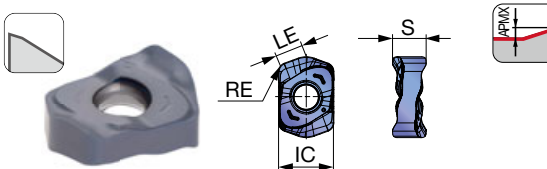
LNMX-ML (Radius, for low cutting force)



LNMX-HJ (High feed, for general purpose)



LNMX-HL (High feed, for low cutting force)



P Steel	☆	★	☆	★	
M Stainless		★		★	
K Cast iron	★	☆	★	☆	
N Non-ferrous					
S Superalloys	★	☆	★	☆	
H Hard materials	★	☆	☆	☆	

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated				LE	IC	S
			AH8015	AH3225	AH120	AH3135			
LNMX0405R4-MJ	0.157	0.157	●	●	●	●	-	0.323	0.220
LNMX0405R4-ML	0.157	0.157			●	●	-	0.323	0.220
LNMX0405ZER-HJ	0.051	0.051	●	●	●	●	0.172	0.323	0.197
LNMX0405ZER-HL	0.051	0.051	●	●		●	0.172	0.323	0.197
LNMX0506R5-MJ	0.197	0.197	●	●	●	●	-	0.409	0.240
LNMX0607R6-MJ	0.236	0.236	●	●	●	●	-	0.496	0.291
LNMX0607ZER-HJ	0.079	0.079	●	●	●	●	0.264	0.500	0.283

● : Line up

Approach angle



STANDARD CUTTING CONDITIONS

FOR RADIUS (MJ, ML)

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, 1020, etc.	- 200HB	First choice	AH3225	MJ	328 - 984	0.008 - 0.024
			Low cutting force	AH3135	ML	328 - 984	0.008 - 0.024
	Carbon steel, Alloy steel 1055, 4140, etc.	- 300HB	First choice	AH3225	MJ	328 - 820	0.008 - 0.024
			Low cutting force	AH3135	ML	328 - 820	0.008 - 0.024
	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	First choice	AH3225	MJ	328 - 656	0.006 - 0.016
			Low cutting force	AH3135	ML	328 - 656	0.006 - 0.016
M	Austenitic Stainless steel 304SS, 316SS, etc.	- 200HB	First choice	AH3135	MJ	328 - 656	0.008 - 0.024
			Low cutting force	AH3135	ML	328 - 656	0.008 - 0.024
	Martensitic Stainless steel 420SS etc.	- 200HB	First choice	AH3135	ML	328 - 984	0.008 - 0.024
			Fracture resistance	AH3135	MJ	328 - 984	0.008 - 0.024
K	Gray cast iron Class 25, Class 30, etc.	150 - 250HB	First choice	AH120	MJ	328 - 984	0.008 - 0.024
			Fracture resistance	AH3225	MJ	328 - 984	0.008 - 0.024
	Ductile cast iron 60-40-18, 80-55-06, etc.	150 - 250HB	First choice	AH120	MJ	262 - 820	0.008 - 0.024
			Fracture resistance	AH3225	MJ	262 - 820	0.008 - 0.024
S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice	AH3135	ML	98 - 197	0.006 - 0.024
			Fracture resistance	AH3135	MJ	98 - 197	0.006 - 0.024
	Superalloys Inconel718, etc.	- 40HRC	First choice	AH8015	MJ	66 - 164	0.002 - 0.012
			Low cutting force	AH120	ML	66 - 164	0.002 - 0.012
H	Hardened steel	H13, etc. 40 - 50HRC	First choice	AH3225	MJ	164 - 492	0.004 - 0.012
			Wear resistance	AH8015	MJ	164 - 492	0.004 - 0.012
	D2, etc. 50 - 60HRC		First choice	AH8015	MJ	164 - 230	0.002 - 0.006

· When using a long shank or modular head with long overhang, please lower the cutting conditions (Vc, fz, ap) to 70% of the maximum conditions for the standard shank.

HIGH FEED (HJ, HL)

LNMX04-HJ/HL

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, 1020, etc.	- 300HB	First choice	AH3225	HJ	328 - 984	0.020 - 0.051
			Wear resistance	AH8015	HJ		
			Low cutting force	AH3225	HL		
	Carbon steel, Alloy steel 1055, 4140, etc.	- 300HB	First choice	AH3225	HJ	328 - 820	0.020 - 0.051
			Wear resistance	AH8015	HJ		
			Low cutting force	AH3225	HL		
	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	First choice	AH3225	HJ	328 - 656	0.016 - 0.039
			Wear resistance	AH8015	HJ		
			Low cutting force	AH3225	HL		
M	Austenitic Stainless steel 304SS, 316SS, etc.	- 200HB	First choice	AH3135	HL	328 - 656	0.012 - 0.035
			Fracture resistance	AH3135	HJ		
	Martensitic Stainless steel 420SS, etc.	- 200HB	First choice	AH3135	HL	328 - 984	0.012 - 0.035
			Fracture resistance	AH3135	HJ		
K	Gray cast iron Class 25, Class 30, etc.	150 - 250HB	First choice	AH120	HJ	328 - 984	0.020 - 0.051
			Fracture resistance	AH3225			
	Ductile cast iron 60-40-18, 80-55-06, etc.	150 - 250HB	First choice	AH120	HJ	262 - 820	0.020 - 0.051
			Fracture resistance	AH3225			
S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice	AH3135	HL	98 - 197	0.012 - 0.028
			Fracture resistance	AH3135	HJ		
	Superalloys Inconel718, etc.	- 40HRC	First choice	AH8015	HL	66 - 164	0.004 - 0.012
			Fracture resistance	AH8015	HJ		
H	Hardened steel	H13, etc.	First choice	AH3225	HJ	164 - 492	0.004 - 0.020
			Wear resistance	AH8015			
		D2, etc.	First choice	AH8015	HJ	164 - 230	0.002 - 0.008

HIGH FEED (HJ, HL)

LNMX06-HJ

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, 1020, etc.	- 300HB	First choice	AH3225	HJ	328 - 984	0.012 - 0.043
			Wear resistance	AH8015			
			First choice	AH3225			
	Carbon steel, Alloy steel 1055, 4140, etc.	- 300HB	Wear resistance	AH8015		328 - 820	0.012 - 0.043
			First choice	AH3225			
			Wear resistance	AH8015			
M	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	First choice	AH3225	HJ	328 - 656	0.008 - 0.028
			Wear resistance	AH8015			
	Austenitic Stainless steel 304SS, 316SS, etc.	- 200HB	First choice	AH3135	HJ	328 - 656	0.008 - 0.028
K	Gray cast iron Class 25, Class 30, etc.	150 - 250HB	First choice	AH120	HJ	328 - 984	0.012 - 0.043
			Fracture resistance	AH3225			
	Ductile cast iron 60-40-18, 80-55-06, etc.	150 - 250HB	First choice	AH120	HJ	262 - 820	0.012 - 0.043
			Fracture resistance	AH3225			
S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice	AH3135	HJ	98 - 197	0.006 - 0.024
			First choice	AH3135			
	Superalloys Inconel718, etc.	- 40HRC	First choice	AH8015	HJ	66 - 164	0.002 - 0.012
			First choice	AH8015			
H	Hardened steel	H13, etc.	First choice	AH3225	HJ	164 - 492	0.004 - 0.012
			Wear resistance	AH8015			
		D2, etc.	First choice	AH8015	HJ	164 - 230	0.002 - 0.006

· When using a long shank or modular head with long overhang, please lower the cutting conditions (Vc, fz, ap) to 70% of the maximum conditions for the standard shank.

Grade

Insert

Toolholder

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

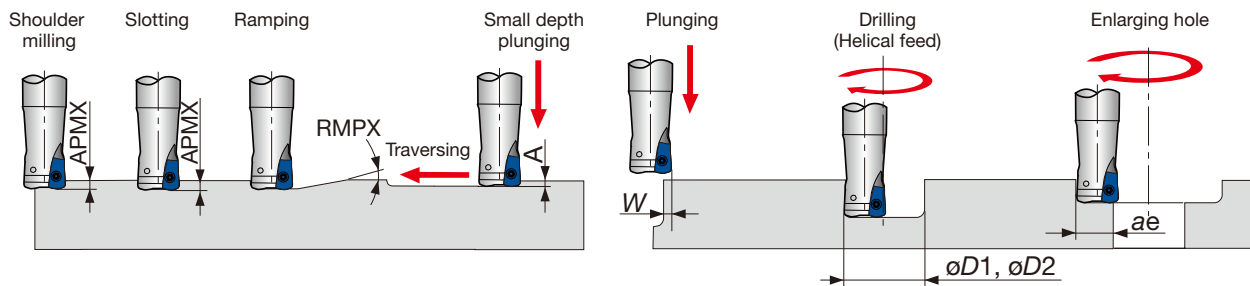
Tooling System

User's Guide

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MACHINING APPLICATIONS



FOR RADIUS (MJ, ML)

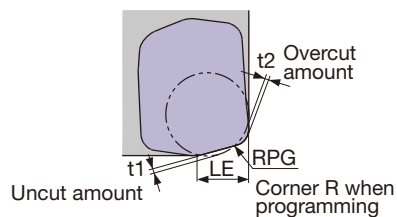
Inch	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging A	Max. cutting width in plunging W	Min. machining dia. øD1	Max. machining dia. øD2	Max. cutting width in enlarging ae
EXLN04U1.00...	1.000	0.157	3°	0.031	0.157	1.535	1.929	0.803
EXLN04U1.25...	1.250	0.157	1.9°	0.031	0.157	2.047	2.402	1.053
EXLN04U1.25C1.25R05	1.250	0.157	1.9°	0.031	0.157	2.047	2.402	1.053
TXLN04U1.50B0.50R06	1.500	0.157	1.2°	0.024	0.157	2.511	2.905	1.342
TXLN04U2.00B0.75R07	2.000	0.157	1°	0.027	0.157	3.496	3.889	1.842
EXLN06U1.25C01.25R02	1.250	0.236	3.7°	0.039	0.394	1.732	2.421	0.827
EXLN06U1.50C01.25R03	1.500	0.236	4°	0.067	0.394	2.165	2.921	1.063
TXLN06U2.00B0.75R05	2.000	0.236	2.7°	0.067	0.394	3.150	3.921	1.575
TXLN06U2.50B0.75R06	2.500	0.236	2.3°	0.079	0.394	4.134	4.921	2.047
TXLN06U3.00B1.00R07	3.000	0.236	1.6°	0.071	0.394	5.157	5.921	2.559

HIGH FEED (HJ, HL)

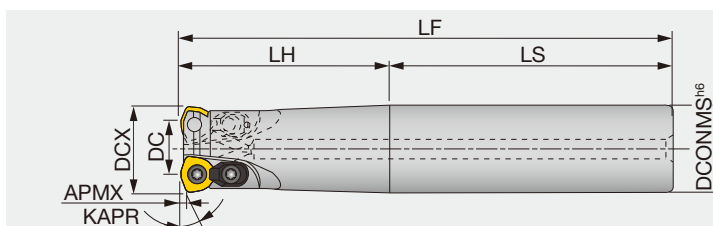
Inch	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging A	Max. cutting width in plunging W	Min. machining øD1	Max. machining øD2	Max. cutting width in enlarging ae
EXLN04U1.00C1.00R03	1.000	0.051	3°	0.030	0.161	1.496	1.929	0.803
EXLN04U1.25C1.25R04	1.250	0.051	2°	0.030	0.161	2.008	2.441	1.053
EXLN04U1.25C1.25R05	1.250	0.051	2°	0.030	0.161	2.008	2.441	1.053
TXLN04U1.50B0.50R06	1.500	0.157	1.3°	0.024	0.161	2.456	2.905	1.342
TXLN04U2.00B0.75R07	2.000	0.157	1°	0.027	0.161	3.456	3.889	1.842
EXLN06U1.25C01.25R02	1.250	0.079	5.7°	0.055	0.433	1.614	2.421	0.787
EXLN06U1.50C01.25R03	1.500	0.079	4.3°	0.059	0.433	2.087	2.921	1.024
TXLN06U2.00B0.75R05	2.000	0.079	2.7°	0.063	0.433	3.110	4.000	1.535
TXLN06U2.50B0.75R06	2.500	0.079	2°	0.067	0.433	4.094	4.921	2.008
TXLN06U3.00B1.00R07	3.000	0.079	1.4°	0.067	0.433	5.079	5.921	2.520

TOOL GEOMETRY ON PROGRAMMING FOR HIGH FEED (HJ, HL)

The following table shows the amount left uncut (t1) and overcut (t2).



	Max. depth of cut APMX (in)	LE (in)	Programmed corner R (in)	Amount left uncut t1 (in)	Amount left overcut t2 (in)
LNMX04-HJ LNMX04-HL	0.051	0.161	R0.059	0.031	-
	0.051	0.161	R0.079	0.026	-
	0.051	0.161	R0.098	0.020	0.002
	0.051	0.161	R0.118	0.014	0.008
LNMX06-HJ	0.079	0.236	R0.079	0.055	-
	0.079	0.236	R0.118	0.043	-
	0.079	0.236	R0.138	0.036	-
	0.079	0.236	R0.157	0.029	0.002
	0.079	0.236	R0.197	0.016	0.014



Inch	APMX	DCX	CICT	DC	DCONMS	LF	LH	LS	KAPR	Air hole	Insert	Shank
EXP05075RSU	0.060	0.750	2	0.480	0.750	4.031	2.000	2.031	15°	With	WPM*05...	Cylindrical
EXP05075RLU	0.060	0.750	2	0.480	0.750	7.000	2.000	2.031	15°	With	WPM*05...	Cylindrical
EXP05075RLLU	0.060	0.750	2	0.480	0.750	10.000	4.000	3.000	15°	With	WPM*05...	Cylindrical
EXP06100RSU	0.060	1.000	2	0.697	1.000	4.781	5.000	3.000	15°	With	WPM*06...	Cylindrical
EXP06100RLU	0.060	1.000	2	0.697	1.000	8.000	5.000	3.000	15°	With	WPM*06...	Cylindrical
EXP06100RLLU	0.060	1.000	2	0.697	1.000	12.000	7.000	5.000	15°	With	WPM*06...	Cylindrical
EXP06125RSBU	0.060	1.250	3	0.929	1.250	5.281	3.000	2.281	20°	With	WPM*06...	Cylindrical
EXP06125RLBU	0.060	1.250	3	0.929	1.250	8.000	5.000	3.000	20°	With	WPM*06...	Cylindrical
EXP06125RLLBU	0.060	1.250	3	0.929	1.250	12.000	7.000	5.000	20°	With	WPM*06...	Cylindrical
EXP06150RSU	0.060	1.500	3	1.169	1.250	5.781	3.500	2.281	20°	With	WPM*06...	Cylindrical
EXP06150RLU	0.060	1.500	3	1.169	1.250	10.000	2.000	8.000	20°	With	WPM*06...	Cylindrical
EXP06150RLLU	0.060	1.500	3	1.169	1.250	12.000	2.000	10.000	20°	With	WPM*06...	Cylindrical
EXP09200RU	0.118	2.000	2	1.477	1.250	4.781	2.500	2.281	20°	With	WPMT09...	Cylindrical
EXP09200RLU	0.118	2.000	2	1.477	1.250	9.750	2.000	7.750	20°	With	WPMT09...	Cylindrical

Metric	APMX	DCX	CICT	DC	DCONMS	LF	LH	LS	KAPR	Air hole	Insert	Shank
EXP05020RL	1.5	20	2	12.4	20	180	100	80	15°	With	WPM*05...	Cylindrical
EXP05020RLL	1.5	20	2	12.4	20	250	130	120	15°	With	WPM*05...	Cylindrical
EXP05020RS	1.5	20	2	12.4	20	130	50	80	15°	With	WPM*05...	Cylindrical
EXP05021RL	1.5	21	2	13.4	20	180	100	80	15°	With	WPM*05...	Cylindrical
EXP05021RLL	1.5	21	2	13.4	20	250	50	200	15°	With	WPM*05...	Cylindrical
EXP05021RS	1.5	21	2	13.4	20	130	50	80	15°	With	WPM*05...	Cylindrical
EXP06025RL	1.5	25	2	16.4	25	200	120	80	20°	With	WPM*06...	Cylindrical
EXP06025RLL	1.5	25	2	16.4	25	300	180	120	20°	With	WPM*06...	Cylindrical
EXP06025RS	1.5	25	2	16.4	25	140	60	80	20°	With	WPM*06...	Cylindrical
EXP06026RL	1.5	26	2	17.4	25	200	120	80	20°	With	WPM*06...	Cylindrical
EXP06026RLL	1.5	26	2	17.4	25	300	60	240	20°	With	WPM*06...	Cylindrical
EXP06026RS	1.5	26	2	17.4	25	140	60	80	20°	With	WPM*06...	Cylindrical
EXP06032RL	1.5	32	2	23.4	32	200	120	80	20°	With	WPM*06...	Cylindrical
EXP06032RLB	1.5	32	3	23.4	32	200	120	80	20°	With	WPM*06...	Cylindrical
EXP06032RLL	1.5	32	2	23.4	32	300	180	120	20°	With	WPM*06...	Cylindrical
EXP06032RS	1.5	32	2	23.4	32	150	70	80	20°	With	WPM*06...	Cylindrical
EXP06032RSB	1.5	32	3	23.4	32	150	70	80	20°	With	WPM*06...	Cylindrical
EXP06033RL	1.5	33	2	24.4	32	200	120	80	20°	With	WPM*06...	Cylindrical
EXP06033RLB	1.5	33	3	24.4	32	200	120	80	20°	With	WPM*06...	Cylindrical
EXP06033RLL	1.5	33	2	24.4	32	300	70	230	20°	With	WPM*06...	Cylindrical
EXP06033RS	1.5	33	2	24.4	32	150	70	80	20°	With	WPM*06...	Cylindrical
EXP06033RSB	1.5	33	3	24.4	32	150	70	80	20°	With	WPM*06...	Cylindrical
EXP06040RL	1.5	40	3	31.4	32	250	50	200	20°	With	WPM*06...	Cylindrical
EXP06040RLL	1.5	40	3	31.4	32	300	50	250	20°	With	WPM*06...	Cylindrical
EXP06040RLS42	1.5	40	3	31.4	42	250	50	200	20°	With	WPM*06...	Cylindrical
EXP06040RS	1.5	40	3	31.4	32	150	50	100	20°	With	WPM*06...	Cylindrical
EXP08040RLA	1.5	40	2	28.6	32	250	50	200	10°	With	WPMT08...	Cylindrical
EXP08040RLL	1.5	40	2	28.6	32	300	50	250	10°	With	WPMT08...	Cylindrical
EXP08040RSA	1.5	40	2	28.6	32	150	50	100	10°	With	WPMT08...	Cylindrical
EXP09050RS	3	50	2	36.4	42	150	50	100	20°	With	WPMT09...	Cylindrical
EXP09050RL	3	50	2	36.4	42	250	50	200	20°	With	WPMT09...	Cylindrical

SPARE PARTS

Designation	Clamp set	Clamping screw	Lubricant	Wrench 1	Wrench 2
EXP05...	-	CSPB-3.5S	M-1000	IP-15D	-
EXP06...	CSY-15	CSPB-4S	M-1000	IP-15D	-
EXP08...	CSX20	CSTB-5	M-1000	-	T-20T
EXP09...	CSY-20	CSPB-5	M-1000	-	IP-20T

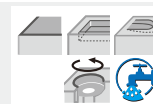
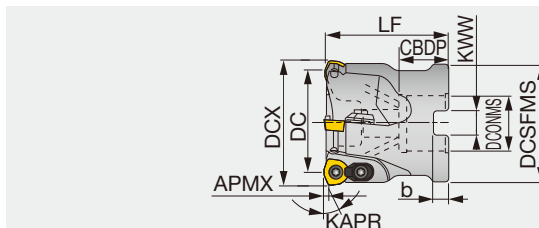
Recommended clamping torque: CSPB-3.5S/CSPB-4S = 2.58 lbs·ft, 3.5 N·m, CSTB-5/CSPB-5 = 3.69 lbs·ft, 5 N·m

 Reference pages: Inserts → **H056**, Standard cutting conditions → **H057 - H058**



High feed bore type cutter with double clamp system

GAMP = +5°, GAMF = -4° - -6°



Inch	APMX	DCX	CICT	DC	DCSFMS	LF	DCONMS	CBDP	KWW	b	KAPR	WT(lb)	Air hole	Insert
TXP06200RBU	0.060	2.000	4	1.650	1.850	1.969	0.750	0.750	0.315	0.197	20°	1.10	With	WPM*06...
TXP08050RU	0.060	2.000	3	1.547	1.850	1.969	0.750	0.750	0.315	0.197	10°	0.87	Without	WPMT08...
TXP08200RU-A	0.060	2.000	3	1.547	1.850	1.969	0.750	0.750	0.315	0.197	10°	0.87	With	WPMT08...
TXP05250RBU	0.060	2.500	6	2.190	2.323	1.969	0.750	0.750	0.315	0.197	15°	1.76	With	WPM*05...
TXP06250RBU	0.060	2.500	5	2.150	2.323	1.969	0.750	0.750	0.315	0.197	20°	1.76	With	WPM*06...
TXP09250RU	0.118	2.500	3	1.971	2.323	1.969	0.750	0.750	0.315	0.197	20°	1.54	With	WPMT09...
TXP05300RBU	0.060	3.000	7	2.690	2.835	2.480	1.000	1.024	0.374	0.236	20°	3.31	With	WPM*05...
TXP06300RBU	0.060	3.000	6	2.650	2.835	2.480	1.000	1.024	0.374	0.236	20°	3.09	With	WPM*06...
TXP08300RU-A	0.060	3.000	5	2.547	2.835	2.480	1.000	1.024	0.375	0.236	10°	3.20	With	WPMT08...
TXP09300RU	0.118	3.000	4	2.470	2.835	2.480	1.000	1.024	0.374	0.236	20°	2.65	With	WPMT09...
TXP08400RU-A	0.060	4.000	6	3.547	3.819	2.480	1.500	1.260	0.625	0.394	10°	5.80	With	WPMT08...
TXP09400RU	0.118	4.000	5	3.471	3.780	2.480	1.500	1.457	0.626	0.394	20°	4.41	With	WPMT09...
TXP09500RU	0.118	5.000	6	4.471	3.780	2.480	1.500	1.457	0.626	0.394	20°	6.83	With	WPMT09...
TXP09600RU	0.118	6.000	7	5.471	4.331	2.480	2.000	1.496	0.748	0.433	20°	9.48	Without	WPMT09...
Metric	APMX	DCX	CICT	DC	DCSFMS	LF	DCONMS	CBDP	KWW	b	KAPR	WT(kg)	Air hole	Insert
TXP06050R	1.5	50	4	41.4	47	50	22	20	10	6	20	0.4	Without	WPM*06...
TXP06050R2	1.5	50	4	41.4	47	50	22.225	20	8	5	20	0.4	With	WPM*06...
TXP06050RA	1.5	50	4	41.4	47	50	22	20	10	6	20	0.4	With	WPM*06...
TXP08050R	1.5	50	3	38.6	47	50	22	19.5	10	6	10	0.4	With	WPMT08...
TXP08050R2	1.5	50	3	38.6	47	50	22.225	19.5	8	5	10	0.4	With	WPMT08...
TXP08050RA	1.5	50	3	38.6	47	50	22	19.5	10	6	10	0.4	With	WPMT08...
TXP08050R-E	1.5	50	3	38.6	47	50	22	20	10.4	6.3	10	0.4	Without	WPMT08...
TXP08052R-E	1.5	52	3	40.6	50	50	22	20	10.4	6.3	10	0.5	Without	WPMT08...
TXP05063RB-E	1.5	63	6	55.4	59	50	22	20	10.4	6.3	15	0.8	With	WPM*05...
TXP06063RB-E	1.5	63	5	54.4	59	50	22	20	10.4	6.3	20	0.7	With	WPM*06...
TXP08063R	1.5	63	4	51.6	59	50	22	20	10	6	10	0.7	With	WPMT08...
TXP08063R2	1.5	63	4	51.6	59	50	22.225	20	8	5	10	0.7	With	WPMT08...
TXP08063RA	1.5	63	4	51.6	59	50	22	20	10	6	10	0.7	With	WPMT08...
TXP08063R-E	1.5	63	4	51.6	59	50	22	20	10.4	6.3	10	0.7	Without	WPMT08...
TXP09063R	3	63	3	49.4	59	50	22	20	10	6	20	0.6	With	WPMT09...
TXP09063R2	3	63	3	49.4	59	50	22.225	20	8	5	20	0.6	With	WPMT09...
TXP09063R-E	3	63	3	49.4	59	50	22	20	10.4	6.3	20	0.6	Without	WPMT09...
TXP08066R-E	1.5	66	4	54.6	63	50	27	22	12.4	7	10	0.8	Without	WPM*06...
TXP05080RB-E	1.5	80	7	72.4	76	63	27	22	12.4	7	15	1.7	With	WPM*05...
TXP06080RB-E	1.5	80	6	71.4	76	63	27	22	12.4	7	20	1.6	With	WPM*06...
TXP08080R	1.5	80	5	68.6	76	63	31.75	32	12.7	8	10	1.4	With	WPMT08...
TXP08080RA	1.5	80	5	68.6	76	63	31.75	32	12.7	8	10	1.4	With	WPMT08...
TXP08080R-E	1.5	80	5	68.6	76	63	27	22	12.4	7	10	1.5	Without	WPM*06...
TXP09080R	3	80	4	66.4	76	63	31.75	32	12.7	8	20	1.3	With	WPMT09...
TXP09080R-E	3	80	4	66.4	76	63	27	22	12.4	7	20	1.3	Without	WPMT09...
TXP08100R	1.5	100	6	88.6	96	63	31.75	32	12.7	8	10	2.5	With	WPMT08...
TXP08100RA	1.5	100	6	88.6	96	63	31.75	32	12.7	8	10	2.5	With	WPMT08...
TXP08100R-E	1.5	100	6	88.6	96	63	32	25	14.4	8	10	2.5	With	WPM*06...
TXP09100R	3	100	5	86.4	96	63	31.75	32	12.7	8	20	2.4	With	WPMT09...
TXP09100R-E	3	100	5	86.4	96	63	32	25	14.4	8	20	2.4	Without	WPMT09...
TXP08125R	1.5	125	7	113.6	80	63	38.1	45	15.9	10	10	3.1	With	WPMT08...
TXP08125R-E	1.5	125	7	113.6	98	63	40	32	16.4	9	10	3.1	Without	WPMT08...
TXP09125R	3	125	6	111.4	98	63	38.1	38	15.9	10	20	3.1	With	WPMT09...
TXP09125R-E	3	125	6	111.4	98	63	40	32	16.4	9	20	2.9	Without	WPMT09...
TXP08160R	1.5	160	8	148.6	100	63	50.8	46	19	11	10	5.1	With	WPMT08...
TXP09160R	3	160	7	146.4	100	63	50.8	38	19	11	20	4.7	With	WPMT09...

Reference pages: Inserts → **H056**, Standard cutting conditions → **H057 - H058**

INCH SPARE PARTS



Designation	Clamp set	Clamping screw	Lubricant	Wrench	Wrench 1	Shell locking bolt (Optional parts)
TXP05250RBU	-	CSPB-3.5S	M-1000	IP-15D	-	(C0.375X1.125H)
TXP05300RBU	-	CSPB-3.5S	M-1000	IP-15D	-	(C0.500X1.375H)
TXP06200RBU, TXP06250RBU	CSY-15	CSPB-4S	M-1000	IP-15D	-	(C0.375X1.125H)
TXP06300RBU	CSY-15	CSPB-4S	M-1000	IP-15D	-	(C0.500X1.375H)
TXP08050RU, TXP08200RU-A	CSX20	CSTB-5	M-1000	-	T-20T	(C0.375X1.125H)
TXP08300RU-A	CSX20	CSTB-5	M-1000	-	T-20T	(C0.500X1.375H)
TXP08400RU-A	CSX20	CSTB-5	M-1000	-	T-20T	(TMBA-0.750H)
TXP09250RU	CSY-20	CSPB-5	M-1000	-	IP-20T	(C0.375X1.125H)
TXP09300RU	CSY-20	CSPB-5	M-1000	-	IP-20T	(C0.500X1.375H)
TXP09400RU, TXP09500RU	CSY-20	CSPB-5	M-1000	-	IP-20T	(TMBA-0.750H)
TXP09600RU	CSY-20	CSPB-5	M-1000	-	IP-20T	-

Recommended clamping torque: CSPB-3.5S/CSPB-4S = 2.58 lbs·ft, CSTB-5/CSPB-5 = 3.69 lbs·ft

METRIC SPARE PARTS



Designation	Clamp set	Clamping screw	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Shell locking bolt 3	Wrench 1	Wrench 2
TXP05063RB-E	CSY-15	CSPB-3.5S	M-1000	-	CM10X30H	-	IP-15D	-
TXP05080RB-E	CSY-15	CSPB-3.5S	M-1000	-	-	CAP-CM12X1.75X30	IP-15D	-
TXP06050R	CSY-15	CSPB-4S	M-1000	-	-	CAP-CM10X1.5X30	IP-15D	-
TXP06050R2, RA TXP06063RB-E	CSY-15	CSPB-4S	M-1000	-	CM10X30H	-	IP-15D	-
TXP06080RB-E	CSY-15	CSPB-4S	M-1000	-	CM12X30H	-	IP-15D	-
TXP08050R TXP0805*R-E	CSX20	CSTB-5	M-1000	-	-	FSHM10-40	-	T-20T
TXP08050R*	CSX20	CSTB-5	M-1000	-	FSHM10-40H	-	-	T-20T
TXP08063R	CSX20	CSTB-5	M-1000	-	-	CAP-CM10X1.5X30	-	T-20T
TXP08063R2 TXP08063RA	CSX20	CSTB-5	M-1000	-	CM10X30H	-	-	T-20T
TXP08063, 066R-E	CSX20	CSTB-5	M-1000	-	-	-	-	T-20T
TXP08080R TXP08100R	CSX20	CSTB-5	M-1000	-	-	CAP-CM16X2.0X40	-	T-20T
TXP08080RA TXP08100RA	CSX20	CSTB-5	M-1000	-	CM16X40H	-	-	T-20T
TXP08080R-E	CSX20	CSTB-5	M-1000	-	-	-	-	T-20T
TXP08100R-E	CSX20	CSTB-5	M-1000	-	-	-	-	IP-20T
TXP08125R	CSX20	CSTB-5	M-1000	TMBA-M20H	-	-	-	T-20T
TXP08160R	CSX20	CSTB-5	M-1000	TMBA-M24H	-	-	-	T-20T
TXP09063R*	CSY-20	CSPB-5	M-1000	-	CM10X30H	-	-	IP-20T
TXP09063R-E TXP09080R-E TXP09100R-E TXP09125R-E	CSY-20	CSPB-5	M-1000	-	-	-	-	IP-20T
TXP09080R TXP09100R	CSY-20	CSPB-5	M-1000	-	CM16X40H	-	-	IP-20T
TXP09125R	CSY-20	CSPB-5	M-1000	TMBA-M20H	-	-	-	IP-20T
TXP09160R	CSY-20	CSPB-5	M-1000	TMBA-M24H	-	-	-	IP-20T

Recommended clamping torque: CSPB-3.5S/CSPB-4S = 3.5 N·m, CSTB-5/CSPB-5 = 5 N·m

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

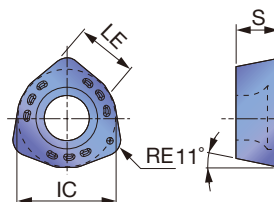
Tooling System

User's Guide

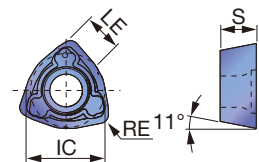
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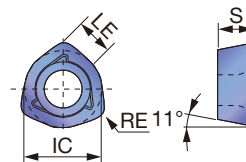
WPMW05/06



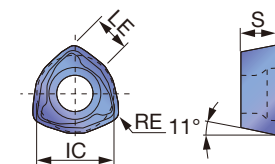
WPMT05/06/08/09-ML



WPMT05/06/08/09-MH



WPMT05/06/08/09-DML



P	Steel	☆			☆	★				
M	Stainless		★	☆		★				
K	Cast iron	★								
N	Non-ferrous									
S	Superalloys	★	☆							
H	Hard materials			★						

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated												LE	IC	S	
			AH120	AH130	AH140	AH730	T3130	AH3135										
WPMW05H315ZPR	0.059	0.060	●		●		●	●								0.197	0.3130	0.138
WPMT05H315ZPR-ML	0.059	0.060	●		●			●	●							0.197	0.3130	0.138
WPMT05H315ZPR-MH	0.059	0.060	●		●				●							0.197	0.3134	0.138
WPMT05H315ZPR-DML	0.059	0.060					●									0.197	0.3130	0.138
WPMW06X415ZPR	0.059	0.060	●		●			●	●							0.236	0.3750	0.165
WPMT06X415ZPR-ML	0.059	0.060	●	●	●			●	●							0.236	0.3750	0.165
WPMT06X415ZPR-MH	0.059	0.060	●		●				●							0.236	0.3755	0.165
WPMT06X415ZPR-DML	0.059	0.060					●									0.236	0.3750	0.165
WPMT080615ZSR	0.059	0.060	●	●	●			●	●							0.315	0.507	0.250
WPMT080615ZPR-ML	0.059	0.060	●	●	●			●	●							0.315	0.507	0.250
WPMT080615ZSR-MH	0.059	0.060	●		●				●							0.315	0.507	0.250
WPMT080615ZPR-DML	0.059	0.060					●									0.315	0.507	0.250
WPMT090725ZSR	0.098	0.118	●		●			●	●							0.354	0.591	0.276
WPMT090725ZPR-ML	0.098	0.118	●	●	●			●	●							0.354	0.591	0.276
WPMT090725ZSR-MH	0.098	0.118	●	●	●				●							0.354	0.591	0.276
WPMT090725ZPR-DML	0.098	0.118					●									0.354	0.591	0.276

●: Line up

Reference pages: Standard cutting conditions → **H057 - H058**

STANDARD CUTTING CONDITIONS

05-06 type

ISO	Workpiece material	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	ø0.787", 0.827" (CICT = 2)	ø0.984", 1.024", (CICT = 2)	ø1.260", 1.299", (CICT = 2, 3)	ø1.575" (CICT = 3)	ø1.969" (CICT = 4)	ø2.480" (CICT = 5, 6)
P	Carbon Steels 1055, etc. < 300HB	AH3135	330 - 820	0.020 - 0.078	Vc = 500 sfm, fz = 0.031 ipt ap = 0.039", ae (in) = 1×DCX	Vc = 500 sfm, fz = 0.039 ipt ap = 0.039", ae (in) = 1×DCX				
					When plunging in small depth: fz = 0.008"					
	Alloy steels 4140, etc. < 300 HB	AH3135	330 - 650	0.020 - 0.078	Vc = 425 sfm, fz = 0.031 ipt ap = 0.039", ae (in) = 1×DCX	Vc = 425 sfm, fz = 0.039 ipt ap = 0.039", ae (in) = 1×DCX				
					When plunging in small depth: fz = 0.008"					
Prehardened steels P20, H13, etc. 30 - 40HRC	AH3135	260 - 500	0.020 - 0.039	Vc = 330 sfm, fz = 0.020 ipt ap = 0.039", ae (in) = 1×DCX	Vc = 330 sfm, fz = 0.020 ipt ap = 0.039", ae (in) = 1×DCX					
				When plunging in small depth: fz = 0.004 ipt						
M	Stainless steels S30400, etc. - 200HB	AH130 (AH3135)	330 - 650	0.020 - 0.078	Vc = 425 sfm, fz = 0.031 ipt ap = 0.039", ae (in) = 1×DCX	Vc = 425 sfm, fz = 0.039 ipt ap = 0.039", ae (in) = 1×DCX				
					When plunging in small depth: fz = 0.008 ipt					
K	Cast irons 250, etc. 150 - 250HB	AH120	330 - 820	0.032 - 0.098	Vc = 500 sfm, fz = 0.039 ipt ap = 0.039", ae (in) = 1×DCX	Vc = 590 sfm, fz = 0.059 ipt ap = 0.039", ae (in) = 1×DCX				
					When plunging in small depth: fz = 0.008 ipt					
S	Titanium alloys Ti-6Al-4V, etc. - 40HRC	AH130	98 - 197	0.012 - 0.028	Vc = 164 sfm, fz = 0.020 ipt, ap = 0.028", ae (in) = 0.5×DCX					
					When plunging in small depth: fz = 0.004 ipt					
	Heat-resistant alloys Inconel 718, etc. - 40HRC	AH120	33 - 131	0.004 - 0.012	Vc = 98 sfm, fz = 0.008 ipt, ap = 0.028", ae (in) = 0.5×DCX					
					When plunging in small depth: fz = 0.004 ipt					
H	Hard materials D2, etc. 40 - 50HRC	AH730	200 - 330	0.020 - 0.078	Vc = 230 sfm, fz = 0.028 ipt, ap = 0.028", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.004 ipt					

08 type

ISO	Workpiece material	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	ø1.575" (CICT = 2)	ø1.969" (CICT = 3)	ø2.480" (CICT = 4)	ø3.150" (CICT = 5)	ø3.937" (CICT = 6)	ø4.921" (CICT = 7)	ø6.299" (CICT = 8)
P	Carbon Steels 1055, etc. < 300HB	AH3135	330 - 820	0.020 - 0.078	Vc = 591 sfm, fz = 0.039 ipt ap = 0.039", ae = 1.575"	Vc = 656 sfm, fz = 0.059 ipt ap = 0.039", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.008 ipt						
	Alloy steels 4140, etc. < 300 HB	AH3135	330 - 650	0.020 - 0.078	Vc = 427 sfm, fz = 0.039 ipt ap = 0.039", ae = 1.575"	Vc = 492 sfm, fz = 0.059 ipt ap = 0.039", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.008 ipt						
Prehardened steels P20, H13, etc. 30 - 40HRC	AH3135	260 - 500	0.020 - 0.039	Vc = 328 sfm, fz = 0.020 ipt ap = 0.039", ae = 1.575"	Vc = 394 sfm, fz = 0.031 ipt ap = 0.039", ae (in) = 1×DCX						
				When plunging in small depth: fz = 0.004 ipt							
M	Stainless steels S30400, etc. - 200HB	AH130 (AH3135)	330 - 650	0.020 - 0.078	Vc = 427 sfm, fz = 0.039 ipt ap = 0.039", ae = 1.575"	Vc = 492 sfm, fz = 0.059 ipt ap = 0.039", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.008 ipt						
K	Cast irons 250, etc. 150 - 250HB	AH120	500 - 820	0.032 - 0.098	Vc = 591 sfm, fz = 0.059 ipt ap = 0.039", ae = 1.575"	Vc = 656 sfm, fz = 0.079 ipt ap = 0.039", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.008 ipt						
S	Titanium alloys Ti-6Al-4V, etc. - 40HRC	AH130	98 - 197	0.012 - 0.028	Vc = 164 sfm, fz = 0.020 ipt, ap = 0.028", ae (in) = 0.5×DCX						
					When plunging in small depth: fz = 0.004 ipt						
	Heat-resistant alloys Inconel 718, etc. - 40HRC	AH120	33 - 131	0.004 - 0.012	Vc = 98 sfm, fz = 0.008 ipt, ap = 0.028", ae (in) = 0.5×DCX						
					When plunging in small depth: fz = 0.004 ipt						
H	Hard materials D2, etc. 40 - 50HRC	AH730	170 - 260	0.020 - 0.039	Vc = 230 sfm, fz = 0.028 ipt, ap = 0.028", ae (in) = 1×DCX						
					When plunging in small depth: fz = 0.004 ipt						

The above values of cutting speed show the standard speed when overhang length of tool is below 3D.

The cutting speed and the feed rate should be set at the lower limit values when overhang length of tool exceeds 3D.

Thick and heavy chips are discharged by these TAC mills. Use internal air supply or air-blowing in order to prevent tool failure.

High Feed
Milling

09 type



Face Milling

Shoulder
Milling

Slot Milling



Profile Milling

Chamfering,
CounterboreFinish
Face Milling

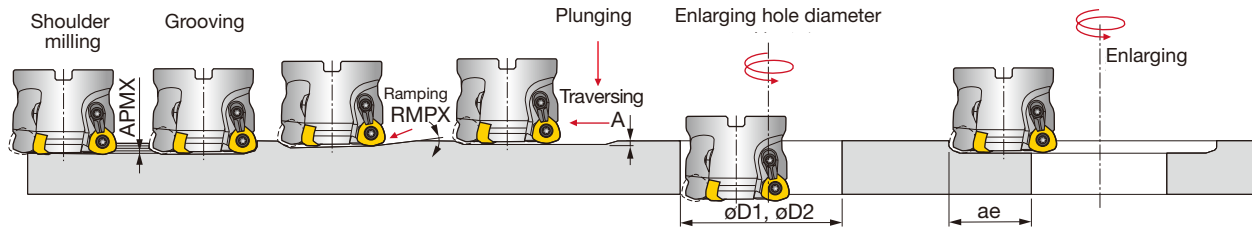
ISO	Workpiece material	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	ø2.000" (CICT = 2)	ø2.500" (CICT = 3)	ø3.000" (CICT = 4)	ø4.000" (CICT = 5)	ø5.000" (CICT = 6)	ø6.000" (CICT = 7)
P	Carbon Steels 1055, etc. < 300HB	AH3135	330 - 820	0.020 - 0.078	Vc = 650 sfm, fz = 0.059 ipt, ap = 0.079", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.008 ipt					
	Alloy steels 4140, etc. < 300 HB	AH3135	330 - 650	0.020 - 0.078	Vc = 500 sfm, fz = 0.059 ipt, ap = 0.079", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.008 ipt					
	Prehardened steels P20, H13, etc. 30 - 40HRC	AH3135	260 - 500	0.020 - 0.039	Vc = 3.94, fz = 0.031 ipt, ap = 0.079", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.004 ipt					
M	Stainless steels S30400, etc. - 200HB	AH130 (AH3135)	330 - 650	0.020 - 0.078	Vc = 500 sfm, fz = 0.059 ipt, ap = 0.079", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.008 ipt					
K	Cast irons 250, etc. 150 - 250HB	AH120	500 - 820	0.032 - 0.098	Vc = 650 sfm, fz = 0.078 ipt, ap = 0.079", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.008 ipt					
S	Titanium alloys Ti-6Al-4V, etc. - 40HRC	AH130	98 - 197	0.012 - 0.028	Vc = 164 sfm, fz = 0.020 ipt, ap = 0.059", ae (in) = 0.5×DCX					
					When plunging in small depth: fz = 0.039 ipt					
	Heat-resistant alloys Inconel 718, etc. - 40HRC	AH120	33 - 131	0.004 - 0.012	Vc = 98 sfm, fz = 0.008 ipt, ap = 0.039", ae (in) = 0.5×DCX					
					When plunging in small depth: fz = 0.039 ipt					
H	Hard materials D2, etc. 40 - 50HRC	AH730	200 - 330	0.020 - 0.039	Vc = 230 sfm, fz = 0.028 ipt, ap = 0.027", ae (in) = 1×DCX					
					When plunging in small depth: fz = 0.004 ipt					

The cutting speed and feed should be set to 70 to 80 % of the value shown in the above table when overhang length of tool exceeds 3D.

Approach
angle

Others

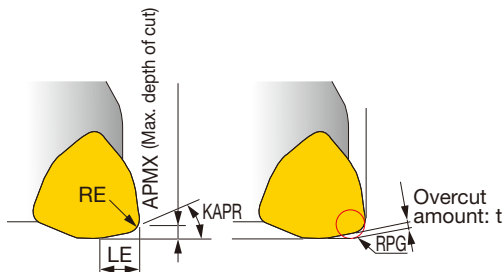
APPLICATION RANGE



Inch	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Min. machining hole dia. øD1	Max. machining hole dia. øD2	Max. cutting width in enlarging hole ae
TXP05250RBU	2.500	0.060	2° 30'	0.020	3.860	4.840	2.240
TXP05300RBU	3.000	0.060	1° 30'	0.020	5.200	6.180	2.910
TXP06250RBU	2.500	0.060	2°	0.040	3.860	4.840	2.240
TXP06200RBU	2.000	0.060	1° 30'	0.040	3.270	3.820	1.770
TXP06300RBU	3.000	0.060	1° 30'	0.040	5.200	6.180	2.910
TXP08050RU	2.000	0.060	4°	0.040	2.830	3.820	1.730
TXP08300RU-A	3.000	0.060	1° 30'	0.040	5.200	6.180	2.910
TXP08400RU-A	4.000	0.060	1°	0.040	6.770	7.760	3.700
TXP09250RU	2.500	0.118	2°	0.060	3.860	4.840	2.200
TXP09300RU	3.000	0.118	1° 30'	0.060	5.200	6.180	2.870
TXP09400RU	4.000	0.118	1°	0.060	6.770	7.760	3.660
TXP09500RU	5.000	0.118	0° 45'	0.060	8.740	9.720	4.650
TXP09600RU	6.000	0.118	0° 30'	0.060	11.500	12.480	6.020
EXP05075...	0.750	0.060	3°	0.020	1.181	1.457	0.630
EXP06100...	1.000	0.060	5°	0.039	1.299	1.850	0.787
EXP06125...	1.250	0.060	3° 30'	0.039	1.850	2.402	1.063
EXP06150...	1.500	0.060	2°	0.039	2.480	2.874	1.299

TOOL GEOMETRY FOR PROGRAMMING

When programming for CAD/CAM, the tool should be assumed to be a radius cutter shown in the table below. In this case, the amount left as uncut (t) is shown below.



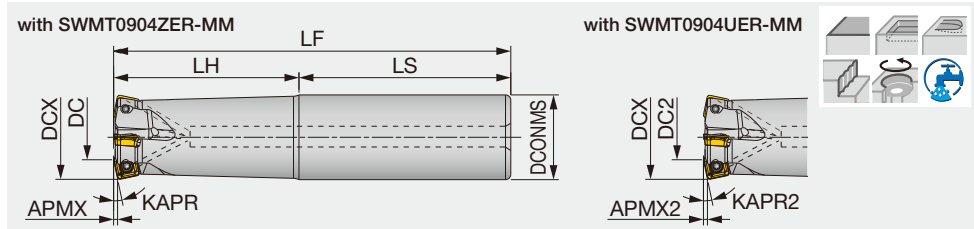
TXP	Max. depth of cut APMX	Corner of insert RE	Cutting edge angle KAPR	LE	t	Corner R when programming RPG
05	0.060	0.059	20°	0.150	0.020	R.078
06	0.060	0.059	20°	0.169	0.028	R.078
08	0.060	0.059	20°	0.224	0.028	R.078
09	0.118	0.098	20°	0.268	0.055	R.118
09	0.118	0.098	20°	0.268	0.047	R.157



MILLQ^{UAD}FEED

EXSW09

High feed mill



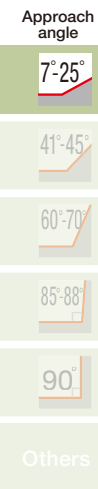
Inch	APMX	APMX2	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	KAPR2	WT(lb)	Air hole	Insert
EXSW09U1.00C1.00R03	0.059	0.039	1.000	3	0.409	0.370	1.000	5.500	2.500	3.000	12°	7°	1.014	With	SWMT09...
EXSW09U1.00C1.00R03L	0.059	0.039	1.000	3	0.409	0.370	1.000	7.000	4.000	3.000	12°	7°	1.279	With	SWMT09...
EXSW09U1.25C1.25R04	0.059	0.039	1.250	4	0.657	0.618	1.250	6.000	3.000	3.000	12°	7°	1.786	With	SWMT09...
EXSW09U1.25C1.25R04L	0.059	0.039	1.250	4	0.657	0.618	1.250	8.000	5.000	3.000	12°	7°	2.359	With	SWMT09...

Metric	APMX	APMX2	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	KAPR2	WT(kg)	Air hole	Insert
EXSW09M025C25.0R03	1.5	1	25	3	10	9	25	140	60	80	12°	7°	0.45	With	SWMT09...
EXSW09M025C25.0R03L	1.5	1	25	3	10	9	25	180	100	80	12°	7°	0.57	With	SWMT09...
EXSW09M032C32.0R04	1.5	1	32	4	17	16	32	150	70	80	12°	7°	0.81	With	SWMT09...
EXSW09M032C32.0R04L	1.5	1	32	4	17	16	32	200	120	80	12°	7°	1.07	With	SWMT09...

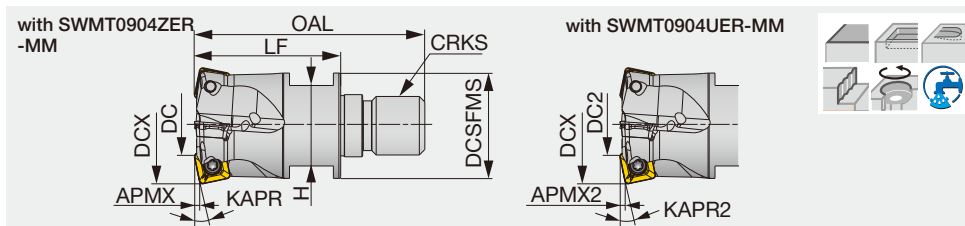
SPARE PARTS

Designation	Clamping screw	Mono block wrench	Lubricant
EXSW09...	CSPD-3	IP-10D	M-1000

Recommended clamping torque: 1.84 lbs·ft, 2.5 N·m



Reference pages: Inserts → [H063](#), Standard cutting conditions → [H064 - H065](#)



Metric	APMX	APMX2	DCX	CICT	DC	DC2	OAL	LF	H	DCSFMS	KAPR	KAPR2	CRKS	WT (kg)	Air hole	Insert
HXSW09M025M12R03	1.5	1	25	3	10	9	57	35	17	20.8	12°	7°	M12	0.09	With	SWMT09...
HXSW09M032M16R04	1.5	1	32	4	17	16	63	40	22	28.8	12°	7°	M16	0.18	With	SWMT09...

SPARE PARTS

Designation	Clamping screw	Mono block wrench	Lubricant
HXSW09...	CSPD-3	IP-10D	M-1000

Recommended clamping torque: 2.5 N·m

High feed mill

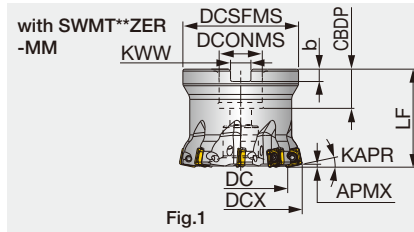


Fig.1

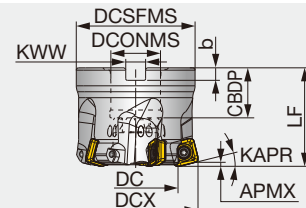


Fig.2 for 4-corner single sided inserts

GAMP = +3.8°, GAMF = -3.5°



Inch	APMX	APMX2	DCX	CICT	DC	DC2	DCSFMS	DCONMS	CBDP	LF	KWW	b	KAPR	KAPR2	WT(lb)	Air hole	Insert	Fig.
TXSW09U1.50B0.50R04	0.059	0.039	1.500	4	0.909	0.870	1.378	0.500	0.630	1.575	0.258	0.157	12°	7°	0.40	With	SWMT09...	1
TXSW09U1.50B0.50R05	0.059	0.039	1.500	5	0.909	0.870	1.378	0.500	0.630	1.575	0.258	0.157	12°	7°	0.40	With	SWMT09...	1
TXSW09U2.00B0.75R05	0.059	0.039	2.000	5	1.406	1.366	1.772	0.750	0.750	1.969	0.315	0.197	12°	7°	0.82	With	SWMT09...	1
TXSW09U2.00B0.75R07	0.059	0.039	2.000	7	1.406	1.366	1.772	0.750	0.750	1.969	0.315	0.197	12°	7°	0.84	With	SWMT09...	1
TXSW15U2.00B0.75R03	0.098	0.079	2.000	3	0.929	0.905	1.850	0.750	0.750	1.969	0.315	0.197	14°	10°	0.95	With	SWMT15...	2
TXSW09U2.50B0.75R06	0.059	0.039	2.500	6	1.906	1.866	2.323	0.750	0.750	1.969	0.315	0.197	12°	7°	1.59	With	SWMT09...	1
TXSW09U2.50B0.75R08	0.059	0.039	2.500	8	1.906	1.866	2.323	0.750	0.750	1.969	0.315	0.197	12°	7°	1.61	With	SWMT09...	1
TXSW15U2.50B0.75R04	0.098	0.079	2.500	4	1.480	1.405	2.323	0.750	0.750	1.969	0.315	0.197	14°	10°	1.52	With	SWMT15...	2
TXSW09U3.00B1.00R07	0.059	0.039	3.000	7	2.406	2.366	2.835	1.000	1.024	2.480	0.374	0.236	12°	7°	3.00	With	SWMT09...	1
TXSW09U3.00B1.00R10	0.059	0.039	3.000	10	2.406	2.366	2.835	1.000	1.024	2.480	0.374	0.236	12°	7°	3.06	With	SWMT09...	1
TXSW15U3.00B1.00R05	0.098	0.079	3.000	5	1.980	1.905	2.835	1.000	1.024	2.480	0.374	0.236	14°	10°	2.71	With	SWMT15...	2
TXSW09U4.00B1.50R08	0.059	0.039	4.000	8	3.406	3.366	3.819	1.500	1.181	2.480	0.626	0.394	12°	7°	4.67	With	SWMT09...	1
TXSW15U4.00B1.50R06	0.098	0.079	4.000	6	2.980	2.905	3.819	1.500	1.063	2.480	0.626	0.394	14°	10°	4.87	With	SWMT15...	2
TXSW15U5.00B1.50R07	0.098	0.079	5.000	7	3.980	3.905	3.819	1.500	1.614	2.480	0.626	0.394	14°	10°	6.37	With	SWMT15...	2
TXSW15U6.00B2.00R08	0.098	0.079	6.000	8	4.980	4.905	4.331	2.000	1.496	2.480	0.748	0.433	14°	10°	8.29	With	SWMT15...	2

Metric	APMX	APMX2	DCX	CICT	DC	DC2	DCSFMS	DCONMS	CBDP	LF	KWW	b	KAPR	KAPR2	WT(kg)	Air hole	Insert	Fig.
TXSW09M040B16.0R04	1.5	1	40	4	25	24	38	16	18	40	8.4	5.6	12°	7°	0.2	With	SWMT09...	1
TXSW09M040B16.0R05	1.5	1	40	5	25	24	38	16	18	40	8.4	5.6	12°	7°	0.2	With	SWMT09...	1
TXSW09M050B22.0R05	1.5	1	50	5	35	34	47	22	20	50	10.4	6.3	12°	7°	0.37	With	SWMT09...	1
TXSW09M050B22.0R07	1.5	1	50	7	35	34	47	22	20	50	10.4	6.3	12°	7°	0.38	With	SWMT09...	1
TXSW15M050B22.0R03	2.5	2	50	3	24.1	22.2	47	22	20	50	10.4	6.3	14°	10°	0.4	With	SWMT15...	2
TXSW09M052B22.0R05	1.5	1	52	5	37	36	49	22	20	50	10.4	6.3	12°	7°	0.42	With	SWMT09...	1
TXSW09M052B22.0R07	1.5	1	52	7	37	36	49	22	20	50	10.4	6.3	12°	7°	0.38	With	SWMT09...	1
TXSW09M063B22.0R06	1.5	1	63	6	48	47	59	22	20	50	10.4	6.3	12°	7°	0.69	With	SWMT09...	1
TXSW09M063B22.0R08	1.5	1	63	8	48	47	59	22	20	50	10.4	6.3	12°	7°	0.7	With	SWMT09...	1
TXSW15M063B22.0R04	2.5	2	63	4	37.1	35.2	59	22	20	50	10.4	6.3	14°	10°	0.66	With	SWMT15...	2
TXSW15J080B31.7R05	2.5	2	80	5	54.1	52.2	76	31.75	32	63	12.7	8	14°	10°	1.31	With	SWMT15...	2
TXSW15M080B27.0R05	2.5	2	80	5	54.1	52.2	76	27	22	63	12.4	7	14°	10°	1.41	With	SWMT15...	2
TXSW15J100B31.7R06	2.5	2	100	6	74.1	72.2	96	31.75	32	63	12.7	8	14°	10°	2.25	With	SWMT15...	2
TXSW15M100B32.0R06	2.5	2	100	6	74.1	72.2	96	32	25	63	14.4	8	14°	10°	2.26	With	SWMT15...	2
TXSW15J125B38.1R07	2.5	2	125	7	99.1	97.2	100	38.1	43	63	15.9	10	14°	10°	2.91	With	SWMT15...	2
TXSW15M125B40.0R07	2.5	2	125	7	99.1	97.2	100	40	37	63	16.4	9	14°	10°	2.83	With	SWMT15...	2
TXSW15J160B50.8R08	2.5	2	160	8	134.1	132.2	100	50.8	46	63	19	11	14°	10°	3.93	With	SWMT15...	2
TXSW15M160B40.0R08	2.5	2	160	8	134.1	132.2	100	40	37	63	16.4	9	14°	10°	4.23	With	SWMT15...	2

INCH SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Shell locking bolt 3	Torx bit
TXSW09U1.50...	CSPD-3	H-TB2W	M-1000	-	-	(SR UNF 1/4X3/4 B18.3)	BLDIP10/S7
TXSW09U2.00...	CSPD-3	H-TB2W	M-1000	-	(C0.375X1.125H)	-	BLDIP10/S7
TXSW09U2.50...	CSPD-3	H-TB2W	M-1000	-	(C0.375X1.125H)	-	BLDIP10/S7
TXSW09U3.00...	CSPD-3	H-TB2W	M-1000	-	(C0.500x1.375H)	-	BLDIP10/S7
TXSW09U4.00...	CSPD-3	H-TB2W	M-1000	(TMBA-0.750H)	-	-	BLDIP10/S7
TXSW15U2.00B0.75R03	TS50115I	H-TB2W	M-1000	-	-	SR 5/16-32UNEF_3/8-24UNF	BT20S
TXSW15U2.50B0.75R04	TS50115I	H-TB2W	M-1000	-	(SD-06-A6)	-	BT20S
TXSW15U3.00B1.00R05	TS50115I	H-TB2W	M-1000	-	(C0.500x1.375H)	-	BT20S
TXSW15U4.00B1.50R06	TS50115I	H-TB2W	M-1000	-	(SD-12-99)	-	BT20S
TXSW15U5.00B1.50R07	TS50115I	H-TB2W	M-1000	(TMBA-0.750H)	-	-	BT20M
TXSW15U6.00B2.00R08	TS50115I	H-TB2W	M-1000	-	-	-	BT20M

Recommended clamping torque: CSPD-3 = 1.84 lbs-ft, TS50115I = 3.69 lbs-ft

Reference pages: Inserts → **H063**, Standard cutting conditions → **H064 - H065**

Uc

A
B
C
D
E
F
G
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M

Tungaloy H063



High Feed
Milling

STANDARD CUTTING CONDITIONS

09 type

	ISO	Workpiece material		Hardness	Priority	Insert type	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	
		Carbon steel 1045, 1055, etc.		- 300HB	First choice	ZER	AH3225	MM	328 - 984	0.02 - 0.059	
					Fracture resistance	ZER	AH3135	MM	328 - 984	0.02 - 0.059	
					Wear resistance	UER	AH3225	MM	328 - 984	0.02 - 0.059	
		Alloy steel 4140, etc.		- 300HB	First choice	ZER	AH3225	MM	328 - 656	0.02 - 0.059	
					Fracture resistance	ZER	AH3135	MM	328 - 656	0.02 - 0.059	
					Wear resistance	UER	AH3225	MM	328 - 656	0.02 - 0.059	
			Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	ZER	AH3225	MM	328 - 656	0.02 - 0.047
						Fracture resistance	ZER	AH3135	MM	328 - 656	0.02 - 0.047
						Wear resistance	UER	AH3225	MM	328 - 656	0.02 - 0.047
	Austenitic stainless steel 304SS, etc.			- 200HB	First choice	UER	AH3135	MM	328 - 492	0.02 - 0.047	
					Fracture resistance	UER	AH130	MM	328 - 492	0.02 - 0.047	
					Low cutting force	ZER	AH3135	MM	328 - 492	0.02 - 0.047	
	Precipitation hardening stainless steel 17-4 PH, etc.			28HRC - (H1150)	First choice	UER	AH3135	MM	262 - 492	0.012 - 0.047	
					Fracture resistance	UER	AH130	MM	262 - 492	0.012 - 0.047	
					Low cutting force	ZER	AH3135	MM	262 - 492	0.012 - 0.047	
		40HRC - (H900)		First choice	UER	AH3135	MM	262 - 394	0.012 - 0.031		
				Fracture resistance	UER	AH130	MM	262 - 394	0.012 - 0.031		
				Low cutting force	ZER	AH3135	MM	262 - 394	0.012 - 0.031		
		Gray cast iron Class 25, Class 30, etc.		150 - 250HB	First choice	ZER	AH8015	MM	328 - 984	0.02 - 0.079	
					Fracture resistance	ZER	AH120	MM	328 - 984	0.02 - 0.079	
		Ductile cast iron 80-55-06, etc.		150 - 250HB	First choice	ZER	AH8015	MM	262 - 656	0.02 - 0.079	
Fracture resistance					ZER	AH120	MM	262 - 656	0.02 - 0.079		
		Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	UER	AH130	MM	98 - 197	0.012 - 0.028	
					Wear resistance	UER	AH8015	MM	98 - 197	0.012 - 0.028	
					Low cutting force	ZER	AH130	MM	98 - 197	0.012 - 0.028	
					First choice	UER	AH8015	MM	66 - 164	0.004 - 0.012	
		Heat-resistance alloys Inconel, Hastelloy, etc.		- 40HRC	Fracture resistance	UER	AH130	MM	66 - 164	0.004 - 0.012	
	Low cutting force				ZER	AH8015	MM	66 - 164	0.004 - 0.012		
	First choice				UER	AH8015	MM	262 - 427	0.004 - 0.012		
		Hardened steel	H13, etc.	40 - 50HRC	Fracture resistance	UER	AH130	MM	262 - 427	0.004 - 0.012	
					Low cutting force	ZER	AH8015	MM	262 - 427	0.004 - 0.012	

15 type

Approach angle	ISO	Workpiece material		Hardness	Priority	Insert type	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	
	P	Carbon steel 1045, 1055, etc.		- 300HB	First choice	ZER	AH3135	MM	328 - 984	0.02 - 0.059	
Wear resistance					ZER	AH120	MM	328 - 984	0.02 - 0.059		
Fracture resistance					ZER	AH3135	MT	328 - 984	0.02 - 0.079		
		Alloy steel 4140, etc.	- 300HB	First choice	ZER	AH3135	MM	328 - 656	0.02 - 0.059		
Wear resistance				ZER	AH120	MM	328 - 656	0.02 - 0.059			
Fracture resistance				ZER	AH3135	MT	328 - 656	0.02 - 0.079			
		Prehardened steel NAK80, PX5, etc.	30 - 40HRC	First choice	ZER	AH3135	MM	328 - 656	0.02 - 0.047		
Wear resistance				ZER	AH120	MM	328 - 656	0.02 - 0.047			
Fracture resistance				ZER	AH3135	MT	328 - 656	0.02 - 0.059			
	M	Austenitic stainless steel 304SS, etc.		- 200HB	First choice	UER	AH3135	MM	328 - 492	0.02 - 0.047	
Low cutting force					ZER	AH3135	MM	328 - 492	0.02 - 0.047		
Precipitation hardening stainless steel 17-4 PH, etc.		28HRC - (H1150)	First choice	UER	AH3135	MM	262 - 492	0.012 - 0.047			
			Low cutting force	ZER	AH3135	MM	262 - 492	0.012 - 0.047			
		40HRC - (H900)	First choice	UER	AH3135	MM	262 - 394	0.012 - 0.031			
			Low cutting force	ZER	AH3135	MM	262 - 394	0.012 - 0.031			
Others		K	Gray cast iron Class 25, Class 30, etc.		150 - 250HB	First choice	ZER	AH120	MT	328 - 984	0.02 - 0.079
						Fracture resistance	ZER	AH3135	MT	328 - 984	0.02 - 0.079
						Low cutting force	ZER	AH120	MM	328 - 984	0.02 - 0.059
	Ductile cast iron 80-55-06, etc.		150 - 250HB	First choice	ZER	AH120	MT	262 - 656	0.02 - 0.079		
				Fracture resistance	ZER	AH3135	MT	262 - 656	0.02 - 0.079		
				Low cutting force	ZER	AH120	MM	262 - 656	0.02 - 0.059		
	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	UER	AH3135	MM	98 - 197	0.012 - 0.028		
				Low cutting force	ZER	AH3135	MM	98 - 197	0.012 - 0.028		
				Fracture resistance	ZER	AH3135	MT	98 - 197	0.012 - 0.028		
Heat-resistance alloys Inconel, Hastelloy, etc.	- 40HRC	First choice	UER	AH3135	MM	66 - 164	0.004 - 0.012				
		Wear resistance	ZER	AH120	MM	66 - 164	0.004 - 0.012				
		H	Hardened steel	H13, etc.	40 - 50HRC	First choice	ZER	AH3135	MT	262 - 427	0.004 - 0.012
Wear resistance	ZER					AH120	MT	262 - 427	0.004 - 0.012		
D2, etc.	50 - 60HRC			First choice	ZER	AH120	MT	164 - 230	0.002 - 0.008		



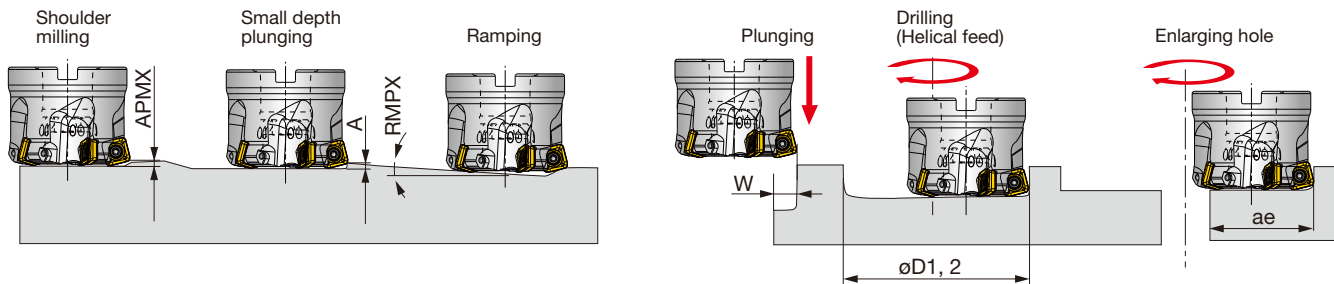
Tool dia.: DC (in), Number of revolutions: n (rpm), Feed speed: V_f (ipm), Number of inserts: CICT

ø1.000", CICT = 3		ø1.250", CICT = 4		ø1.500", CICT = 5		ø2.000", CICT = 7	
n	V_f	n	V_f	n	V_f	n	V_f
2,550	301	1,990	313	1,590	313	1,270	350
$V_c = 660 \text{ sfm}, f_z = 0.040 \text{ ipt}$							
1,910	226	1,490	235	1,190	234	960	265
$V_c = 490 \text{ sfm}, f_z = 0.040 \text{ iptt}$							
1,910	180	1,490	188	1,190	187	960	212
$V_c = 490 \text{ sfm}, f_z = 0.031 \text{ ipt}$							
1,530	144	1,190	150	960	151	760	168
$V_c = 400 \text{ sfm}, f_z = 0.031 \text{ ipt}$							
1,530	144	1,190	150	960	151	760	168
$V_c = 400 \text{ sfm}, f_z = 0.031 \text{ ipt}$							
1,270	90	1,000	94	800	94	640	106
$V_c = 330 \text{ sfm}, f_z = 0.024 \text{ ipt}$							
2,550	361	1,990	376	1,590	376	1,270	420
$V_c = 660 \text{ sfm}, f_z = 0.047 \text{ ipt}$							
1,910	271	1,490	281	1,190	281	1,270	420
$V_c = 490 \text{ sfm}, f_z = 0.047 \text{ ipt}$							
510	30	400	31	320	31	250	35
$V_c = 150 \text{ sfm}, f_z = 0.020 \text{ ipt}$							
380	9	300	9	240	9	190	11
$V_c = 120 \text{ sfm}, f_z = 0.008 \text{ ipt}$							
1,270	30	1,000	31	800	31	640	35
$V_c = 100 \text{ sfm}, f_z = 0.200 \text{ ipt}$							

Tool dia.: DC (in), Number of revolutions: n (rpm), Feed speed: V_f (ipm), Number of inserts: CICT

ø2.000", CICT = 3		ø2.500", CICT = 4		ø3.000", CICT = 5		ø4.000", CICT = 6		ø5.000", CICT = 7		ø6.000", CICT = 8	
n	V_f	n	V_f	n	V_f	n	V_f	n	V_f	n	V_f
1,270	150	1,010	159	800	157	640	151	510	141	400	126
$V_c = 660 \text{ sfm}, f_z = 0.040 \text{ ipt}$											
1,270	180	1,010	191	800	189	640	181	510	169	400	151
$V_c = 660 \text{ sfm}, f_z = 0.047 \text{ ipt}$											
960	113	760	120	600	118	480	113	380	105	300	94
$V_c = 490 \text{ sfm}, f_z = 0.040 \text{ ipt}$											
960	136	760	144	600	142	480	136	380	126	300	113
$V_c = 490 \text{ sfm}, f_z = 0.047 \text{ ipt}$											
960	91	760	96	600	94	480	91	380	84	300	76
$V_c = 490 \text{ sfm}, f_z = 0.031 \text{ ipt}$											
960	113	760	120	600	118	480	113	380	105	300	94
$V_c = 490 \text{ sfm}, f_z = 0.040 \text{ ipt}$											
760	72	610	77	480	76	380	72	310	69	240	61
$V_c = 400 \text{ sfm}, f_z = 0.031 \text{ ipt}$											
760	72	610	77	480	76	380	72	310	69	240	61
$V_c = 400 \text{ sfm}, f_z = 0.031 \text{ ipt}$											
640	45	510	48	400	47	320	45	250	41	200	38
$V_c = 330 \text{ sfm}, f_z = 0.024 \text{ ipt}$											
1,270	180	1,010	191	800	189	640	181	510	169	400	151
$V_c = 660 \text{ sfm}, f_z = 0.047 \text{ ipt}$											
1,270	150	1,010	159	800	157	640	151	510	141	400	126
$V_c = 660 \text{ sfm}, f_z = 0.040 \text{ ipt}$											
960	136	760	144	600	142	480	136	380	126	300	113
$V_c = 490 \text{ sfm}, f_z = 0.047 \text{ ipt}$											
960	113	760	120	600	118	480	113	380	105	300	94
$V_c = 490 \text{ sfm}, f_z = 0.040 \text{ ipt}$											
250	15	200	16	160	16	130	15	100	14	80	13
$V_c = 150 \text{ sfmn}, f_z = 0.020 \text{ ipt}$											
200	5	150	5	120	5	100	5	80	4	60	4
$V_c = 120 \text{ sfm}, f_z = 0.008 \text{ ipt}$											
640	15	510	16	400	16	320	15	250	14	200	13
$V_c = 100 \text{ sfm}, f_z = 0.200 \text{ ipt}$											
380	6	300	6	240	6	190	6	150	5	120	5
$V_c = 60 \text{ sfm}, f_z = 0.120 \text{ ipt}$											

APPLICATION RANGE



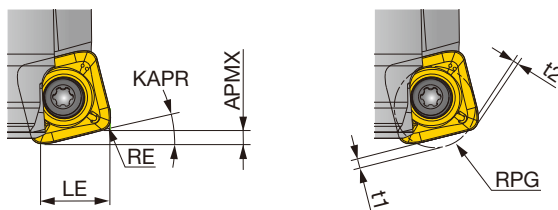
09 type

	Tool dia.	Max. depth of cut		Max. plunging depth		Max. ramping angle		Max. cutting width in plunging		Min. machining dia.		Max. machining dia.		Max. cutting width in enlarging	
		APMX		A		RMPX		W		øD1		øD2		ae	
		SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER
Inch	DCX														
EXSW09U1.00...	1.000	0.059	0.039	0.012	4.6°	5.8°	0.275	0.295	1.370	1.331	1.881	1.881	0.665	0.645	
EXSW09U1.25...	1.250	0.059	0.039	0.012	2.7°	3.2°	0.275	0.295	1.870	1.831	2.381	2.381	0.914	0.894	
TXSW09U1.50B0.50R04	1.500	0.059	0.039	0.012	1.9°	2.2°	0.276	0.295	2.370	2.331	2.882	2.882	1.165	1.146	
TXSW09U2.00B0.75R05	2.000	0.059	0.039	0.012	1.2°	1.4°	0.276	0.295	3.370	3.331	3.882	3.882	1.665	1.646	
TXSW09U2.50B0.75R06	2.500	0.059	0.039	0.012	0.9°	0.9°	0.276	0.295	4.370	4.331	4.882	4.882	2.165	2.146	
TXSW09U2.50B0.75R08	2.500	0.059	0.039	0.012	0.9°	0.9°	0.276	0.295	4.370	4.331	4.882	4.882	2.165	2.146	
TXSW09U3.00B1.00R07	3.000	0.059	0.039	0.012	0.7°	0.8°	0.276	0.295	5.370	5.331	5.882	5.882	2.665	2.646	
TXSW09U3.00B1.00R10	3.000	0.059	0.039	0.012	0.4°	0.6°	0.276	0.295	5.370	5.331	5.882	5.882	2.665	2.646	
TXSW09U4.00B1.50R08	4.000	0.059	0.039	0.012	0.5°	0.6°	0.276	0.295	7.370	7.331	7.882	7.882	3.665	3.646	

15 type

	Tool dia.	Max. depth of cut		Max. plunging depth		Max. ramping angle		Max. cutting width in plunging		Min. machining dia.		Max. machining dia.		Max. cutting width in enlarging	
		APMX		A		RMPX		W		øD1		øD2		ae	
		SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER
Inch	DCX														
TXSW15U2.00B0.75R03	2.000	0.098	0.079	0.028	4.6°	5.8°	0.591	0.630	2.787	2.787	3.772	3.772	1.433	1.393	
TXSW15U2.50B0.75R04	2.500	0.098	0.079	0.028	2.9°	3.2°	0.591	0.630	3.819	3.819	4.803	4.803	1.949	1.909	
TXSW15U3.00B1.00R05	3.000	0.098	0.079	0.028	2.1°	2.2°	0.591	0.630	4.819	4.819	5.803	5.803	2.449	2.409	
TXSW15U4.00B1.50R06	4.000	0.098	0.079	0.028	1.4°	1.4°	0.591	0.630	6.819	6.819	7.803	7.803	3.449	3.409	
TXSW15U5.00B1.50R07	5.000	0.098	0.079	0.028	1°	1°	0.591	0.630	8.819	8.819	9.803	9.803	4.449	4.409	
TXSW15U6.00B2.00R08	6.000	0.098	0.079	0.028	0.8°	0.8°	0.591	0.630	10.819	10.819	11.803	11.803	5.449	5.409	

TOOL GEOMETRY FOR PROGRAMMING



09 type

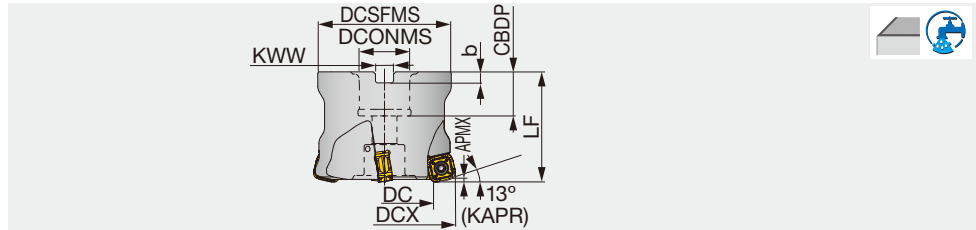
APMX (in)		Actual corner radius RE (in)	LE (in)		KAPR		Programmed corner radius RPG	Uncut amount: t1 (in)		Overcut amount: t2 (in)	
SWMT 09**ZER	SWMT 09**UER		SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER		SWMT 09**ZER	SWMT 09**UER	SWMT 09**ZER	SWMT 09**UER
0.059	0.039	0.039	0.291	0.311	12°	7°	0.025	0.054	0.033	-	-
0.059	0.039	0.039	0.291	0.311	12°	7°	0.050	0.049	0.031	-	-
0.059	0.039	0.039	0.291	0.311	12°	7°	0.075	0.045	0.028	-	0.0002
0.059	0.039	0.039	0.291	0.311	12°	7°	0.100	0.040	0.025	0.001	0.006
0.059	0.039	0.039	0.291	0.311	12°	7°	0.125	0.036	0.022	0.006	0.015

- When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set in SWMT09**ZER insert: RPG = 0.059". If a larger radius is used, overcutting may occur.

15 type

APMX (in)		Actual corner radius RE (in)	LE (in)		KAPR		Programmed corner radius RPG	Uncut amount: t1 (in)		Overcut amount: t2 (in)	
SWMT 15**ZER	SWMT 15**UER		SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER		SWMT 15**ZER	SWMT 15**UER	SWMT 15**ZER	SWMT 15**UER
0.098	0.079	0.079	0.500	0.543	14°	10°	0.138	0.083	0.073	-	-
0.098	0.079	0.079	0.500	0.543	14°	10°	0.157	0.078	0.070	-	-
0.098	0.079	0.079	0.500	0.543	14°	10°	0.178	0.074	0.067	-	0.001
0.098	0.079	0.079	0.500	0.543	14°	10°	0.197	0.070	0.063	0.0003	0.005

- When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set in SWMT15**ZER insert: RPG = 0.177", SWMT**UER insert: RPG = 0.157". If a larger radius is used, overcutting may occur. The above table shows the uncut (t1) and overcut (t2) amounts for the programmed corner radius.



Inch	APMX	DCX	CICT	DC	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert
TXQ12R200U0075A03	0.079	2.000	3	1.362	1.850	1.969	0.750	0.750	0.315	0.197	1.120	With	SQMU12...
TXQ12R200U0075A04	0.079	2.000	4	1.362	1.850	1.969	0.750	0.750	0.315	0.197	1.120	With	SQMU12...
TXQ12R250U0075A04	0.079	2.500	4	1.862	2.323	1.969	0.750	0.750	0.315	0.197	1.760	With	SQMU12...
TXQ12R300U0100A05	0.079	3.000	5	2.362	2.835	2.480	1.000	1.024	0.374	0.236	3.770	With	SQMU12...
TXQ12R400U0150A06	0.079	4.000	6	3.362	3.780	2.480	1.500	1.457	0.626	0.394	5.710	With	SQMU12...
TXQ12R500U0150A07	0.079	5.000	7	4.362	3.780	2.480	1.500	1.457	0.626	0.394	7.010	With	SQMU12...
TXQ12R600U0200AZ08	0.079	6.000	8	5.37	3.937	2.480	2.000	1.496	0.748	0.433	9.700	With	SQMU12...

Metric	APMX	DCX	CICT	DC	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TXQ12R050M22.0E03	2	50	3	33.8	47	50	22	20	10.4	6.3	0.4	With	SQMU12...
TXQ12R050M22.2-03	2	50	3	33.8	47	50	22.225	20	8	5	0.4	With	SQMU12...
TXQ12R052M22.0E03	2	52	3	35.8	49	50	22	20	10.4	6.3	0.5	With	SQMU12...
TXQ12R063M22.0E04	2	63	4	46.8	59	50	22	20	10.4	6.3	0.8	With	SQMU12...
TXQ12R063M22.2-04	2	63	4	46.8	59	50	22.225	20	8	5	0.8	With	SQMU12...
TXQ12R066M27.0E04	2	66	4	49.8	63	50	27	22	12.4	7	0.9	With	SQMU12...
TXQ12R080M27.0E05	2	80	5	63.8	76	63	27	22	12.4	7	1.6	With	SQMU12...
TXQ12R080M31.7-05	2	80	5	63.8	76	63	31.75	32	12.7	8	1.5	With	SQMU12...
TXQ12R100M31.7-06	2	100	6	83.8	96	63	31.75	32	12.7	8	2.6	With	SQMU12...
TXQ12R100M32.0E06	2	100	6	83.8	96	63	32	25	14.4	8	3	With	SQMU12...
TXQ12R125M38.1-07	2	125	7	108.8	98	63	38.1	44	15.9	10	3.3	With	SQMU12...
TXQ12R125M40.0E07	2	125	7	108.8	98	63	40	32	16.4	9	3.2	With	SQMU12...

INCH SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit	Shell locking bolt (Optional parts)
TXQ12R**U0075A...	CSPB-4	H-TBS	M-1000	BLDIP15/S7	(C0.375X1.125H)
TXQ12R300U0100A05	CSPB-4	H-TBS	M-1000	BLDIP15/S7	(C0.500X1.375H)
TXQ12R**U0150A...	CSPB-4	H-TBS	M-1000	BLDIP15/S7	(TMBA-0.750H)
TXQ12R600U0200AZ08	CSPB-4	H-TBS	M-1000	BLDIP15/S7	-

Recommended clamping torque: 2.58 lbs·ft

METRIC SPARE PARTS

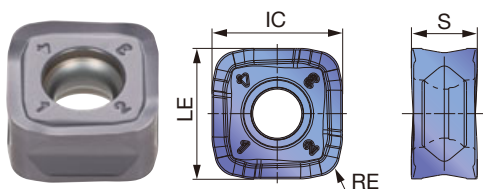
Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TXQ12R050, 052M22.0...	CSPB-4	H-TBS	M-1000	-	FSHM10-40H	BLDIP15/S7
TXQ12R063M...	CSPB-4	H-TBS	M-1000	-	CM10X30H	BLDIP15/S7
TXQ12R066, 080M27.0...	CSPB-4	H-TBS	M-1000	-	CM12X30H	BLDIP15/S7
TXQ12R080, 100M31.7...	CSPB-4	H-TBS	M-1000	-	CM16X40H	BLDIP15/S7
TXQ12R100M32.0E06	CSPB-4	H-TBS	M-1000	-	CM16X40H	BLDIP15/S7
TXQ12R125M...	CSPB-4	H-TBS	M-1000	TMBA-M20H	-	BLDIP15/S7

Recommended clamping torque: 3.5 N·m



INSERT

SQMU-MJ



P	Steel	☆	★	☆
M	Stainless		★	☆
K	Cast iron	★		☆
N	Non-ferrous			
S	Superalloys	★	☆	★
H	Hard materials		★	

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated				LE	S	IC
			AH120	AH130	AH725	T3130			
SQMU1206ZSR-MJ	0.079	0.079	●	●	●	●	0.461	0.236	0.461

● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	Priority	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Carbon steels 1045, 1055, etc.	- 300HB	First choice	AH725	330 - 980	0.020 - 0.080
			Wear resistance	T3130	330 - 980	0.020 - 0.080
			Fracture resistance	AH130	330 - 980	0.020 - 0.080
	Alloy steels 4140, etc.	- 300HB	First choice	AH725	330 - 660	0.020 - 0.060
			Wear resistance	T3130	330 - 660	0.020 - 0.060
			Fracture resistance	AH130	330 - 660	0.020 - 0.060
	Prehardened steels NAK80, PX5, etc.	30 - 40HRC	-	AH725	330 - 660	0.020 - 0.040
M	Stainless steels 304, 316, etc.	- 200HB	-	AH130	330 - 500	0.012 - 0.030
K	Gray cast irons No.25, No.30, etc.	150 - 250HB	-	AH120	100 - 300	0.020 - 0.080
	Ductile cast irons 60-40-18, 65-45-12, etc.	150 - 250HB	-	AH120	260 - 660	0.020 - 0.080
S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	-	AH725	100 - 200	0.012 - 0.028
H	Hardened steels H13, D2, etc.	40 - 50HRC	-	AH725	260 - 43	0.004 - 0.012
		50 - 60HRC	-	AH725	160 - 230	0.001 - 0.003

- Slot or pocket milling is not recommended, since chip re-cutting easily occurs.
- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.

- Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

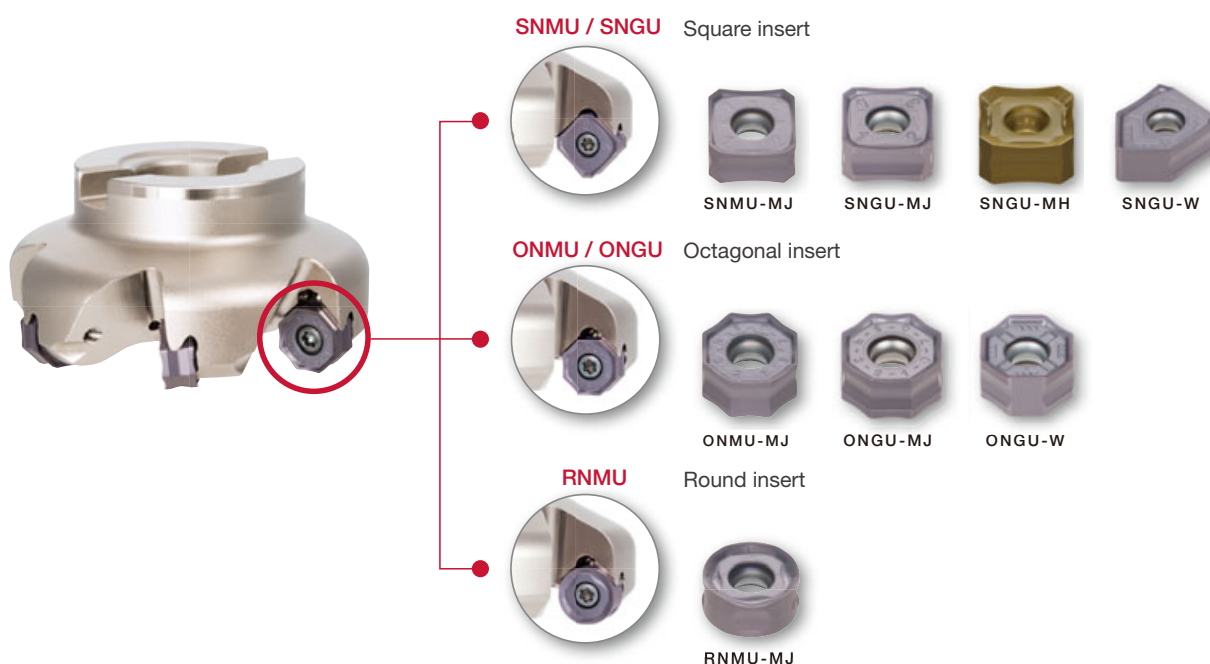
Tool dia: DCX (in), Number of revolution: <i>n</i> (rpm), Feed speed: <i>Vf</i> (ipm), Max. depth of cut: APMX = 0.079"									
ø2.000"		ø2.500"		ø3.000"		ø4.000"		ø5.000"	
<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>	<i>n</i>	<i>Vf</i>
1,260	227	1,010	242	790	237	630	227	500	210
Vc = 660 sfm, fz = 0.060 ipt									
950	114	750	120	590	118	470	113	380	106
Vc = 500 sfm, fz = 0.040 ipt									
950	86	750	90	590	89	470	85	380	80
Vc = 490 sfm, fz = 0.030 ipt									
760	46	600	48	470	47	380	46	300	42
Vc = 400 sfm, fz = 0.020 ipt									
1,260	227	1,010	242	790	237	630	227	500	210
Vc = 660 sfm, fz = 0.060 ipt									
950	171	750	180	590	177	470	170	380	160
Vc = 500 sfm, fz = 0.060 ipt									
250	15	200	16	150	15	120	14	100	14
Vc = 130 sfm, fz = 0.020 ipt									
630	15	500	16	390	16	310	15	250	14
Vc = 330 sfm, fz = 0.008 ipt									
380	2	300	2	240	2	190	2	150	2
Vc = 200 sfm, fz = 0.002 ipt									



Brings a top performance in every operation: from high feed milling, scale removing, finish milling ... to stainless steel milling

Versatility

3 types of double sided inserts fit in the same pocket



High efficiency with close pitch cutter/Extra-close pitch type available in addition to regular close pitch type

Tool line-up includes extra close pitch cutter maximizing efficiency in cast iron machining.



Standard pitch



Close pitch



Extra-close pitch

Reference pages: **H095 - H098**



Super high density PCD cutter for efficient finishing of aluminum

■ Super high density cutter



Super high density design
High speed cutting more than $V_c = 9843$ sfm is possible.

Cutter diameter (in)	Max num. of teeth	Max. rotation number (rpm)	Cutter weight (lb)
2	8	20,000	1.92
2.5	10	19,000	1.34
3	16	17,000	2.56
4	22	15,000	4.30
5	26	14,000	8.03
6	34	12,000	10.76

■ CamAdjust - super simple adjusting mechanism

Clamping insert

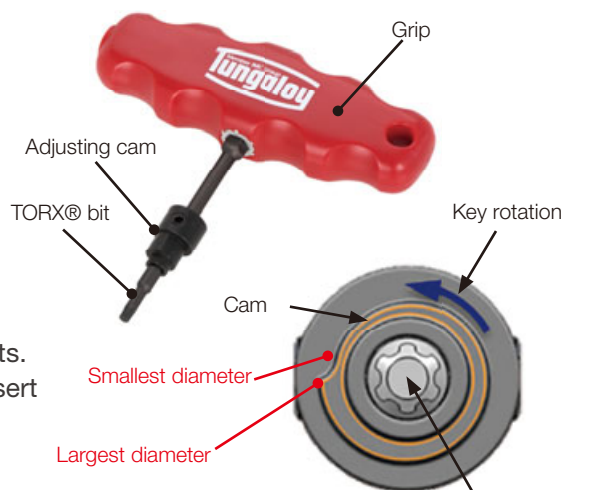


Adjusting axial runout



The same key is used for mounting and adjusting the inserts.
The key wrench is operated in a single direction making insert adjustment easy on the pre-setter.

Special key wrench with adjusting cam



Insert's axial runout is adjusted with the eccentric cam profile.

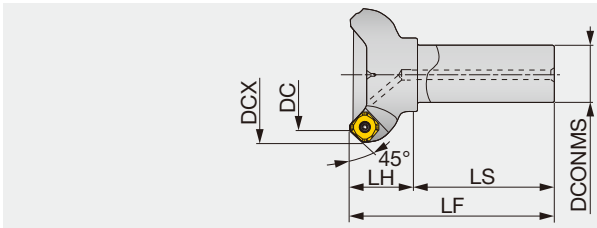


TUNG MILL

EAW13

Face endmill, shank type, with screw clamp system

GAMP=+17°~+20°,GAMF=-16°~-11°



Right hand (R) shown.

Metric	DC	DCX	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EAW13R025M25.0-02	25	39	2	25	80	35	115	0.4	With	SW*T13...
EAW13R032M32.0-02	32	46	2	32	80	35	115	0.7	With	SW*T13...
EAW13R040M32.0-03	40	54	3	32	80	35	115	0.8	With	SW*T13...
EAW13R050M32.0-03	50	63	3	32	80	40	120	1	With	SW*T13...
EAW13R050M32.0-04	50	63	4	32	80	40	120	0.9	With	SW*T13...
EAW13R063M32.0-04	63	76	4	32	80	40	120	1.1	With	SW*T13...
EAW13R063M32.0-05	63	76	5	32	80	40	120	1.1	With	SW*T13...
EAW13R080M32.0-04	80	94	4	32	80	40	120	1.5	With	SW*T13...
EAW13R080M32.0-06	80	94	6	32	80	40	120	1.4	With	SW*T13...

SPARE PARTS

Designation	Clamping screw	Lubricant	Shim screw	Shim	Wrench	Wrench 1
EAW13R025 - 040...	CSPB-3.5	M-1000	-	-	IP-15D	-
EAW13R050 - 080...	CSPB-3.5	M-1000	DTS5-3.5SS	FSSA1102	IP-15D	P-3.5

Recommended clamping torque: 3.5 N·m

Approach angle

7°-25°

41°-45°

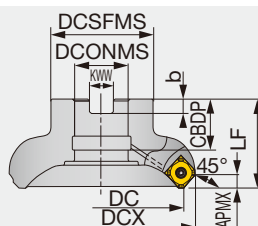
60°-70°

85-88°

90°

Others

Reference pages: Inserts → **H075**

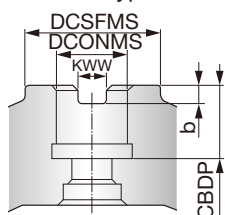


Right hand (R) shown.

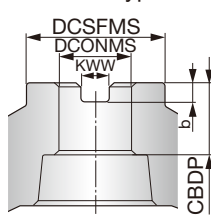
Inch	DC	DCX	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Insert	Arbor type
TAW13R200U0075A03	2.000	3	2.510	1.693	1.575	0.750	0.750	0.315	0.197	0.880	With	SW*T13...	A
TAW13R200U0075A04	2.000	4	2.510	1.693	1.575	0.750	0.750	0.315	0.197	0.880	With	SW*T13...	A
TAW13R200U0075A05	2.000	5	2.510	1.693	1.575	0.750	0.750	0.315	0.197	0.880	With	SW*T13...	A
TAW13R300U0100A04	3.000	4	3.510	1.969	1.969	1.000	1.020	0.374	0.236	1.980	With	SW*T13...	A
TAW13R300U0100A06	3.000	6	3.510	1.969	1.969	1.000	1.020	0.374	0.236	1.980	With	SW*T13...	A
TAW13R300U0100A08	3.000	8	3.510	1.969	1.969	1.000	1.020	0.374	0.236	1.980	With	SW*T13...	A
TAW13R400U0150A05	4.000	5	4.520	3.150	1.969	1.500	1.378	0.626	0.394	3.750	With	SW*T13...	B
TAW13R400U0150A07	4.000	7	4.520	3.150	1.969	1.500	1.378	0.626	0.394	3.530	With	SW*T13...	B
TAW13R400U0150A10	4.000	10	4.520	3.150	1.969	1.500	1.378	0.626	0.394	3.750	With	SW*T13...	B
TAW13R500U0150A06	5.000	6	5.510	3.150	2.480	1.500	1.457	0.626	0.394	6.170	With	SW*T13...	B
TAW13R500U0150A08	5.000	8	5.510	3.150	2.480	1.500	1.457	0.626	0.394	5.950	With	SW*T13...	B
TAW13R500U0150A12	5.000	12	5.510	3.150	2.480	1.500	1.457	0.626	0.394	6.170	With	SW*T13...	B
TAW13R600U0200A07	6.000	7	6.510	3.937	2.480	2.000	1.500	0.748	0.433	9.040	Without	SW*T13...	B
TAW13R600U0200A10	6.000	10	6.510	3.937	2.480	2.000	1.500	0.748	0.433	8.600	Without	SW*T13...	B
TAW13R600U0200A16	6.000	16	6.510	3.937	2.480	2.000	1.500	0.748	0.433	9.040	Without	SW*T13...	B

Arbor type

Arbor type A



Arbor type B



SPARE PARTS

Designation	Clamping screw	Lubricant	Shim screw	Shell locking bolt	Shim	Wrench	Wrench 1
TAW13R200...	CSPB-3.5	M-1000	DTS5-3.5SS	C0.375X1.125H	FSSA1102	IP-15D	P-3.5
TAW13R300...	CSPB-3.5	M-1000	DTS5-3.5SS	C0.500X1.375H	FSSA1102	IP-15D	P-3.5
TAW13R400, 500...	CSPB-3.5	M-1000	DTS5-3.5SS	TMBA-0.750H	FSSA1102	IP-15D	P-3.5
TAW13R600...	CSPB-3.5	M-1000	DTS5-3.5SS	-	FSSA1102	IP-15D	P-3.5

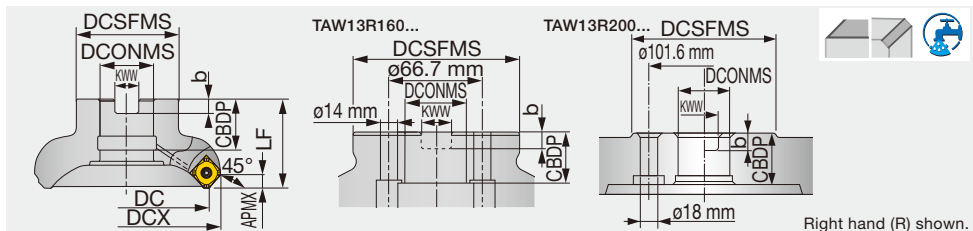
Recommended clamping torque: 2.58 lbs·ft



TUNG MILL

TAW13

Face mill, with screw clamp system



	Metric	DC	DCX	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
	TAW13R050M22.0-03	50	63	3	41	40	22	20	10	6	0.4	With	SW*T13...
	TAW13R050M22.0-04	50	63	4	41	40	22	20	10	6	0.4	With	SW*T13...
	TAW13R050M22.0E04	50	63	4	41	40	22	20	10.4	6.3	0.4	With	SW*T13...
	TAW13R050M22.0E05	50	63	5	41	40	22	20	10.4	6.3	0.4	With	SW*T13...
	TAW13R063M22.0-04	63	76	4	41	40	22	20	10	6	0.5	With	SW*T13...
	TAW13R063M22.0-05	63	76	5	41	40	22	20	10	6	0.6	With	SW*T13...
	TAW13R063M22.0E05	63	76	5	41	40	22	20	10.4	6.3	0.6	With	SW*T13...
	TAW13R063M22.0E06	63	76	6	41	40	22	20	10.4	6.3	0.6	With	SW*T13...
	TAW13R080M25.4-04	80	94	4	50	50	25.4	26	9.5	6	1	With	SW*T13...
	TAW13R080M25.4-06	80	94	6	50	50	25.4	26	9.5	6	1	With	SW*T13...
	TAW13R080M27.0E06	80	94	6	50	50	27	22	12.4	7	1	With	SW*T13...
	TAW13R080M27.0E08	80	94	8	50	50	27	22	12.4	7	1	With	SW*T13...
	TAW13R100M31.7-05	100	114	5	60	50	31.75	32	12.7	8	1.5	With	SW*T13...
	TAW13R100M31.7-07	100	114	7	60	50	31.75	32	12.7	8	1.5	With	SW*T13...
	TAW13R100M32.0E07	100	114	7	60	50	32	28.5	14.4	8	1.5	With	SW*T13...
	TAW13R100M32.0E10	100	114	10	60	50	32	28.5	14.4	8	1.5	With	SW*T13...
	TAW13R125M38.1-06	125	139	6	80	63	38.1	38	15.9	10	2.8	With	SW*T13...
	TAW13R125M38.1-08	125	139	8	80	63	38.1	38	15.9	10	2.7	With	SW*T13...
	TAW13R125M40.0E08	125	139	8	80	63	40	32	16.4	9	2.7	With	SW*T13...
	TAW13R125M40.0E12	125	139	12	80	63	40	32	16.4	9	3	With	SW*T13...
	TAW13R160M40.0E10	160	174	10	100	63	40	29	16.4	9	4.4	Without	SW*T13...
	TAW13R160M40.0E16	160	174	16	100	63	40	29	16.4	9	4.4	Without	SW*T13...
	TAW13R160M50.8-07	160	174	7	100	63	50.8	40	19	11	4.4	Without	SW*T13...
	TAW13R160M50.8-10	160	174	10	100	63	50.8	40	19	11	4.4	Without	SW*T13...
	TAW13R200M47.6-08	200	213	8	130	63	47.625	38	25.4	14	8	Without	SW*T13...

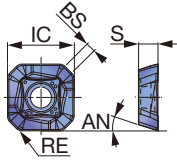
SPARE PARTS

Designation	Clamping screw	Lubricant	Shim screw	Shell locking bolt 1	Shell locking bolt 2	Shim	Wrench	Wrench 1
TAW13R050 - 063...	CSPB-3.5	M-1000	DTSS-3.5SS	-	CM10X30H	FSSA1102	IP-15D	P-3.5
TAW13R080...	CSPB-3.5	M-1000	DTSS-3.5SS	-	CM12X30H	FSSA1102	IP-15D	P-3.5
TAW13R100...	CSPB-3.5	M-1000	DTSS-3.5SS	TMBA-M16H	-	FSSA1102	IP-15D	P-3.5
TAW13R125...	CSPB-3.5	M-1000	DTSS-3.5SS	TMBA-M20H	-	FSSA1102	IP-15D	P-3.5
TAW13R160..., TAW13R200...	CSPB-3.5	M-1000	DTSS-3.5SS	-	-	FSSA1102	IP-15D	P-3.5

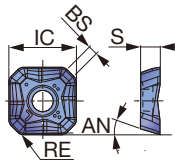
Recommended clamping torque: 3.5 N·m

INSERT

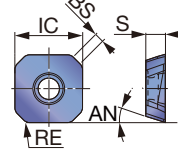
SWMT13T3-MJ



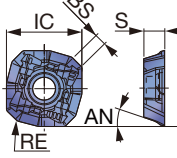
SWMT13T3-ML



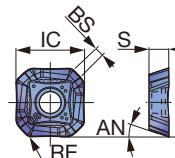
SWMW13T3 (Flat)



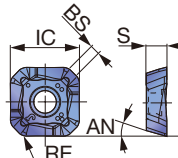
SWMT13T3-HJ



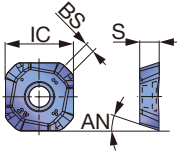
SWMT13T3-MS



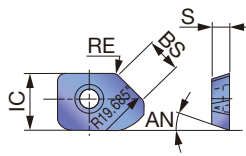
SWGT13T3-MJ



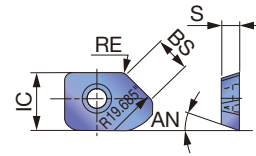
SWGT13T3-AJ



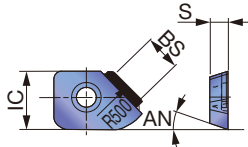
WWCW13T3AFER-WS



WWCW13T3AFFR-WS



WWCW13T3AFFR-WD



P	Steel
M	Stainless
K	Cast iron
N	Non-ferrous
S	Superalloys
H	Hard materials

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated							Cermet	Uncoated	PCD	IC	S	AN	BS
			AH120	AH130	AH140	AH3135	GH110	T1115	T1215	T3130	T3225	DS1100				
SWMT13T3AFPR-MJ	0.059	0.157	●	●	●	●	●	●	●	●	●	●	0.547	0.157	18.5°	0.079
SWMT13T3AFER-ML	0.059	0.098	●	●	●	●	●	●	●	●	●	●	0.547	0.157	18.5°	0.079
SWMW13T3AFTR	0.059	0.197	●	●	●	●	●	●	●	●	●	●	0.547	0.157	18.5°	0.079
SWMT13T3AFPR-HJ	0.059	0.079	●	●	●	●	●	●	●	●	●	●	0.579	0.157	18.5°	0.091
SWMT13T3AFPR-MS	0.039	0.157	●	●	●	●	●	●	●	●	●	●	0.555	0.157	18.5°	0.079
SWGT13T3AFPR-MJ	0.059	0.157	●	●	●	●	●	●	●	●	●	●	0.547	0.157	18.5°	0.079
SWGT13T3AFFR-AJ	-	0.157	●	●	●	●	●	●	●	●	●	●	0.555	0.157	18.5°	0.079
WWCW13T3AFER-WS	0.059	-	●	●	●	●	●	●	●	●	●	●	0.504	0.157	18.5°	0.307
WWCW13T3AFFR-WS	0.059	-	●	●	●	●	●	●	●	●	●	●	0.504	0.157	18.5°	0.307
WWCW13T3AFFR-WD	-	-	●	●	●	●	●	●	●	●	●	●	0.504	0.157	18.5°	0.307

● : Line up

DX140 : Packing Quantity = 1 pc.

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



EAW13

e-catalog

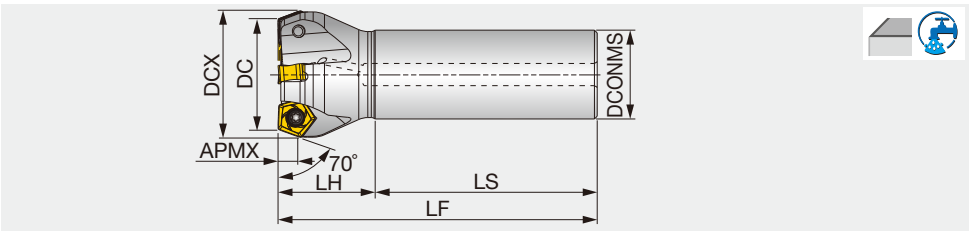


TAW13



Face endmill, shank type, with screw clamp system

GAMP=-6°,GAMF=-2°~-10°



Inch	APMX	DC	DCX	CICT	DCONMS	LS	LH	LF	WT (lb)	Air hole	Insert
EEN09R125U0125W03	0.252	1.250	1.49	3	1.250	2.280	1.500	3.780	0.700	With	PN*U0905...
EEN09R150U0125W04	0.252	1.500	1.74	4	1.250	2.280	2.000	4.280	0.700	With	PN*U0905...

Metric	APMX	DC	DCX	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EEN09R032M32.0-03	6.4	32	38	3	32	80	35	115	0.7	With	PN*U0905...
EEN09R040M32.0-04	6.4	40	46	4	32	80	35	115	0.7	With	PN*U0905...
EEN09R050M32.0-04	6.4	50	56	4	32	80	40	120	0.9	With	PN*U0905...
EEN09R063M32.0-06	6.4	63	69	6	32	80	40	120	1	With	PN*U0905...
EEN09R080M32.0-07	6.4	80	86	7	32	80	40	120	1.3	With	PN*U0905...

SPARE PARTS



Designation	Clamping screw	Lubricant	Wrench
EEN09...	CSTR-4L100	M-1000	T-15D

Recommended clamping torque: 2.58 lbs·ft, 3.5 N·m

Approach angle

7°-25°

41°-45°

60°-70°

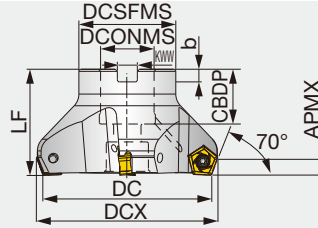
85-88°

90°

Others



Arbor type A

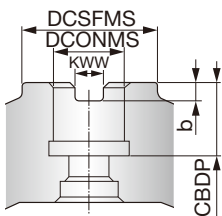


Right hand (R) shown.

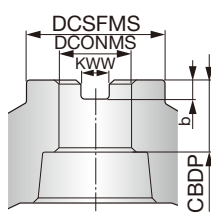
Inch	APMX	DC	CICT	DCX	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TEN09R200U0075A03	0.250	2.000	3	2.240	1.690	1.570	0.750	0.750	0.310	0.200	0.9	With	PN*U0905...	A
TEN09R200U0075A04	0.250	2.000	4	2.240	1.690	1.570	0.750	0.750	0.310	0.200	0.9	With	PN*U0905...	A
TEN09R200U0075A06	0.250	2.000	6	2.240	1.690	1.570	0.750	0.750	0.310	0.200	0.9	With	PN*U0905...	A
TEN09R250U0075A04	0.250	2.500	4	2.740	1.690	1.570	0.750	0.750	0.310	0.200	1.3	With	PN*U0905...	A
TEN09R250U0075A06	0.250	2.500	6	2.740	1.690	1.570	0.750	0.750	0.310	0.200	1.3	With	PN*U0905...	A
TEN09R250U0075A08	0.250	2.500	8	2.740	1.690	1.570	0.750	0.750	0.310	0.200	1.3	With	PN*U0905...	A
TEN09R300U0100A04	0.250	3.000	4	3.240	1.970	1.970	1.000	1.020	0.370	0.240	2.0	With	PN*U0905...	A
TEN09R300U0100A07	0.250	3.000	7	3.240	1.970	1.970	1.000	1.020	0.370	0.240	2.0	With	PN*U0905...	A
TEN09R300U0100A10	0.250	3.000	10	3.240	1.969	1.970	1.000	1.020	0.370	0.240	2.2	With	PN*U0905...	A
TEN09R400U0150A05	0.250	4.000	5	4.240	3.150	1.970	1.500	1.380	0.630	0.390	3.5	With	PN*U0905...	B
TEN09R400U0150A08	0.250	4.000	8	4.240	3.150	1.970	1.500	1.380	0.630	0.390	3.7	With	PN*U0905...	B
TEN09R400U0150A12	0.250	4.000	12	4.240	3.150	1.970	1.500	1.380	0.630	0.390	4.0	With	PN*U0905...	B
TEN09R500U0150A06	0.250	5.000	6	5.240	3.150	2.480	1.500	1.460	0.630	0.390	6.0	With	PN*U0905...	B
TEN09R500U0150A10	0.250	5.000	10	5.240	3.150	2.480	1.500	1.460	0.630	0.390	6.4	With	PN*U0905...	B
TEN09R500U0150A16	0.250	5.000	16	5.240	3.150	2.480	1.500	1.460	0.630	0.390	6.8	With	PN*U0905...	B
TEN09R600U0200A07	0.250	6.000	7	6.240	3.940	2.480	2.000	1.500	0.750	0.430	8.6	Without	PN*U0905...	B
TEN09R600U0200A12	0.250	6.000	12	6.240	3.940	2.480	2.000	1.500	0.750	0.430	9.3	Without	PN*U0905...	B
TEN09R600U0200A20	0.250	6.000	20	6.240	3.940	2.480	2.000	1.500	0.750	0.430	10.0	Without	PN*U0905...	B
TEN09R800U0250A14	0.252	8.000	14	8.230	5.120	2.480	2.500	1.500	1.000	0.550	14.0	Without	PN*U0905...	B
TEN09R1000U0250A16	0.252	10.000	16	10.230	5.120	2.480	2.500	1.500	1.000	0.550	30.4	Without	PN*U0905...	B

Arbor type

Arbor type A



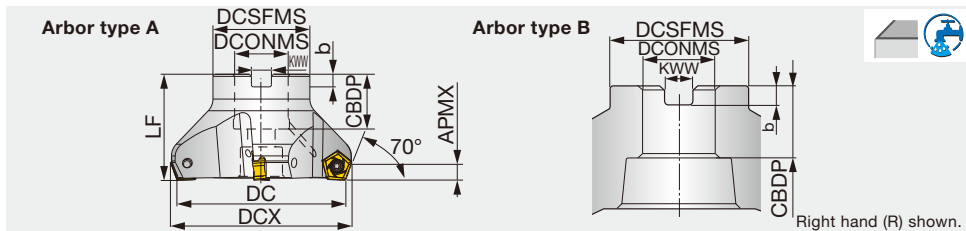
Arbor type B



SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt (Optional parts)	Torx bit
TEN09R200, 250...	CSTR-4L100	H-TBS	M-1000	(C0.375X1.125H)	BT15S
TEN09R300...	CSTR-4L100	H-TBS	M-1000	(C0.500X1.375H)	BT15S
TEN09R400, 500...	CSTR-4L100	H-TBS	M-1000	(TMBA-0.750H)	BT15S
TEN09R600, 800, 1000...	CSTR-4L100	H-TBS	M-1000	-	BT15M

Recommended clamping torque: 2.58 lbs·ft

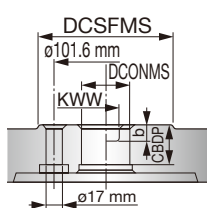


Metric	APMX	DC	CICT	DCX	DCSFMS	LF	DCONMS	CDBP	KWW	b	WT(kg)	Air hole	Insert	Arbor type
TEN09R050M22.0-03	6.4	50	3	56	41	40	22	20	10	6	0.3	With	PN*U0905...	A
TEN09R050M22.0-04	6.4	50	4	56	41	40	22	20	10	6	0.3	With	PN*U0905...	A
TEN09R050M22.0-06	6.4	50	6	56	41	40	22	20	10	6	0.3	With	PN*U0905...	A
TEN09R050M22.0E04	6.4	50	4	56	41	40	22	20	10.4	6.3	0.3	With	PN*U0905...	A
TEN09R050M22.0E06	6.4	50	6	56	41	40	22	20	10.4	6.3	0.3	With	PN*U0905...	A
TEN09R063M22.0-04	6.4	63	4	69	41	40	22	20	10	6	0.5	With	PN*U0905...	A
TEN09R063M22.0-06	6.4	63	6	69	41	40	22	20	10	6	0.5	With	PN*U0905...	A
TEN09R063M22.0-08	6.4	63	8	69	41	40	22	20	10	6	0.5	With	PN*U0905...	A
TEN09R063M22.0E06	6.4	63	6	69	41	40	22	20	10.4	6.3	0.5	With	PN*U0905...	A
TEN09R063M22.0E08	6.4	63	8	69	41	40	22	20	10.4	6.3	0.5	With	PN*U0905...	A
TEN09R080M25.4-04	6.4	80	4	86	46	50	25.4	26	9.5	6	0.9	With	PN*U0905...	A
TEN09R080M25.4-07	6.4	80	7	86	46	50	25.4	26	9.5	6	0.9	With	PN*U0905...	A
TEN09R080M25.4-10	6.4	80	10	86	46	50	25.4	26	9.5	6	0.9	With	PN*U0905...	A
TEN09R080M27.0E07	6.4	80	7	86	50	50	27	22	12.4	7	0.9	With	PN*U0905...	A
TEN09R080M27.0E10	6.4	80	10	86	50	50	27	22	12.4	7	1	With	PN*U0905...	A
TEN09R100M31.7-05	6.4	100	5	106	60	50	31.75	32	12.7	8	1.3	With	PN*U0905...	B
TEN09R/L100M31.7-08*	6.4	100	8	106	60	50	31.75	32	12.7	8	1.3	With	PN*U0905...	B
TEN09R100M31.7-12	6.4	100	12	106	60	50	31.75	32	12.7	8	1.4	With	PN*U0905...	B
TEN09R/L100M32.0E08*	6.4	100	8	106	60	50	32	28.5	14.4	8	1.3	With	PN*U0905...	B
TEN09R100M32.0E12	6.4	100	12	106	60	50	32	28.5	14.4	8	1.4	With	PN*U0905...	B
TEN09R125M38.1-06	6.4	125	6	131	80	63	38.1	38	15.9	10	2.6	With	PN*U0905...	B
TEN09R/L125M38.1-10*	6.4	125	10	131	80	63	38.1	38	15.9	10	2.7	With	PN*U0905...	B
TEN09R125M38.1-16	6.4	125	16	131	80	63	38.1	43	15.9	10	2.9	With	PN*U0905...	B
TEN09R/L125M40.0E10*	6.4	125	10	131	71	63	40	32	16.4	9	2.3	With	PN*U0905...	B
TEN09R125M40.0E16	6.4	125	16	131	71	63	40	32	16.4	9	2.5	With	PN*U0905...	B
TEN09R160M50.8-07	6.4	160	7	166	100	63	50.8	46	19	11	4.4	Without	PN*U0905...	B
TEN09R/L160M40.0E12*	6.4	160	12	166	100	63	40	29	16.4	9	4	Without	PN*U0905...	B
TEN09R160M40.0E20	6.4	160	20	166	100	63	40	29	16.4	9	4.3	Without	PN*U0905...	B
TEN09R/L160M50.8-12*	6.4	160	12	166	100	63	50.8	46	19	11	4.6	Without	PN*U0905...	B
TEN09R160M50.8-20	6.4	160	20	166	100	63	50.8	46	19	11	4.9	Without	PN*U0905...	B
TEN09R200M47.6-10	6.4	200	10	206	130	63	47.625	38	25.4	14	6.5	Without	PN*U0905...	C
TEN09R200M60.0E14	6.4	200	14	206	130	63	60	38	25.7	14	6.34	Without	PN*U0905...	C
TEN09R250M47.6-12	6.4	250	12	256	130	63	47.625	38	25.4	14	12.94	Without	PN*U0905...	C
TEN09R250M60.0E16	6.4	250	16	256	130	63	60	38	25.7	14	13.46	Without	PN*U0905...	C
TEN09R315M47.6-14	6.4	315	14	321	220	63	47.625	38	25.4	14	17.9	Without	PN*U0905...	D

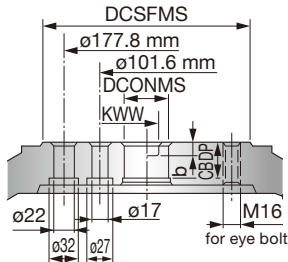
*Please use neutral hand inserts for TEN09L (left hand cutter).

Arbor type

Arbor type C



Arbor type D



SPARE PARTS

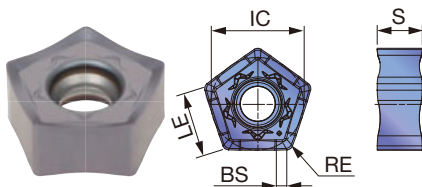
Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TEN09R050 - 063...	CSTR-4L100	H-TBS	M-1000	-	CM10X30H	BT15S
TEN09R080...	CSTR-4L100	H-TBS	M-1000	-	CM12X30H	BT15S
TEN09R/L100...	CSTR-4L100	H-TBS	M-1000	TMBA-M16H	-	BT15S
TEN09R125...06, TEN09R/L125M...10	CSTR-4L100	H-TBS	M-1000	TMBA-M20H	-	BT15M
TEN09R125M...16	CSTR-4L100	H-TBS	M-1000	TMBA-M20H	-	BT15S
TEN09R160M...07, TEN09R/L160M...12, TEN09R200M..., TEN09R250M...	CSTR-4L100	H-TBS	M-1000	-	-	BT15M
TEN09R160M...20	CSTR-4L100	H-TBS	M-1000	-	-	BT15S
TEN09R315M...	CSTR-4L100	H-TBS	M-1000	-	-	BT15L

Recommended clamping torque: 3.5 N·m

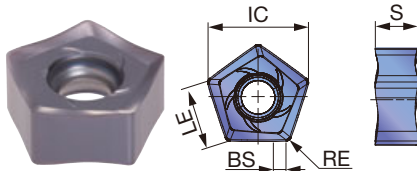
Reference pages: Inserts → **H079**, Standard cutting conditions → **H080**

■ INSERT

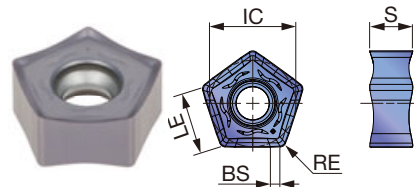
PN*U0905GNEN-MJ (Neutral)



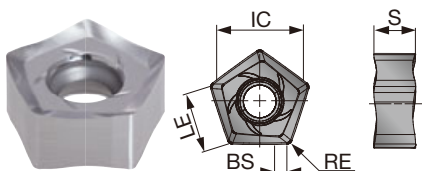
PNCU0905GNER-MJ (Right hand)



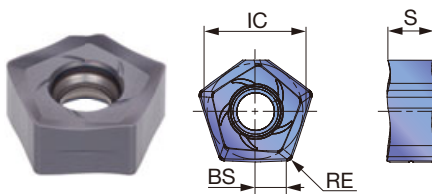
PNCU0905-ML (Neutral)



PNCU0905-AJ (Right hand)



PNCU0905-W (Right hand)



P	Steel	★☆☆★★☆☆☆
M	Stainless	★★★★☆☆☆☆
K	Cast iron	☆☆★★★☆☆
N	Non-ferrous	☆☆☆☆☆☆☆☆
S	Superalloys	☆☆☆☆☆☆☆☆
H	Hard materials	★☆☆☆☆☆☆

Designation	RE	APMX	Coated							Cermet	Uncoated					LE	S	IC	BS		
			AH3225	AH8015	AH3135	AH120	AH140	AH725	T1215	T1115	T3225	T3130	NS740	TH10							
PNMU0905GNEN-MJ	0.031	0.252	●	●	●	●			●		●							0.350	0.236	0.480	0.055
PNCU0905GNEN-MJ	0.031	0.252	●	●	●	●					●		●					0.350	0.236	0.480	0.055
PNCU0905GNER-MJ	0.031	0.252				●	●	●		●		●						0.350	0.233	0.480	0.055
PNCU0905GNEN-ML	0.031	0.252	●	●	●													0.350	0.235	0.480	0.055
PNCU0905GNFR-AJ	0.031	0.252														●		0.350	0.246	0.480	0.055
PNCU0905GNER-W	0.031	0.079						●										-	0.233	0.480	0.150

●: Line up



STANDARD CUTTING CONDITIONS

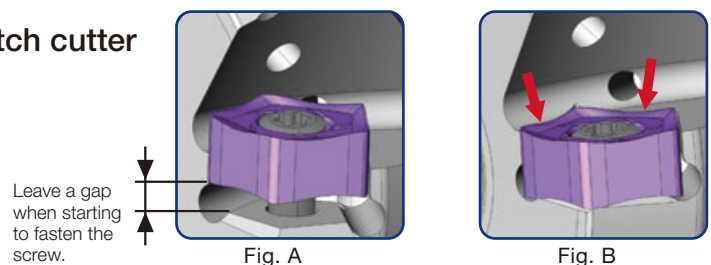
ISO	Workpiece materials	Hardness	Selection criteria	Recommended grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steels 1015, etc.	200 - 300 HB	First choice	AH3225	MJ	330 - 820	0.004 - 0.016
		200 - 300 HB	Low cutting force	AH3225	ML	330 - 820	0.004 - 0.012
		200 - 300 HB	Wear resistance	T3225	MJ	660 - 1150	0.004 - 0.012
		200 - 300 HB	Surface quality	NS740	MJ	330 - 820	0.004 - 0.012
	High carbon steels, alloyed steels 1045, etc.	150 - 300 HB	First choice	AH3225	MJ	330 - 820	0.004 - 0.014
		150 - 300 HB	Low cutting force	AH3225	ML	330 - 820	0.004 - 0.012
		150 - 300 HB	Wear resistance	T3225	MJ	59 - 990	0.004 - 0.012
		150 - 300 HB	Surface quality	NS740	MJ	330 - 820	0.004 - 0.012
	Prehardened steels NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3225	MJ	330 - 660	0.004 - 0.012
		30 - 40 HRC	Low cutting force	AH3225	ML	330 - 660	0.004 - 0.010
		30 - 40 HRC	Wear resistance	T3225	MJ	490 - 820	0.004 - 0.010
M	Stainless steel S30400, etc.	- 200 HB	First choice	AH3135	ML	330 - 660	0.004 - 0.012
		- 200 HB	Fracture resistance	AH3135	MJ	330 - 660	0.004 - 0.014
		- 200 HB	Wear resistance	T3225	MJ	330 - 820	0.004 - 0.012
K	Gray cast irons No.250B, No.300B, etc.	150 - 250 HB	First choice	T1215	MJ	330 - 980	0.004 - 0.014
		150 - 250 HB	Fracture resistance	AH120	MJ	330 - 820	0.004 - 0.016
	Ductile cast iron 60-40-18, etc.	150 - 250 HB	First choice	T1215	MJ	330 - 980	0.004 - 0.014
		150 - 250 HB	Fracture resistance	AH120	MJ	260 - 660	0.004 - 0.016
N	Aluminum alloys Si < 13%	-	First choice	TH10	AJ	1640 - 4920	0.004 - 0.020
	Aluminum alloys Si ≥ 13%	-	First choice	TH10	AJ	490 - 1640	0.004 - 0.020
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH3135	ML	98 - 197	0.004 - 0.012
		- 40 HRC	Fracture resistance	AH3135	MJ	98 - 197	0.004 - 0.012
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	First choice	AH725	MJ	33 - 131	0.0004 - 0.004
H	Hardened materials H-13, etc.	- 45 HRC	First choice	AH8015	MJ	260 - 490	0.002 - 0.006
		- 45 HRC	Low cutting force	AH8015	ML	260 - 490	0.002 - 0.006

- Remove excessive chips with an air blast to prevent chip jamming.
- Use water-soluble coolant to avoid built-up edge in case extreme welding occurs on cutting edges. (ex. aluminum machining).
- For operations with a varied depth of cut (ex. casting skin) and machining of workpiece materials with interrupted surface, the feed (fz) should be set to the lower recommended value shown in the above table.

- Cutting conditions may be limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

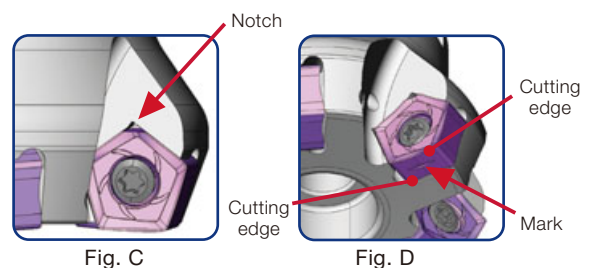
Installation of inserts on an extra close-pitch cutter

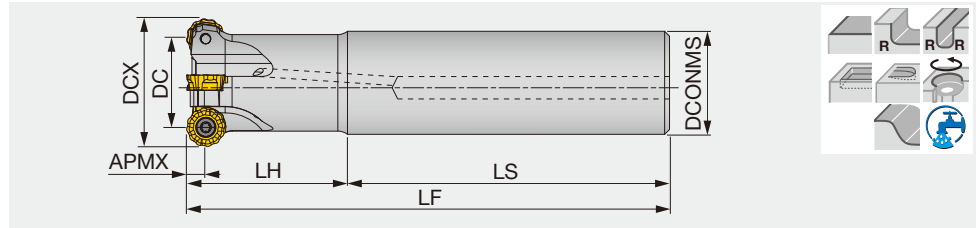
- On an extra close-pitch cutter, the screw hole of an insert pocket is placed at an angle.
- Leave a gap between the insert and pocket when starting to fasten the screw on the cutter body as shown in Fig. A.
- After fastening the screw, please ensure that there is no gap between the cutter body and insert. (Fig. B)



Notes for using wiper inserts

- When fine surface finish is required, wiper insert PNCU0905GNER-W is recommended.
- Attach the insert with its notch on the top, as shown in Fig. C.
- Also, make sure that the mark of the insert is located at the bottom of the cutter body, as shown in Fig. D.
- The wiper insert has two corners available (Fig. D). Do not use the other corners as the cutter body may be broken.





Inch	APMX	DCX	DC	CICT	DCONMS	LF	LH	LS	WT(lb)	Air hole	Insert
ERC12R125U0125-03L	0.236	1.250	0.778	3	1.250	6.000	2.250	3.750	2.050	With	RCMT1204...
ERC12R125U0125-03LL	0.236	1.250	0.778	3	1.250	12.000	7.000	5.000	3.370	With	RCMT1204...
ERC12R125U0125-03LM	0.236	1.250	0.778	3	1.250	8.000	4.000	4.000	2.250	With	RCMT1204...
ERC12R125U0125W03	0.236	1.250	0.778	3	1.250	5.000	2.750	2.250	1.320	With	RCMT1204...
ERC12R125U150-03LL	0.236	1.250	0.778	3	1.500	12.000	7.000	5.000	4.190	With	RCMT1204...
ERC12R150U0125-04LM	0.236	1.500	1.028	4	1.250	8.000	4.000	4.000	2.360	With	RCMT1204...
ERC12R150U0125-04LX	0.236	1.500	1.028	4	1.250	12.000	7.000	5.000	3.550	With	RCMT1204...
ERC12R150U0125W04	0.236	1.500	1.028	4	1.250	5.000	2.340	2.660	1.430	With	RCMT1204...
ERC12R150U0150-04L	0.236	1.500	1.028	4	1.500	6.000	2.000	3.750	2.420	With	RCMT1204...
ERC12R150U0150-04LM	0.236	1.500	1.028	4	1.500	8.000	4.000	4.000	3.080	With	RCMT1204...
ERC12R150U0150-04LX	0.236	1.500	1.028	4	1.500	12.000	7.000	5.000	4.410	With	RCMT1204...
ERC12R150U0150W04	0.236	1.500	1.028	4	1.500	5.000	2.340	2.660	1.830	With	RCMT1204...
ERC12R150U150-04LL	0.236	1.500	1.028	4	1.500	12.000	2.000	10.000	5.290	With	RCMT1204...
ERC16R150U0125-02LL	0.315	1.500	0.870	2	1.250	12.000	2.000	10.000	3.810	With	RCMT1606...
ERC16R150U0125-02LM	0.315	1.500	0.870	2	1.250	8.000	2.000	6.000	2.470	With	RCMT1606...
ERC16R150U0125W02	0.315	1.500	0.870	2	1.250	5.000	2.340	2.660	1.430	With	RCMT1606...
ERC16R150U0150-02L	0.315	1.500	0.870	2	1.500	6.000	2.000	4.000	2.380	With	RCMT1606...
ERC16R150U0150-02LM	0.315	1.500	0.870	2	1.500	8.000	4.000	4.000	3.080	With	RCMT1606...
ERC16R150U0150-02LX	0.315	1.500	0.870	2	1.500	12.000	7.000	5.000	4.620	With	RCMT1606...
ERC16R150U0150W02	0.315	1.500	0.870	2	1.500	5.000	2.340	2.660	1.830	With	RCMT1606...
ERC16R150U150-02LL	0.315	1.500	0.870	2	1.500	12.000	2.000	10.000	5.290	Without	RCMT1606...

Metric	APMX	DCX	DC	CICT	DCONMS	LF	LH	LS	WT(kg)	Air hole	Insert
ERC12R032M32.0-03	6	32	20	3	32	150	70	80	0.8	With	RCMT1204...
ERC12R032M32.0-03L	6	32	20	3	32	250	150	100	1.3	With	RCMT1204...
ERC12R032M32.0-03LL	6	32	20	3	32	300	180	120	1.6	With	RCMT1204...
ERC12R033M32.0-03	6	33	21	3	32	150	70	80	0.8	With	RCMT1204...
ERC12R033M32.0-03L	6	33	21	3	32	250	150	100	1.4	With	RCMT1204...
ERC12R033M32.0-03LL	6	33	21	3	32	300	70	230	1.7	With	RCMT1204...
ERC12R040M32.0-04	6	40	28	4	32	150	50	100	0.8	With	RCMT1204...
ERC12R040M32.0-04L	6	40	28	4	32	250	50	200	1.5	With	RCMT1204...
ERC12R040M32.0-04LL	6	40	28	4	32	300	50	250	1.8	With	RCMT1204...
ERC12R050M42.0-05	6	50	38	5	42	150	50	100	1.5	With	RCMT1204...
ERC12R050M42.0-05L	6	50	38	5	42	250	50	200	2.6	With	RCMT1204...
ERC12R050M42.0-05LL	6	50	38	5	42	300	50	250	3	With	RCMT1204...
ERC16R040M32.0-02	8	40	24	2	32	150	50	100	0.8	With	RCMT1606...
ERC16R040M32.0-02L	8	40	24	2	32	250	50	200	1.4	With	RCMT1606...
ERC16R040M32.0-02LL	8	40	24	2	32	300	50	250	1.7	With	RCMT1606...
ERC16R050M42.0-03	8	50	34	3	42	150	50	100	1.4	With	RCMT1606...
ERC16R050M42.0-03L	8	50	34	3	42	250	50	200	2.4	With	RCMT1606...
ERC16R050M42.0-03LL	8	50	34	3	42	300	50	250	3	With	RCMT1606...

SPARE PARTS

Designation	Clamping screw	Wewnch
ERC12R...	CSTB-4L090	T-15DB
ERC16R040...	CSTB-5L105	T-20DB
ERC16R050...	CSTB-5L120	T-20DB

Recommended clamping torque: CSTB-4L090 = 2.58 lbs·ft, 3.5 N·m, CSTB-5L105/CSTB-5L120 = 3.69 lbs·ft, 5 N·m

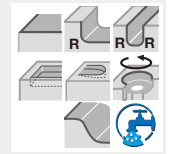
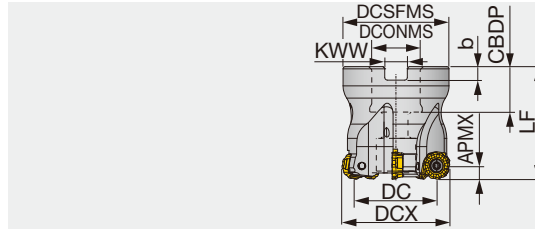


ROUNDSPLIT

TRC12/16

Face mill bore type cutter

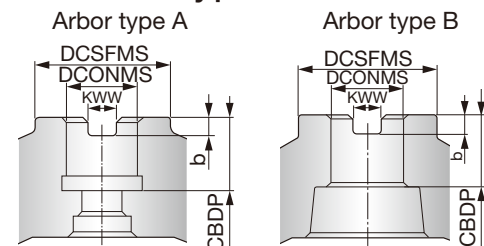
GAMP = +0°, GAMF = -1° ~ -5°



Inch	APMX	DCX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TRC12R200U0075A05	0.236	2.000	1.528	5	1.850	2.000	0.750	0.750	0.320	0.200	0.880	With	RCMT1204...	A
TRC12R250U0075A06	0.236	2.500	2.028	6	2.320	2.000	0.750	0.750	0.320	0.200	1.540	With	RCMT1204...	A
TRC12R300U0100A07	0.315	3.000	2.528	7	2.830	2.500	1.000	1.020	0.370	0.240	2.860	With	RCMT1204...	A
TRC16R200U0075A04	0.315	2.000	1.370	4	1.850	2.000	0.750	0.750	0.320	0.200	0.880	With	RCMT1606...	A
TRC16R250U0075A05	0.315	2.500	1.870	5	2.320	2.000	0.750	0.750	0.320	0.200	1.540	With	RCMT1606...	A
TRC16R300U0100A06	0.315	3.000	2.370	6	2.830	2.500	1.000	1.020	0.370	0.240	2.860	With	RCMT1606...	A
TRC16R400U0150A07	0.315	4.000	3.370	7	3.820	2.500	1.500	1.460	0.620	0.390	3.520	With	RCMT1606...	B
TRC16R500U0150A08	0.315	5.000	4.370	8	3.780	2.500	1.500	1.460	0.620	0.390	7.930	With	RCMT1606...	B

Metric	APMX	DCX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	
TRC12R040M16.0-04	6	40	28	4	35	40	16	18	8.2	5.6	0.2	With	RCMT1204...	
TRC12R040M16.0E04	6	40	28	4	35	40	16	19	8.4	5.6	0.2	With	RCMT1204...	
TRC12R050M22.0-05	6	50	38	5	47	50	22	20	10	6	0.4	With	RCMT1204...	
TRC12R050M22.0E05	6	50	38	5	47	50	22	20	10.4	6.3	0.4	With	RCMT1204...	
TRC12R050M22.2-05	6	50	38	5	47	50	22.225	20	8	5	0.4	With	RCMT1204...	
TRC12R052M22.0E05	6	52	40	5	49	50	22	20	10.4	6.3	0.4	With	RCMT1204...	
TRC12R063M22.0-06	6	63	51	6	59	50	22	20	10	6	0.7	With	RCMT1204...	
TRC12R063M22.0E06	6	63	51	6	59	50	22	20	10.4	6.3	0.7	With	RCMT1204...	
TRC12R063M22.2-06	6	63	51	6	59	50	22.225	20	8	5	0.7	With	RCMT1204...	
TRC12R066M22.0E06	6	66	54	6	62	50	22	20	10.4	6.3	0.7	With	RCMT1204...	
TRC12R080M27.0E07	6	80	68	7	76	50	27	22	12.4	7	1.1	With	RCMT1204...	
TRC12R080M31.7-07	6	80	68	7	76	63	31.750	32	12.7	8	1.5	With	RCMT1204...	
TRC16R050M22.0-04	8	50	34	4	47	50	22	20	10	6	0.4	With	RCMT1606...	
TRC16R050M22.0E04	8	50	34	4	47	50	22	20	10.4	6.3	0.3	With	RCMT1606...	
TRC16R050M22.2-04	8	50	34	4	47	50	22.225	20	8	5	0.4	With	RCMT1606...	
TRC16R052M22.0E04	8	52	36	4	49	50	22	20	10.4	6.3	0.4	With	RCMT1606...	
TRC16R063M22.0-05	8	63	47	5	59	50	22	20	10	6	0.6	With	RCMT1606...	
TRC16R063M22.0E05	8	63	47	5	59	50	22	20	10.4	6.3	0.6	With	RCMT1606...	
TRC16R063M22.2-05	8	63	47	5	59	50	22.225	20	8	5	0.7	With	RCMT1606...	
TRC16R066M22.0E05	8	66	50	5	62	50	22	20	10.4	6.3	0.7	With	RCMT1606...	
TRC16R080M27.0E06	8	80	64	6	76	50	27	22	12.4	7	1	With	RCMT1606...	
TRC16R080M31.7-06	8	80	64	6	76	63	31.75	32	12.7	8	1.3	With	RCMT1606...	
TRC16R100M31.7-07	8	100	84	7	96	63	31.75	32	12.7	8	1.6	With	RCMT1606...	
TRC16R100M32.0E07	8	100	84	7	96	63	32	25	14.4	8	2.4	With	RCMT1606...	
TRC16R125M38.1-08	8	125	109	8	98	63	38.1	43	15.9	10	3.6	With	RCMT1606...	
TRC16R125M40.0E08	8	125	109	8	98	63	40	32	16.4	9	3	With	RCMT1606...	

Arbor type



Reference pages: Inserts → **H084**

INCH SPARE PARTS



Designation	Clamping screw	Grip	Shell locking bolt (Optional parts)	Torx bit
TRC12R...	CSTB-4L090	H-TBS	(C0.375X1.125H)	BT15S
TRC16R200, 250...	CSTB-5L120	H-TB	(C0.375X1.125H)	BT20S
TRC16R300...	CSTB-5L120	H-TB	(C0.500X1.375H)	BT20M
TRC16R400, 500...	CSTB-5L120	H-TB	(TMBA-0.750H)	BT20M

Recommended clamping torque: CSTB-4L090 = 2.58 lbs·ft, CSTB-5L120 = 3.69 lbs·ft

METRIC SPARE PARTS



Designation	Clamping screw	Grip	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TRC12R040...	CSTB-4L090	H-TBS	-	FSHM8-30H	BT15S
TRC12R050 - 066...	CSTB-4L090	H-TBS	-	CM10X30H	BT15S
TRC12R080M27.0E07	CSTB-4L090	H-TBS	-	CM12X30H	BT15S
TRC12R080M31.7-07	CSTB-4L090	H-TBS	-	CM16X40H	BT15S
TRC16R050 - 052...	CSTB-5L120	H-TB	-	FSHM10-40H	BT20S
TRC16R063 - 066...	CSTB-5L120	H-TB	-	CM10X30H	BT20S
TRC16R080M27.0E06	CSTB-5L120	H-TB	-	CM12X30H	BT20S
TRC16R080M31.7-06	CSTB-5L120	H-TB	-	CM16X40H	BT20S
TRC16R100...	CSTB-5L120	H-TB	-	CM16X40H	BT20S
TRC16R125...	CSTB-5L120	H-TB	TMBA-M20H	-	BT20M

Recommended clamping torque: CSTB-4L090 = 3.5 N·m, CSTB-5L120 = 5 N·m

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

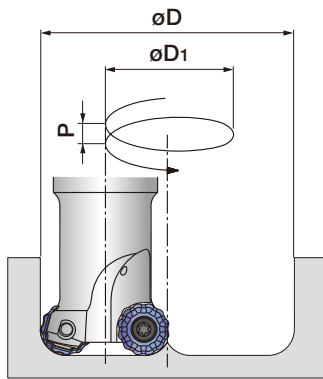
Drilling tool

Tooling System

User's Guide

Index

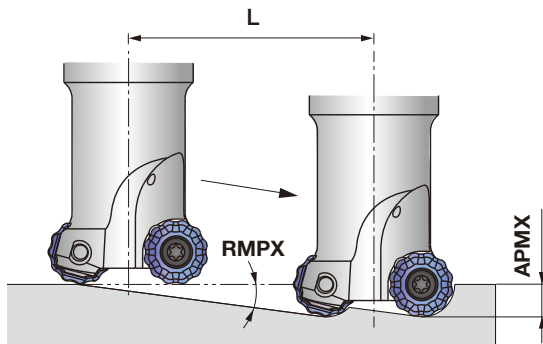
Holemaking with helical feed



Inch	Tool ϕ DCX (in)	Min. machining diameter (in)		Max. machining diameter (in)		Pitch P (in)
		ϕD	ϕD_1	ϕD	ϕD_1	
ERC12R125U...	1.250	2.028	0.778	2.421	1.171	< 0.236
ERC12R150U...	1.500	2.528	1.028	2.921	1.421	< 0.236
TRC12R200U...	2.000	3.528	1.528	3.921	1.921	< 0.236
TRC12R250U...	2.500	4.528	2.028	4.921	2.421	< 0.236
TRC12R300U...	3.000	5.528	2.528	5.921	2.921	< 0.236
ERC16R150U...	1.500	2.370	0.870	2.921	1.421	< 0.315
TRC16R200U...	2.000	3.370	1.370	3.921	1.921	< 0.315
TRC16R250U...	2.500	4.370	1.870	4.921	2.421	< 0.315
TRC16R300U...	3.000	5.370	2.370	5.921	2.921	< 0.315
TRC16R400U...	4.000	7.370	3.370	7.921	3.921	< 0.315
TRC16R500U...	5.000	9.370	4.370	9.921	4.921	< 0.315

When holemaking with a helical feed, the pitch (P) needs to be set at lower values than that shown above.

Ramping



Inch	Tool ϕ DCX (in)	Max. ramping angle RMPX	L: tool pass length when ramping angle is 2° APMX (in)				
			0.079	0.118	0.158	0.236	0.315
ERC12R125U...	1.250	10°	2.244	3.346	4.488	6.732	–
ERC12R150U...	1.500	7°	2.244	3.346	4.488	6.732	–
TRC12R200U...	2.000	5.5°	2.244	3.346	4.488	6.732	–
TRC12R250U...	2.500	3.5°	2.244	3.346	4.488	6.732	–
TRC12R300U...	3.000	2.5°	2.244	3.346	4.488	6.732	–
ERC16R150U...	1.500	16°	2.244	3.346	4.488	6.732	–
TRC16R200U...	2.000	9.5°	2.244	3.346	4.488	6.732	9.016
TRC16R250U...	2.500	6.5°	2.244	3.346	4.488	6.732	9.016
TRC16R300U...	3.000	4.5°	2.244	3.346	4.488	6.732	9.016
TRC16R400U...	4.000	3°	2.244	3.346	4.488	6.732	9.016
TRC16R500U...	5.000	2.5°	2.244	3.346	4.488	6.732	9.016

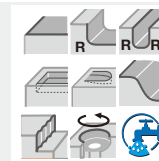
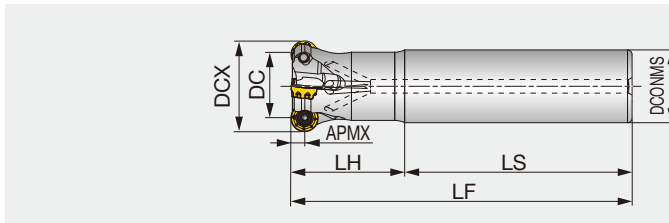
Tool pass length: $L = ap / \tan RMPX$, Ramping angle needs to be set at smaller than 2 degrees in order to prevent chips from getting tangled.



New
FIXRMILL
ERRQ12

Radius endmill with anti-rotation system, shank type

GAMP = +5°, GAMF = -3°

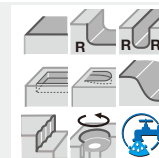
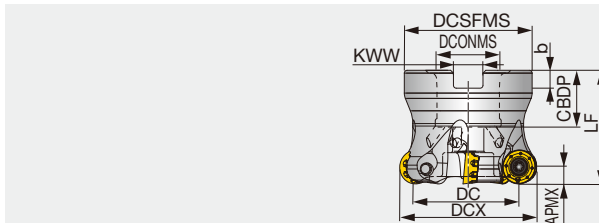


Metric	APMX	DCX	CICT	DC	DCONMS	LF	LH	LS	WT(kg)	Air hole	Insert
ERRQ12M040C32.0R04	6	40	4	28	32	150	50	100	0.84	With	RQMT12...

New
TRRQ12

Radius mill with anti-rotation system

GAMP = +5°, GAMF = -3°



Metric	APMX	DCX	CICT	DC	DCSFMS	DCONMS	LF	CBDP	KWW	b	WT(kg)	Air hole	Insert
TRRQ12M040B16.0R04 ⁽¹⁾	6	40	4	28	34	16	40	24	8.4	5.6	0.16	With	RQMT12...
TRRQ12M050B22.0R05	6	50	5	38	45	22	40	20	10.4	6.3	0.27	With	RQMT12...
TRRQ12M050B22.0R06	6	50	6	38	45	22	40	20	10.4	6.3	0.26	With	RQMT12...
TRRQ12M052B22.0R05	6	52	5	40	45	22	40	20	10.4	6.3	0.29	With	RQMT12...
TRRQ12M063B22.0R06	6	63	6	51	50	22	40	20	10.4	6.3	0.44	With	RQMT12...
TRRQ12M063B22.0R07	6	63	7	51	50	22	40	20	10.4	6.3	0.42	With	RQMT12...
TRRQ12M080B27.0R06	6	80	6	68	56	27	50	22	12.4	7	0.88	With	RQMT12...

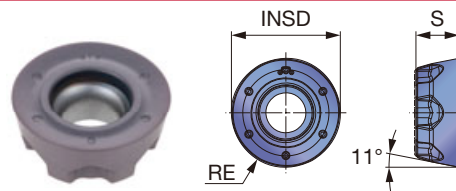
(1) Always use the dedicated shell locking bolt # SRPS118-0416 when assembling the cutter on the arbor. See page **H087** for the instruction for the cutter-arbor assembly.
Coolant needs to be supplied from the end of the arbor inlay. Coolant cannot be supplied from the shell locking bolt.

SPARE PARTS

Designation	Clamping screw	Torx bit	Grip	Shell locking bolt 1	Shell locking bolt 2
ERRQ12M040C32.0R04	CSPB-4S	BLDIP15/S7	H-TB2W	-	-
TRRQ12M040B16.0R04	CSPB-4S	BLDIP15/S7	H-TB2W	-	SRPS118-0416
TRRQ12M050 - 063...	CSPB-4S	BLDIP15/S7	H-TB2W	CM10X30H	-
TRRQ12M080B27.0R06	CSPB-4S	BLDIP15/S7	H-TB2W	CM12X30H	-

Recommended clamping torque: 3.5 N·m

RQMT1204ENC6-MM



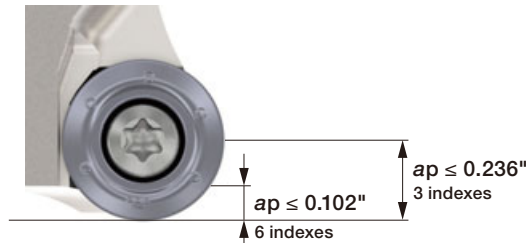
P	Steel
M	Stainless
K	Cast iron
N	Non-ferrous
S	Superalloy
H	Hard materials

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated												INSD	S
			AH3135	AH8015												
RQMT1204ENC8-MM	0.236	0.236	●	●											0.472	0.187
RQMT1204ENC6-MM	0.236	0.236	●	●											0.472	0.187

●: Line up

- Both inserts can be clamped in the same pocket
- Inserts can be selected based on the required depth of cut for best cost per edge



RQMT1204ENC6-MM

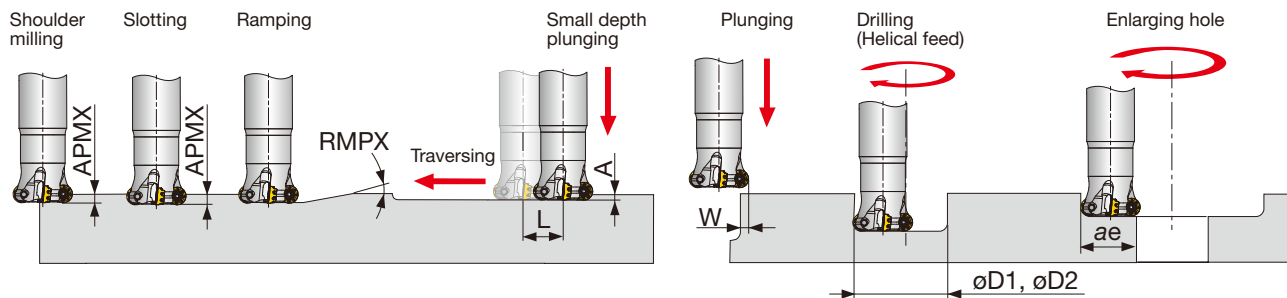
Allows up to 8 indexes for 0.055" or smaller D.O.C. and up to 4 indexes for up to 0.236" D.O.C.

Allows up to 6 indexes for 0.102" or smaller D.O.C. and up to 3 indexes for up to 0.236" D.O.C.

ISO	Workpiece materials		Hardness	Priority	Grades	Chipbreaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, etc.		- 200HB	First choice	AH3135	MM	328 - 984	ap = 0.236" : 0.004 - 0.012 ap = 0.079" : 0.006 - 0.024 ap = 0.039" : 0.008 - 0.031
	Carbon steel and alloy steel 1055, etc.		- 300HB	First choice	AH3135	MM	328 - 820	
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	AH3135	MM	328 - 656	
M	Austenitic stainless steel 304, 316, etc.		- 200HB	First choice	AH3135	MM	328 - 656	ap = 0.236" : 0.004 - 0.010 ap = 0.079" : 0.006 - 0.020 ap = 0.039" : 0.008 - 0.026
	Martensitic stainless steel 420, etc.		- 200HB	First choice	AH3135	MM	328 - 984	
K	Gray cast iron No.250B, etc.		150 - 250HB	First choice	AH8015	MM	328 - 984	ap = 0.236" : 0.004 - 0.012 ap = 0.079" : 0.006 - 0.024 ap = 0.039" : 0.008 - 0.031
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250HB	First choice	AH8015	MM	262 - 820	
S	Titanium alloys Ti-6Al-4V, etc.		-	First choice	AH3135	MM	98 - 197	ap = 0.236" : 0.003 - 0.008 ap = 0.079" : 0.005 - 0.016 ap = 0.039" : 0.006 - 0.024 ap = 0.236" : 0.002 - 0.005 ap = 0.079" : 0.003 - 0.010 ap = 0.039" : 0.004 - 0.012
	Heat-resistant alloys Inconel718, etc.		-	First choice	AH8015	MM	66 - 164	
H	Hardened steel	H13, etc.	40 - 50HRC	First choice	AH3135	MM	164 - 492	ap = 0.236" : 0.001 - 0.004 ap = 0.079" : 0.002 - 0.005 ap = 0.039" : 0.002 - 0.006
		D2, etc.	50 - 60HRC	First choice	AH8015	MM	164 - 230	



APPLICATION RANGE

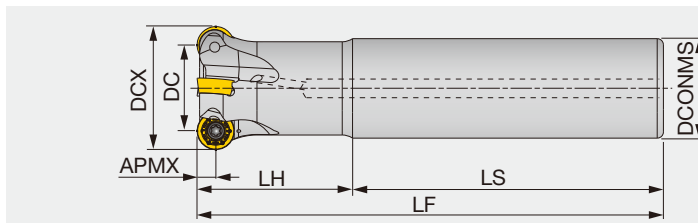


		Max. depth of cut	Max. ramping angle	Max. plunging depth	Max. cutting width in plunging	Machining length for removing uncut portion	Min. machining diameter	Max. machining diameter	Max. cutting width engagement
Metric	DCX	APMX	RMPX	A	W	L	øD1	øD2*	ae
T/ERRQ12M040...	40	6	5.1°	2.4	6	29	59	79	32
TRRQ12M050B22.0...	50	6	3.6°	2.4	6	39	79	99	42
TRRQ12M052B22.0R05	52	6	3.4°	2.4	6	41	83	103	44
TRRQ12M063B22.0...	63	6	3°	2.4	6	52	105	125	55
TRRQ12M080B27.0R06	80	6	2.1°	2.4	6	69	139	159	72

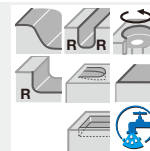
* For flat bottom hole

FIXRMILL
ERP

Radius endmill with anti-rotation system, shank type



GAMP = +10° ~ +4°, GAMF = -2° ~ -8.5°



Approach angle	Inch	APMX	DCX	DC	CICT	DCONMS	LS	LH	LF	Air hole	Insert
7°-25°	ERP10R100U0100-02	0.197	1.000	0.606	2	1.000	4.000	2.000	6.000	With	RPMT10T3...
	ERP10R125U0125-04	0.197	1.250	0.856	4	1.250	4.000	2.000	6.000	With	RPMT10T3...
41°-45°	ERP10R150U0125-04	0.197	1.500	1.106	4	1.250	4.000	2.000	6.000	With	RPMT10T3...
	ERP12R125U0125-03	0.236	1.250	0.776	3	1.250	4.000	2.000	6.000	With	RPMT1204...
	ERP12R150U0125-04	0.236	1.500	1.034	4	1.250	4.000	2.000	6.000	With	RPMT1204...
60°-70°	ERP16R150U0125-02	0.315	1.500	0.866	2	1.250	4.000	2.000	6.000	With	RPMT1606...
Others	Metric	APMX	DCX	DC	CICT	DCONMS	LS	LH	LF	Air hole	Insert
	ERP10R020M20.0-02	5	20	10	2	20	100	50	150	With	RPMT10T3...
	ERP10R025M25.0-02	5	25	15	2	25	90	60	150	With	RPMT10T3...
	ERP10R032M32.0-04	5	32	22	4	32	80	70	150	With	RPMT10T3...
	ERP10R035M32.0-04	5	35	25	4	32	100	50	150	With	RPMT10T3...
	ERP12R032M32.0-03	6	32	20	3	32	100	50	150	With	RPMT1204...
	ERP12R040M32.0-04	6	40	28	4	32	100	50	150	With	RPMT1204...
	ERP16R040M32.0-02	8	40	24	2	32	100	50	150	With	RPMT1606...

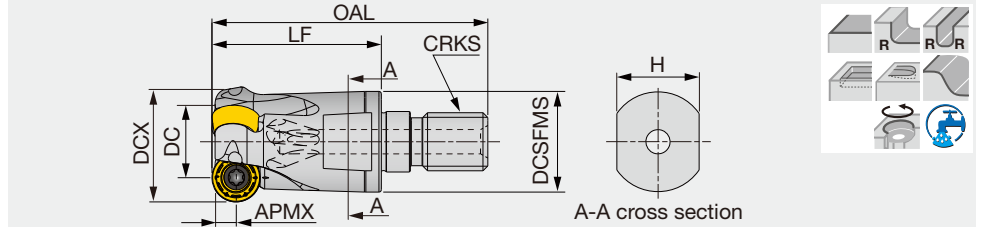
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
ERP10R...	CSPB-3.5S	M-1000	IP-15D
ERP12R...	CSTR-4L100	M-1000	T-15DB
ERP16R...	CSPB-5	M-1000	IP-20D

Recommended clamping torque: CSPB-3.5S/CSTR-4L100 = 2.58 lbs·ft, 3.5 N·m, CSPB-5 = 3.69 lbf·ft, 5 N·m

Reference pages: Inserts → **H090**

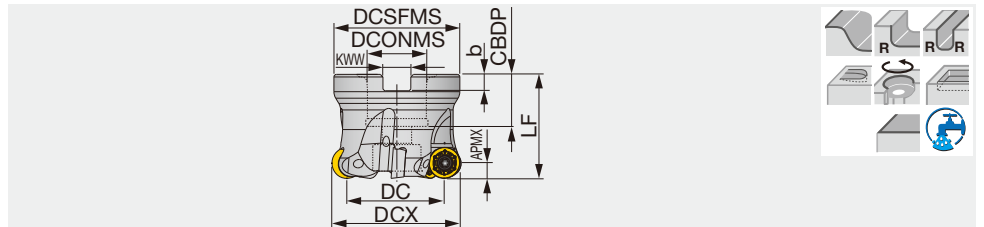
Radius endmill with anti-rotation system, modular type (TungFlex)



Metric	APMX	DCX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HRP10R020MM10-02	5	20	10	2	49	30	15	17.8	M10	0.1	With	RPMT10T3...
HRP10R025MM12-02	5	25	15	2	57	35	17	20.8	M12	0.1	With	RPMT10T3...
HRP10R032MM16-04	5	32	22	4	63	40	22	28.8	M16	0.2	With	RPMT10T3...
HRP12R032MM16-03	6	32	20	3	63	40	22	28.8	M16	0.2	With	RPMT1204...

TRP10/12/16

Radius mill with anti-rotation system



Inch	APMX	DCX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(lb)	Air hole	Insert
TRP12R200U0075A05	0.236	2.000	1.528	5	1.850	0.750	0.750	1.575	0.197	0.315	0.66	With	RPMT1204...
TRP12R250U0100A06	0.236	2.500	2.028	6	2.323	1.000	1.024	1.969	0.236	0.374	1.32	With	RPMT1204...
TRP16R250U0100A05	0.315	2.500	1.869	5	2.323	1.000	1.024	1.969	0.236	0.374	1.32	With	RPMT1606...

Metric	APMX	DCX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TRP10R040M16.0E05	5	40	30	5	35	16	18	40	5.6	8.4	0.2	With	RPMT10T3...
TRP12R050M22.0E05	6	50	38	5	47	22	20	40	6.3	10.4	0.3	With	RPMT1204...
TRP12R052M22.0E05	6	52	40	5	49	22	20	40	6.3	10.4	0.3	With	RPMT1204...
TRP12R063M22.0E06	6	63	51	6	59	22	20	40	6.3	10.4	0.6	With	RPMT1204...
TRP12R066M27.0E06	6	66	54	6	62	27	22	40	7	12.4	0.6	With	RPMT1204...
TRP16R063M22.0E05	8	63	47	5	59	22	20	40	6.3	10.4	0.6	With	RPMT1606...
TRP16R066M27.0E05	8	66	50	5	62	27	22	40	7	12.4	0.7	With	RPMT1606...

INCH SPARE PARTS



Designation	Clamping screw	Lubricant	Torx bit	Grip	Shell locking bolt (Optional parts)
TRP12R200U0075A05	CSTR-4L100	M-1000	BT15S	H-TBS	(C0.375X1.125H)
TRP12R250U0100A06	CSTR-4L100	M-1000	BT15S	H-TBS	(C0.500X1.375H)
TRP16R250U0100A05	CSPB-5	M-1000	BLDIP20/S7	H-TBS	(C0.500X1.375H)

Recommended clamping torque: CSTR-4L100 = 2.58 lbs·ft, CSPB-5 = 3.69 lbs·ft

METRIC SPARE PARTS



Designation	Clamping screw	Lubricant	Wrench		Torx bit	Grip	Shell locking bolt
			Bit	Grip			
HRP10R...	CSPB-3.5S	M-1000	BLD IP15/S7	H-TBS	-	-	-
HRP12R...	CSTR-4L100	M-1000	BT15S	H-TBS	-	-	-
TRP10R040M16.0E05	CSPB-3.5S	M-1000	-	-	BLDIP15/S7	H-TBS	FSHM8-30H
TRP12R050 - 063M22.0...	CSTR-4L100	M-1000	-	-	BT15S	H-TBS	CM10X30H
TRP12R066M27.0E06	CSTR-4L100	M-1000	-	-	BT15S	H-TBS	CM12X30H
TRP16R063M22.0E05	CSPB-5	M-1000	-	-	BLDIP20/S7	H-TBS	CM10X30H
TRP16R066M27.0E05	CSPB-5	M-1000	-	-	BLDIP20/S7	H-TBS	CM12X30H

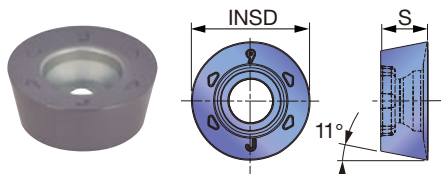
Recommended clamping torque: CSPB-3.5S/CSTR-4L100 = 3.5 N·m, CSPB-5 = 5 N·m

Reference pages: Inserts → **H090**, TungFlex → **H038 - H039**

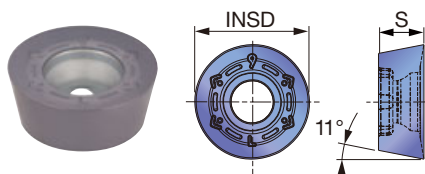


INSERT

RPMT-MJ



RPMT-ML



P	Steel		★		
M	Stainless	★	☆	★	
K	Cast iron		☆		
N	Non-ferrous				
S	Superalloy	☆	★		
H	Hard materials				

★ : First choice
☆ : Second choice

Designation	APMX	Coated			INSD	S
		AH130	AH725	AH4035		
RPMT10T3EN-MJ	0.197	●	●	●	0.394	0.156
RPMT10T3EN-ML	0.197	●	●	●	0.394	0.156
RPMT1204EN-MJ	0.236	●	●	●	0.472	0.187
RPMT1204EN-ML	0.236	●	●	●	0.472	0.187
RPMT1606EN-MJ	0.315	●	●	●	0.630	0.250
RPMT1606EN-ML	0.315	●	●	●	0.630	0.250

●: Line up

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



ERP

e-catalog



HRP-M

e-catalog



TRP10/12/16

Approach
angle

7°-25°

41°-45°

60°-70°

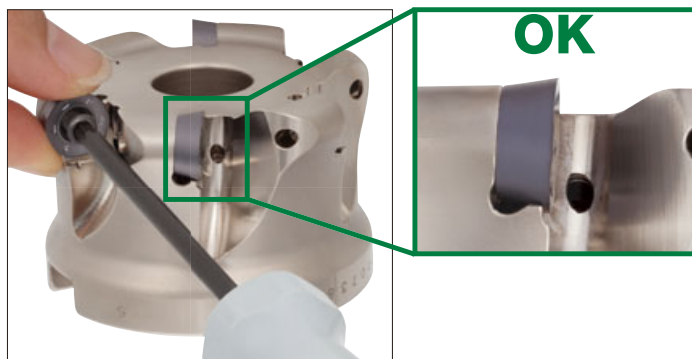
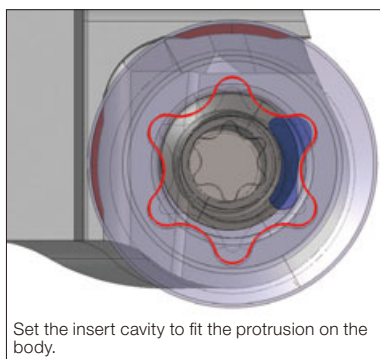
85°-88°

90°

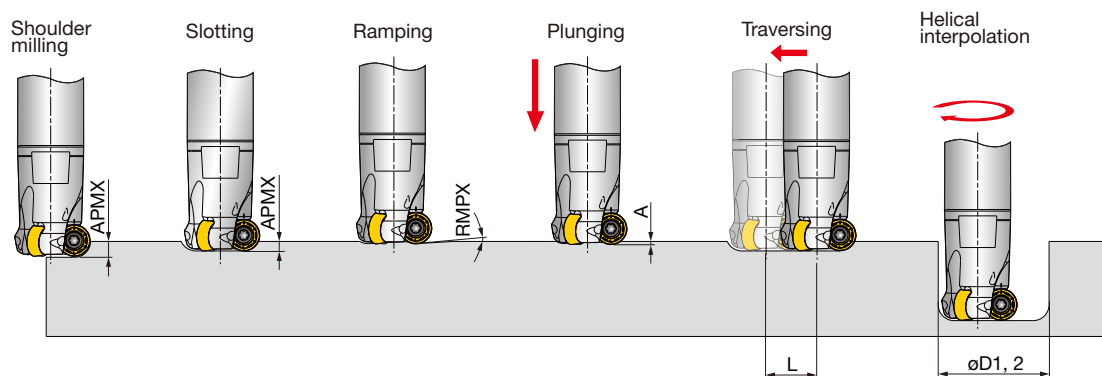
Others

Caution for insert clamping

When clamping an insert, please carefully locate it in the seat, fasten the screw, and make sure there is no gap between it and the body.



APPLICATION RANGE



Inch	Tool- ϕ DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Machining length for removing uncut portion L	Min.machining $\phi D1, 2$	*Max. machining $\phi D2$
ERP10R100U0100-02	1.000	0.197	3	0.0276	0.630	1.457	1.969
ERP10R125U0125-04	1.250	0.197	8	0.0984	0.866	1.811	2.441
ERP10R150U0125-04	1.500	0.197	6	0.0984	1.142	2.283	2.953
ERP12R125U0125-03	1.250	0.236	8.3	0.0906	0.787	1.693	2.441
ERP12R150U0125-04	1.500	0.236	4	0.0630	1.063	2.244	2.953
ERP16R150U0125-02	1.500	0.315	6	0.0709	0.906	2.008	2.953
TRP12R200U0075A05	2.000	0.236	4	0.0984	1.575	3.189	3.937
TRP12R250U0100A06	2.500	0.236	2.7	0.0906	2.047	4.213	4.921
TRP16R250U0100A05	2.500	0.315	3	0.0906	1.890	3.976	4.921

*For flat bottom hole

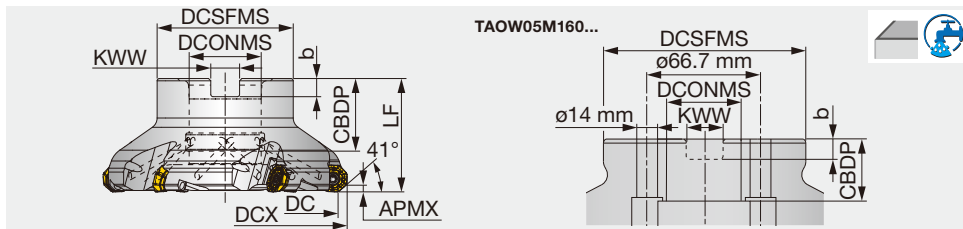


TUNGHEMILL

TAOW05

Face mill, with screw clamp system

GAMP = +23°, GAMF = -5°

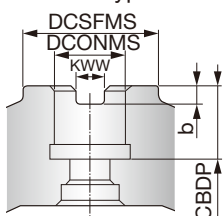


Inch	APMX	DC	DCX	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Arbor type
TAOW05U2.00B0.75R04	0.118	2.000	2.310	4	1.850	1.575	0.750	0.750	0.315	0.197	0.970	With	OW*T05...	A
TAOW05U2.50B0.75R05	0.118	2.500	2.800	5	1.850	1.575	0.750	0.750	0.315	0.197	1.300	With	OW*T05...	A
TAOW05U3.00B1.00R07	0.118	3.000	3.300	7	1.969	1.969	1.000	1.020	0.374	0.236	1.960	With	OW*T05...	A
TAOW05U4.00B1.50R08	0.118	4.000	4.300	8	3.150	1.969	1.500	1.100	0.626	0.394	3.590	With	OW*T05...	B
TAOW05U5.00B1.50R10	0.118	5.000	5.300	10	3.150	2.480	1.500	1.300	0.626	0.394	6.190	With	OW*T05...	B
TAOW05U6.00B2.00R08	0.118	6.000	6.300	8	3.937	2.480	2.000	1.500	0.748	0.433	9.700	Without	OW*T05...	B

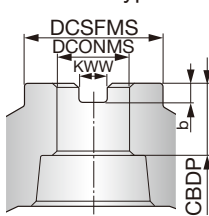
Metric	APMX	DC	DCX	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Arbor type
TAOW05M050B22.0R04	3	50	57.8	4	41	40	22	20	10.4	6.3	0.35	With	OW*T05...	A
TAOW05M063B22.0R05	3	63	70.7	5	47	40	22	20	10.4	6.3	0.54	With	OW*T05...	A
TAOW05M080B27.0R07	3	80	87.7	7	58	50	27	22	12.4	7	1.07	With	OW*T05...	A
TAOW05J080B25.4R05	3	80	87.7	5	58	50	25.4	26	9.5	6	1.12	With	OW*T05...	A
TAOW05M100B32.0R08	3	100	107.6	8	60	50	32	28.5	14.4	8	1.20	With	OW*T05...	B
TAOW05J100B31.7R06	3	100	107.6	6	60	50	31.75	32	12.7	8	1.27	With	OW*T05...	B
TAOW05M125B40.0R10	3	125	132.6	10	71	63	40	32	16.4	9	2.41	With	OW*T05...	B
TAOW05J125B38.1R07	3	125	132.6	7	80	63	38.1	38	15.9	10	2.72	With	OW*T05...	B
TAOW05M160B40.0R12	3	160	167.6	12	100	63	40	29	16.4	9	4.39	Without	OW*T05...	B
TAOW05J160B50.8R08	3	160	167.6	8	100	63	50.8	46	19	11	4.22	Without	OW*T05...	B

Arbor type

Arbor type A



Arbor type B

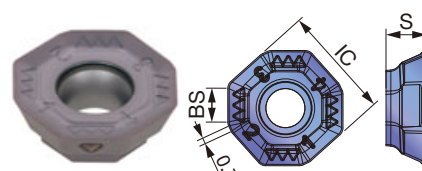


SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Shell locking bolt	Shell locking bolt (Optional parts)
TAOW05U2.00..., TAOW05U2.50...	CSPB-4S	SW6-SD	BLDIP15/S7	-	(C0.375X1.125H)
TAOW05U3.00...	CSPB-4S	SW6-SD	BLDIP15/S7	-	(C0.500X1.375H)
TAOW05U4.00..., TAOW05U5.00...	CSPB-4S	SW6-SD	BLDIP15/S7	-	(TMBA-0.750H)
TAOW05U6.00...	CSPB-4S	SW6-SD	BLDIP15/S7	-	-
TAOW05**050..., TAOW05**063...	CSPB-4S	SW6-SD	BLDIP15/S7	CM10X30H	-
TAOW05**080...	CSPB-4S	SW6-SD	BLDIP15/S7	CM12X30H	-
TAOW05**100...	CSPB-4S	SW6-SD	BLDIP15/S7	TMBA-M16H	-
TAOW05**125...	CSPB-4S	SW6-SD	BLDIP15/S7	TMBA-M20H	-
TAOW05**160...	CSPB-4S	SW6-SD	BLDIP15/S7	-	-

Recommended clamping torque: 2.58 lbs-ft, 3.5 N-m

OWHT05T3C07AFER-MW



★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated										IC	S	BS
			AH120	AH3135											
OWMT05T3AFER-MM	0.031	0.118	●	●									0.489	0.177	0.039
OWHT05T3C07AFER-MM	-	0.118	●	●									0.488	0.177	0.045
OWHT05T3C07AFER-MW	-	0.118	●	●									0.488	0.177	0.146

●: Line up

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, 1020, etc.	- 200 HB	First choice	AH3135	MM	325 - 980	0.002 - 0.014
			Wear resistance	AH120	MM	325 - 980	0.002 - 0.014
	High carbon and alloy steel 1055, 4140, etc.	- 300 HB	First choice	AH3135	MM	325 - 820	0.002 - 0.012
			Wear resistance	AH120	MM	325 - 820	0.002 - 0.012
	Prehardened steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3135	MM	260 - 655	0.002 - 0.012
			Wear resistance	AH120	MM	260 - 655	0.002 - 0.012
M	Austenitic stainless steel 304, 316, etc.	- 200 HB	First choice	AH3135	MM	325 - 655	0.002 - 0.014
			Wear resistance	AH120	MM	325 - 655	0.002 - 0.014
	Martensitic stainless steel 420, etc.	- 220 HB	First choice	AH3135	MM	325 - 980	0.002 - 0.012
			Wear resistance	AH120	MM	325 - 980	0.002 - 0.012
K	Gray cast iron No.250B, etc.	150 - 250 HB	First choice	AH120	MM	325 - 980	0.002 - 0.014
			Fracture resistance	AH3135	MM	325 - 980	0.002 - 0.014
	Ductile cast iron 80-55-06, etc.	150 - 250 HB	First choice	AH120	MM	260 - 820	0.002 - 0.012
			Fracture resistance	AH3135	MM	260 - 820	0.002 - 0.012
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH3135	MM	95 - 195	0.002 - 0.008
			Wear resistance	AH120	MM	95 - 195	0.002 - 0.008
	Heat-resistant alloys Inconel718, etc.	- 40 HRC	First choice	AH120	MM	65 - 160	0.002 - 0.006
			Fracture resistance	AH3135	MM	65 - 160	0.002 - 0.006
H	Hardened steel H13, etc.	40 - 50 HRC	First choice	AH3135	MM	225 - 425	0.002 - 0.006
			Wear resistance	AH120	MM	225 - 425	0.002 - 0.006

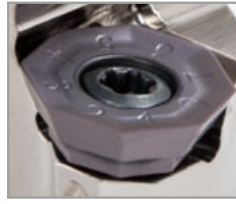


■ IMPORTANT NOTES

■ Installing MM inserts

Before tightening the insert screw, make sure that the insert is correctly positioned in the pocket. If the screw is tightened with the insert not in place, the pocket may be damaged.

Do not use an excessive tightening torque as it may damage the pocket preventing proper positioning of the insert.



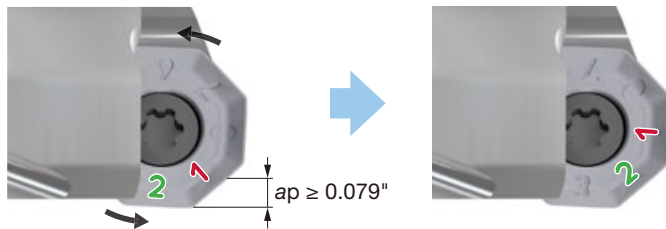
■ Installing MW (wiper) inserts

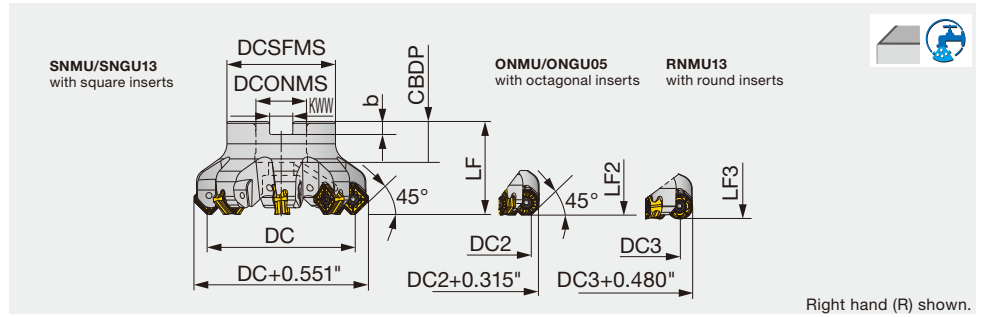
Wiper edge is identified with a ▼ inscribed on the insert flank. Make sure to match the ▼ mark to the ▲ mark on the cutter body when installing the wiper insert.



■ When indexing MM insert

When MM insert is used at a cutting depth of 0.079" or greater, the adjacent wiper is also engaged in the cut. Therefore, it is recommended that the insert is then rotated in the counter clockwise direction for indexing a new cutting edge.

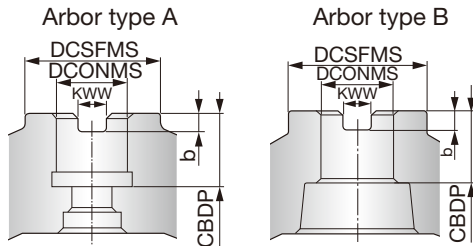




Inch	DC	DC2	DC3	CICT	DCSFMS	LF	LF2	LF3	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Arbor type
TASN13U2.00B0.75R05	2.000	2.118	1.949	5	1.850	1.575	1.516	1.517	0.750	0.750	0.315	0.197	0.900	With	A
TASN13U2.50B0.75R06	2.500	2.618	2.449	6	1.850	1.575	1.516	1.517	0.750	0.750	0.315	0.197	1.320	With	A
TASN13U2.50B0.75R08	2.500	2.618	2.449	8	1.850	1.575	1.516	1.517	0.750	0.750	0.315	0.197	1.540	With	A
TASN13U3.00B1.00R08	3.000	3.118	2.949	8	1.969	1.969	1.909	1.911	1.000	1.024	0.374	0.236	1.980	With	A
TASN13U3.00B1.00R10	3.000	3.118	2.949	10	1.969	1.969	1.909	1.911	1.000	1.024	0.374	0.236	2.200	With	A
TASN13U4.00B1.50R08 *	4.000	4.118	3.949	8	3.150	1.969	1.909	1.911	1.500	1.276	0.626	0.394	3.750	Without	B
TASN13U4.00B1.50R12 *	4.000	4.118	3.949	12	3.150	1.969	1.909	1.911	1.500	1.276	0.626	0.394	3.750	Without	B
TASN13U4.00B1.50R08LF2.5	4.000	4.118	3.949	8	3.150	2.480	2.421	2.422	1.500	1.496	0.626	0.394	4.410	Without	B
TASN13U4.00B1.50R12LF2.5	4.000	4.118	3.949	12	3.150	2.480	2.421	2.422	1.500	1.496	0.626	0.394	4.630	Without	B
TASN13U5.00B1.50R10	5.000	5.118	4.949	10	3.150	2.480	2.421	2.422	1.500	1.378	0.626	0.394	5.950	Without	B
TASN13U5.00B1.50R14	5.000	5.118	4.949	14	3.150	2.480	2.421	2.422	1.500	1.378	0.626	0.394	6.720	Without	B
TASN13U6.00B2.00R12	6.000	6.118	5.949	12	3.937	2.480	2.421	2.422	2.000	1.496	0.748	0.433	8.600	Without	B

* Discontinued items

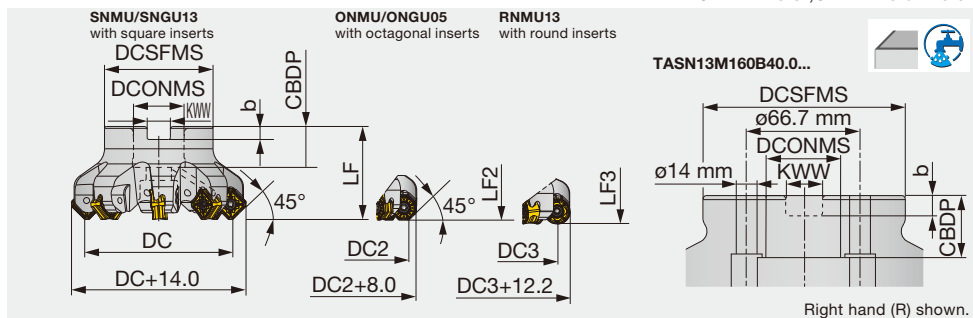
Arbor type



SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1 (Optional parts)	Shell locking bolt 2 (Optional parts)	Torx bit
TASN13... (DC ≤ 3.000")	CSPB-4	H-TB2W	M-1000	-	(C0.375X1.125H)	BLDIP15/S7
TASN13... (DC = 3.000")	CSPB-4	H-TB2W	M-1000	-	(C0.500X1.375H)	BLDIP15/S7
TASN13... (DC = 4.000")	CSPB-4	H-TB2W	M-1000	(TMBA-0.750S.375H)	-	BLDIP15/S7
TASN13... (DC = 5.000")	CSPB-4	H-TB2W	M-1000	(TMBA-0.750S.375H)	-	BLDIP15/M7
TASN13... (DC = 6.000")	CSPB-4	H-TB2W	M-1000	-	-	BLDIP15/M7

Recommended clamping torque: 2.58 lbs·ft



GAMP=+6.0°, GAMF=-6.8°~-6.3°

	Metric	DC	DC2	DC3	CICT	DCSFMS	LF	LF2	LF3	DCONMS	CBDP	KWW	b	WT(kg)	Air hole
	TASN13M050B22.0R04	50	53	48.7	4	41	40	38.5	38.5	22	20	10.4	6.3	0.4	With
	TASN13M050B22.0R05	50	53	48.7	5	41	40	38.5	38.5	22	20	10.4	6.3	0.4	With
	TASN13M063B22.0R05	63	66	61.7	5	47	40	38.5	38.5	22	20	10.4	6.3	0.7	With
	TASN13M063B22.0R06	63	66	61.7	6	47	40	38.5	38.5	22	20	10.4	6.3	0.6	With
	TASN13M063B22.0R08	63	66	61.7	8	47	40	38.5	38.5	22	20	10.4	6.3	0.6	With
	TASN13M080B27.0R05	80	83	78.7	5	58	50	48.5	48.5	27	22	12.4	7	1.1	With
	TASN13M080B27.0R08	80	83	78.7	8	58	50	48.5	48.5	27	22	12.4	7	1.1	With
	TASN13M080B27.0R10	80	83	78.7	10	58	50	48.5	48.5	27	22	12.4	7	1.2	With
	TASN13J080B25.4R05	80	83	78.7	5	58	50	48.5	48.5	25.4	26	9.5	6	1.2	With
	TASN13J080B25.4R08	80	83	78.7	8	58	50	48.5	48.5	25.4	26	9.5	6	1.1	With
	TASN13J080B25.4R10	80	83	78.7	10	58	50	48.5	48.5	25.4	26	9.5	6	1.2	With
	TASN13M100B32.0R06	100	103	98.7	6	60	50	48.5	48.5	32	28.5	14.4	8	1.4	With
	TASN13M100B32.0R08	100	103	98.7	8	60	50	48.5	48.5	32	28.5	14.4	8	1.4	With
	TASN13M100B32.0R12	100	103	98.7	12	60	50	48.5	48.5	32	28.5	14.4	8	1.4	With
	TASN13J100B31.7R06	100	103	98.7	6	60	50	48.5	48.5	31.75	32	12.7	8	1.4	With
	TASN13J100B31.7R08	100	103	98.7	8	60	50	48.5	48.5	31.75	32	12.7	8	1.4	With
	TASN13J100B31.7R12	100	103	98.7	12	60	50	48.5	48.5	31.75	32	12.7	8	1.4	With
	TASN13M125B40.0R07	125	128	123.7	7	71	63	61.5	61.5	40	32	16.4	9	2.2	With
	TASN13M125B40.0R10	125	128	123.7	10	71	63	61.5	61.5	40	32	16.4	9	2.3	With
	TASN13M125B40.0R14	125	128	123.7	14	71	63	61.5	61.5	40	32	16.4	9	2.5	With
	TASN13J125B38.1R07	125	128	123.7	7	80	63	61.5	61.5	38.1	38	15.9	10	2.6	With
	TASN13J125B38.1R10	125	128	123.7	10	80	63	61.5	61.5	38.1	38	15.9	10	2.7	With
	TASN13J125B38.1R14	125	128	123.7	14	80	63	61.5	61.5	38.1	38	15.9	10	2.9	With
	TASN13M160B40.0R08	160	163	158.7	8	100	63	61.5	61.5	40	29	16.4	9	4.1	Without
	TASN13M160B40.0R12	160	163	158.7	12	100	63	61.5	61.5	40	29	16.4	9	4.2	Without
	TASN13J160B50.8R08	160	163	158.7	8	100	63	61.5	61.5	50.8	38	19	11	4.1	Without
	TASN13J160B50.8R12	160	163	158.7	12	100	63	61.5	61.5	50.8	38	19	11	4.2	Without

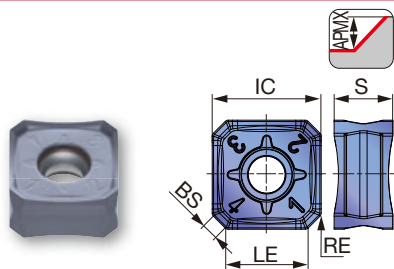
SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TASN13M0**B22.0R0*	CSPB-4	H-TB2W	M-1000	-	CM10X30H	BLDIP15/S7
TASN13*080B2**R0*	CSPB-4	H-TB2W	M-1000	-	CM12X30H	BLDIP15/S7
TASN13*100B3**R0*	CSPB-4	H-TB2W	M-1000	TMBA-M16H	-	BLDIP15/S7
TASN13*125B**R*	CSPB-4	H-TB2W	M-1000	TMBA-M20H	-	BLDIP15/S7
TASN13*160B0.*R*	CSPB-4	H-TB2W	M-1000	-	-	BLDIP15/M7

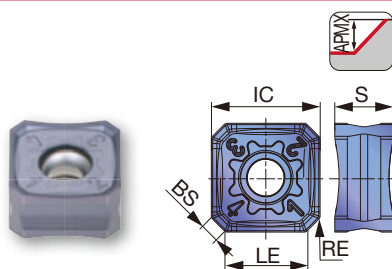
Recommended clamping torque: 3.5 N·m

INSERTS

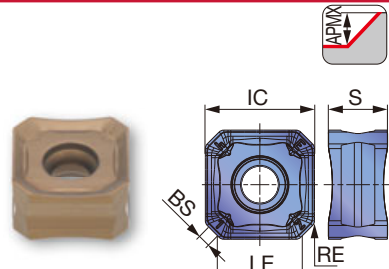
SNMU-MJ



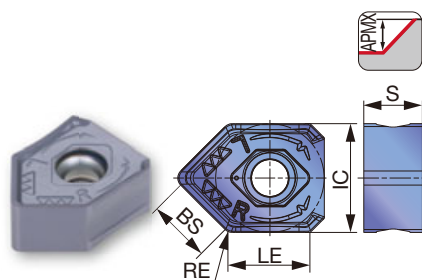
SNGU-MJ



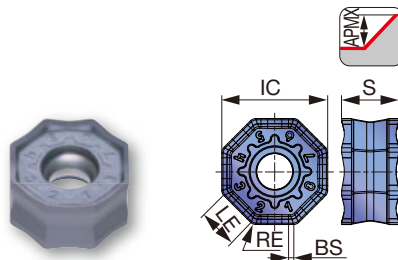
SNGU-MH



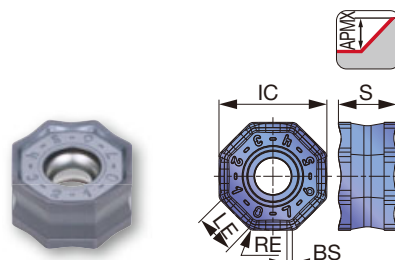
SNGU-W



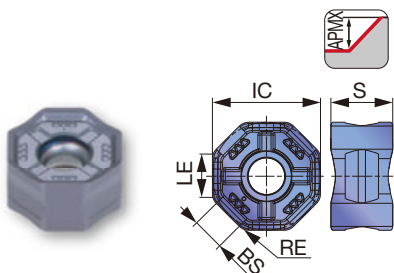
ONMU-MJ



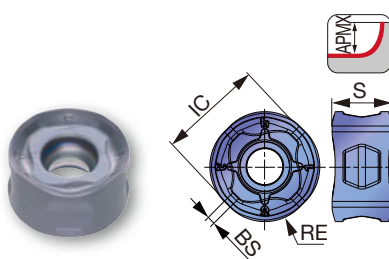
ONGU-MJ



ONGU-W



RNMU-MJ



P Steel	☆	★	☆	★
M Stainless		☆	★	★
K Cast iron	★	☆		★
N Non-ferrous				
S Superalloys	★	☆		
H Hard materials				

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated					LE	IC	S	BS
			AH120	AH3225	AH3135	T3225	T1215				
SNMU1307ANEN-MJ	0.020	0.236	●	●	●	●	●	0.370	0.512	0.276	0.079
SNGU1307ANEN-MJ	0.020	0.236	●	●	●	●	●	0.370	0.512	0.276	0.079
SNGU1307ANEN-MH	0.031	0.236				●		0.354	0.512	0.276	0.079
SNGU1307ANEN-W	0.047	0.236	●	●	●			0.378	0.512	0.276	0.295
ONMU0507ANEN-MJ	0.031	0.134	●	●	●	●	●	0.193	0.512	0.276	0.028
ONGU0507ANEN-MJ	0.031	0.134	●	●	●	●	●	0.193	0.512	0.276	0.028
ONGU0507ANEN-W	0.063	0.134	●	●	●			0.197	0.512	0.293	0.154
RNMU1307ZNER-MJ	0.236	0.236	●	●	●	●	●	-	0.512	0.286	0.039

● : Line up

Reference pages: Standard cutting conditions → **H098**



STANDARD CUTTING CONDITIONS

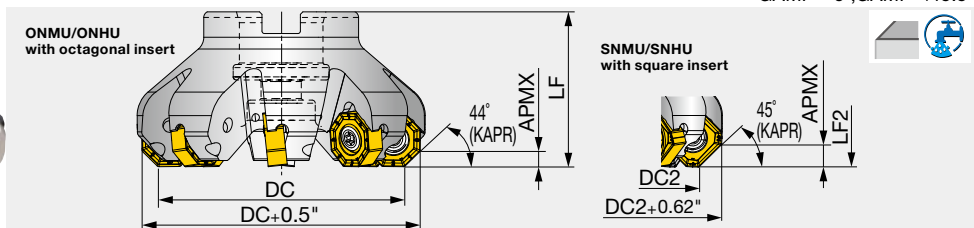
SNMU / SNGU / ONMU / ONGU

ISO	Workpiece materials		Hardness	Priority	Grades	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, 1020, etc.		200 - 300HB	First choice	AH3225	MJ	330 - 820	0.004 - 0.020
				For wear resistance	T3225	MJ	660 - 1150	0.004 - 0.016
	High carbon and alloy steel 1055, 4140, etc.		150 - 300HB	First choice	AH3225	MJ	330 - 820	0.004 - 0.016
				For wear resistance	T3225	MJ	590 - 980	0.004 - 0.016
M	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	AH3225	MJ	330 - 660	0.004 - 0.016
				For wear resistance	T3225	MJ	490 - 820	0.004 - 0.016
	Stainless steel 304SS, 316SS, etc.		- 200HB	First choice	AH3135	MJ	330 - 660	0.004 - 0.014
				For wear resistance	T3225	MJ	330 - 820	0.004 - 0.012
K	Cast stainless steel 1.4849, etc.		-	First choice	T3225	MH	200 - 390	0.004 - 0.012
				For low cutting force	AH3135	MJ	200 - 390	0.004 - 0.012
	Gray cast iron Class 25, Class 30, etc.		150 - 250HB	First choice	T1215	MJ	330 - 980	0.004 - 0.016
					AH120	MJ	330 - 820	0.004 - 0.020
S	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250HB	First choice	T1215	MJ	330 - 980	0.004 - 0.016
					AH120	MJ	260 - 660	0.004 - 0.020
	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	AH3135	MJ	100 - 200	0.004 - 0.012
H	Heat-resistant alloys Inconel718, etc.		- 40HRC	First choice	AH120	MJ	30 - 130	0.002 - 0.006
	Hardened steel	H13, etc.	40 - 50HRC	First choice	AH3225	MJ	260 - 430	0.004 - 0.008
		D2, etc.	50 - 60HRC	First choice	AH120	MJ	160 - 230	0.001 - 0.004

RNMU

ISO	Workpiece materials		Hardness	Priority	Grades	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, 1020, etc.		200 - 300HB	First choice	AH3225	MJ	330 - 820	*ap = 0.236": 0.004 - 0.012 *ap = 0.078": 0.016 - 0.031 *ap = 0.039": 0.031 - 0.059
				For wear resistance	T3225	MJ	660 - 1150	
	High carbon and alloy steel 1055, 4140, etc.		150 - 300HB	First choice	AH3225	MJ	330 - 820	
				For wear resistance	T3225	MJ	590 - 980	
M	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	AH3225	MJ	330 - 660	*ap = 0.236": 0.004 - 0.010 *ap = 0.078": 0.012 - 0.027 *ap = 0.039": 0.024 - 0.051
				For wear resistance	T3225	MJ	490 - 820	
	Stainless steel 304SS, 316SS, etc.		- 200HB	First choice	AH3135	MJ	330 - 660	
				For wear resistance	T3225	MJ	330 - 820	
K	Cast stainless steel 1.4849, etc.		-	First choice	T3225	MJ	200 - 390	*ap = 0.078": 0.008 - 0.016 *ap = 0.039": 0.012 - 0.031
				For fracture resistance	AH3135	MJ	200 - 390	
	Gray cast iron Class 25, Class 30, etc.		150 - 250HB	First choice	AH120	MJ	330 - 980	
					T1215	MJ	330 - 820	
S	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250HB	First choice	AH120	MJ	330 - 980	*ap = 0.236": 0.004 - 0.012 *ap = 0.078": 0.016 - 0.031 *ap = 0.039": 0.031 - 0.059
					T1215	MJ	260 - 660	
	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	AH3135	MJ	100 - 200	
H	Heat-resistant alloys Inconel718, etc.		- 40HRC	First choice	AH120	MJ	30 - 130	ap = 0.039": 0.006 - 0.031 ap = 0.039": 0.002 - 0.012
	Hardened steel	H13, etc.	40 - 50HRC	First choice	AH3225	MJ	260 - 430	
		D2, etc.	50 - 60HRC	First choice	AH120	MJ	160 - 230	

* When using T3225 or T1215, decrease the feed per tooth (fz) to 80% of the above mentioned value.

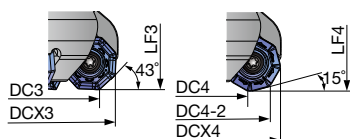


Inch	DC	DC2	CICT	DCSFMS	LF	LF2	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Insert	Arbor type
TAN07R250U0075A05	2.500	2.394	5	1.750	1.750	1.805	0.750	0.750	0.313	0.188	1.000	With	SN*U/ON*U...	A
TAN07R250U0075A06	2.500	2.394	6	1.750	1.750	1.805	0.750	0.750	0.313	0.188	1.000	With	SN*U/ON*U...	A
TAN07R300U0100A06	3.000	2.894	6	2.000	2.000	2.055	1.000	0.750	0.375	0.219	2.000	With	SN*U/ON*U...	A
TAN07R300U0100A08	3.000	2.894	8	2.000	2.000	2.055	1.000	0.750	0.375	0.219	2.000	With	SN*U/ON*U...	A
TAN07R400U0150A07	4.000	3.894	7	2.400	2.000	2.055	1.500	1.000	0.625	0.375	3.000	With	SN*U/ON*U...	B
TAN07R400U0150A10	4.000	3.894	10	2.400	2.000	2.055	1.500	1.000	0.625	0.375	3.000	With	SN*U/ON*U...	B
TAN07R500U0150A08	5.000	4.894	8	2.400	2.500	2.555	1.500	1.000	0.625	0.375	5.000	With	SN*U/ON*U...	B
TAN07R500U0150A12	5.000	4.894	12	2.400	2.500	2.555	1.500	1.000	0.625	0.375	5.000	With	SN*U/ON*U...	B
TAN07R600U0200A10	6.000	5.894	10	4.000	2.500	2.555	2.000	1.000	0.750	0.438	7.000	Without	SN*U/ON*U...	B
TAN07R600U0200A15	6.000	5.894	15	4.000	2.500	2.555	2.000	1.000	0.750	0.438	7.000	Without	SN*U/ON*U...	B
TAN07R800U0250A12	8.000	7.894	12	5.300	2.500	2.555	2.500	1.400	1.000	0.531	13.000	Without	SN*U/ON*U...	C
TAN07R800U0250A18	8.000	7.894	18	5.300	2.500	2.555	2.500	1.400	1.000	0.531	13.000	Without	SN*U/ON*U...	C

Dimension when using positive type inserts (OWMT)

OWMT-ML

OWMT-HJ



Inch	OWMT-ML			OWMT-HJ			
	DC3	DCX3	LF3	DC4	DC4-2	DCX4	LF4
TAN07R250U0075A...	2.520	2.213	1.789	3.000	2.665	3.028	1.805
TAN07R300U0100A...	3.020	2.713	2.039	3.500	3.165	3.528	2.055
TAN07R400U0150A...	4.020	3.713	2.039	4.500	4.165	4.528	2.055
TAN07R500U0150A...	5.020	4.713	2.539	5.500	5.165	5.528	2.555
TAN07R600U0200A...	6.020	5.713	2.539	6.500	6.165	6.528	2.555
TAN07R800U0250A...	8.020	7.713	2.539	8.500	8.165	8.528	2.555

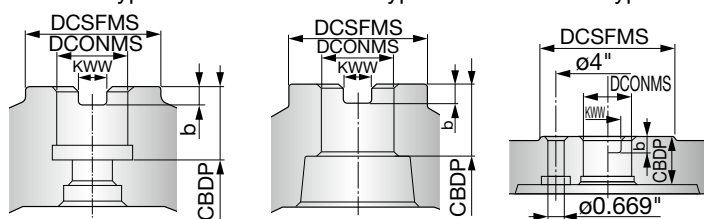
OWMT08 inserts can be only used with screw on type cutters.

Arbor type

Arbor type A

Arbor type B

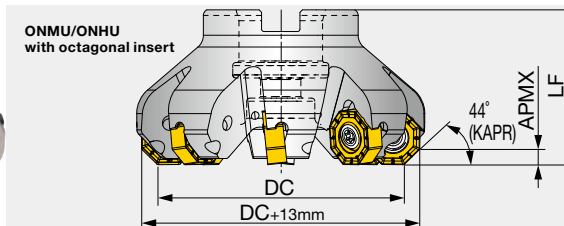
Arbor type C



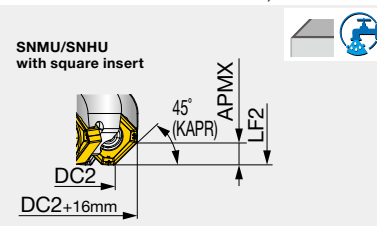
SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Shell locking bolt (Optional parts)
TAN07R250...	SRM5X0.8IP20X+ACROLYTE	H-TB	BLD IP20/S7	(C0.375X1.125H)
TAN07R300...	SRM5X0.8IP20X+ACROLYTE	H-TB	BLD IP20/S7	(C0.500X1.375H)
TAN07R400, 500...	SRM5X0.8IP20X+ACROLYTE	H-TB	BLD IP20/S7	(TMBA-0.750H)
TAN07R600, 800...	SRM5X0.8IP20X+ACROLYTE	H-TB	BLD IP20/S7	-

Recommended clamping torque: 5.53 lbs·ft



GAMP=-6°, GAMF=+15.5°



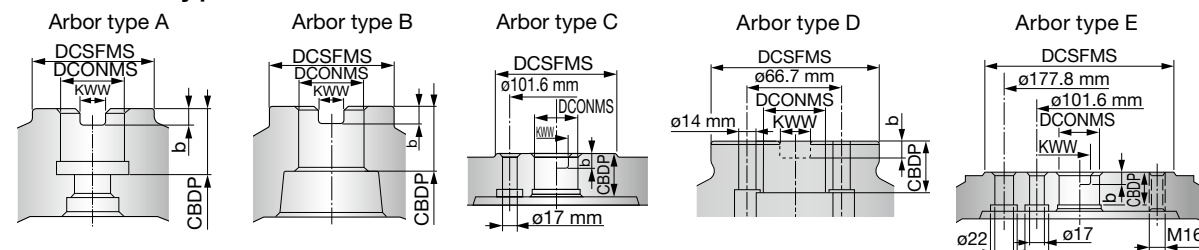
	Metric	DC	DC2	CICT	DCSFMS	LF	LF2	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Arbor type
	TAN07R063M22.0E05	63	60.3	5	41	40	41.4	22	20	10.4	6.3	0.5	With	SN*U/ON*U...	A
	TAN07R063M22.0E06	63	60.3	6	41	40	41.4	22	20	10.4	6.3	0.5	With	SN*U/ON*U...	A
	TAN07R080M25.4-06	80	77.3	6	50	50	51.4	25.4	26	9.5	6	1	With	SN*U/ON*U...	A
	TAN07R080M25.4-08	80	77.3	8	50	50	51.4	25.4	26	9.5	6	1	With	SN*U/ON*U...	A
	TAN07R080M27.0E06	80	77.3	6	50	50	51.4	27	22	12.4	7	1	With	SN*U/ON*U...	A
	TAN07R080M27.0E08	80	77.3	8	50	50	51.4	27	22	12.4	7	1	With	SN*U/ON*U...	A
	TAN07R100M31.7-07	100	97.3	7	60	50	51.4	31.75	32	12.7	8	1.5	With	SN*U/ON*U...	B
	TAN07R100M31.7-10	100	97.3	10	60	50	51.4	31.75	32	12.7	8	1.5	With	SN*U/ON*U...	B
	TAN07R100M32.0E07	100	97.3	7	60	50	51.4	32	28.5	14.4	8	1.5	With	SN*U/ON*U...	B
	TAN07R100M32.0E10	100	97.3	10	60	50	51.4	32	28.5	14.4	8	1.5	With	SN*U/ON*U...	B
	TAN07R125M38.1-08	125	122.3	8	80	63	64.4	38.1	38	15.9	10	2.5	With	SN*U/ON*U...	B
	TAN07R125M38.1-12	125	122.3	12	80	63	64.4	38.1	38	15.9	10	2.5	With	SN*U/ON*U...	B
	TAN07R125M40.0E08	125	122.3	8	71	63	64.4	40	29	16.4	9	2.5	With	SN*U/ON*U...	B
	TAN07R125M40.0E12	125	122.3	12	71	63	64.4	40	29	16.4	9	2.5	With	SN*U/ON*U...	B
	TAN07R160M40.0E10	160	157.3	10	100	63	64.4	40	29	16.4	9	4	Without	SN*U/ON*U...	D
	TAN07R160M40.0E15	160	157.3	15	100	63	64.4	40	29	16.4	9	4	Without	SN*U/ON*U...	D
	TAN07R160M50.8-10	160	157.3	10	100	63	64.4	50.8	38	19	11	4	Without	SN*U/ON*U...	B
	TAN07R160M50.8-15	160	157.3	15	100	63	64.4	50.8	38	19	11	4	Without	SN*U/ON*U...	B
	TAN07R200M47.6-12	200	197.3	12	130	63	64.4	47.625	38	25.4	14	6.6	Without	SN*U/ON*U...	C
	TAN07R200M47.6-18	200	197.3	18	130	63	64.4	47.625	38	25.4	14	6.7	Without	SN*U/ON*U...	C
	TAN07R200M60.0E12	200	197.3	12	135	63	64.4	60	38	25.7	14	6.5	Without	SN*U/ON*U...	C
	TAN07R200M60.0E18	200	197.3	18	135	63	64.4	60	38	25.7	14	6.5	Without	SN*U/ON*U...	C
	TAN07R250M47.6-15	250	247.3	15	130	63	64.4	47.625	38	25.4	14	9.3	Without	SN*U/ON*U...	C
	TAN07R250M47.6-21	250	247.3	21	130	63	64.4	47.625	38	25.4	14	9.4	Without	SN*U/ON*U...	C
	TAN07R250M60.0E15	250	247.3	15	130	63	64.4	60	38	25.7	14	9	Without	SN*U/ON*U...	C
	TAN07R250M60.0E21	250	247.3	21	130	63	64.4	60	38	25.7	14	9	Without	SN*U/ON*U...	C
	TAN07R315M47.6-18	315	312.3	18	220	63	64.4	47.625	38	25.4	14	17.9	Without	SN*U/ON*U...	C
	TAN07R315M47.6-24	315	312.3	24	220	63	64.4	47.625	38	25.4	14	18	Without	SN*U/ON*U...	C
	TAN07R315M60.0E18	315	312.3	18	220	80	81.4	60	38	25.7	14	18	Without	SN*U/ON*U...	E
	TAN07R315M60.0E24	315	312.3	24	220	80	81.4	60	38	25.7	14	18	Without	SN*U/ON*U...	E

Dimension when using positive type inserts (OWMT)

OWMT-ML	OWMT-HJ	Designation	OWMT-ML			OWMT-HJ			
			DC3	DCX3	LF3	DC4	DC4-2	DCX4	LF4
		TAN07R063M...	63.5	76	41	55.7	67.2	76.4	41.4
		TAN07R080M...	80.5	93	51	72.7	84.2	93.4	51.4
		TAN07R100M...	100.5	113	51	92.7	104.2	113.4	51.4
		TAN07R125M...	125.5	138	64	117.7	129.2	138.4	64.4
		TAN07R160M...	160.5	173	64	152.7	164.2	173.4	64.4
		TAN07R200M...	200.5	213	64	192.7	204.2	213.4	64.4
		TAN07R250M...	250.5	263	64	242.7	254.2	263.4	64.4
		TAN07R315M...	315.5	328	64	307.7	319.2	328.4	64.4

Note: OWMT08 inserts can be only used with screw on type cutters.

Arbor type

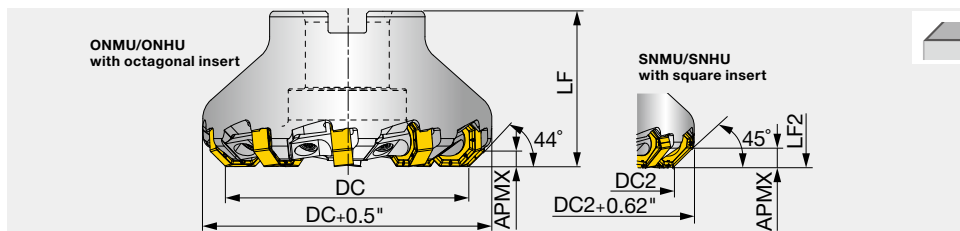


SPARE PARTS

Designation	Clamping screw	Grip	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TAN07R063M22.0...	SRM5X0.8IP20X+ACROLYTE	H-TB	-	CM10X30H	BLD IP20/S7
TAN07R080M25.4...	SRM5X0.8IP20X+ACROLYTE	H-TB	-	CM12X30H	BLD IP20/S7
TAN07R100M31.7...	SRM5X0.8IP20X+ACROLYTE	H-TB	TMBA-M16H	-	BLD IP20/S7
TAN07R125M38.1...	SRM5X0.8IP20X+ACROLYTE	H-TB	TMBA-M20H	-	BLD IP20/S7
TAN07R160 - 315...	SRM5X0.8IP20X+ACROLYTE	H-TB	-	-	BLD IP20/M7

Recommended clamping torque: 7.5 N·m

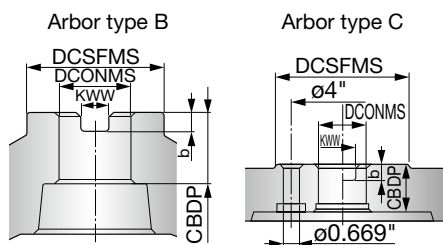
Reference pages: Inserts → H103, Standard cutting conditions → H104



Inch	DC	DC2	CICT	DCSFMS	LF	LF2	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Insert	Arbor type
TAN07R250U0075A08W	2.500	2.394	8	1.750	1.750	1.805	0.750	0.750	0.313	0.188	1.60	Without	SN*U/ON*U...	B
TAN07R300U0100A10W	3.000	2.894	10	2.000	2.000	2.055	1.000	0.750	0.375	0.219	2.00	Without	SN*U/ON*U...	B
TAN07R400U0150A14W	4.000	3.894	14	2.400	2.000	2.055	1.500	1.000	0.625	0.375	2.80	Without	SN*U/ON*U...	B
TAN07R500U0150A18W	5.000	4.894	18	2.400	2.500	2.555	1.500	1.000	0.625	0.375	4.30	Without	SN*U/ON*U...	B
TAN07R600U0200A22W	6.000	5.894	22	4.000	2.500	2.555	2.000	1.000	0.750	0.438	6.80	Without	SN*U/ON*U...	B
TAN07R800U0250A28W	8.000	7.894	28	5.300	2.500	2.555	2.500	1.400	1.000	0.531	13.50	Without	SN*U/ON*U...	C

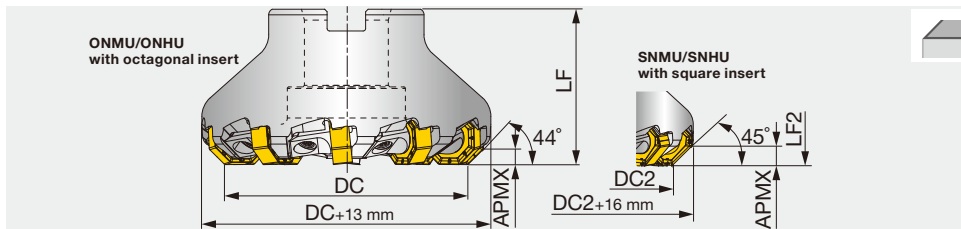
OWMT insert cannot be used with a wedge clamp type cutter.

Arbor type



SPARE PARTS

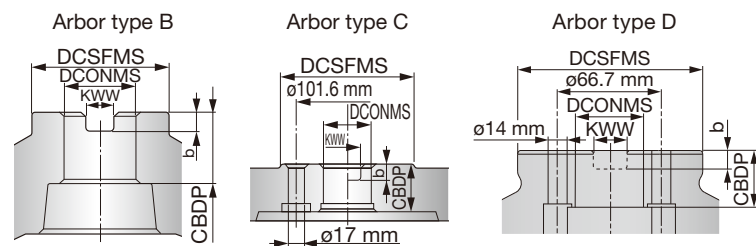
Designation	Grip	Torx bit	Wedge	Clamping screw	Shell locking bolt (Optional parts)
TAN07R250U**W	H-TBS	BLD IP15/S7	CL ARM-10-TUNG1	DS-6P	(C0.375X1.125H)
TAN07R300U**W	H-TBS	BLD IP15/S7	CL ARM-10-TUNG1	DS-6P	(C0.500X1.375H)
TAN07R400U**W, TAN07R500U**W	H-TBS	BLD IP15/S7	CL ARM-10-TUNG1	DS-6P	(TMBA-0.750H)
TAN07R600U**W, TAN07R800U**W	H-TBS	BLD IP15/S7	CL ARM-10-TUNG1	DS-6P	-



Metric	DC	DC2	CICT	DCSFMS	LF	LF2	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Arbor type
TAN07R063M22.0E08W	63	60.3	8	41	40	41.4	22	20	10.4	6.3	0.6	Without	SN*U/ON*U...	B
TAN07R080M25.4-10W	80	77.3	10	50	50	51.4	25.4	26	9.5	6	1	Without	SN*U/ON*U...	B
TAN07R080M27.0E10W	80	77.3	10	50	50	51.4	27	25	12.4	7	1.1	Without	SN*U/ON*U...	B
TAN07R100M31.7-14W	100	97.3	14	60	50	51.4	31.75	32	12.7	8	1.3	Without	SN*U/ON*U...	B
TAN07R100M32.0E14W	100	97.3	14	60	50	51.4	32	28.5	14.4	8	1.6	Without	SN*U/ON*U...	B
TAN07R125M38.1-18W	125	122.3	18	80	63	64.4	38.1	38	15.9	10	2.8	Without	SN*U/ON*U...	B
TAN07R125M40.0E18W	125	122.3	18	71	63	64.4	40	29	16.4	9	2.5	Without	SN*U/ON*U...	B
TAN07R160M50.8-22W	160	157.3	22	100	63	64.4	50.8	38	19	11	4	Without	SN*U/ON*U...	B
TAN07R160M40.0E22W	160	157.3	22	100	63	64.4	40	29	16.4	9	3.6	Without	SN*U/ON*U...	D
TAN07R200M60.0E28W	200	197.3	28	135	63	64.4	60	39	25.7	14	5.8	Without	SN*U/ON*U...	C

OWMT insert cannot be used with a wedge clamp type cutter.

Arbor type

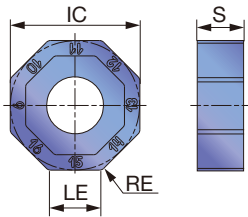


SPARE PARTS

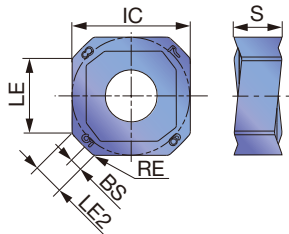
Designation	Grip	Wedge	Wedge fixing screw	Torx bit
TAN07-W	H-TBS	CLARM-10-TUNG1	DS-6P	BLDIP15/S7

INSERT

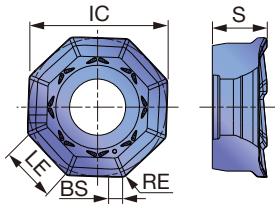
ONMU/ONHU0705-MJ / -ML



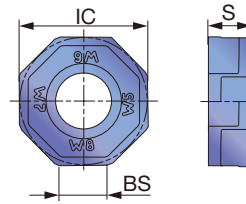
SNMU/SNHU1706 -MJ / -ML



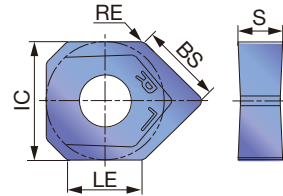
OWMT0807-ML



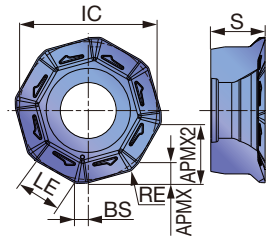
ONHU0705-W



SNHU1706-W



OWMT0807-HJ



P Steel				☆	★	★		★	
M Stainless		☆			★			★	
K Cast iron	★			☆			★		
N Non-ferrous									
S Superalloys		☆			☆				
H Hard materials					☆				

★ : First choice
☆ : Second choice

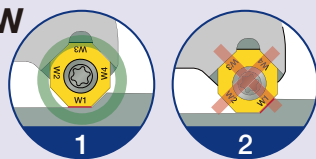
Designation	RE	APMX	Coated							LE	S	LE2	IC	BS	APMX2
			AH120	AH130	AH140	AH725	AH3135	T1115	T1215	T3225					
ONMU0705ANPN-MJ	0.031	0.187			●	●	●	●	●	●	0.283	0.244	-	0.681	-
ONHU0705ANPN-MJ	0.031	0.187			●	●			●	●	0.283	0.244	-	0.681	-
ONMU0705ANPN-ML	0.031	0.187	●				●				0.283	0.244	-	0.681	-
ONHU0705ANTN-ML	0.031	0.187	●		●						0.283	0.244	-	0.681	-
ONHU0705ANPR-W *	-	0.187	●								0.283	0.228	-	0.689	0.252
OWMT0807ZNER-HJ	0.031	0.059					●				-	0.291	-	0.748	0.039
OWMT0807AAER-ML	0.047	0.138		●			●				0.205	0.291	-	0.047	-
SNMU1706ANPR-MJ	0.031	0.295			●	●	●		●	●	0.433	0.275	0.173	0.681	0.709
SNHU1706ANPR-MJ	0.031	0.295			●	●					0.433	0.275	0.173	0.681	0.709
SNMU1706ANTR-ML	0.031	0.295	●				●				0.433	0.275	0.173	0.681	0.709
SNHU1706ANTR-ML	0.031	0.295	●								0.433	0.275	0.173	0.681	0.709
SNHU1706ANFN-W *	0.016	0.295	●								0.681	0.256	-	0.681	0.433

* Pay attention to the wiper insert installation procedure below.

●: Line up

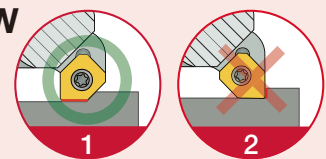
Attention for wiper inserts

ONHU0705ANPR-W



Attach only one wiper insert on the cutter and make sure the wiper edge faces the machining surface.
Feed rate: $f < 0.217$ ipr

SNHU1706ANFN-W



Attach only one wiper insert on the cutter and make sure the wiper edge faces the machining surface.
Feed rate: $f < 0.374$ ipr

Reference pages: Standard cutting conditions → **H104**



STANDARD CUTTING CONDITIONS

Negative type

ISO	Workpiece material	Hardness	Priority	Recommendation		Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
				Grade	Chipbreaker		
P	Low carbon steel 1015, etc.	- 200 HB	First choice	AH3135	MJ	330 - 820	0.008 - 0.020
		- 200 HB	Wear resistance	T3225	MJ	660 - 1150	0.008 - 0.016
		- 200 HB	Low cutting force	AH3135	ML	330 - 820	0.008 - 0.016
	High carbon steel 1045, 1055, etc.	200 - 300 HB	First choice	AH3135	MJ	330 - 750	0.008 - 0.016
		200 - 300 HB	Wear resistance	T3225	MJ	590 - 660	0.008 - 0.016
		200 - 300 HB	Low cutting force	AH3135	ML	330 - 750	0.008 - 0.016
	Alloy steel 4140, etc.	150 - 330 HB	First choice	AH3135	MJ	330 - 660	0.008 - 0.016
		150 - 330 HB	Wear resistance	T3225	MJ	490 - 820	0.008 - 0.016
		150 - 330 HB	Low cutting force	AH3135	ML	330 - 660	0.008 - 0.016
M	Stainless steel S30400, etc.	- 200 HB	First choice	AH3135	MJ	330 - 660	0.004 - 0.012
		- 200 HB	Wear resistance	T3225	MJ	330 - 820	0.004 - 0.012
K	Gray cast iron No.35B, No.45B, etc.	150 - 250 HB	First choice	T1215	MJ	490 - 660	0.008 - 0.020
		150 - 250 HB	Fracture resistance	AH725	MJ	330 - 820	0.008 - 0.020
		150 - 250 HB	Low cutting force	AH120	ML	330 - 820	0.008 - 0.020
	Ductile cast iron 60-40-18, etc.	150 - 300 HB	First choice	T1215	MJ	330 - 660	0.008 - 0.020
		150 - 300 HB	Fracture resistance	AH725	MJ	260 - 660	0.008 - 0.020
		150 - 300 HB	Low cutting force	AH120	ML	260 - 660	0.008 - 0.020
H	Hardened steel	40 - 50 HRC	First choice	AH725	MJ	260 - 430	0.004 - 0.008
		50 - 60 HRC	First choice	AH725	MJ	160 - 230	0.002 - 0.004

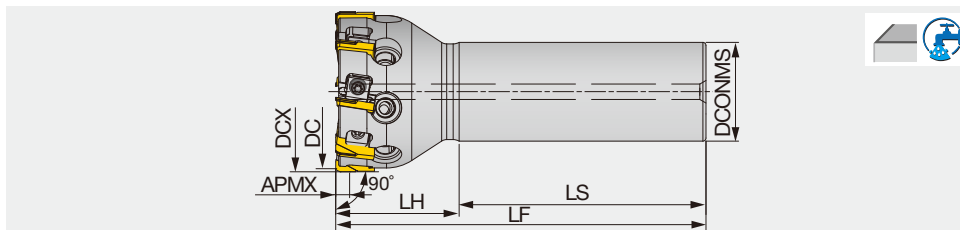
Positive type

ISO	Workpiece material	Hardness	Priority	Grade	Cutting speed Vc (sfm)	Feed per tooth : fz (ipt)	
						ML	HJ*
P	Low carbon steel 1015, etc.	- 200 HB	First choice	AH3135	330 - 980	0.004 - 0.016	0.02 - 0.059
		- 200 HB	Fracture resistance	AH130	330 - 980	0.004 - 0.016	-
	High carbon steel 1045, 1055, etc.	200 - 300 HB	First choice	AH3135	330 - 750	0.004 - 0.010	0.02 - 0.059
		200 - 300 HB	Fracture resistance	AH130	330 - 750	0.004 - 0.010	-
	Alloy steel 4140, etc.	150 - 330 HB	First choice	AH3135	330 - 660	0.004 - 0.010	0.02 - 0.059
		150 - 330 HB	Fracture resistance	AH130	330 - 660	0.004 - 0.010	-
M	Stainless steel S30400, etc.	- 200 HB	First choice	AH3135	330 - 500	0.004 - 0.010	0.012 - 0.02
		- 200 HB	Fracture resistance	AH130	330 - 500	0.004 - 0.010	-
K	Gray cast iron No.35B, No.45B, etc.	150 - 250 HB	First choice	AH3135	330 - 830	0.004 - 0.016	0.02 - 0.059
		150 - 250 HB	Fracture resistance	AH130	330 - 830	0.004 - 0.016	-
	Ductile cast iron 60-40-18, etc.	150 - 250 HB	First choice	AH3135	260 - 660	0.004 - 0.010	0.02 - 0.059
		150 - 250 HB	Fracture resistance	AH130	260 - 660	0.004 - 0.010	-
S	Titanium alloy Ti-6Al-4V, etc.	- HRC 40	First choice	AH3135	100 - 200	0.004 - 0.010	0.012 - 0.02
		- HRC 40	Fracture resistance	AH130	100 - 200	0.004 - 0.010	-
	Heat resistant alloy Inconel718, etc.	- HRC 40	First choice	AH3135	30 - 130	0.002 - 0.006	0.004 - 0.012
		- HRC 40	Fracture resistance	AH130	30 - 130	0.002 - 0.006	-
H	Hardened steel	40 - 50 HRC	First choice	AH3135	260 - 420	-	0.004 - 0.012
		50 - 60 HRC	First choice	AH3135	160 - 230	-	0.001 - 0.003

* Apply 20% of recommended feed when using HJ insert with ap over 0.059".

Face milling cutter for non-ferrous applications, shank type, with PCD inserts

GAMP = +9°, GAMF = +4°



Inch	APMX	DC	DCX	CICT	DCONMS	LF	LH	LS	WT(lb)	Air hole	RPMX(min ⁻¹)	Insert
EPYD06U2.00C1.25R08	0.177	2.000	2.079	8	1.250	4.500	1.575	2.925	1.920	With	22,000	YDEN0603...

Metric	APMX	DC	DCX	CICT	DCONMS	LF	LH	LS	WT(kg)	Air hole	RPMX(min ⁻¹)	Insert
EPYD06M050C32.0R06	4.5	50	52	6	32	120	40	80	0.91	With	20,000	YDEN0603...
EPYD06M050C32.0R08	4.5	50	52	8	32	120	40	80	0.9	With	20,000	YDEN0603...

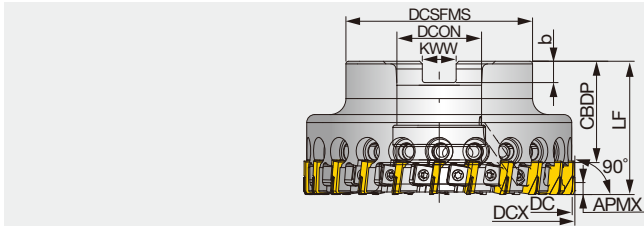
SPARE PARTS

Designation	Insert locking wedge	Wedge fixing screw	Adjusting cam	Torx bit	Cam tightening screw	Wrench	Grip
EPYD06...	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W



Face milling cutter for non-ferrous applications, bore type, with PCD inserts

GAMP = +9°, GAMF = +4°



Inch	APMX	DC	DCX	CICT	DCSFMS	LF	DCON	CBDP	KWW	b	WT(lb)	Air hole	RPMX(min ⁻¹)	Insert
TPYD06U2.50B0.75R10	0.177	2.500	2.579	10	1.772	1.575	0.750	0.750	0.315	0.197	1.340	With	19,000	YDEN0603...
TPYD06U3.00B1.00R16	0.177	3.000	3.079	16	2.362	1.969	1.000	1.024	0.374	0.236	2.560	With	17,000	YDEN0603...
TPYD06U4.00B1.25R22	0.177	4.000	4.079	22	2.756	1.969	1.250	0.827	0.500	0.315	4.300	With	15,000	YDEN0603...
TPYD06U5.00B1.50R26	0.177	5.000	5.079	26	3.543	2.362	1.500	1.299	0.626	0.394	8.030	With	14,000	YDEN0603...
TPYD06U6.00B1.50R34	0.177	6.000	6.079	34	3.543	2.362	1.500	1.299	0.626	0.394	10.760	With	12,000	YDEN0603...

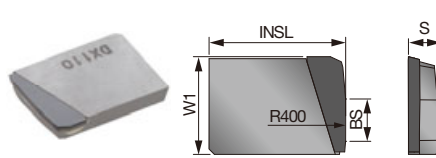
Metric	APMX	DC	DCX	CICT	DCSFMS	LF	DCON	CBDP	KWW	b	WT(kg)	Air hole	RPMX(min ⁻¹)	Insert
TPYD06M063B22.0R08	4.5	63	65	8	45	40	22	20	10.4	6.3	0.59	With	19,000	YDEN0603...
TPYD06M063B22.0R10	4.5	63	65	10	45	40	22	20	10.4	6.3	0.57	With	19,000	YDEN0603...
TPYD06M080B27.0R10	4.5	80	82	10	60	50	27	22	12.4	7	1.3	With	17,000	YDEN0603...
TPYD06M080B27.0R16	4.5	80	82	16	60	50	27	22	12.4	7	1.24	With	17,000	YDEN0603...
TPYD06J080B25.4R10	4.5	80	82	10	60	50	25.4	26	9.5	6	1.31	With	17,000	YDEN0603...
TPYD06J080B25.4R16	4.5	80	82	16	60	50	25.4	26	9.5	6	1.26	With	17,000	YDEN0603...
TPYD06M100B32.0R12	4.5	100	102	12	70	50	32	25	14.4	8	1.85	With	15,000	YDEN0603...
TPYD06M100B32.0R22	4.5	100	102	22	70	50	32	25	14.4	8	1.78	With	15,000	YDEN0603...
TPYD06J100B31.7R12	4.5	100	102	12	70	50	31.75	32	12.7	8	1.84	With	15,000	YDEN0603...
TPYD06J100B31.7R22	4.5	100	102	22	70	50	31.75	32	12.7	8	1.76	With	15,000	YDEN0603...
TPYD06M125B40.0R14	4.5	125	127	14	90	60	40	32	16.4	9	3.59	With	14,000	YDEN0603...
TPYD06M125B40.0R26	4.5	125	127	26	90	60	40	32	16.4	9	3.48	With	14,000	YDEN0603...
TPYD06J125B38.1R14	4.5	125	127	14	90	60	38.1	38	15.9	10	3.61	With	14,000	YDEN0603...
TPYD06J125B38.1R26	4.5	125	127	26	90	60	38.1	38	15.9	10	3.56	With	14,000	YDEN0603...
TPYD06M160B40.0R20	4.5	160	162	20	90	60	40	32	16.4	9	5.34	With	12,000	YDEN0603...
TPYD06M160B40.0R34	4.5	160	162	34	90	60	40	32	16.4	9	5.2	With	12,000	YDEN0603...
TPYD06J160B38.1R20	4.5	160	162	20	90	60	38.1	38	15.9	10	5.43	With	12,000	YDEN0603...
TPYD06J160B38.1R34	4.5	160	162	34	90	60	38.1	38	15.9	10	5.29	With	12,000	YDEN0603...

SPARE PARTS

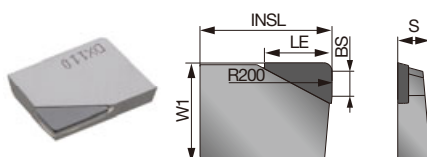


Designation	Insert locking wedge	Wedge fixing screw	Adjusting cam	Torx bit	Cam tightening screw	Wrench	Grip	Shell locking bolt	Shell locking bolt (Optional parts)
TPYD06U2.50B0.75R10	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	-	(C0.375X1.125H)
TPYD06U3.00B1.00R16	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	-	(C0.500X1.375H)
TPYD06U4.00B1.25R22	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	-	-
TPYD06U5.00..., 6.00...	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	-	(TMBA-0.750H)
TPYD06M063B22.0R**	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	CM10x30H	-
TPYD06*080B2*.R**	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	CM12x30H	-
TPYD06M100B32.0R**	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	CM16x40H	-
TPYD06J100B31.7R**	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	TMBA-M16H	-
TPYD06*125B**.*R**, TPYD06*160B**.*R**	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	TMBA-M20H	-

YDEN0603PDFR-BD



YDEN0603(04/08)PDFR-D



★ : First choice

● : Line up
Package quantity = 1 pc. per box

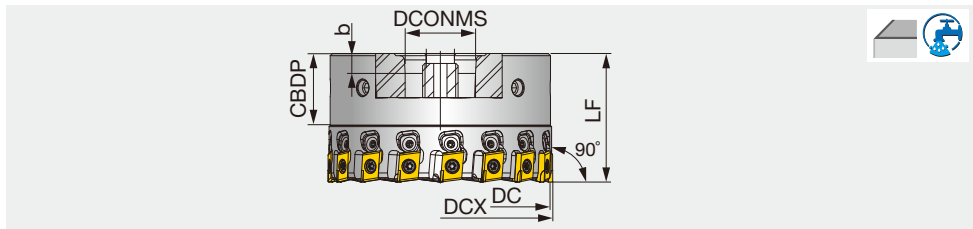
- The values in the above list are of standard recommendations and may require adjustments in consideration with cutting depths and/or workpiece/machine rigidity.
- Use wiper inserts (-WD) for better surface requirements and deburring inserts (-BD) to remove burrs.
- Always use wet cutting (emulsion coolant) for machining aluminum or copper alloys.
- To make the best of the cutter's deburring ability, make sure to place a deburring insert immediately behind every standard insert on the cutter.



TUNGSMILL

TPYP12

High speed PCD mill for non ferrous metal



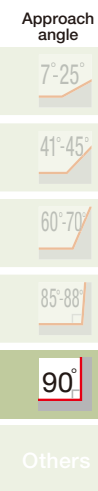
	Metric	DC	DCX	CICT	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
	TPYP12M050B22.0R08	50	51.4	8	55	22	20	10.4	6.3	0.9	With	YPEB12X3-*P...
	TPYP12M063B22.0R10	63	64.4	10	55	22	20	10.4	6.3	1.3	With	YPEB12X3-*A...
	TPYP12M080B27.0R12	80	81.4	12	58	27	22	12.4	7	2.2	With	YPEB12X3-*A...
	TPYP12J080B25.4R12	80	81.4	12	58	25.4	26	9.5	6	2.2	With	YPEB12X3-*A...
	TPYP12M100B32.0R16	100	101.4	16	58	32	25	14.4	8	1.9	With	YPEB12X3-*A...
	TPYP12J100B31.7R16	100	101.4	16	58	31.75	32	12.7	8	1.9	With	YPEB12X3-*A...
	TPYP12M125B40.0R20	125	126.4	20	58	40	28	16.4	9	2.9	With	YPEB12X3-*A...
	TPYP12J125B38.1R20	125	126.4	20	58	38.1	38	15.9	10	2.9	With	YPEB12X3-*A...

DCX: Outside diameter
DC: Diameter with 01 type insert

SPARE PARTS

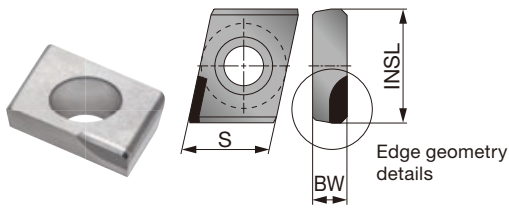
Designation	Clamping screw	Wrench	Wedge fixing screw	Wedge	Wrench	Cover	Shell locking bolt
TPYP12M050B22.0R08	VX040024A	T-15F	RSRGR7M40	RSFTC1008	T-8F	-	RSFTS-050M
TPYP12M063B22.0R10	VX040024A	T-15F	RSRGR7M40	RSFTC1008	T-8F	RSFTS6063M	VC004762I10035F
TPYP12M080B27.0R12, TPYP12J080B25.4R12	VX040024A	T-15F	RSRGR7M40	RSFTC1008	T-8F	RSFTS6080	VC00TEDI12040F
TPYP12M100B32.0R16, TPYP12J100B31.7R16	VX040024A	T-15F	RSRGR7M40	RSFTC1008	T-8F	RSFTS6100	VC00TANG16040F
TPYP12M125B40.0R20, TPYP12J125B38.1R20	VX040024A	T-15F	RSRGR7M40	RSFTC1008	T-8F	RSFTS6125	VC00TEDI20040F

Recommended clamping torque: 4.5 N·m

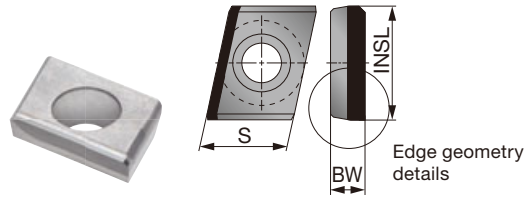


INSERT

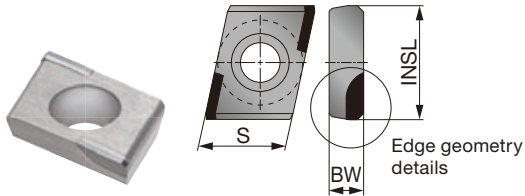
YPEB12X3-1A



YPEB12X-FP



YPEB12X3-2A/P



Note: Insert with -1/2A are suitable for diameter over D50mm only.

Edge geometry details

01R-D

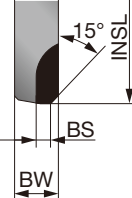


Fig.1

02R-D

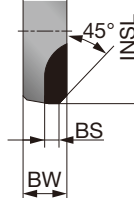


Fig.2

07R-D

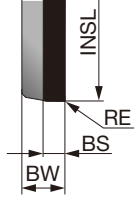


Fig.3

P	Steel
M	Stainless
K	Cast iron
N	Non-ferrous
S	Superalloys
H	Hard materials

★

★ : First choice
☆ : Second choice

Designation	No. of corner	RE	APMX	PCD					INSL	S	BW	BS	Applicable cutter diameter	Fig.
				DX160										
YPEB12X3-1A01R-D	1	-	0.157	●					0.503	0.375	0.152	0.063	DC > ø50 mm	1
YPEB12X3-1A02R-D	1	-	0.157	●					0.502	0.375	0.152	0.051	DC > ø50 mm	2
YPEB12X3-1A07R-D	1	0.016	0.157	●					0.502	0.375	0.152	0.053	DC > ø50 mm	3
YPEB12X3-1P02R-D	1	-	0.157	●					0.505	0.375	0.152	0.054	DC ≤ ø50 mm	2
YPEB12X3-1P07R-D	1	0.016	0.157	●					0.505	0.375	0.152	0.054	DC ≤ ø50 mm	3
YPEB12X3-FP02R-D	1	-	0.433	●					0.505	0.375	0.152	0.054	DC ≤ ø50 mm	2
YPEB12X3-FP07R-D	1	0.016	0.433	●					0.505	0.375	0.152	0.054	DC ≤ ø50 mm	3
YPEB12X3-2A01R-D	2	-	0.157	●					0.504	0.375	0.152	0.063	DC > ø50 mm	1
YPEB12X3-2A02R-D	2	-	0.157	●					0.504	0.375	0.152	0.081	DC > ø50 mm	2
YPEB12X3-2A07R-D	2	0.016	0.157	●					0.504	0.375	0.152	0.081	DC > ø50 mm	3
YPEB12X3-2P07R-D	2	0.016	0.157	●					0.507	0.375	0.152	0.081	DC ≤ ø50 mm	3

● : Line up
2 pieces per package

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
N	Aluminum cast Si < 13%	DX160	≤ 19685	0.002 - 0.010
	Aluminum cast Si ≥ 13%	DX160	≤ 4921	0.002 - 0.010
	Copper, brass, etc.	DX160	≤ 6562	0.002 - 0.010
	Non metallic material	DX160	≤ 9843	0.002 - 0.010

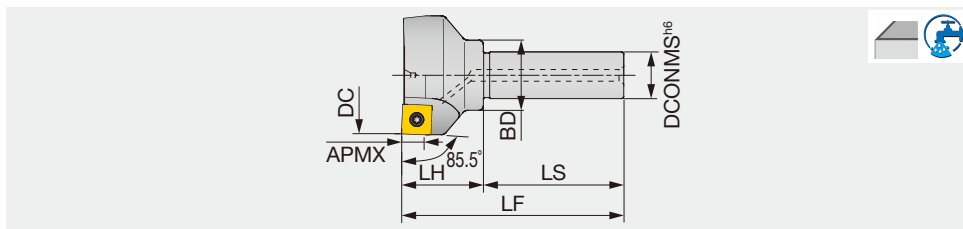


EFE / TFE

EFE12R

Face endmill for aluminum machining, shank type, with screw clamp system

GAMP = +13°, GAMF = +7°



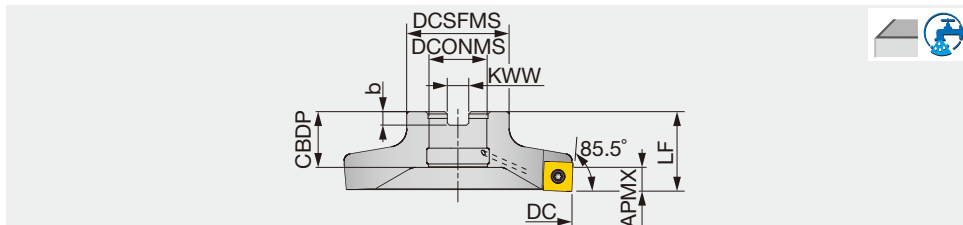
Inch	APMX	DC	CICT	DCONMS	BD	LS	LH	LF	WT (lb)	Air hole	Insert
EFE12200RU	0.315	2.000	3	0.750	1.180	2.362	1.375	3.406	0.77	With	SEG*12X4...

Metric	APMX	DC	CICT	DCONMS	BD	LS	LH	LF	WT(kg)	Air hole	Insert
EFE12050R	8	50	3	20	30	60	35	95	0.37	With	SEG*12X4...

TFE12R

Face mill for aluminum machining, with screw clamp system, light weight

GAMP = +13°, GAMF = +7°



Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CDBP	KWW	b	WT (lb)	Air hole	Insert
TFE12300RU	0.315	3.000	4	1.970	1.380	1.000	0.964	0.375	0.236	0.880	With	SEG*12X4...
TFE12400RU	0.315	4.000	6	1.970	1.380	1.000	0.964	0.375	0.236	1.340	With	SEG*12X4...

Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CDBP	KWW	b	WT(kg)	Air hole	Insert
TFE12063R	8	63	3	45	35	22	19	10	6	0.34	With	SEG*12X4...
TFE12080R	8	80	4	50	35	25.4	24.5	9.5	6	0.45	With	SEG*12X4...
TFE12100R	8	100	6	50	35	25.4	24.5	9.5	6	0.59	With	SEG*12X4...
TFE12125R	8	125	6	50	35	25.4	24.5	9.5	6	0.9	With	SEG*12X4...

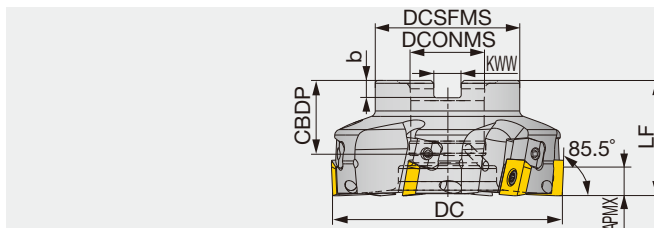
SPARE PARTS



Designation	Clamping screw	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Wrench
EFE12...	CSPB-4S	M-1000	-	-	IP-15D
TFE12300RU, TFE12400RU	CSPB-4S	M-1000	-	TMBA-0.500H	IP-15D
TFE12063R	CSPB-4S	M-1000	-	CM10X30H	IP-15D
TFE12080R - TFE12125R	CSPB-4S	M-1000	TMBA-M12H	-	IP-15D

Recommended clamping torque: 2.58 lbs·ft, 3.5 N·m

Reference pages: Inserts → [H112](#), Standard cutting conditions → [H113](#)



Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CDBP	KWW	b	WT(kg)	Air hole	Insert
TFE12R080M25.4-06A	8	80	6	50	40	25.4	26	9.5	6	0.70	With	SEG*12X4...
TFE12R080M27.0E06A	8	80	6	55	40	27	22	12.4	7	0.69	With	SEG*12X4...
TFE12R100M25.4-08A	8	100	8	50	40	25.4	26	9.5	6	1.15	With	SEG*12X4...
TFE12R100M27.0E08A	8	100	8	55	40	27	22	12.4	7	1.11	With	SEG*12X4...
TFE12R125M31.7-10A	8	125	10	70	50	31.7	32	12.7	8	2.24	With	SEG*12X4...
TFE12R125M32.0E10A	8	125	10	70	50	32	28.5	14.4	8	2.14	With	SEG*12X4...

SPARE PARTS

Designation	Clamping screw	Adjustable Wedge	Lubricant	Shell locking bolt	Right-left screw	Wrench 1	Wrench 2
TFE12R**A	CSTB-4	FW-701R	M-1000	TMBA-M12H	MCS520-2.5	P-2.5T	T-15LB

Recommended clamping torque: 3.5 N·m

INSERT SETTING PROCEDURE – ADJUSTABLE-TYPE TFE FACE MILLING CUTTER

1 Cleaning insert pockets



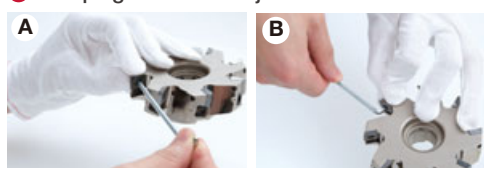
Remove all the inserts. Use air pressure to thoroughly clean the pockets of dust and chips.

2 Loosening wedges



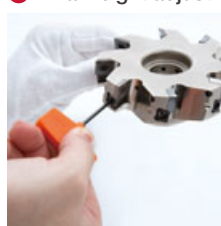
Use the included key for wedge adjustment to loosen all the wedges so that they do not exceed the cutter's outer diameter.

3 Clamping inserts for adjustments



Place the insert in the pocket and lightly tighten the clamping screw with the included key. Suggested method: Tighten the screw first with the straight end of the key (Fig A) until finger tight, then use the angled end to further tighten the screw for insert steadiness (Fig B). Do NOT fully tighten the screw at this moment as this procedure is prior to insert adjustment. Repeat the procedure for all inserts.

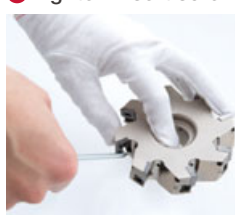
4 Axial height adjustment of inserts



Mount the cutter in Step ③ on the setting fixture of the pre-setter. Determine the highest insert, and, while carefully monitoring each insert's axial position, rotate the wedge screw in the CW direction to raise the insert in the axial direction, as close as possible to that of the highest insert. Repeat this procedure for all inserts.

Note:
Since the insert is clamped, loosening the wedge screw will not bring down the insert. To lower insert height, both the insert and wedge screws need to be loosened. Start the adjusting procedure for this insert again from Step 1.

5 Tighten insert screws



Tighten the insert clamping screw at 3.5 Nm, using the key as shown to the left. Repeat the procedure for all inserts.

6 Final adjustments



After final tightening of all insert screws, measure to ensure all inserts are at the desired axial heights. If necessary, further tighten any wedge screws in the CW direction for the final few microns. For inserts exceeding the required runout, re-start the adjustment procedure from Step ①.

Note:
Do not re-tighten the insert screw after insert adjustment is completed. Additional tightening may weaken wedge clamping torque.

Cautions:

- ① Always clean all the insert pockets thoroughly of dust and chips. Any objects present in the pocket may shift the insert's position during machining and cause poor surface finishing quality.
- ② Always loosen the wedge screw before installing the insert as described in Step ②. If the wedge is left tightened in the cutter, the adjustment range of the wedge will be limited, and insert height may not be as freely adjustable as possible.
- ③ With a finger, firmly press and hold the insert into the wedge while tightening the insert screw. If the insert is not in contact, the wedge has to be driven until the gap in between is closed, with no actual insert movement.
- ④ Loosening the wedge will not lower the insert. When the insert height exceeds the desired setting during adjustment, loosen both the insert and wedge screws and re-start the adjustment procedure from Step ①. If the insert slides downward when the wedge screw is loosened, the clamping torque of the insert screw is too low. Tighten the insert screw with a slightly higher torque. Suggested clamping method: First use the straight end of the key to tighten the screw until finger tight, then switch the key to the angled side and turn an additional 45°.
- ⑤ Do not exceed the recommended clamping torque when fixing the insert. This may damage or fracture the insert screw.

How to put each insert together

			For general	Accuracy of machining surface priority	Burr reduction priority
Applicable insert	General insert	SEGW12X4ZEFR-D DX140	◎	◎	◎
		2QP-SECW12X412ZETR BX480			
	Wiper insert	SEGW12X4ZEFR-WD DX140	—	◎	—
		1QP-SECW12X4ZETR-W BX480			
	Wiper insert for burr reduction	SEGW12X4ZEFR-BD DX140	—	—	◎
		1QP-SECW12X4ZETR-B BX480			
	Number of Inserts by type		All general	1 or 2 wiper inserts in cutter body	General insert : Burr wiper insert = 1 : 1
Accuracy of machining surface (roughness and undulation)			△	◎	○
Burr of machining surface			△	○	◎

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	Grade	Designation	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Carbon steels and alloy steels	< 300HB	AH120	SEGW12X4ZEPR	330 - 590	0.001 - 0.006
		< 300HB	NS740	SEGW12X4ZEPR	330 - 590	0.001 - 0.006
M	Stainless steels	< 250HB	AH140	SEGW12X4ZEPR	260 - 590	0.001 - 0.006
K	Gray and ductile cast irons	150 - 250 HB	AH120	SEGW12X4ZEPR	330 - 650	0.001 - 0.006
	Gray cast iron	150 - 250 HB	BX480	2QP-SECW12X412ZETR	2625 - 4921	0.002 - 0.012
	Ductile cast irons	150 - 250 HB	BX480	2QP-SECW12X412ZETR	1640 - 2625	0.002 - 0.008
N	Cast aluminum alloy / Die-cast Si < 13%	-	KS05F	SEGT12X4ZEFR-AJ	650 - 4900	0.001 - 0.008
		-	DX140	SEGW12X4ZEFR-D	650 - 4900	0.001 - 0.008
	Cast aluminum alloy / Die-cast Si ≥ 13%	-	KS05F	SEGT12X4ZEFR-AJ	260 - 650	0.001 - 0.008
		-	DX140	SEGW12X4ZEFR-D	650 - 1650	0.001 - 0.008
	Aluminum alloy Tensile strength < 350 N/mm ²	-	KS05F	SEGT12X4ZEFR-AJ	650 - 4900	0.001 - 0.008
		-	DX140	SEGW12X4ZEFR-D	650 - 4900	0.001 - 0.008
	Aluminum alloy Tensile strength > 350 N/mm ²	-	KS05F	SEGW12X4ZEFR	650 - 4900	0.001 - 0.008
		-	DX140	SEGW12X4ZEFR-D	650 - 4900	0.001 - 0.008
	Copper alloy	-	KS05F	SEGT12X4ZEFR-AJ	650 - 1640	0.001 - 0.008
		-	DX140	SEGW12X4ZEFR-D	650 - 1640	0.001 - 0.008

Notes:

- In milling aluminum and copper alloys:
 - For improved surface finish, use together with wiper insert SEGW12X4ZEFR-WD
 - For reducing burr occurrence, use together with deburring inserts SEGW12X4ZEFR-BD
- When milling aluminum and copper alloys, use of a water soluble cutting fluid is recommended. When milling steels, cast irons, and stainless steels, dry cutting is recommended.
- When the length-to-diameter overhang ratio of the tool (L/D) exceeds 3, reduce cutting speed and feed to 70 to 80% of the values given in the table.

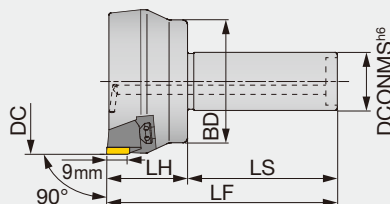


EDPD / DPD

EDPD09

Endmill for aluminum machining, shank type, for PCD inserts

GAMP = +8.5°, GAMF = +3°

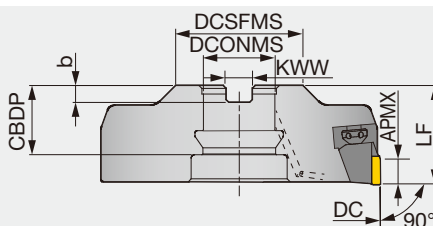


Metric	APMX	DC	CICT	DCONMS	BD	LS	LH	LF	WT(kg)	Air hole	Insert
EDPD09063R	7	63	3	25	37	60	40	100	0.75	With	YDEN0905...

DPD09

Face mill for aluminum machining, for PCD inserts

GAMP = +8.5°, GAMF = +3° ~ +5°



Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CDBP	KWW	b	WT(kg)	Air hole	Insert
DPD09080R	7	80	4	50	41	25.4	23	9.5	6	0.8	With	YDEN0905...
DPD09080RB	7	80	6	50	41	25.4	28.5	9.5	6	0.82	With	YDEN0905...
DPD09100R	7	100	6	50	35	25.4	24.5	9.5	6	1.13	With	YDEN0905...
DPD09100RB	7	100	8	50	35	25.4	24.5	9.5	6	1.17	With	YDEN0905...
DPD09125R	7	125	6	50	35	25.4	24.5	9.5	6	1.7	With	YDEN0905...
DPD09125RB	7	125	10	50	35	25.4	24.5	9.5	6	1.77	With	YDEN0905...
DPD09160R	7	160	8	60	52	31.75	40	12.7	8	3.28	With	YDEN0905...
DPD09160RB	7	160	12	60	52	31.75	40	12.7	8	3.25	With	YDEN0905...

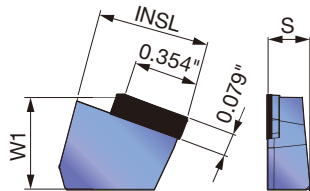
SPARE PARTS

Designation	Wedge	Wedge fixing screw	Adjusting screw	Helisert	Shell locking bolt 1	Shell locking bolt 2	Wrench1	Wrench 2
EDPD09063R	FW-304R-T	FDS-8SST	AJM5	LM5-0.8X1DNS	-	-	T-27T	T-7F
DPD09080R*	FW-304R-T	FDS-8ST-18	AJM5	LM5-0.8X1DNS	-	CM12X30H	T-27T	T-7F
DPD09100R*, DPD09125R*	FW-304R-T	FDS-8ST-18	AJM5	LM5-0.8X1DNS	TMBA-M12H	-	T-27T	T-7F
DPD09160R*	FW-304R-T	FDS-8ST-18	AJM5	LM5-0.8X1DNS	TMBA-M16H	-	T-27T	T-7F

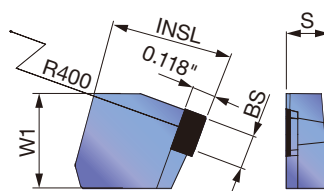
Recommended clamping torque: 10 N·m

INSERT

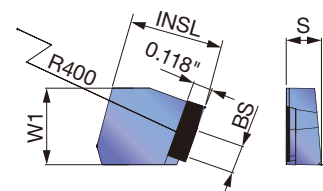
YDEN0905PDFR-D



YDEN0905PDFR-WD



YDEN0905PDFR-BD



P	Steel
M	Stainless
K	Cast iron
N	Non-ferrous
S	Superalloys
H	Hard materials



★ : First choice
☆ : Second choice

Designation	APMX	PCD								W1	INSL	S	BS
		DX140											
YDEN0905PDFR-D	0.276	●								0.488	0.594	0.224	-
YDEN0905PDFR-WD	-	●								0.488	0.598	0.224	0.177
YDEN0905PDFR-BD	-	●								0.488	0.598	0.224	0.177

Tungaloy provides refurbishing service for these inserts upon request.

● : Line up
1 piece per package

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Designation	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
N	Aluminum alloy castings & die castings Si < 13%	DX140	YDEN0905PDFR-D	500 ~ 4000	0.001 ~ 0.008
	Aluminum alloy castings & die castings Si ≥ 13%	DX140	YDEN0905PDFR-D	650 ~ 1650	0.001 ~ 0.008
	Rolled aluminum alloys	DX140	YDEN0905PDFR-D	1650 ~ 13000	0.001 ~ 0.008
	Copper alloys	DX140	YDEN0905PDFR-D	300 ~ 1650	0.001 ~ 0.008

Notes:

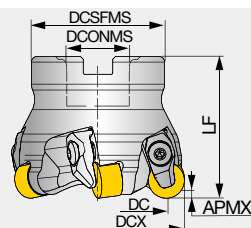
- When requiring improved surface finish, use the wiper insert together with regular inserts YDEN0905PDFR-WD.
- When requiring reduced burr occurrence, use the deburring inserts together with regular inserts YDEN0905PDFR-BD.
- When using the cutter at speeds over 1500m/min, use an arbor or tool-holder balanced to within G16.
- Wet cutting, using a water soluble cutting fluid, is recommended.
- When the length-to-diameter overhang ratio of the tool (L/D) exceeds 3, reduce cutting speed and feed to 70 to 80% of the values given in the table.

How to put each insert together

		For general	Accuracy of machining surface priority	Burr reduction priority
Applicable insert	General insert YDEN0905PDFR-D	◎	◎	◎
	Wiper insert YDEN0905PDFR-WD	—	◎	—
	Wiper insert for burr reduction YDEN0905PDFR-BD	—	—	◎
Number of Inserts by type		All general	1 or 2 wiper inserts in cutter body	General insert : Burr wiper insert = 1 : 1
Specification of insert setting				
Accuracy of machining surface (roughness and undulation)		△	◎	○
Burr of machining surface		△	○	◎

Face milling cutter for high temperature alloy applications

GAMP = -7° , GAMF = $+15^\circ$



Inch	APMX	DC	DCX	CICT	DCONMS	LF	DCSFMS	WT(lb)	Insert
TFMRND2.00-12-4Z-FL	0.080	1.528	2.000	4	0.750	2.000	1.770	0.88	RNGN120700...
TFMRND2.50-12-5Z-FL	0.080	2.000	2.500	5	1.570	1.969	0.750	0.99	RNGN120700...
TFMRND3.00-12-5Z-FL	0.080	2.500	3.000	5	1.750	1.969	1.000	2.07	RNGN120700...

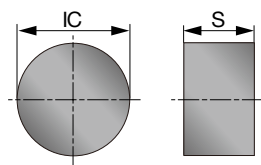
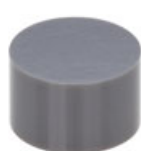
Metric	APMX	DC	DCX	CICT	DCONMS	LF	DCSFMS	WT(kg)	Insert
TFMRN563-22R-12FL	2	50.35	63	5	22	50	47	0.6	RNGN120700...
TFMRN580-27R-12FL	2	67.34	80	5	27	50	58	0.9	RNGN120700...

SPARE PARTS

Designation	Clamp	Screw	Snap ring
TFMRND..., TFMRN...	CCL-5S-F	CLS3C	CSR2

■ INSERT

RNGN-E/T1



P	Steel			
M	Stainless			
K	Cast iron			
N	Non-ferrous			
S	Superalloys	★	★	
H	Hard materials			

★ : First choice

[illegible]

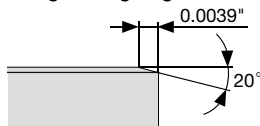
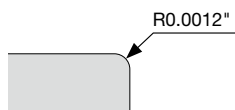
* Types of cutting edge preparations

●: Line up

Edge prep

E: Low cutting force

T1: Strong cutting edge



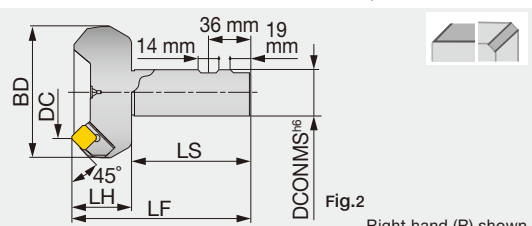
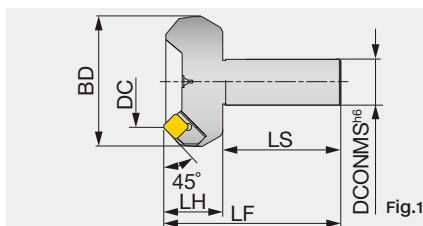
STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Priority	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	Depth of cut ap (in)
	Ni-based super alloys	Wear resistance	TS200	1804 - 4265	0.002 - 0.008	0.004 - 0.079
		First choice	TS300	886 - 1804	0.002 - 0.008	0.004 - 0.079
	Co-based super alloys	Wear resistance	TS200	1804 - 4921	0.002 - 0.008	0.004 - 0.079
		First choice	TS300	886 - 1804	0.002 - 0.008	0.004 - 0.079

EME4400

Face endmill, shank type, with wedge clamp system

GAMP = +24°, GAMF = -13° ~ -8°

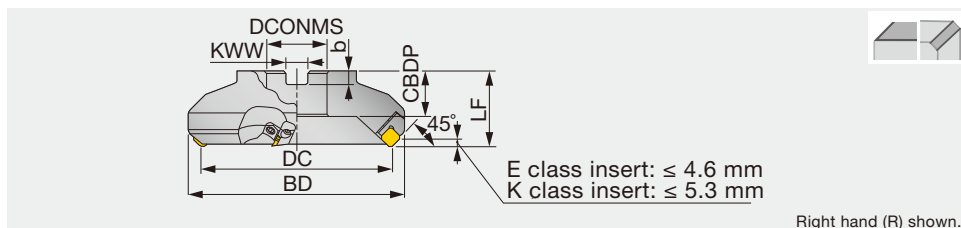


Metric	APMX	DC	CICT	BD	DCONMS	LS	LH	LF	Fig.	Insert
EME4450R	4	50	3	73.4	32	80	40	120	1	SE*N1203...
EME4463R	4	63	4	87.2	32	80	40	120	1	SE*N1203...
EME4403RI	4	80	5	101.5	32	80	40	120	2	SE*N1203...
EME4404RI	4	100	5	120.2	32	80	40	120	2	SE*N1203...

TME4400R/LI/B

Face mill, with wedge clamp system

GAMP = +24°, GAMF = -8° ~ -6°

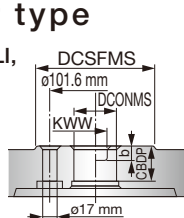


Metric	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
TME4463RB-E	4	63	5	87.2	40	22	20	10.4	6.3	1.0	SE*N1203
TME4403R/LI	4	80	4	101.5	50	25.4	26	9.5	6	1.43	SE*N1203
TME4403RI-E	4	80	4	101.5	50	27	26	12.4	7	1.43	SE*N1203
TME4403RB	4	80	6	101.5	50	25.4	26	9.5	6	1.43	SE*N1203
TME4403RB-E	4	80	6	101.5	50	27	26	12.4	7	1.43	SE*N1203
TME4404R/LI	4	100	5	120.2	63	31.75	32	12.7	8	2.74	SE*N1203
TME4404RI-E	4	100	5	120.2	63	32	32	14.4	8	2.74	SE*N1203
TME4404RB	4	100	7	120.2	63	31.75	32	12.7	8	2.77	SE*N1203
TME4404RB-E	4	100	7	120.2	50	32	28.5	14.4	8	2.77	SE*N1203
TME4405R/LI	4	125	6	145.2	63	38.1	38	15.9	10	4.04	SE*N1203
TME4405RI-E	4	125	6	145.2	63	40	32	16.4	9	4.04	SE*N1203
TME4405RB	4	125	9	145.2	63	38.1	38	15.9	10	4.06	SE*N1203
TME4405RB-E	4	125	9	145.2	63	40	32	16.4	9	4.06	SE*N1203
TME4406R/LI	4	160	8	181.2	63	50.8	38	19	11	5.82	SE*N1203
TME4406RI-E	4	160	8	181.2	63	40	29	16.4	9	5.82	SE*N1203
TME4406RB	4	160	12	181.2	63	50.8	38	19	11	5.86	SE*N1203
TME4406RB-E	4	160	12	181.2	63	40	29	16.4	9	5.86	SE*N1203
TME4408R/LI	4	200	10	220.5	63	47.625	38	25.4	14	9.18	SE*N1203
TME4408RB	4	200	15	220.5	63	47.625	38	25.4	14	9.24	SE*N1203
TME4410R/LI	4	250	12	269.8	63	47.625	38	25.4	14	16.64	SE*N1203
TME4412RI	4	315	14	334.4	63	47.625	38	25.4	14	25.72	SE*N1203

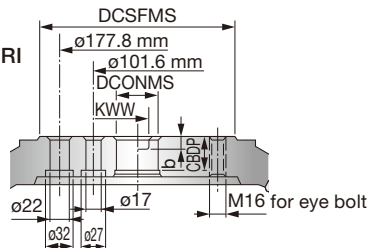
Cutting edge height (LF) is for when SEEN1203AG*N type inserts are used.

Arbor type

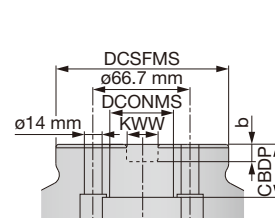
TME4408/10R/LI,
TME4408RB



TME4412RI



TME4406RI-E,
TME4406RB-E



SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench
TME4463RB-E	LE444R	DS-8	CM4X0.7X14	WT402R	TP-4
EME4400..., TME4403R... - TME4405R...	LE444R	FDS-8S	CM4X0.7X14	WF444R	TP-4
TME4403RB - TME4405RB	LE444L	FDS-8S	CM4X0.7X14	WF444L	TP-4
TME4403L... - TME4405L...	LE446R	FDS-8S	CM4X0.7X14	WF444R	TP-4
TME4406R... - TME4412R...	LE446L	FDS-8S	CM4X0.7X14	WF444L	TP-4
TME4406RB, TME4408RB, TME4403 - 06RB-E					
TME4406L... - TME4412L...					

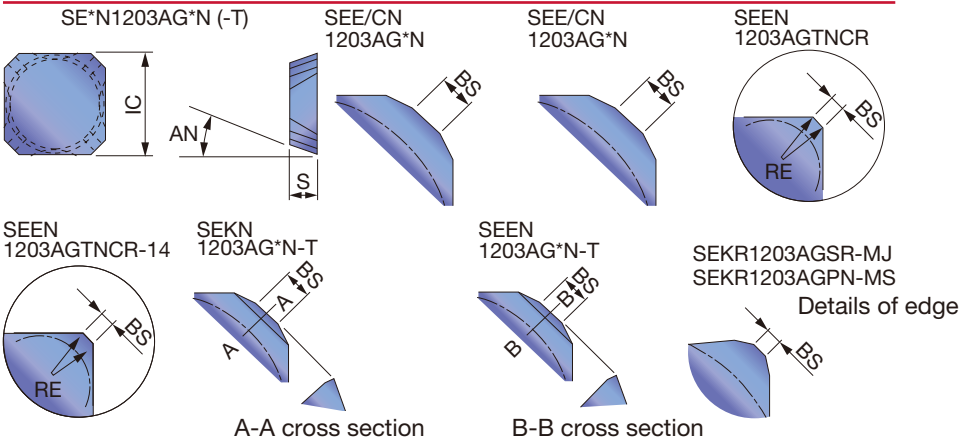
Recommended clamping torque: 8 N·m

Reference pages: Inserts → **H118**



INSERT

SECN/SEEN/SEKN /SEKR 1203



P Steel	☆	☆	☆	★	☆	★	★	☆					
M Stainless		★	☆		☆								
K Cast iron	★					★							
N Non-ferrous										★			
S Superalloys	☆	☆											
H Hard materials													

★ : First choice
☆ : Second choice

Designation	APMX	Coated						Cermet	Uncoated						IC	S	AN	BS
		AH120	AH130	AH140	AH330	GH330	T1115	T3130	NS740	UX30	TH10							
SECN1203AGFN	0.157										●				0.500	0.125	20°	0.094
SEEN1203AGFN	0.157										●				0.500	0.125	20°	0.094
SEEN1203AGTN	0.157	●	●	●		●	●		●	●					0.500	0.125	20°	0.094
SEEN1203AGTN-T	0.157							●	●	●					0.500	0.125	20°	0.094
SEEN1203AGTNCR	0.157	●	●	●	●			●							0.500	0.125	20°	0.063
SEEN1203AGTNCR-14	0.157							●							0.500	0.125	20°	0.055
SEKN1203AGFN-T	0.157										●				0.500	0.125	20°	0.063
SEKN1203AGTN	0.157	●	●	●	●	●		●	●	●					0.500	0.125	20°	0.063
SEKN1203AGTN-T	0.157					●	●	●	●	●					0.500	0.125	20°	0.063
SEKN1203AGTNCR	0.157							●							0.500	0.125	20°	0.063
SEKR1203AGSR-MJ	0.157	●			●	●		●							0.500	0.125	20°	0.063
SEKR1203AGPN-MS	0.157		●	●											0.500	0.125	20°	0.063

●: Line up

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



EME4400

e-catalog



TME4400R/LI

e-catalog

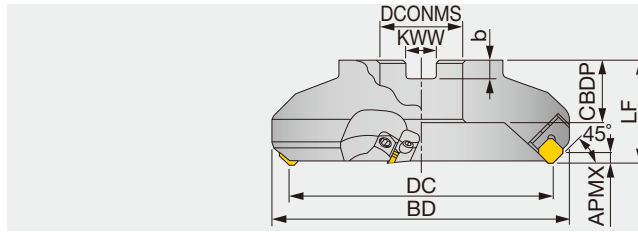


TME4400R/LB

TME5400RI

45° face mill, with wedge clamp system

GAMP = +24°, GAMF = -8° ~ -6°



Right hand (R) shown.

Metric	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
TME5404RI	6	100	5	123.6	63	31.75	32	12.7	8	2.82	SE**1504...
TME5405RI	6	125	6	148.6	63	38.1	38	15.9	10	4.08	SE**1504...
TME5406RI	6	160	8	183	63	50.8	38	19	11	5.99	SE**1504...
TME5408RI	6	200	10	223	63	47.625	38	25.4	14	9.23	SE**1504...
TME5410RI	6	250	12	273	63	47.625	38	25.4	14	16.94	SE**1504...
TME5412RI	6	315	14	338	63	47.625	38	25.4	14	25.94	SE**1504...

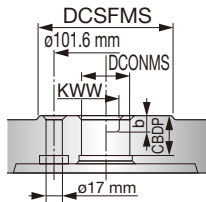
SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench
TME5400RI	LE540R	FDS-8S	CM4X0.7X14	WF540R	TP-4

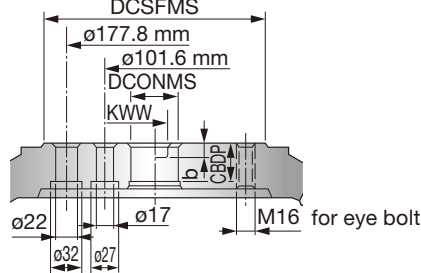
Recommended clamping torque: 8 N·m

Arbor type

TME5408/10RI

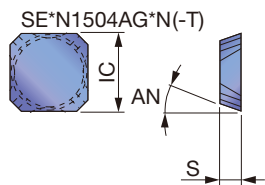


TME5412RI

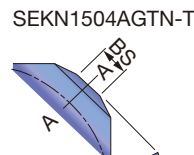
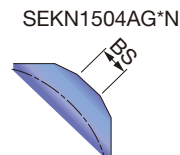


INSERT

SECN/SEEN/SEKN 1504



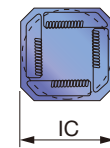
Details of edge



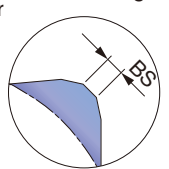
A-A cross section

SEKR1504-MJ

SEKR1504AGSR-MJ with 3-dimensional chipbreaker



Details of edge



	P	M	K	N	S	H
Steel	☆	★	★	★	★	☆
Stainless		★				
Cast iron	★					
Non-ferrous				★		
Superalloys	★					
Hard materials						

★ : First choice
☆ : Second choice

Designation	APMX	Coated				Cermet	Uncoated						IC	S	AN	BS
		AH120	AH140	GH330	T3130	NS740	TH10	UX30								
SEEN1504AGTN	0.236					●		●					0.625	0.187	20°	0.094
SEKN1504AGFN	0.236						●						0.625	0.187	20°	0.063
SEKN1504AGTN	0.236	●	●	●	●	●		●					0.625	0.187	20°	0.063
SEKN1504AGTN-T	0.236				●	●							0.625	0.187	20°	0.063
SEKR1504AGSR-MJ	0.236			●	●								0.625	0.187	20°	0.063

●: Line up

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog

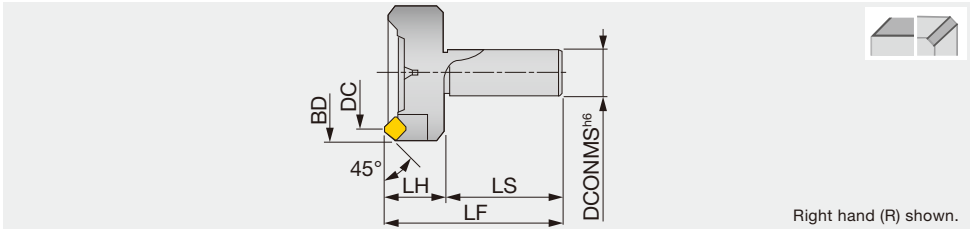




EMD4400RI

Endmill, shank type, with wedge clamp system

GAMP = +15°, GAMF = -3°



Right hand (R) shown.

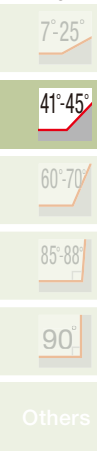
Metric	APMX	DC	CICT	BD	DCONMS	LS	LH	LF	WT(kg)	Insert
EMD4403RI-S32	4	80	4	95	32	80	40	120	2	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA

SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench
EMD4403RI-S32	LD440R	FDS-8S	CM4X0.7X14	WP440R	TP-4

Recommended clamping torque: 8 N·m

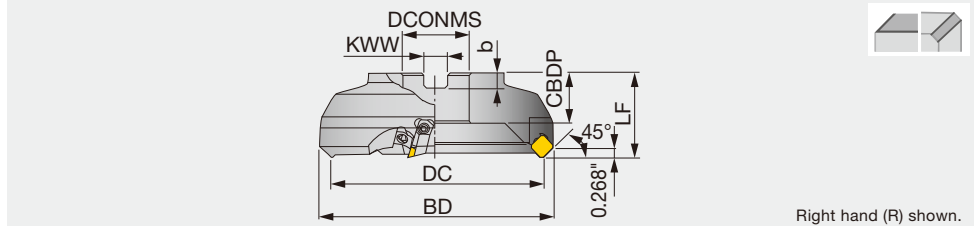
Approach angle



TMD4400R/LI

Face mill, with wedge clamp system

GAMP = +15°, GAMF = -3°

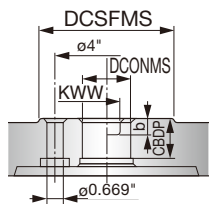


Inch	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT (lb)	Insert
TMD4403RI-U	0.157	3.150	4	3.780	1.970	1.000	1.020	0.375	0.236	3.100	SD*N42.../SD*R1203...
TMD4404RI-U	0.157	3.940	5	4.530	2.480	1.500	1.260	0.500	0.315	5.500	SD*N42.../SD*R1203...
TMD4405RI-U	0.157	4.920	6	5.470	2.480	1.500	1.500	0.625	0.394	7.900	SD*N42.../SD*R1203...
TMD4406RI-U	0.157	6.300	8	6.510	2.480	2.000	1.500	0.750	0.433	12.300	SD*N42.../SD*R1203...
TMD4408RI-U	0.157	7.870	10	8.390	2.480	2.500	1.500	1.000	0.551	19.100	SD*N42.../SD*R1203...
TMD4410RI-U	0.157	9.840	12	10.350	2.480	2.500	1.500	1.000	0.551	35.900	SD*N42.../SD*R1203...
TMD4412RI-U	0.157	12.400	14	12.870	2.480	2.500	1.500	1.000	0.551	55.400	SD*N42.../SD*R1203...

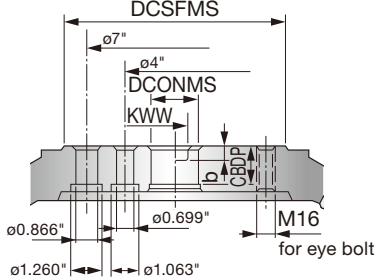
Metric	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
TMD4403R/LI	4	80	4	96	50	25.4	26	9.5	6	1.4	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TMD4404R/LI	4	100	5	115	63	31.75	32	12.7	8	2.5	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TMD4405R/LI	4	125	6	139	63	38.1	38	15.9	10	3.60	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TMD4406R/LI	4	160	8	173	63	50.8	38	19	11	5.6	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TMD4408R/LI	4	200	10	213	63	47.625	38	25.4	14	8.7	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TMD4410R/LI	4	250	12	263	63	47.625	38	25.4	14	16.3	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TMD4412RI	4	315	14	327	63	47.625	38	25.4	14	25.2	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA

Arbor type

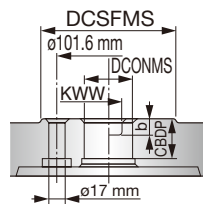
TMD4408/10RI-U



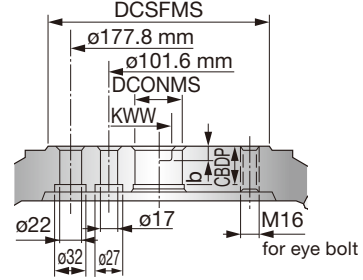
TMD4412RI-U



TMD4408/10R/LI



TMD4412RI



SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench	Shell locking bolt (Optional parts)
TMD4403RI-U	LD440R	FDS-8S	CM4X0.7X14	WP440R	TP-4	(TMBA-0.500H)
TMD4404RI-U, TMD4405RI-U	LD440R	FDS-8S	CM4X0.7X14	WP440R	TP-4	(TMBA-0.750H)
TMD4406RI-U - TMD4412RI-U TMD4403RI - TMD4412RI	LD440R	FDS-8S	CM4X0.7X14	WP440R	TP-4	-
TMD4403LI - TMD4410LI	LD440L	FDS-8S	CM4X0.7X14	WP440L	TP-4	-

Recommended clamping torque: 5.9 lbs·ft, 8 N·m

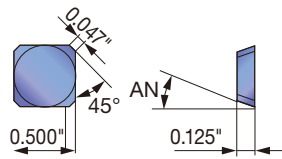
Reference pages: Inserts → **H122**



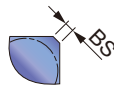
INSERT

SDCN/SDEN/SDKN 42Z

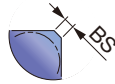
Regular edge
SD*N42Z*N



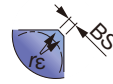
Details of edge
SDKN42ZTN16



SD*N42ZTN20

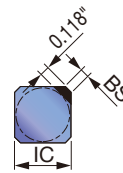


SDKN42ZTNCR
SDEN42ZTNCR



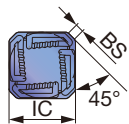
SDCN42ZFN-DIA

SDCN42ZFN-DIA

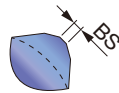


SDKR42Z-MJ

SDKR42ZSR-MJ
with 3-dimensional chipbreaker

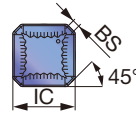


Details of edge



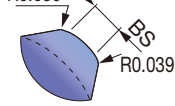
SDMR/SDKR 1203-MJ

SD*R1203AETN-MJ
with 3-dimensional chipbreaker

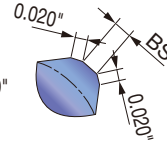


Details of edge

SDMR1203AETN-MJ

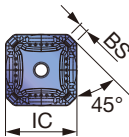


SDKR1203AETN-MJ

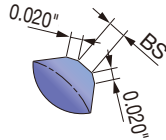


SDKR42Z-MS

SDKR42ZPN-MS

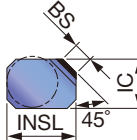


Details of edge



WDCN42ZFR-DIA

Wiper edge
WDCN42ZFR-DIA



P	Steel	★	★		☆	☆		☆	☆	★	☆	☆						
M	Stainless	★		★	☆				☆									
K	Cast iron		★				☆	★										
N	Non-ferrous														★		★	
S	Superalloys		★	☆														
H	Hard materials																	

★ : First choice
☆ : Second choice

Designation	APMX	Coated								Cermet		Uncoated		PCD	IC	INSL	S	AN	BS
		AH135	AH120	AH130	AH140	AH330	GH330	T1115	T1215	T3130	T3225	NS740	N308	UX30	TH10	DX140			
SDCN42ZFN	0.157														●		0.500	-	0.125 15° 0.047
SDCN42ZTN	0.157											●	●		●		0.500	-	0.125 15° 0.047
SDCN42ZTN20	0.157											●					0.500	-	0.125 15° 0.079
SDEN42ZFN	0.157														●		0.500	-	0.125 15° 0.047
SDEN42ZTN	0.157	●	●		●		●	●	●			●	●		●		0.500	-	0.125 15° 0.047
SDEN42ZTNCR	0.157	●	●		●	●						●					0.500	-	0.125 15° 0.063
SDEN42ZTN20	0.157									●	●						0.500	-	0.125 15° 0.079
SDKN42ZFN	0.157														●		0.500	-	0.125 15° 0.047
SDKN42ZTN	0.157	●	●	●	●	●	●	●	●			●	●		●		0.500	-	0.125 15° 0.047
SDKN42ZTNCR	0.157											●					0.500	-	0.125 15° 0.063
SDKN42ZTN16	0.157									●	●						0.500	-	0.125 15° 0.063
SDCN42ZFN-DIA	0.079															●	0.500	-	0.125 15° 0.047
SDKR42ZSR-MJ	0.157	●	●			●	●			●	●						0.500	-	0.125 15° 0.063
SDMR1203AETN-MJ	0.157											●					0.500	-	0.125 15° 0.063
SDKR1203AETN-MJ	0.157											●					0.500	-	0.125 15° 0.063
SDKR42ZPN-MS	0.157	●		●	●												0.500	-	0.125 15° 0.063
WDCN42ZFR-DIA	0.020															●	0.480 0.616	0.125 15°	0.193

●: Line up

DX140: 1 piece per package

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



e-catalog

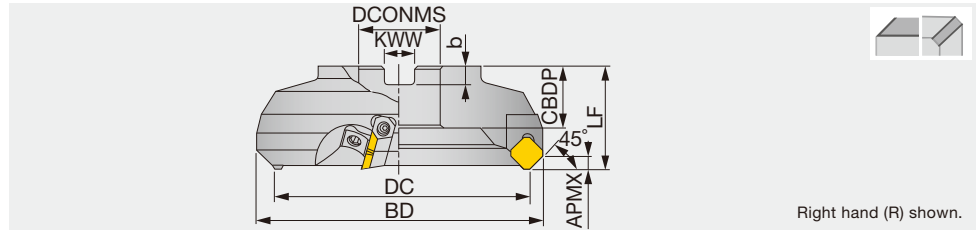


EMD4400RI TMD4400R/LI

TMD5400RI

Face mill, with wedge clamp system

GAMP = +15°, GAMF = -3°

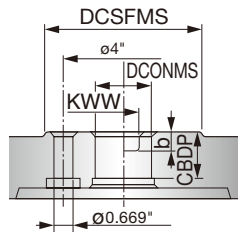


Inch	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT(lb)	Insert
TMD5404RI-U	0.236	3.940	4	4.650	2.480	1.500	1.260	0.625	0.394	5.510	SD*N53Z...
TMD5405RI-U	0.236	4.920	5	5.590	2.480	1.500	1.500	0.625	0.394	8.160	SD*N53Z...
TMD5406RI-U	0.236	6.300	5	6.930	2.480	2.000	1.500	0.750	0.433	12.790	SD*N53Z...
TMD5408RI-U	0.236	7.870	8	8.500	2.480	2.500	1.500	1.000	0.551	19.840	SD*N53Z...
TMD5410RI-U	0.236	9.840	10	10.430	2.480	2.500	1.500	1.000	0.551	35.930	SD*N53Z...
TMD5412RI-U	0.236	12.400	12	12.990	2.480	2.500	1.500	1.000	0.551	55.560	SD*N53Z...

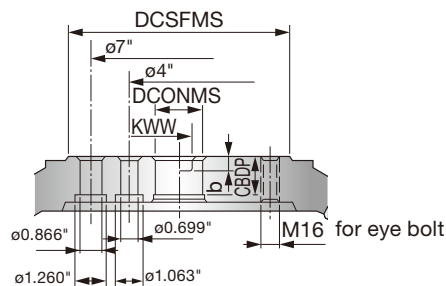
Metric	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
TMD5404RI	6	100	4	118	63	31.75	32	12.7	8	2.5	SD*N53Z...
TMD5404RI-E	6	100	4	118	50	32	28.5	14.4	8	2.5	SD*N53Z...
TMD5405RI	6	125	6	142	63	38.1	38	15.9	10	2.5	SD*N53Z...
TMD5405RI-E	6	125	6	142	63	40	32	16.4	9	3.7	SD*N53Z...
TMD5406RI	6	160	6	176	63	50.8	38	19	11	5.8	SD*N53Z...
TMD5406RI-E	6	160	6	176	63	40	29	16.4	9	5.8	SD*N53Z...
TMD5408RI	6	200	8	216	63	47.625	38	25.4	14	9	SD*N53Z...
TMD5408RI-E	6	200	8	216	63	60	38	25.7	14	9	SD*N53Z...
TMD5410RI	6	250	10	265	63	47.625	38	25.4	14	16.3	SD*N53Z...
TMD5410RI-E	6	250	10	265	63	60	38	25.7	14	16.3	SD*N53Z...
TMD5412RI	6	315	12	330	63	47.625	38	25.4	14	25.2	SD*N53Z...
TMD5412RI-E	6	315	12	330	63	60	38	25.7	14	25.2	SD*N53Z...

Arbor type

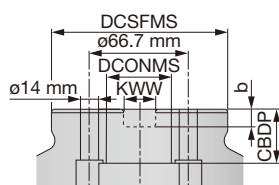
TMD5408RI-U...,
TMD5410RI-U...



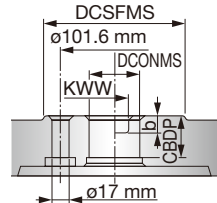
TMD5412RI-U



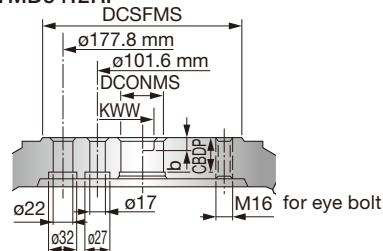
TMD5406RI-E



TMD5408/10...



TMD5412RI



SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench	Shell locking bolt (Optional parts)
TMD5404RI-U, TMD5405RI-U	LD540R	FDS-8S	CM4X0.7X20	WF500R	TP-4	(TMBA-0.750H)
TMD5406RI-U - TMD5412RI-U TMD54**RI (-E)	LD540R	FDS-8S	CM4X0.7X20	WF500R	TP-4	-

Recommended clamping torque: 5.9 lbs·ft, 8 N·m

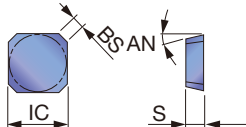
Reference pages: Inserts → **H124**



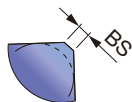
INSERT

SDCN/SDEN 53Z

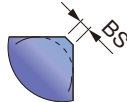
SD*N53Z*N



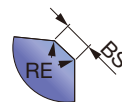
SDEN53ZTN20
Details of edge



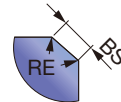
SDKN53ZTN16
Details of edge



SDEN53ZTNCR
Details of edge

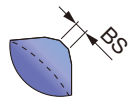
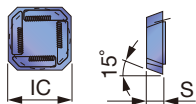


SDKN53ZTNCR
Details of edge



SDKR53-MJ

SDKR53ZSR-MJ
with 3-dimensional chipbreaker



P	Steel	☆				★		★	☆	☆								
M	Stainless		★	☆	☆													
K	Cast iron	★																
N	Non-ferrous											★						
S	Superalloys																	
H	Hard materials																	

★ : First choice
☆ : Second choice

Designation	APMX	Coated					Cermet		Uncoated									
		AH120	AH130	AH140	GH330	T3130	NS740	N308	UX30	TH10							IC	S
SDCN53ZTN	0.236						●	●									0.625	0.187
SDEN53ZFN	0.236									●							0.625	0.187
SDEN53ZTN	0.236				●		●		●								0.625	0.187
SDEN53ZTNCR	0.236						●										0.625	0.187
SDEN53ZTN20	0.236					●											0.625	0.187
SDKN53ZFN	0.236									●							0.625	0.187
SDKN53ZTN	0.236	●	●	●	●		●	●	●								0.625	0.187
SDKN53ZTNCR	0.236						●										0.625	0.187
SDKN53ZTN16	0.236					●											0.625	0.187
SDKR53ZSR-MJ	0.236				●	●											0.625	0.187

● : Line up

STANDARD CUTTING CONDITIONS

Please scan below.

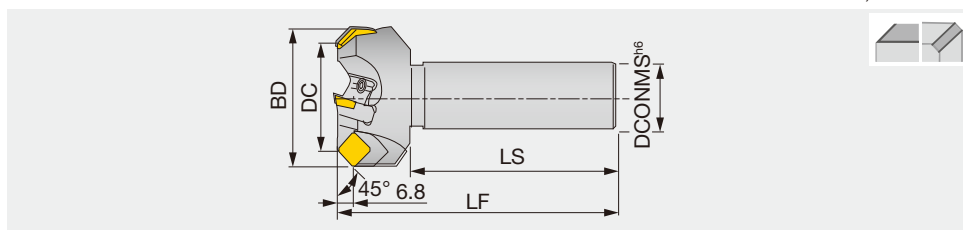
e-catalog



EGD4400

45° face endmill, shank type, with wedge clamp system

GAMP = +15°, GAMF = -3°

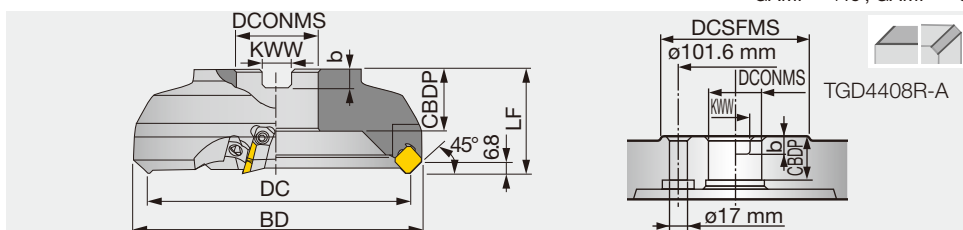


Metric	APMX	DC	CICT	BD	DCONMS	LS	LH	LF	WT(kg)	Insert
EGD4450R	4	50	4	67	32	80	35	115	1.1	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
EGD4463R	4	63	4	79	32	80	35	115	1.4	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA

TGD4400-A

45° face mill, with wedge clamp system

GAMP = +15°, GAMF = -3°



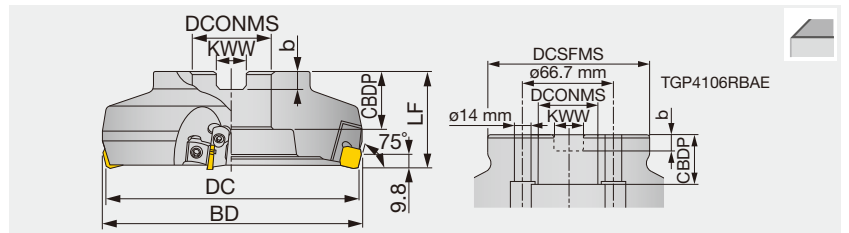
Metric	APMX	DC	CICT	BD	LF	DCONMS	CDBP	KWW	b	WT(kg)	Insert
TGD4403R-A	4	80	6	96	50	25.4	26	9.5	6	1.4	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TGD4404R-A	4	100	6	115	63	31.75	32	12.7	8	2.5	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TGD4405R-A	4	125	8	139	63	38.1	38	15.9	10	3.6	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TGD4406R-A	4	160	8	173	63	50.8	38	19	11	5.6	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA
TGD4408R-A	4	200	10	213	63	47.625	38	25.4	14	8.7	SD*N42.../SD*R1203.../ WDCN42ZFR-DIA

SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench
EGD4400	LD442R	DS-8	BM3X0.5X6	WP193TR	TP-4
TGD4400-A	LD440R	FDS-8S	CM4X0.7X14	WP440R	TP-4

Recommended clamping torque: 8 N·m

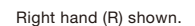
75° face mill, with wedge clamp system



SPARE PARTS

Recommended clamping torque: 8 N·m

SPCN/SPEN/SPKN 42S



★ : First choice
☆ : Second choice

Note: Insert marked with * and a wiper insert should not be used together.

Please scan below.

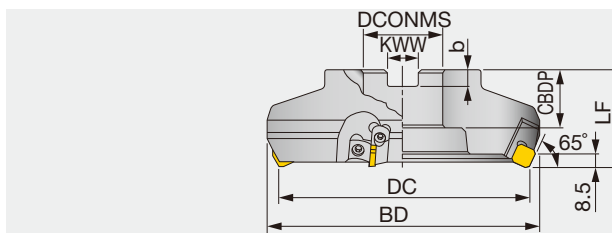




TGP4200R-A

Face mill, with wedge clamp system

GAMP = +5°, GAMF = +1°



Right hand (R) shown.

Metric	APMX	DC	CICT	BD	LF	DCONMS	CDDP	KWW	b	WT(kg)	Insert
TGP4203R-A	6	80	5	95	50	25.4	26	9.5	6	1.4	SP*N42.../ WPAN42ZFR
TGP4204R-A	6	100	6	114	63	31.75	32	12.7	8	2.4	SP*N42.../ WPAN42ZFR
TGP4205R-A	6	125	8	139	63	38.1	38	15.9	10	3.9	SP*N42.../ WPAN42ZFR
TGP4206R-A	6	160	10	174	63	50.8	38	19	11	6.1	SP*N42.../ WPAN42ZFR

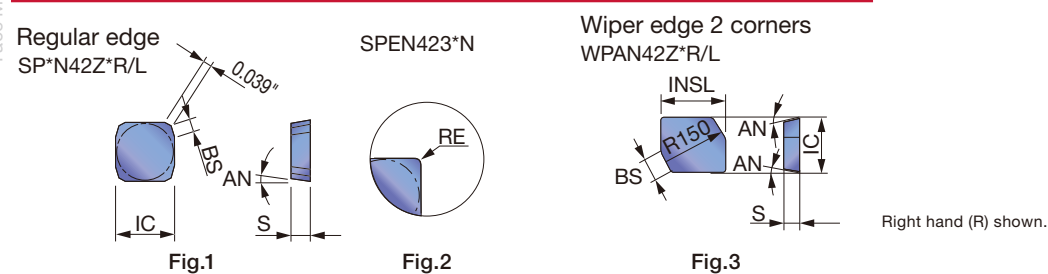
SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench
TGP42**R-A	LP413R	FDS-8S	CM4X0.7X14	WP440R	TP-4

Recommended clamping torque: 8 N·m

INSERT

SPAN/SPCN/SPEN/SPKN 42Z



Right hand (R) shown.

P	Steel	★	★	☆	☆	☆				
M	Stainless									
K	Cast iron	★					★			
N	Non-ferrous									
S	Superalloys									
H	Hard materials									

★ : First choice
☆ : Second choice

Designation	APMX	Coated		Cermet		Uncoated		☆ : Second choice							
		T1115	T3130	NS740	X407	N308	UX30	TH10	IC	INSL	S	AN	BS	RE	Fig.
SPAN42ZFR	0.236						●		0.500	-	0.125	11°	0.079	-	1
SPCN42ZFL	0.236						●		0.500	-	0.125	11°	0.079	-	1
SPCN42ZFR	0.236						●		0.500	-	0.125	11°	0.079	-	1
SPCN42ZTR	0.236			●	●	●			0.500	-	0.125	11°	0.079	-	1
SPEN423TN	0.236		●	●			●		0.500	-	0.125	11°	-	0.047	2
SPEN423FN	0.236						●		0.500	-	0.125	11°	-	0.047	2
SPEN42ZTR	0.236			●					0.500	-	0.125	11°	0.079	-	1
SPKN42ZFL	0.236						●		0.500	-	0.125	11°	0.079	-	1
SPKN42ZFR	0.236						●		0.500	-	0.125	11°	0.079	-	1
SPKN42ZTR	0.236	●	●	●	●	●			0.500	-	0.125	11°	0.079	-	1
WPAN42ZFR	0.236						●		0.480	0.562	0.125	11°	0.177	-	3

● : Line up

STANDARD CUTTING CONDITIONS

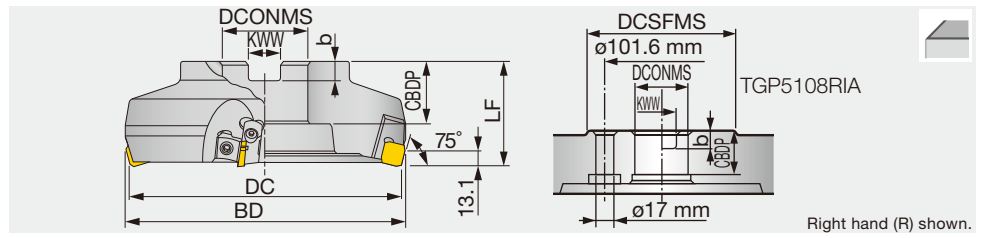
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TGP5100RIA

Face mill, with wedge clamp system



Metric	APMX	DC	CICT	BD	LF	DCONMS	CDDP	KWW	b	WT(kg)	Insert
TGP5104RIA	10	100	5	109	63	31.75	32	12.7	8	2.3	SP*N53...
TGP5105RIA	10	125	6	133	63	38.1	38	15.9	10	3.5	SP*N53...
TGP5106RIA	10	160	8	167	63	50.8	38	19	11	5.7	SP*N53...
TGP5108RIA	10	200	10	207	63	47.625	38	25.4	14	8.4	SP*N53...

SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench
TGP51**RIA	LP514R	FDS-8S	CM4X0.7X14	WF500R	TP-4

Recommended clamping torque: 8 N·m

INSERT

SPCN/SPKN 53S

SP*N53S*R/L

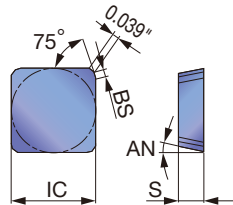


Fig.1

SPKN53STR20

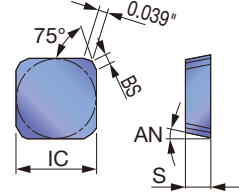


Fig.2

SPKR53SSR-MJ
with 3-dimensional chipbreaker

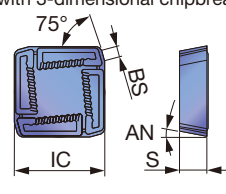


Fig.3

Right hand (R) shown.

P	Steel	★	★	★	☆	☆					
M	Stainless	★	☆			☆					
K	Cast iron		★					☆			
N	Non-ferrous										
S	Superalloys										
H	Hard materials										

★ : First choice
☆ : Second choice

Designation	APMX	Coated		Cermet		Uncoated		IC	S	AN	BS	Fig.
		GH330	T1115	NS740	N308	UX30	TH10					
SPCN53SFR	0.394					●		0.625	0.187	11°	0.047	1
SPCN53STR	0.394				●	●		0.625	0.187	11°	0.047	1
SPKN53SFR	0.394					●		0.625	0.187	11°	0.047	1
SPKN53STL	0.394					●		0.625	0.187	11°	0.047	1
SPKN53STR	0.394	●	●	●		●		0.625	0.187	11°	0.047	1
SPKN53STR20	0.394		●					0.625	0.187	11°	0.079	2
SPKR53SSR-MJ	0.394	●	●					0.625	0.187	11°	0.079	3

● : Line up

STANDARD CUTTING CONDITIONS

Please scan below.

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S-TAQ System

The world's highest level repeatability **S-TAQ**System

Improved surface quality and increased tool life

- Two-face restricted (1/10 short taper and flange face) coupling.
- High-level coupling performance contributes to high accuracy and excellent rigidity.
- Excellent dynamic balance reduces vibration, chatter, and cutting noise at high speeds.

Improved productivity

- High speed machining can reduce machining time.
- High repeatability can eliminate trial cut.

Performance

Original clamp system provides high rigidity, accuracy and operating speed.

Clamping force (Strong clamp system)

- Lubricant coating on clamping piece.
- 4-points balancing clamp.
- Sufficient clamping for the smaller diameter part of taper.

Designation	Dimensions (mm)				S/M	K	Recommend clamping torque (N·m)	Clamping force (N)
	D CONWS	BD	ℓ 1	ℓ 2				
TAQ32	19	32	18	8.5	3/M6	8	3	4×10^3
TAQ40	24	40	21	10	3/M6	10	5	5.5×10^3
TAQ50	30	50	25	12	4/M8	12	8	9×10^3
TAQ63	38	63	32	15	4/M8	16	10	12×10^3
TAQ80	48	80	40	18	5/M10	18	20	18×10^3
TAQ100	60	100	50	22	6/M12	20	30	23×10^3

Comparison of clamping force

	Taper	Taper dia.(mm) / holder dia.(mm)	Recommend clamping torque (N·m)	Draw-in force (N)	Draw-in force / Torque (m·N)
TAQ63	1 / 10	38 / 63	10	12×10^3	1200
QC adapter	10°	35 / 70	20	9.8×10^3	490
Other makes A	4°	35 / 62	22.5	9.8×10^3	436

Repeatability for accuracy

Radial run out	Within 0.003 mm
Axial run out	Within 0.002 mm

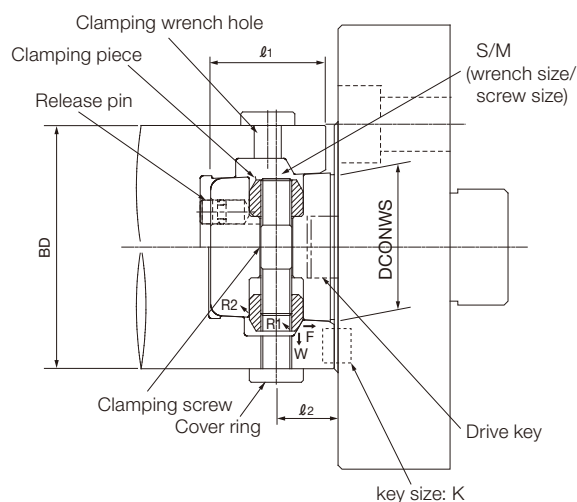
Note: Measured at 150 mm far from end face.



Labor-saving tool change

- Can eliminate detaching the toolholder from the main spindle.
- Can eliminate the brakes for the main spindle.
- Labor-saving clamping by only one T-wrench.

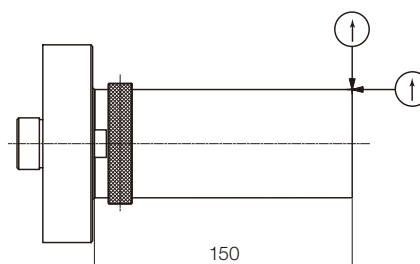
Part assembly



W: Driving force by clamping screw

F: Clamping force

R1 = R2: Receiving force of clamping piece

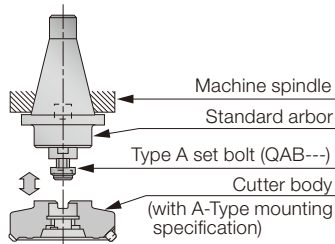


QC system for TAC Mills

TAC mills QC system facilitate easy and quick mounting of the cutter body (face milling cutter, etc.) to the machine tools.

Small dia. TAC mills QC system Dia. $\phi 80 \sim 160$ mm

Type A QC system



Features

- Cutter body replacement is possible without removing the bolt.
- A QC system is made up only by installing the Type A set bolt to our standard arbor. (The cutter body is made to A-Type mounting specification.)
- Standard arbor used ensures superior economy and rigidity.

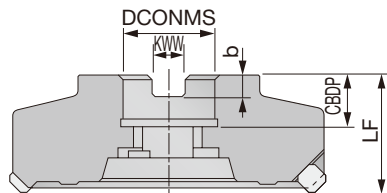
Replacement method

Mounting - Direct the set bolt direction to align with the cutter spot facing hole, then mount the cutter. Turn the set bolt one to two turns for tightening.

Removal - Loosen the bolt one turn, press the cutter to the spindle, and turn the set bolt one to two turns. The cutter can now be removed.

A-type QC Mounting System for Small Diameter TAC Mills

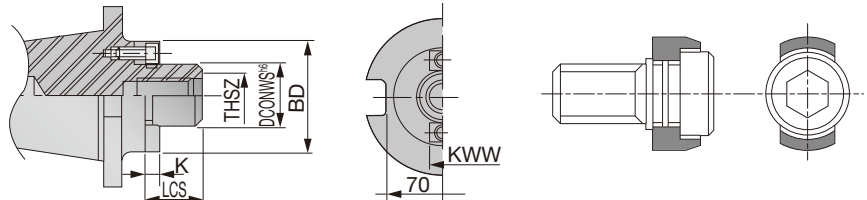
Dimensional details of mount (For $\phi 80$ to $\phi 160$ mm dia. TAC mills)



Cutter dia. (mm)	DCONMS	b	KWW	CDDP	LF
$\phi 80$	25.4	6	9.5	20	50
$\phi 100$	31.75	8	12.7	22	50
$\phi 125$	38.1	10	15.9	27	63
$\phi 160$	50.8	11	19	27	63

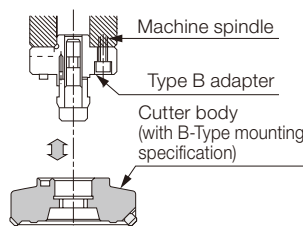
Arbors

Standard arbors (FMA, FMC type) can't be used. Special arbors applicable for below dimensions can be made to order on request.



Dimensions (mm)						Cutter fixing screw for A-type		Hex wrench size(mm)
DCONWS	BD	THSZ	LCS	KWW	K			
25.4	50	M12	18	9.5	5	QAB-3 (R/L)	Hex. Socket-head screw M12 x 30	10
31.75	60	M16	20	12.7	7	QAB-4 (R/L)	Hex. Socket-head screw M12 x 30	14
38.1	80	M20	25	15.9	9	QAB-5 (R/L)		17
50.8	100	M24	25	19.05	10	QAB-6 (R/L)		19

Type B QC system



Features

- Cutter body replacement is possible without removing the bolt.
- Loosening of the adapter is not enough to remove the cutter. This is to prevent the cutter from falling.
- Type B QC adapter and Type B cutter installation are necessary.
- It is not necessary to set the set bolt direction with that of the cutter hole. The cutter is fit into the adapter only by aligning the match marks.

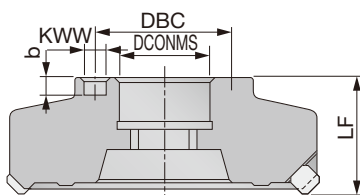
Replacement method

Mounting - Set the cutter into the adapter. Direct the cutter match mark to align with that of adapter, then the cutter enters the adapter. Turn the cutter by 90° and turn adapter bolt one to two turns for tightening.

Removal - Loosen adapter bolt by one or two turns and turn the cutter by 90°. The cutter can now be removed.

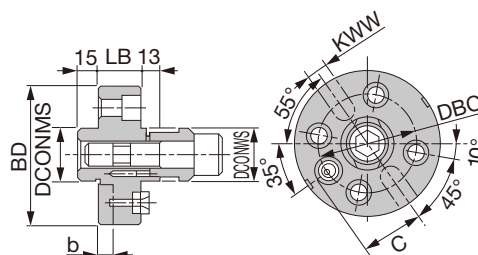
B-type QC Mounting System for Small Diameter TAC Mills

Dimensional details of mount (For $\phi 80$ to $\phi 160$ mm dia. TAC mills)



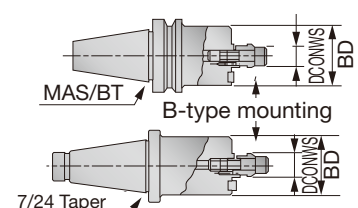
Cutter dia.	DCONMS	b	KWW	LF	DBC
$\phi 80$	25.4	7	10	50	45
$\phi 100$	31.75	7	12	63	55
$\phi 125$	38.1	7	15	63	70
$\phi 160$	50.8	7	18	63	85

Dimensional details of B-type adapters



Cutter dia.	DCONWS	c	BD	DCONMS	KWW	b	DBC	S	LB
$\phi 80$	25.4	22.5	80	25.4	9.5	7	45	M10	25
$\phi 100$	31.75	27.5	100	31.75	12.7	8	55	M10	25
$\phi 125$	38.1	35	100	38.1	15.9	10	70	M12	30
$\phi 160$	50.8	42.5	125	50.8	19	11	85	M16	30

Instead of the above B-type adapters, BT- and T-type arbors can be also used for B-type QC mount cutters. These arbors are made to order on request.

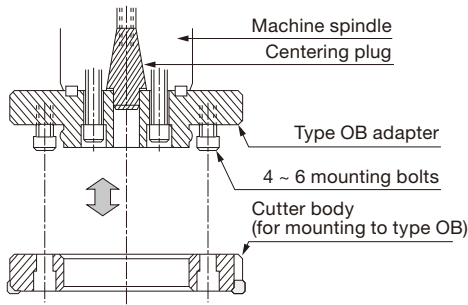




QC system for TAC Mills

Large dia. TAC mills QC system Dia. $\phi 200$ mm -

Type OB QC system (Elongated mounting hole type)



Features

- The cutter body can be replaced without removing bolt.
- Cutter does not fall when only the bolt is removed.
- The cutter body weight is about one half of usual cutter.
- The cutter bolt is fixed to the adapter with four to six large bolts, ensuring high rigidity.

Replacement method

Mounting - Align the adapter tightening bolts (4 ~ 6) to the cutter mounting holes, turn the cutter whilst pressing it against the adapter, and turn the bolt to tighten.

Removal - Loosen the bolt slightly, and by one turn, turn the cutter to remove it from the adapter.

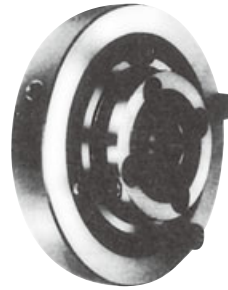
OB-type QC Mounting System for Large Diameter TAC Mills (Elongated mounting hole type)

Cutter body ($\phi 200$ - $\phi 400$ mm)

This system is applied to "flush edge-top" Standard type TAC mills with OB mount.

For the details of the OB-type cutter bodies.

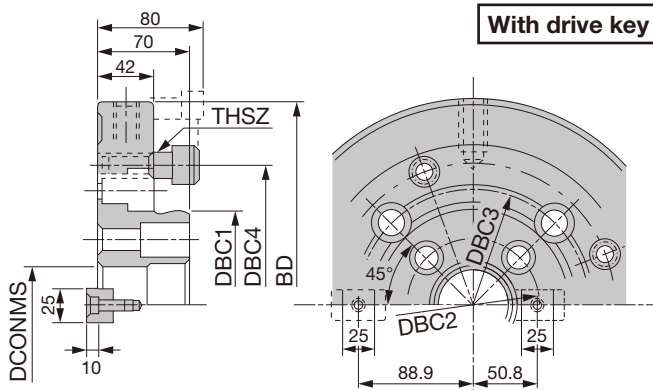
OB type adapter



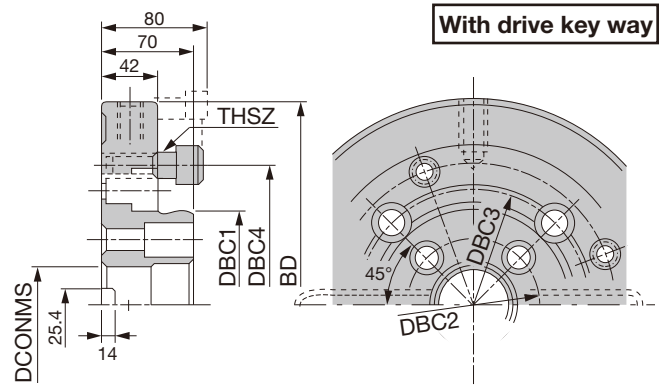
OB type cutter body



● Dimensional details of mount of OB-type adapters



QA12K to QA16K type shown.



QA12M to QA16M type shown.

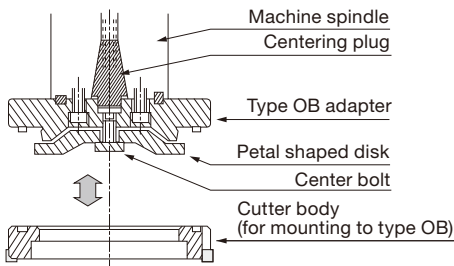
Adapter Designation	Dimensions (mm)							
	BD	DCONMS	DBC1	DBC2	DBC3	DBC4	THSZ	Bolts
QA08K/M	198	47.625	63.5	101.6	-	114.3	M16×40	4
QA10K/M	248	60	133.35	101.6	-	177.8	M16×50	4
QA12K/M	313	60	146.05	101.6	177.8	215.9	M20×50	4
QA14K/M	353	60	215.9	101.6	177.8	260.4	M20×50	6
QA16K/M	398	60	254	101.6	177.8	304.8	M20×50	6

- Notes:
- Dimension ϕd can be made to customer's specifications.
 - Special centering plugs for $\phi 60$ mm hole are made to order.

Notes: In Designation, K indicates "with drive key" type, and M indicates "with drive key way" type. ("N" shows number of tapped holes.)

Large dia. TAC mills QC system Dia. ø200 mm -

Type CB QC system (Center bolt type)



Features

- Move the petal-shaped disk up and down with one center bolt in the adapter, removing the cutter. Since only one bolt is used, replacement takes only one half of the time required by Type CB.
- The cutter body is lighter by 20% than that of OB type and easy to handle.
- Compatible with auto clamp unit.
- The cutter does not fall when the center bolt only is loosened.

Replacement method

- Mounting** - Align the cutter notch with the adapter clamber and turn the cutter whilst pressing it against the adapter. Tighten with the center bolt.
- Removal** - Loosen the center bolt once and lift the cutter upward in the spindle direction. Turn the cutter further slightly, and the cutter can be removed from the adapter.

CB-type QC Mounting System for Large Diameter TAC Mills (Center bolt type)

Cutter body (ø200 - ø400 mm)

This system is applied to "flush edge-top" type TAC mills with CB mount.

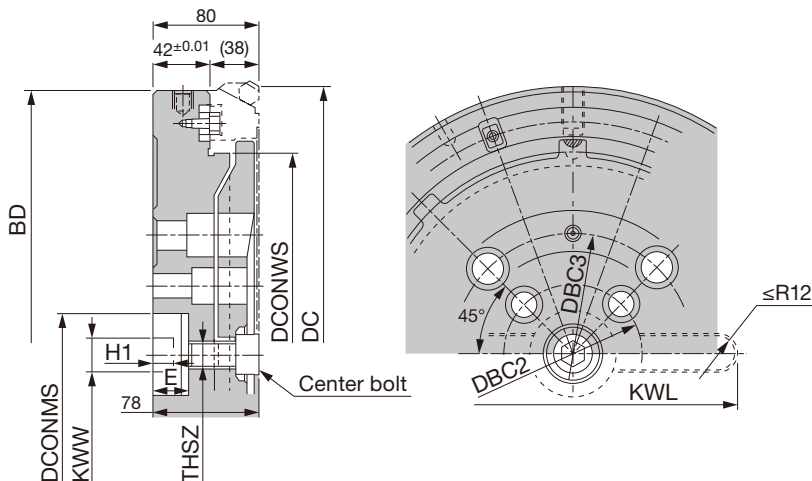
CB type adapter



CB type cutter body



● Dimensional details of mount of CB-type adapters



Adapter Designation	Dimensions (mm)											
	DC	DCONMS	BD	DCONWS	DBC2	DBC3	KWW	H1	KWL	THSZ	E	Center bolt
QACB-08MR/L	200	47.625	195	119.97	101.6	-	25.4	14	150	M20	25	TMBA-M20
QACB-10MR/L	250	60	245	159.97	101.6	-	25.4	14	150	M20	25	TMBA-M20
QACB-12MR/L	315	60	310	214.97	101.6	-	25.4	14	150	M20	25	TMBA-M20
QACB-14MR/L	355	60	350	254.97	-	177.8	25.4	14	245	M20	25	TMBA-M20
QACB-16MR/L	400	60	395	299.95	-	177.8	25.4	14	245	M20	25	TMBA-M20

Note: • Dimension ød can be made to customer's specifications.

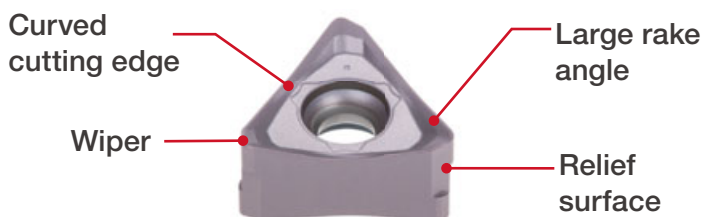
- Because of the dimensional restriction of "E", standard CO- type centering plugs can not be used for the adapters shown in the above table. Special centering plugs applicable for the above adapters can be made to order on request.



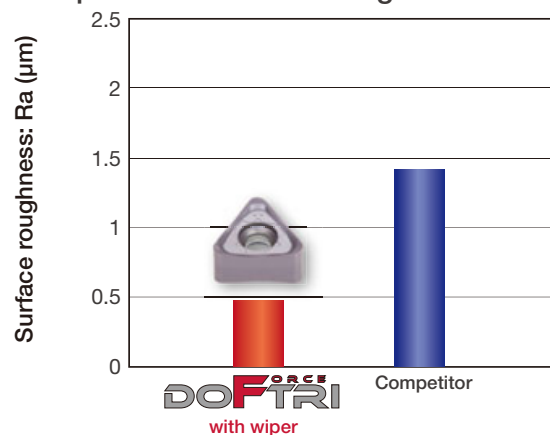
High precision shoulder mill series with economical double-sided triangular inserts

Innovative insert

- Highly economical 6-corner double sided inserts.
- Long effective cutting edge allows shoulder milling with large depth of cut.
- Low cutting force at low depth of cut, and high machining stability at large depth of cut.
 - Concave cutting edge and large rake angle produce barrel-shape chips, resulting in excellent chip evacuation.
 - The design with wiper edge (front cutting edge) is also suitable for face milling.



Comparison of surface roughness



Reference pages: **H171 - H174**

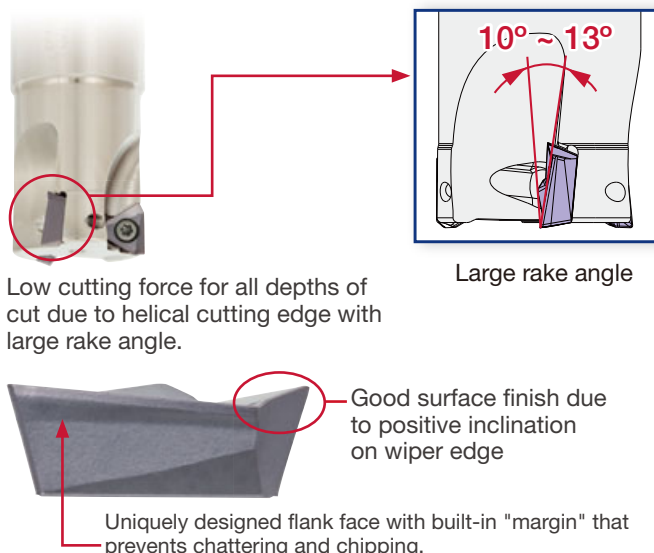


Excellent cutting performance with improved profitability

Economical 3 cutting-edge inserts



Drastically reduced cutting force



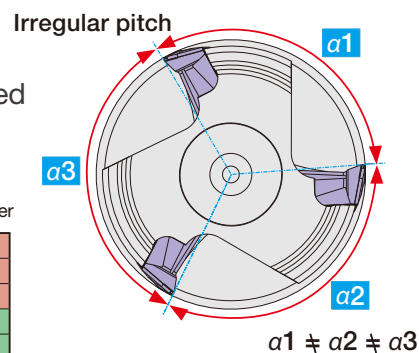
Applicable for a wide range of cutting conditions

Insert positioning in irregular pitch, combined with uniquely designed flank face of inserts, prevents chattering during machining.

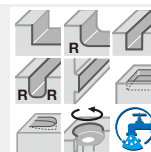
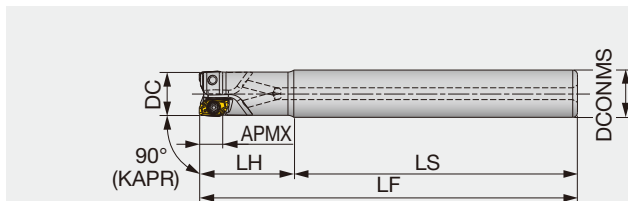
Cutting performance

ap (in)	0.400	OK				
	0.360					
	0.320					
	0.280					
	0.240					
	0.200					
	0.160					
	0.120					
	0.080					
	0.040					
Applicable area	0.002 0.004 0.006 0.008 0.010	fz (ipt)				

ap (in)	0.400	OK				
	0.360					
	0.320					
	0.280					
	0.240					
	0.200					
	0.160					
	0.120					
	0.080					
	0.040					
Applicable area	0.002 0.004 0.006 0.008 0.010	fz (ipt)				



Cutter : EPA10R125U0125W03N
(DC = 1.250", CICT = 3)
Insert : TOMT100404PDER-MJ
Grade : AH3135
Workpiece : 1055 (200 HB)
Cutting speed : Vc = 500 sfm
Width of cut : ae = 1.250"
Machine : Vertical M/C, CAT50



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EPAV06U0.31C0.37R01	0.236	0.313	1	0.375	2.463	0.787	3.250	0.09	With	AVGT06...
EPAV06U0.37C0.37R01	0.236	0.375	1	0.375	2.463	0.787	3.250	0.09	With	AVGT06...
EPAV06U0.37C0.37R01L	0.236	0.375	1	0.375	2.622	1.378	4.000	0.11	With	AVGT06...
EPAV06U0.50C0.50R02	0.236	0.500	2	0.500	2.463	0.787	3.250	0.15	With	AVGT06...
EPAV06U0.50C0.50R03	0.236	0.500	3	0.500	2.463	0.787	3.250	0.15	With	AVGT06...
EPAV06U0.50C0.50R02L	0.236	0.500	2	0.500	3.388	1.362	4.750	0.22	With	AVGT06...
EPAV06U0.62C0.62R03	0.236	0.625	3	0.625	2.713	0.787	3.500	0.26	With	AVGT06...
EPAV06U0.62C0.62R04	0.236	0.625	4	0.625	2.713	0.787	3.500	0.26	With	AVGT06...
EPAV06U0.62C0.62R03L	0.236	0.625	3	0.625	4.122	1.378	5.500	0.42	With	AVGT06...
EPAV12U0.62W0.62R02	0.453	0.625	2	0.625	1.906	1.000	2.906	0.22	With	AVM/GT12...
EPAV12U0.62W0.62R03	0.453	0.625	3	0.625	1.906	1.000	2.906	0.22	With	AVM/GT12...
EPAV12U0.62C0.62R02L	0.453	0.625	2	0.625	4.250	1.500	5.750	0.44	With	AVM/GT12...
EPAV06U0.75C0.62R04	0.236	0.750	4	0.625	2.815	1.185	4.000	0.33	With	AVGT06...
EPAV06U0.75C0.75R04	0.236	0.750	4	0.750	2.815	1.185	4.000	0.44	With	AVGT06...
EPAV06U0.75C0.75R05	0.236	0.750	5	0.750	2.815	1.185	4.000	0.44	With	AVGT06...
EPAV06U0.75C0.75R04L	0.236	0.750	4	0.750	6.500	1.375	7.875	0.90	With	AVGT06...
EPAV12U0.75W0.75R03	0.453	0.750	3	0.750	2.031	1.250	3.281	0.33	With	AVM/GT12...
EPAV12U0.75W0.75R04	0.453	0.750	4	0.750	2.031	1.250	3.281	0.33	With	AVM/GT12...
EPAV12U0.75C0.75R03L	0.453	0.750	3	0.750	5.250	2.000	7.250	0.79	With	AVM/GT12...
EPAV06U1.00C0.75R06	0.236	1.000	6	0.750	3.125	1.375	4.500	0.55	With	AVGT06...
EPAV06U1.00C1.00R05	0.236	1.000	5	1.000	3.125	1.375	4.500	0.93	With	AVGT06...
EPAV06U1.00C1.00R06	0.236	1.000	6	1.000	3.125	1.375	4.500	0.93	With	AVGT06...
EPAV06U1.00C1.00R04L	0.236	1.000	4	1.000	6.425	1.575	8.000	1.68	With	AVGT06...
EPAV12U1.00W1.00R03	0.453	1.000	3	1.000	2.281	1.500	3.781	0.71	With	AVM/GT12...
EPAV12U1.00W1.00R04	0.453	1.000	4	1.000	2.281	1.500	3.781	0.71	With	AVM/GT12...
EPAV12U1.00W1.00R06	0.453	1.000	6	1.000	2.281	1.500	3.781	0.71	With	AVM/GT12...
EPAV12U1.00C1.00R03L	0.453	1.000	3	1.000	5.750	2.750	8.500	1.65	With	AVM/GT12...
EPAV12U1.25W1.25R04	0.453	1.250	4	1.250	2.281	1.500	3.781	1.10	With	AVM/GT12...
EPAV12U1.25W1.25R06	0.453	1.250	6	1.250	2.281	1.500	3.781	1.12	With	AVM/GT12...
EPAV12U1.25W1.25R08	0.453	1.250	8	1.250	2.281	1.500	3.781	1.15	With	AVM/GT12...
EPAV12U1.25C1.25R03L	0.453	1.250	3	1.250	7.000	3.000	10.000	3.15	With	AVM/GT12...

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPAV04M006C06.0R01	4	6	1	6	48	12	60	0.01	With	AVMT04...
EPAV04M008C08.0R02	4	8	2	8	48	12	60	0.02	With	AVMT04...
EPAV04M008C08.0R02L	4	8	2	8	60	20	80	0.03	With	AVMT04...
EPAV06M008C10.0R01	6	8	1	10	60	20	80	0.04	With	AVGT06...
EPAV04M010C10.0R02	4	10	2	10	60	20	80	0.04	With	AVMT04...
EPAV04M010C10.0R03	4	10	3	10	60	20	80	0.04	With	AVMT04...
EPAV04M010C10.0R02L	4	10	2	10	65	35	100	0.05	With	AVMT04...
EPAV06M010C10.0R02	6	10	2	10	60	20	80	0.04	With	AVGT06...
EPAV06M010C10.0R02L	6	10	2	10	65	35	100	0.06	With	AVGT06...
EPAV06M010C08.0R02L	6	10	2	8	80	20	100	0.04	With	AVGT06...
EPAV04M012C12.0R03	4	12	3	12	60	20	80	0.06	With	AVMT04...
EPAV04M012C12.0R04	4	12	4	12	60	20	80	0.06	With	AVMT04...
EPAV04M012C12.0R03L	4	12	3	12	85	35	120	0.09	With	AVMT04...
EPAV06M012C12.0R02	6	12	2	12	60	20	80	0.06	With	AVGT06...
EPAV06M012C12.0R03	6	12	3	12	60	20	80	0.06	With	AVGT06...
EPAV06M012C12.0R02L	6	12	2	12	85	35	120	0.09	With	AVGT06...
EPAV06M012C10.0R02L	6	12	2	10	100	20	120	0.07	With	AVGT06...
EPAV06M012C10.0R03	6	12	3	10	60	20	80	0.04	With	AVGT06...
EPAV12M012C12.0R01	11.5	12	1	12	60	25	85	0.06	With	AVM/GT12...
EPAV06M014C12.0R03	6	14	3	12	60	20	80	0.07	With	AVGT06...
EPAV06M014C12.0R03L	6	14	3	12	120	20	140	0.11	With	AVGT06...

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPAV04M016C16.0R04	4	16	4	16	70	20	90	0.12	With	AVMT04...
EPAV04M016C16.0R05	4	16	5	16	70	20	90	0.12	With	AVMT04...
EPAV04M016C16.0R04L	4	16	4	16	105	35	140	0.19	With	AVMT04...
EPAV12M016C16.0R02	11.5	16	2	16	60	25	85	0.12	With	AVM/GT12...
EPAV12M016C16.0R03	11.5	16	3	16	60	25	85	0.12	With	AVM/GT12...
EPAV12M016C16.0R02L	11.5	16	2	16	105	40	145	0.20	With	AVM/GT12...
EPAV06M016C16.0R03	6	16	3	16	70	20	90	0.12	With	AVGT06...
EPAV06M016C16.0R04	6	16	4	16	70	20	90	0.12	With	AVGT06...
EPAV06M016C16.0R03L	6	16	3	16	105	35	140	0.20	With	AVGT06...
EPAV06M018C16.0R03	6	18	3	16	70	20	90	0.13	With	AVGT06...
EPAV06M018C16.0R04	6	18	4	16	70	20	90	0.13	With	AVGT06...
EPAV06M018C16.0R03L	6	18	3	16	160	20	180	0.26	With	AVGT06...
EPAV06M020C20.0R04	6	20	4	20	70	30	100	0.23	With	AVGT06...
EPAV06M020C20.0R05	6	20	5	20	70	30	100	0.21	With	AVGT06...
EPAV06M020C20.0R04L	6	20	4	20	165	35	200	0.45	With	AVGT06...
EPAV06M020C16.0R04	6	20	4	16	80	30	110	0.17	With	AVGT06...
EPAV12M020C20.0R03	11.5	20	3	20	70	30	100	0.22	With	AVM/GT12...
EPAV12M020C20.0R04	11.5	20	4	20	70	30	100	0.21	With	AVM/GT12...
EPAV12M020C20.0R02L	11.5	20	2	20	135	50	185	0.41	With	AVM/GT12...
EPAV06M025C25.0R05	6	25	5	25	80	35	115	0.4	With	AVGT06...
EPAV06M025C25.0R06	6	25	6	25	80	35	115	0.4	With	AVGT06...
EPAV06M025C25.0R04L	6	25	4	25	160	40	200	0.72	With	AVGT06...
EPAV06M025C20.0R06	6	25	6	20	80	35	115	0.27	With	AVGT06...
EPAV12M025C25.0R04	11.5	25	4	25	80	35	115	0.38	With	AVM/GT12...
EPAV12M025C25.0R06	11.5	25	6	25	80	35	115	0.39	With	AVM/GT12...
EPAV12M025C25.0R03L	11.5	25	3	25	150	70	220	0.74	With	AVM/GT12...
EPAV06M032C32.0R08	6	32	8	32	80	40	120	0.7	With	AVGT06...
EPAV06M032C32.0R06L	6	32	6	32	155	45	200	1.2	With	AVGT06...
EPAV12M032C32.0R06	11.5	32	6	32	80	40	120	0.68	With	AVM/GT12...
EPAV12M032C32.0R08	11.5	32	8	32	80	40	120	0.68	With	AVM/GT12...
EPAV12M032C32.0R03L	11.5	32	3	32	175	80	255	1.47	With	AVM/GT12...

INCH SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EPAV06U...	CSPB-2H	M-1000	IP-6DB
EPAV12U0.62W0.62R02	CSPB-2.5	-	IP-8D
EPAV12U0.62W0.62R03	CSPB-2.5S	-	IP-8D
EPAV12U0.62C0.62R02L	CSPB-2.5	-	IP-8D
EPAV12U0.75W0.75R03	CSPB-2.5	-	IP-8D
EPAV12U0.75W0.75R04	CSPB-2.5S	-	IP-8D
EPAV12U0.75C0.75R03L	CSPB-2.5	-	IP-8D
EPAV12U1.00W1.00R03	CSPB-2.5	-	IP-8D
EPAV12U1.00W1.00R04	CSPB-2.5	-	IP-8D
EPAV12U1.00W1.00R06	CSPB-2.5S	-	IP-8D
EPAV12U1.00C1.00R03L	CSPB-2.5	-	IP-8D
EPAV12U1.25W1.25R04	CSPB-2.5	-	IP-8D
EPAV12U1.25W1.25R06	CSPB-2.5	-	IP-8D
EPAV12U1.25W1.25R08	CSPB-2.5S	-	IP-8D
EPAV12U1.25C1.25R03L	CSPB-2.5	-	IP-8D

Recommended clamping torque:
CSPB-2H = 0.52 lbs-ft, CSPB-2.5, CSPB-2.5S = 0.96 lbs-ft

METRIC SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EPAV04M006C06.0R01	CSPB-1.8L3.3	M-1000	IP-6DB
EPAV04M008... - EPAV04M016...	CSPB-1.8L3.6	M-1000	IP-6DB
EPAV06M...	CSPB-2H	M-1000	IP-6DB
EPAV12M012C12.0R01	CSPB-2.5	M-1000	IP-8D
EPAV12M016C16.0R02	CSPB-2.5	M-1000	IP-8D
EPAV12M016C16.0R03	CSPB-2.5S	M-1000	IP-8D
EPAV12M016C16.0R02L	CSPB-2.5	M-1000	IP-8D
EPAV12M020C20.0R03	CSPB-2.5	M-1000	IP-8D
EPAV12M020C20.0R04	CSPB-2.5S	M-1000	IP-8D
EPAV12M020C20.0R02L	CSPB-2.5	M-1000	IP-8D
EPAV12M025C25.0R04	CSPB-2.5	M-1000	IP-8D
EPAV12M025C25.0R06	CSPB-2.5S	M-1000	IP-8D
EPAV12M025C25.0R03L	CSPB-2.5	M-1000	IP-8D
EPAV12M032C32.0R06	CSPB-2.5	M-1000	IP-8D
EPAV12M032C32.0R08	CSPB-2.5S	M-1000	IP-8D
EPAV12M032C32.0R03L	CSPB-2.5	M-1000	IP-8D

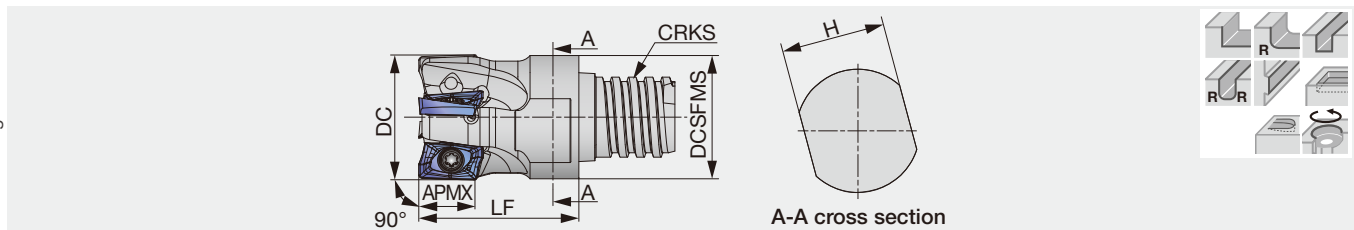
Recommended clamping torque:
CSPB-1.8L3.3, CSPB-1.8L3.6 = 0.5 N-m, CSPB-2H = 0.7 N-m,
CSPB-2.5, CSPB-2.5S = 1.3 N-m



HPAV06-S

Square shoulder endmill, modular type (TungMeister), with screw clamp system

GAMP = +6.9°~ +7.6°, GAMF = -35.2°~ -32.4°



Metric	APMX	DC	CICT	LF	H	DCSFMS	CRKS	WT(kg)	Insert
HPAV06M010S05R02	6	10	2	10	8	8	S05	0.01	AVGT06...
HPAV06M010S06R02	6	10	2	16	8	9.8	S06	0.01	AVGT06...
HPAV06M012S08R02	6	12	2	18	10	11.7	S08	0.02	AVGT06...
HPAV06M012S08R03	6	12	3	18	10	11.7	S08	0.02	AVGT06...
HPAV06M016S10R03	6	16	3	20	13	15.4	S10	0.03	AVGT06...
HPAV06M016S10R04	6	16	4	20	13	15.4	S10	0.03	AVGT06...

For connections between metric shank and TungMeister thread, please use VAD-M type connector

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
HPAV06M...	CSPB-2H	M-1000	IP-6DB

Recommended clamping torque: 0.7 N·m

Designation	Wrench*	
HPAV06M010S...	KEYV-S06	
HPAV06M012S...	KEYV-S08	
HPAV06M016S...	KEYV-S10	

*sold separately

Approach angle

7°-25°

41°-45°

60°-70°

85°-88°

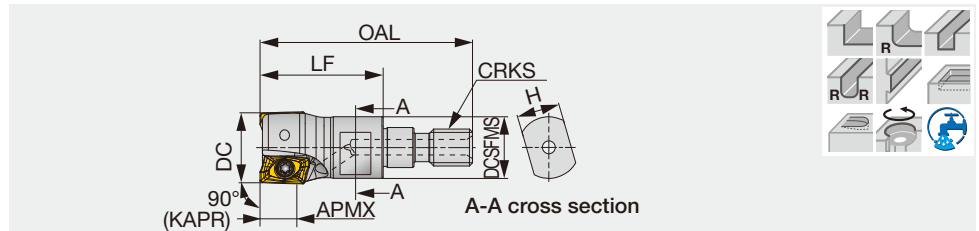
90°

Others

HPAV06/12-M

Square shoulder endmill, modular type (TungFlex),
with screw clamp system

HPAV06-M: GAMP = +6.9° ~ +7.6°, GAMF = -35.2° ~ -32.4°
HPAV12-M: GAMP = +6° ~ +7.6°, GAMF = -37.1° ~ -32.4°



Metric	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPAV06M010M06R02	6	10	2	34.5	20	7	9.5	M6	0.01	Without	AVGT06...
HPAV06M012M06R02	6	12	2	34.5	20	7	10	M6	0.01	Without	AVGT06...
HPAV06M012M06R03	6	12	3	34.5	20	7	10	M6	0.01	Without	AVGT06...
HPAV06M016M08R03	6	16	3	42	25	10	13	M8	0.03	Without	AVGT06...
HPAV06M016M08R04	6	16	4	42	25	10	13	M8	0.03	Without	AVGT06...
HPAV12M016M08R02	11.5	16	2	42	25	10	14.5	M8	0.03	With	AVM/GT12...
HPAV12M016M08R03	11.5	16	3	42	25	10	14.5	M8	0.03	With	AVM/GT12...
HPAV12M020M10R03	11.5	20	3	49	30	15	17.8	M10	0.06	With	AVM/GT12...
HPAV12M020M10R04	11.5	20	4	49	30	15	17.8	M10	0.05	With	AVM/GT12...
HPAV12M025M12R04	11.5	25	4	57	35	17	23	M12	0.1	With	AVM/GT12...
HPAV12M025M12R06	11.5	25	6	57	35	17	23	M12	0.1	With	AVM/GT12...
HPAV12M032M16R06	11.5	32	6	63	40	22	28.8	M16	0.21	With	AVM/GT12...
HPAV12M032M16R08	11.5	32	8	63	40	22	28.8	M16	0.21	With	AVM/GT12...
HPAV12M040M16R06	11.5	40	6	63	40	22	28.8	M16	0.25	With	AVM/GT12...
HPAV12M040M16R08	11.5	40	8	63	40	22	28.8	M16	0.24	With	AVM/GT12...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
HPAV06M...	CSPB-2H	M-1000	IP-6DB
HPAV12M016M08R02	CSPB-2.5	-	IP-8D
HPAV12M016M08R03	CSPB-2.5S	-	IP-8D
HPAV12M020M10R03	CSPB-2.5	-	IP-8D
HPAV12M020M10R04	CSPB-2.5S	-	IP-8D
HPAV12M025M12R04	CSPB-2.5	-	IP-8D
HPAV12M025M12R06	CSPB-2.5S	-	IP-8D
HPAV12M032M16R06	CSPB-2.5	-	IP-8D
HPAV12M032M16R08	CSPB-2.5S	-	IP-8D
HPAV12M040M16R06	CSPB-2.5	-	IP-8D
HPAV12M040M16R08	CSPB-2.5	-	IP-8D

Recommended clamping torque: 1.3 N·m

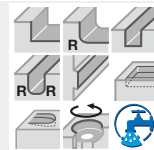
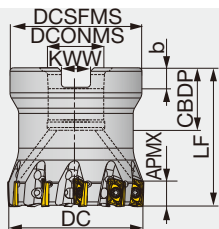


TUNG F^{ORCE} REC

TPAV06/12

Square shoulder mill, bore type, with screw clamp system

TPAV06: GAMP = +7.7°, GAMF = -29.8°
TPAV12: GAMP = +6° ~ +7.6°, GAMF = -37.1° ~ -32.4°



Inch	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	KWW	b	WT(lb)	Air hole	Insert
TPAV12U1.50B0.50R05	0.453	1.500	5	1.417	0.500	0.630	1.575	0.258	0.157	0.460	With	AVM/GT12...
TPAV12U2.00B0.75R05	0.453	2.000	5	1.772	0.750	0.750	1.575	0.315	0.197	0.770	With	AVM/GT12...
TPAV12U2.00B0.75R12	0.453	2.000	12	1.772	0.750	0.750	1.575	0.315	0.197	0.840	With	AVM/GT12...

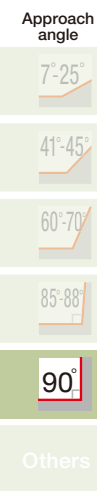
Metric	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	KWW	b	WT(kg)	Air hole	Insert
TPAV06M040B16.0R10	6	40	10	38	16	18	40	8.4	5.6	0.24	With	AVGT06...
TPAV12M050B22.0R08	11.5	50	8	47	22	20	40	10.4	6.3	0.37	With	AVM/GT12...
TPAV12M050B22.0R12	11.5	50	12	47	22	20	40	10.4	6.3	0.37	With	AVM/GT12...
TPAV12M063B22.0R08	11.5	63	8	47	22	20	40	10.4	6.3	0.52	With	AVM/GT12...
TPAV12M063B22.0R14	11.5	63	14	47	22	20	40	10.4	6.3	0.54	With	AVM/GT12...

SPARE PARTS



Designation	Clamping screw	Lubricant	Wrench	Shell locking bolt
TPAV06M040B16.0R10	CSPB-2H	M-1000	IP-6DB	CM8X30H
TPAV12U1.50B...	CSPB-2.5	-	IP-8D	SR UNF 1/4X3/4 B18.3
TPAV12U2.00B...	CSPB-2.5	-	IP-8D	C0.375X1.125H

Recommended clamping torque: CSPB-2H = 0.52 lbs-ft, 0.7 N-m, CSPB-2.5 = 0.96 lbs-ft, 1.3 N-m



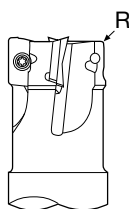
Reference pages: Standard cutting conditions → [H142](#) - [H143](#)

EPAV12, HPAV12-M, TPAV12

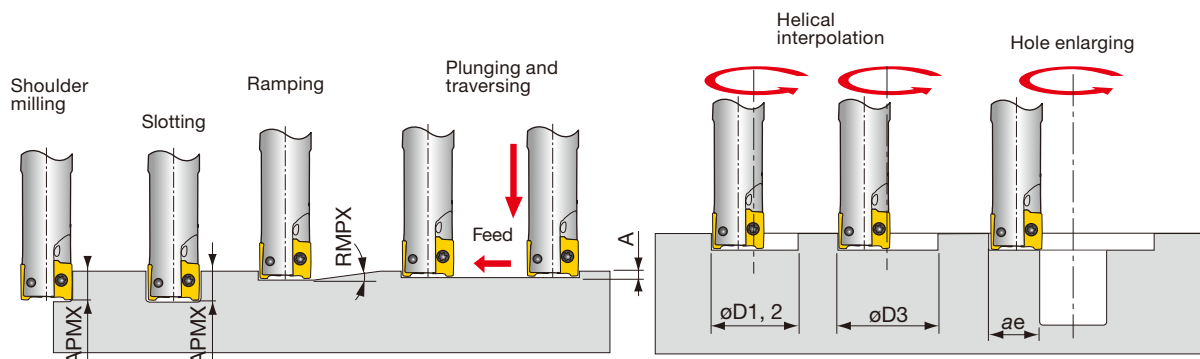
ISO	Workpiece materials	Hardness	Priority	Grades	Cutting speed V _c (sfm)	Feed per tooth f _z (ipt)
P	Low carbon steel 1028, etc.	- 200 HB	First choice	AH3225	328 - 984	0.002 - 0.009
		- 200 HB	Wear resistance	T3225	656 - 1312	0.002 - 0.007
	Carbon steel and alloy steel 1045, etc.	- 300 HB	First choice	AH3225	328 - 820	0.002 - 0.009
		- 300 HB	Wear resistance	T3225	656 - 1312	0.002 - 0.007
	Prehardend steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3225	328 - 656	0.002 - 0.009
		30 - 40 HRC	Wear resistance	T3225	656 - 1312	0.002 - 0.006
M	Stainless steel 304SS, etc.	- 200 HB	First choice	AH3225	262 - 591	0.003 - 0.008
K	Gray cast iron No. 250B, etc.	150 - 250 HB	First choice	AH120	328 - 984	0.002 - 0.007
		150 - 250 HB	Wear resistance	T1215	656 - 1312	0.002 - 0.005
	Ductile cast iron 60-40-18, etc.	150 - 250 HB	First choice	AH120	328 - 820	0.002 - 0.007
		150 - 250 HB	Wear resistance	T1215	492 - 984	0.002 - 0.005
N	Aluminum alloys Si < 13%	-	First choice	KS05F	984 - 4921	0.002 - 0.013
	Aluminum alloys Si ≥ 13%	-	First choice	KS05F	328 - 656	0.002 - 0.013
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH3225	66 - 197	0.002 - 0.006
	Superalloys Inconel718, etc.	- 40 HRC	First choice	AH120	66 - 131	0.002 - 0.006
H	Hardened steel	H13, etc.	40 - 50 HRC	AH120	164 - 492	0.002 - 0.003
		D2, etc.	50 - 60 HRC	AH120	131 - 230	0.002 - 0.003

Cautionary point in modifying cutter bodies

When using inserts with corner radius
 $RE \geq 0.0787"$, standard cutter bodies have to be
 modified "R". (EPAV12, TPAV12, HPAV12)



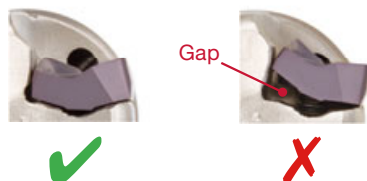
Corner radius RE (in)	The dimension of modifying (in)
0.0157 - 0.0623	Unnecessary
0.0787 - 0.1181	0.0787



		Max. depth of cut	Max. ramping angle	Max. plunging	Min. machining	Max. machining		Max. cutting width in enlarging
Inch	DC	APMX	RMPX	A	øD1	øD2	øD3*	ae
EPAV06U0.31...	0.313	0.236	-	-	-	-	-	-
EPAV06U0.37...	0.375	0.236	3°	0.012	0.591	0.748	0.709	0.374
EPAV06U0.50...	0.500	0.236	3°	0.012	0.709	0.906	0.866	0.453
EPAV06U0.62...	0.625	0.236	2.3°	0.012	1.026	1.220	1.181	0.610
EPAV06U0.75...	0.750	0.236	2°	0.012	1.276	1.460	1.421	0.730
EPAV06U1.00...	1.000	0.236	1.6°	0.012	1.775	1.960	1.921	0.980
EPAV12U0.62...	0.625	0.453	3.5°	0.020	0.986	1.211	1.171	0.586
EPAV12U0.75...	0.750	0.453	3°	0.020	1.224	1.461	1.421	0.711
EPAV12U1.00...	1.000	0.453	2.5°	0.020	1.709	1.961	1.921	0.961
EPAV12U1.25...	1.250	0.453	2°	0.020	2.201	2.461	2.421	1.211
TPAV12U1.50...	1.500	0.453	1.7°	0.020	2.700	2.961	2.921	1.461
TPAV12U2.00...	2.000	0.453	1.2°	0.020	3.750	3.961	3.921	1.961

*Flat bottom hole

When clamping the insert, please confirm that there is no gap between the cutter body and the insert as shown in the picture.



Approach angle

7°-25°

41°-45°

60°-70°

85-88°

90°

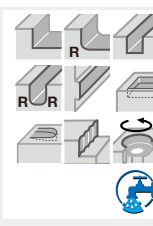
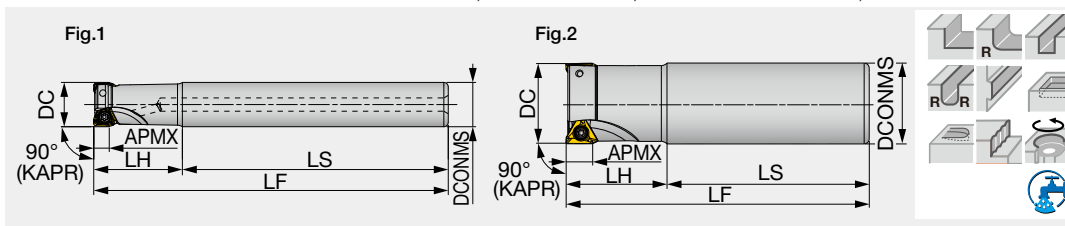
Others

H



High precision square shoulder endmill, shank type, with screw clamp system

EPA04: GAMP = +12.1°~ +12.2°, GAMF = -14.2°~ -18.3°, EPA06: GAMP = +8.5°~ +11.5°, GAMF = -5.5°~ -12.5°, EPA10: GAMP = +9.5°~ +11°, GAMF = -4.5°~ -0.5°, EPA15: GAMP = +12°~ +13.5°, GAMF = -6°~ -3.5°



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert	Fig.
EPA06R050U0050-01N	0.236	0.500	1	0.500	2.250	0.750	3.000	0.15	Without	TOMT06...	2
EPA06R063U0063-02N	0.236	0.625	2	0.625	2.563	0.937	3.500	0.29	Without	TOMT06...	2
EPA06R075U0075-03N	0.236	0.750	3	0.750	2.858	1.142	4.000	0.46	With	TOMT06...	2
EPA06R100U0100W04N	0.236	1.000	4	1.000	2.280	1.500	3.780	0.76	Without	TOMT06...	2
EPA10R100U0075W02N	0.394	1.000	2	0.750	2.362	1.378	3.740	0.44	Without	TO*T10...	2
EPA10R100U0100W02N	0.394	1.000	2	1.000	2.362	1.378	3.740	0.71	Without	TO*T10...	2
EPA10R100U0100W02L	0.394	1.000	2	1.000	5.748	2.752	8.500	1.68	With	TO*T10...	2
EPA10R125U0125W02L	0.394	1.250	2	1.250	7.000	3.000	10.000	3.15	With	TO*T10...	2
EPA10R125U0125W03N	0.394	1.250	3	1.250	2.362	1.378	3.740	1.12	Without	TO*T10...	2
EPA10R125U0125W03ML	0.394	1.250	3	1.250	4.250	2.250	6.500	2.07	With	TO*T10...	2
EPA10R150U0125W02L	0.394	1.500	2	1.250	8.000	2.000	10.000	3.33	With	TO*T10...	2
EPA10R150U0125W03ML	0.394	1.500	3	1.250	4.250	2.250	6.500	2.43	With	TO*T10...	2
EPA10R150U0125W04N	0.394	1.500	4	1.250	3.157	1.969	5.126	1.68	Without	TO*T10...	2
EPA15R150U0125W03N	0.590	1.500	3	1.250	2.250	2.250	4.500	1.48	With	TO*T15...	2
EPA15R150U0125W02L	0.590	1.500	2	1.250	2.250	4.250	6.500	2.07	With	TO*T15...	2
EPA15R200U0125W04N	0.590	2.000	4	1.250	2.250	2.250	4.500	1.74	Without	TO*T15...	2

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert	Fig.
EPA04R008M08.0-01	3.5	8	1	8	48	12	60	0.02	With	TOMT04...	1
EPA04R010M10.0-02	3.5	10	2	10	60	20	80	0.04	With	TOMT04...	1
EPA04R010M10.0-02L	3.5	10	2	10	65	35	100	0.05	With	TOMT04...	1
EPA04R012M12.0-02	3.5	12	2	12	60	20	80	0.06	With	TOMT04...	1
EPA04R012M12.0-03	3.5	12	3	12	60	20	80	0.06	With	TOMT04...	1
EPA04R012M12.0-02L	3.5	12	2	12	85	35	120	0.09	With	TOMT04...	1
EPA04R016M16.0-03	3.5	16	3	16	70	20	90	0.12	With	TOMT04...	1
EPA04R016M16.0-04	3.5	16	4	16	70	20	90	0.12	With	TOMT04...	1
EPA04R016M16.0-03L	3.5	16	3	16	105	35	140	0.19	With	TOMT04...	1
EPA04R020M20.0-04	3.5	20	4	20	70	30	100	0.21	With	TOMT04...	1
EPA04R020M20.0-05	3.5	20	5	20	70	30	100	0.21	With	TOMT04...	1
EPA04R020M20.0-04L	3.5	20	4	20	165	35	200	0.44	With	TOMT04...	1
EPA04R025M25.0-05	3.5	25	5	25	80	35	115	0.39	With	TOMT04...	1
EPA04R025M25.0-06	3.5	25	6	25	80	35	115	0.39	With	TOMT04...	1
EPA04R025M25.0-04L	3.5	25	4	25	160	40	200	0.7	With	TOMT04...	1
EPA06R012M16.0-01N	6	12	1	16	50	18	68	0.09	Without	TO*T06...	2
EPA06R016M16.0-02N	6	16	2	16	60	24	84	0.12	Without	TO*T06...	2
EPA06R016M16.0-02L	6	16	2	16	105	40	145	0.2	With	TO*T06...	2
EPA06R018M16.0-02N	6	18	2	16	60	24	84	0.13	Without	TO*T06...	2
EPA06R018M16.0-02L	6	18	2	16	115	30	145	0.21	With	TO*T06...	2
EPA06R020M16.0-02N	6	20	2	16	60	30	90	0.14	With	TO*T06...	2
EPA06R020M20.0-02N	6	20	2	20	70	30	100	0.23	Without	TO*T06...	2
EPA06R020M20.0-03N	6	20	3	20	70	30	100	0.22	Without	TO*T06...	2
EPA06R020M20.0-02L	6	20	2	20	135	50	185	0.41	With	TO*T06...	2
EPA06R022M20.0-02N	6	22	2	20	70	30	100	0.23	Without	TO*T06...	2
EPA06R022M20.0-03N	6	22	3	20	70	30	100	0.23	Without	TO*T06...	2
EPA06R022M20.0-02L	6	22	2	20	145	40	185	0.42	With	TO*T06...	2
EPA06R025M25.0-03N	6	25	3	25	80	35	115	0.41	Without	TO*T06...	2
EPA06R025M25.0-04N	6	25	4	25	80	35	115	0.41	Without	TO*T06...	2
EPA06R025M25.0-02L	6	25	2	25	150	70	220	0.78	With	TO*T06...	2
EPA06R028M25.0-03N	6	28	3	25	80	35	115	0.42	Without	TO*T06...	2
EPA06R028M25.0-04N	6	28	4	25	80	35	115	0.42	Without	TO*T06...	2
EPA06R028M25.0-02L	6	28	2	25	180	40	220	0.8	Without	TO*T06...	2
EPA10R025M25.0-02N	10	25	2	25	80	35	115	0.38	With	TO*T10...	2
EPA10R025M25.0-02L	10	25	2	25	150	70	220	0.75	With	TO*T10...	2

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert	Fig.
EPA10R028M25.0-02N	10	28	2	25	80	35	115	0.39	Without	TO*T10...	2
EPA10R028M25.0-02L	10	28	2	25	185	35	220	0.78	With	TO*T10...	2
EPA10R032M32.0-02N	10	32	2	32	80	40	120	0.66	Without	TO*T10...	2
EPA10R032M32.0-03N	10	32	3	32	80	40	120	0.65	Without	TO*T10...	2
EPA10R032M32.0-02L	10	32	2	32	175	80	255	1.46	With	TO*T10...	2
EPA10R035M32.0-02N	10	35	2	32	80	40	120	0.7	Without	TO*T10...	2
EPA10R035M32.0-03N	10	35	3	32	80	40	120	0.68	Without	TO*T10...	2
EPA10R035M32.0-02L	10	35	2	32	215	40	255	1.52	With	TO*T10...	2
EPA10R040M32.0-03N	10	40	3	32	80	40	120	0.72	Without	TO*T10...	2
EPA10R040M32.0-04N	10	40	4	32	80	40	120	0.73	Without	TO*T10...	2
EPA10R040M32.0-02L	10	40	2	32	205	50	255	1.57	With	TO*T10...	2
EPA15R040M32.0-03N	15	40	3	32	80	40	120	0.73	Without	TO*T15...	2
EPA15R040M32.0-02L	15	40	2	32	205	50	255	1.56	With	TO*T15...	2
EPA15R050M32.0-04N	15	50	4	32	80	40	120	0.83	Without	TO*T15...	2
EPA15R050M42.0-02L	15	50	2	42	310	50	360	3.84	With	TO*T15...	2

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Wrench	Torx bit
EPA04R008M08.0-01	CSPB-1.8L3.3	IP-6DB	-	-	-
EPA04R010 - 025...	CSPB-1.8L3.6	IP-6DB	-	-	-
EPA06R050, 063U... EPA06R012 - 018M...	CSTB-2.5S	-	M-1000	T-8D	-
EPA06R075, 100U... EPA06R020 - 028M...	CSTB-2.5	-	M-1000	T-8D	-
EPA10...	SR14-562/S	SW6-SD	M-1000	-	BLDT10/S7
EPA15...	TS45120I	H-TB2W	M-1000	-	BT20S

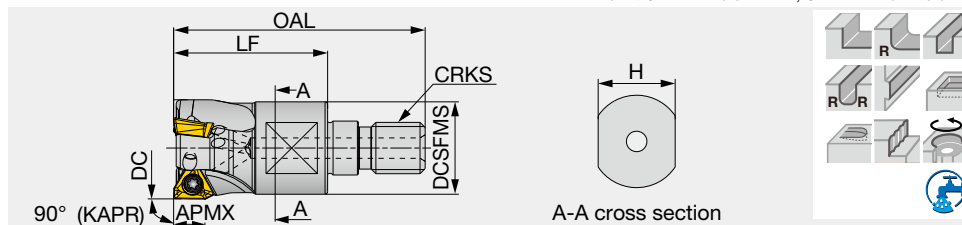
Recommended clamping torque: CSPB-1.8L3.6 = 0.37 lbs-ft, 0.5 N·m, CSTB-2.5S, CSTB-2.5 = 0.96 lbs-ft, 1.3 N·m, SR14-562/S = 2.58 lbs-ft, 3.5 N·m, CSPB-1.8L3.3, TS45120I = 3.69 lbs-ft, 5 N·m

TUNG-TRI

HPA06/10-M

High precision square shoulder endmill, modular type (TungFlex)

HPA06-M: GAMP = +8.5°~ +11.5°, GAMF = -12.5°~ -5.5°
HPA10-M: GAMP = +9.5°~ +11°, GAMF = -4.5°~ -0.5°

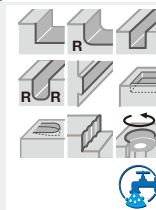
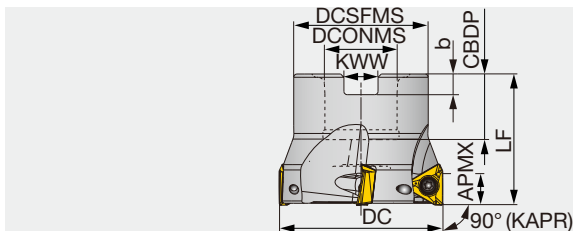


Metric	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPA06R016MM08-02	6	16	2	42	25	10	13	M8	0.03	with	TO*T06...
HPA06R020MM10-03	6	20	3	49	30	15	18	M10	0.06	with	TO*T06...
HPA06R025MM12-04	6	25	4	57	35	17	21	M12	0.1	with	TO*T06...
HPA06R032MM16-05	6	32	5	63	40	22	29	M16	0.20	with	TO*T06...
HPA10R025MM12-02	10	25	2	57	35	17	21	M12	0.08	with	TO*T10...
HPA10R032MM16-03	10	32	3	63	40	22	29	M16	0.18	with	TO*T10...

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Wrench	Torx bit
HPA06R016MM08-02	CSTB-2.5S	-	M-1000	T-8D	-
HPA06R020 - 032MM...	CSTB-2.5	-	M-1000	T-8D	-
HPA10...	SR14-562/S	SW6-SD	M-1000	-	BLDT10/S7

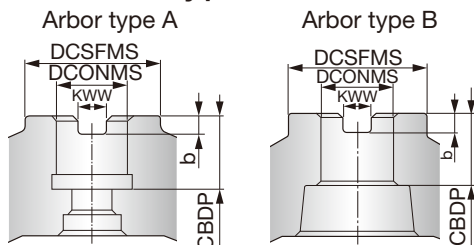
Recommended clamping torque: CSTB-2.5, CSTB-2.5S = 1.3 N·m, SR14-562/S = 3.5 N·m



Inch	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(lb)	Air hole	Insert	Arbor type
TPA10R150U0050A04	0.394	1.500	4	1.378	0.500	0.610	1.575	0.157	0.258	0.400	With	TO*T10...	A
TPA06R200U0075A08	0.236	2.000	8	1.693	0.750	0.750	1.575	0.197	0.315	0.310	With	TOMT06...	A
TPA10R200U0075A04	0.394	2.000	4	1.693	0.750	0.750	1.575	0.197	0.315	0.440	With	TO*T10...	A
TPA15R200U0075A04	0.590	2.000	4	1.625	0.750	0.750	1.570	0.197	0.315	0.600	With	TO*T15...	A
TPA10R250U0075A06	0.394	2.500	6	1.693	0.750	0.750	1.575	0.197	0.315	0.680	With	TO*T10...	A
TPA15R250U0075A05	0.590	2.500	5	2.125	0.750	0.750	1.570	0.197	0.315	0.900	With	TO*T15...	A
TPA10R300U0100A07	0.394	3.000	7	2.283	1.000	1.024	1.969	0.236	0.374	1.120	With	TO*T10...	A
TPA15R300U0100A06	0.590	3.000	6	2.250	1.000	1.024	1.750	0.236	0.374	1.900	With	TO*T15...	A
TPA10R400U0150A08	0.394	4.000	8	3.150	1.500	1.413	2.480	0.394	0.626	2.290	With	TO*T10...	B
TPA15R400U0150A07N	0.590	4.000	7	3.000	1.500	1.181	2.000	0.394	0.626	1.270	Without	TO*T15...	B
TPA15R500U0150A08N	0.590	5.000	8	4.000	1.500	1.175	2.000	0.394	0.626	2.800	Without	TO*T15...	B
TPA15R600U0200A10N	0.590	6.000	10	4.750	2.000	1.220	2.000	0.433	0.748	10.520	Without	TO*T15...	B

Metric	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TPA06R032M16.0E05	6	32	5	30	16	18	40	5.6	8.4	0.14	With	TO*T06...
TPA06R040M16.0E06	6	40	6	35	16	18	40	5.6	8.4	0.22	With	TO*T06...
TPA10R040M16.0E04	10	40	4	35	16	18	40	5.6	8.4	0.2	With	TO*T10...
TPA06R050M22.0E08	6	50	8	41	22	20	40	6.3	10.4	0.31	With	TO*T06...
TPA10R050M22.0E04	10	50	4	41	22	20	40	6.3	10.4	0.31	With	TO*T10...
TPA15R050M22.0E04	15	50	4	41	22	20	40	6.3	10.4	0.27	With	TO*T15...
TPA10R063M22.0E06	10	63	6	41	22	20	40	6.3	10.4	0.51	With	TO*T10...
TPA15R063M22.0E05	15	63	5	41	22	20	40	6.3	10.4	0.41	With	TO*T15...
TPA10R080M25.4-07	10	80	7	58	25.4	26	50	6	9.5	1.04	With	TO*T10...
TPA10R080M27.0E07	10	80	7	58	27	22	50	7	12.4	1.04	With	TO*T10...
TPA15R080M25.4-06	15	80	6	46	25.4	26	50	6	9.5	0.83	With	TO*T15...
TPA15R080M27.0E06	15	80	6	50	27	22	50	7	12.4	0.86	With	TO*T15...
TPA10R100M31.7-08	10	100	8	70	31.75	32	63	8	12.7	2.02	With	TO*T10...
TPA10R100M32.0E08	10	100	8	60	32	28.5	50	8	14.4	2.02	With	TO*T10...
TPA15R100M31.7-07	15	100	7	60	31.75	32	50	8	12.7	1.3	With	TO*T15...
TPA15R100M32.0E07	15	100	7	60	32	28.5	50	8	14.4	1.27	With	TO*T15...
TPA15R125M38.1-08	15	125	8	80	38.1	38	63	10	15.9	2.7	With	TO*T15...
TPA15R125M40.0E08	15	125	8	71	40	32	63	9	16.4	2.47	With	TO*T15...
TPA15R160M40.0E10N	15	160	10	100	40	32	63	9	16.4	4.77	Without	TO*T15...
TPA15R160M50.8-10N	15	160	10	100	50.8	46	63	11	19	4.4	Without	TO*T15...

Arbor type



INCH SPARE PARTS

Designation	Clamping screw	Grip 1	Grip 2	Lubricant	Wrench	Torx bit	Shell locking bolt (Optional parts)
TPA06R200U0075A08	CSTB-2.5	-	-	M-1000	T-8D	-	(C0.375X1.125H)
TPA10R150U0050A04	SR14-562/S	-	SW6-SD	M-1000	-	BLDT10/S7	(SF UNF 1/4x3/4 B18.3)
TPA10R200 - 250U...	SR14-562/S	-	SW6-SD	M-1000	-	BLDT10/S7	(C0.375X1.125H)
TPA10R300U0100A07	SR14-562/S	-	SW6-SD	M-1000	-	BLDT10/S7	(C0.500X1.375H)
TPA10R400U0150A08	SR14-562/S	-	SW6-SD	M-1000	-	BLDT10/S7	(TMBA-0.750H)
TPA15R200, 250U...	TS45120I	H-TB2W	-	M-1000	-	BT20S	(C0.375X1.125H)
TPA15R300U0100A06	TS45120I	H-TB2W	-	M-1000	-	BT20S	(C0.500X1.375H)
TPA15R400U0150A07N	TS45120I	H-TB2W	-	M-1000	-	BT20S	(TMBA-0.750H)
TPA15R500U0150A08N	TS45120I	H-TB2W	-	M-1000	-	BT20M	(TMBA-0.750H)
TPA15R600U0200A10N	TS45120I	H-TB2W	-	M-1000	-	BT20M	-

Recommended clamping torque: CSTB-2.5 = 0.96 lbs-ft, SR14-562/S = 2.58 lbs-ft, TS45120I = 3.69 lbs-ft

METRIC SPARE PARTS

Designation	Clamping screw	Grip 1	Grip 2	Lubricant	Center bolt 1	Center bolt 2	Wrench	Torx bit
TPA06R032M16.0E05	CSTB-2.5	-	-	M-1000	-	FSHM8-30H	T-8D	-
TPA06R040M16.0E06	CSTB-2.5	-	-	M-1000	-	CM8X30H	T-8D	-
TPA06R050M22.0E08	CSTB-2.5	-	-	M-1000	-	CM10X30H	T-8D	-
TPA10R040M16.0E04	SR14-562/S	-	SW6-SD	M-1000	-	CM8X30H	-	BLDT10/S7
TPA10R050, 063M...	SR14-562/S	-	SW6-SD	M-1000	-	CM10X30H	-	BLDT10/S7
TPA10R080M...	SR14-562/S	-	SW6-SD	M-1000	-	CM12X30H	-	BLDT10/S7
TPA10R100M...	SR14-562/S	-	SW6-SD	M-1000	-	CM16X40H	-	BLDT10/S7
TPA15R050M22.0E04	TS45120I	H-TB2W	-	M-1000	-	FSHM10-40H	-	BT20S
TPA15R063M22.0E05	TS45120I	H-TB2W	-	M-1000	-	CM10X30H	-	BT20S
TPA15R080M...	TS45120I	H-TB2W	-	M-1000	-	-	-	BT20S
TPA15R100M...	TS45120I	H-TB2W	-	M-1000	TMBA-M16H	TMBA-M16H	-	BT20S
TPA15R125M...	TS45120I	H-TB2W	-	M-1000	TMBA-M20H	TMBA-M20H	-	BT20M
TPA15R160M...	TS45120I	H-TB2W	-	M-1000	-	-	-	BT20M

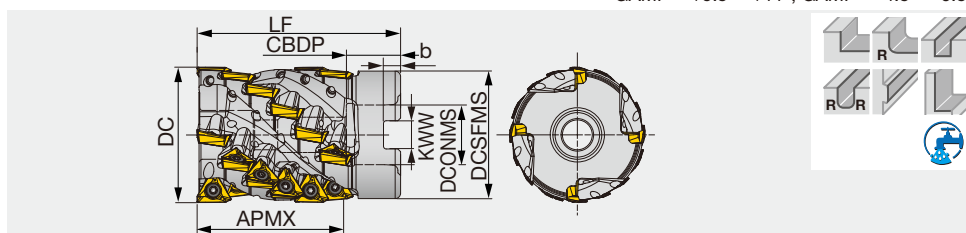
Recommended clamping torque: CSTB-2.5 = 1.3 N·m, SR14-562/S = 3.5 N·m, TS45120I = 5 N·m

TUNG-TRI

TLA10

Square shoulder mill for roughing, with screw clamp system

GAMP = +9.5° ~ +11°, GAMF = -4.5° ~ -0.5°



Inch	APMX	DC	ZEFP	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(lb)	Air hole	Insert
TLA10R200L213U0075A04	2.126	2.000	4	24	1.875	0.750	0.750	3.250	0.197	0.315	1.760	With	TO*T10...
TLA10R250L213U0100A04	2.126	2.500	4	24	2.375	1.000	1.024	3.250	0.236	0.374	2.960	With	TO*T10...

Metric	APMX	DC	ZEFP	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TLA10R050L054M22.0E04	54	50	4	24	47	22	20	75	6.3	10.4	0.64	With	TO*T10...
TLA10R063L054M25.4-04	54	63	4	24	60	25.4	26	80	6	9.5	1.26	With	TO*T10...
TLA10R063L054M27.0E04	54	63	4	24	60	27	22	80	7	12.4	1.25	With	TO*T10...

Note: Coolant needs to be supplied from the end of the arbor inlay. Coolant cannot be supplied from the set bolt.

SPARE PARTS

Designation	Clamping screw	Lubricant	Center bolt 1	Center bolt 2	Wrench	Shell locking bolt
TLA10R200L213U0075A04	SR14-562	M-1000	-	-	T-10D	SD06-102
TLA10R250L213U0100A04	SR14-562	M-1000	-	-	T-10D	SD-08-C8
TLA10R050L054M22.0E04	SR14-562	M-1000	CAP-CM10X1.5X55-H	-	T-10D	-
TLA10R063L...	SR14-562	M-1000	-	CAP-CM12X1.75X50	T-10D	-

Recommended clamping torque: 2.58 lbs-ft, 3.5 N·m

Reference pages: Inserts → **H153**, Standard cutting conditions → **H154 - H155**

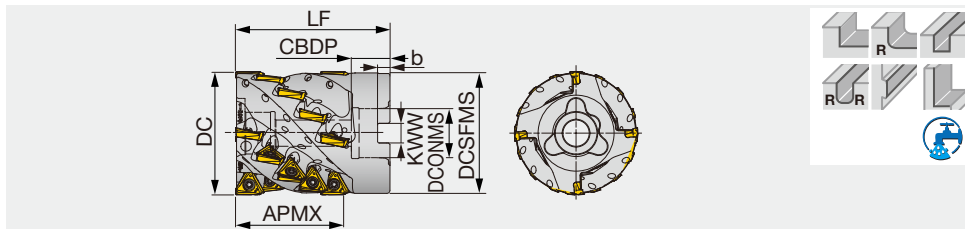


TUNG-TRI

TLA15-M

Square shoulder mill for roughing, with screw clamp system

GAMP = +12° ~ +13.5°, GAMF = -6° ~ -3.5°



Inch	APMX	DC	ZEFP	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(lb)	Air hole	Insert
TLA15R300L275U0125A04M	2.756	3.000	4	20	2.937	1.250	1.260	3.940	0.315	0.500	4.560	With	TO*T15...
TLA15R400L326U0150A05M	3.268	4.000	5	20	3.875	1.500	1.260	4.375	0.394	0.626	10.00	With	TO*T15...

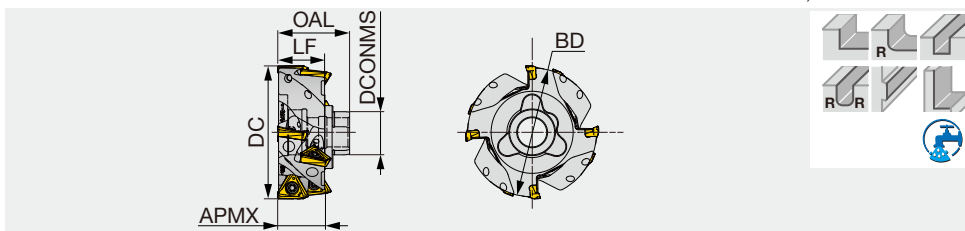
Metric	APMX	DC	ZEFP	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TLA15R080L070M31.7-04M	70	80	4	20	78	31.75	32	100	8	12.7	2.29	With	TO*T15...
TLA15R080L070M32.0E04M	70	80	4	20	78	32	25	100	8	14.4	2.38	With	TO*T15...
TLA15R100L083M38.1-05M	83	100	5	30	98	38.1	38	110	10	15.9	4.24	With	TO*T15...
TLA15R100L083M40.0E05M	83	100	5	30	98	40	32	110	9	16.4	4.26	With	TO*T15...

Note: Coolant needs to be supplied from the end of the arbor inlay. Coolant cannot be supplied from the set bolt.

TLA15-S

Subunit for TLA15-M, square shoulder mill for roughing, with screw clamp system, for triangular inserts

GAMP = +12° ~ +13.5°, GAMF = -6° ~ -3.5°



Inch	APMX	DC	ZEFP	CICT	BD	DCONMS	OAL	LF	WT(lb)	Air hole	Insert
TLA15R300L110A04S	1.102	3.000	4	8	2.898	1.024	1.703	1.102	1.240	With	TO*T15...
TLA15R400L110A05S	1.102	4.000	5	10	3.882	1.299	1.814	1.102	2.440	With	TO*T15...

Metric	APMX	DC	ZEFP	CICT	BD	DCONMS	OAL	LF	WT(kg)	Air hole	Insert
TLA15R080L028-04S	28	80	4	8	77.6	27	43	28.2	0.65	With	TO*T15...
TLA15R100L028-05S	28	100	5	10	97.2	33	46	28	1.05	With	TO*T15...

Note: Coolant needs to be supplied from the end of the arbor inlay. Coolant cannot be supplied from the set bolt.

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit	Center bolt	Shell locking bolt
TLA15R300L275U0125A04M	TS45120I	H-TB2W	M-1000	BT20S	-	SD-10-54
TLA15R400L326U0150A05M	TS45120I	H-TB2W	M-1000	BT20S	-	SD12-B9
TLA15R080L**M	TS45120I	H-TB2W	M-1000	BT20S	CM16X75	-
TLA15R100L**M	TS45120I	H-TB2W	M-1000	BT20S	CM20X80	-
TLA15R**S	TS45120I	H-TB2W	M-1000	BT20S	-	-

Recommended clamping torque: 3.69 lbs·ft, 5 N·m

CENTER BOLT

(Optional parts)

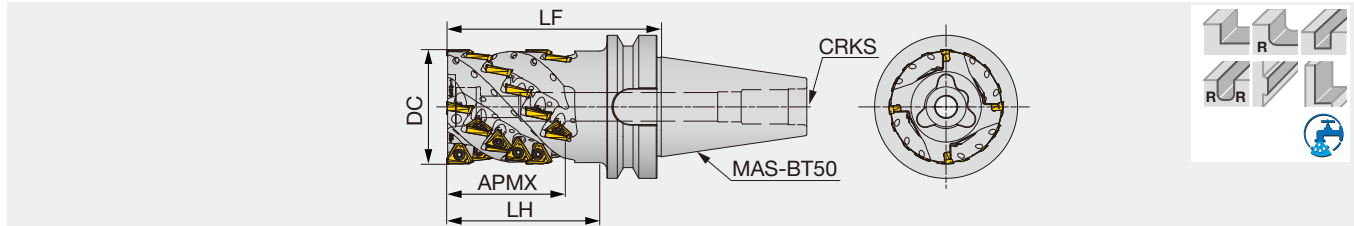
No. of subunits	1 pc	2 pcs
TLA15R300..	SD10-04	SD10-B3
TLA15R400..	SD12-C1	SD12-B8

CENTER BOLT

(Optional parts)

No. of subunits	1	2
TLA15R080L028-04S	CM16x120	CM16x140
TLA15R100L028-05S	CM20x120	CM20x150

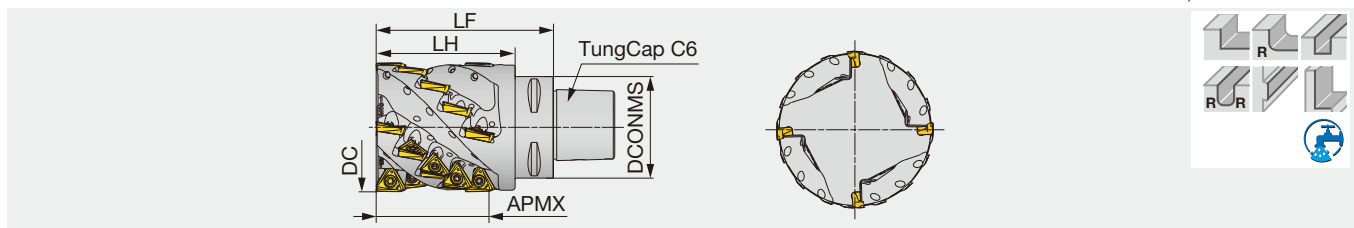
Reference pages: Inserts → **H153**, Standard cutting conditions → **H154 - H155**



Metric	APMX	DC	ZEFP	CICT	LF	LH	WT(kg)	Air hole	CRKS	Insert
TLA15R080L083BT50-04M	83	80	4	24	150	107	6.29	With	M24	TO*T15...
TLA15R100L097BT50-05M	97	100	5	35	165	126.5	8.92	With	M24	TO*T15...

C-TLA

Square shoulder mill for roughing



Metric	APMX	DC	ZEFP	CICT	LF	LH	DCONMS	WT(kg)	Air hole	Insert
C6TLA15M063R03L100	55	63	3	12	100	78	63	2.13	With	TO*T15...
C6TLA15M080R04L110	70	80	4	20	110	86.2	63	3.17	With	TO*T15...

Applicable for 7 MPa coolant

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit	Shell locking bolt
TLA15R080L083BT50-04M	TS45120I	H-TB2W	M-1000	BT20S	CAP-CM16x2.0x55
TLA15R100L097BT50-05M	TS45120I	H-TB2W	M-1000	BT20S	CAP-CM20x2.5x50
C6TLA15M0**R0*L1**	TS45120I	H-TB2W	-	BT20S	-

Recommended clamping torque: 5 N·m

CENTER BOLT

(Optional parts)

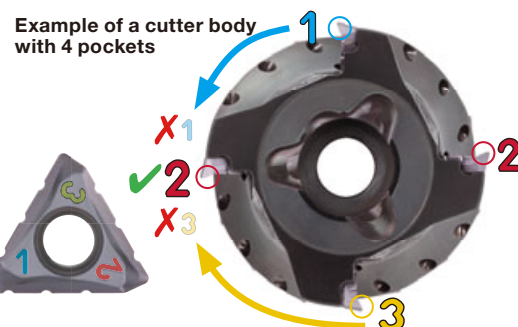
No. of subunits	1	2
TLA15R080L083BT50-04M	CAP-CM16x2.0x55	CM16x120
TLA15R100L097BT50-05M	CAP-CM20x2.5x50	CM20x80

Caution for using NMJ chipbreaker

! Insert with NMJ chipbreaker has a number marked on each corner.
DO NOT place the corners with the same number in adjacent flute as the cutter may be damaged.

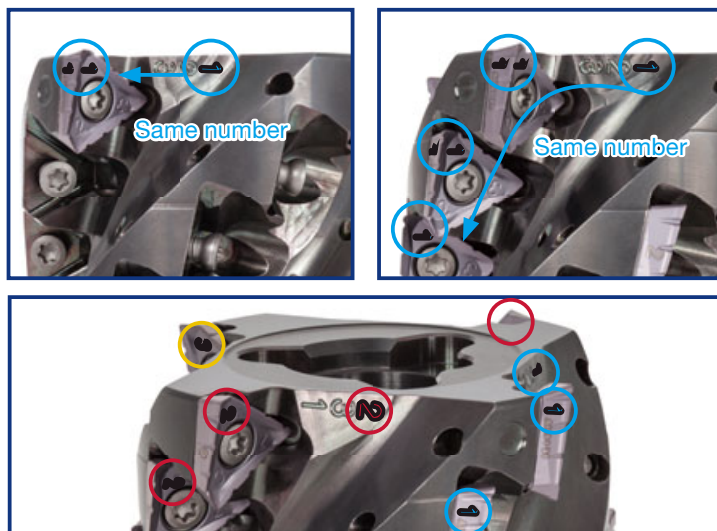
For example, if you place the corner #1 in one flute, be sure to use #2 or #3 (and avoid #1) in the next one.

Item: TOMT150608PDER-NMJ



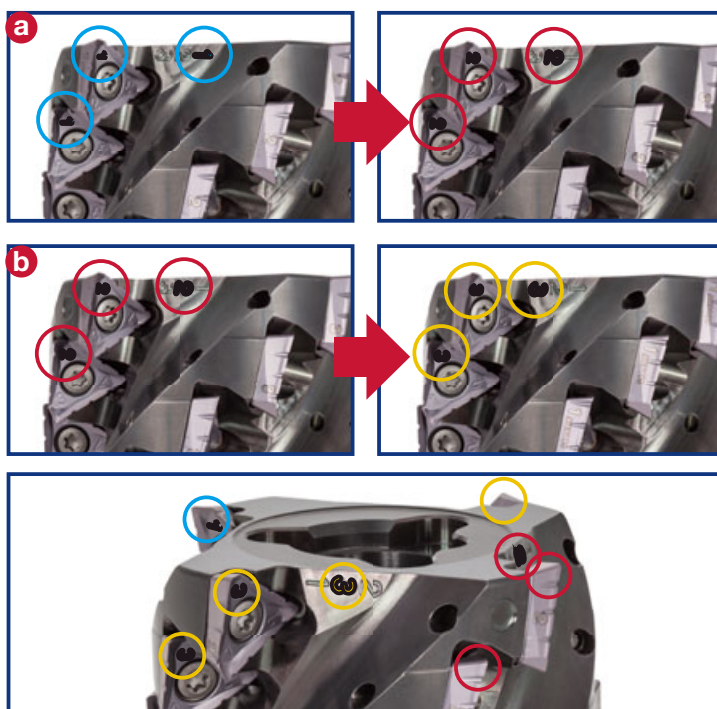
Directions for setting NMJ inserts on roughing type bodies

- 1 Attach the insert on the cutter body so that the number on the working cutting edge matches the first number marked on the cutter body.
(See the image on the right.)
- 2 Attach the remaining inserts on the same flute with the same number marked on the working cutting edge.
- 3 Repeat steps 1 and 2 for the other flutes.
- 4 Make sure the number on the working cutting edge is different from the number used on the adjacent flutes.



Directions for changing corners for inserts on roughing type bodies

- 1
 - a First time to change the corner rotate the insert clock-wise to match the number on the working cutting edge with the second number marked on the cutter body.
(See the image on the right.)
Ex: 1 → 2
2 → 3
3 → 1
 - b Second time to change the corner rotate the insert clock-wise to match the number on the working cutting edge with the last number marked on the cutter body.
(See the image on the right.)
Ex: 2 → 3
3 → 1
1 → 2
- 2 Repeat step 1 for all inserts.
- 3 Make sure the number on the working cutting edge is different from the number used on the adjacent flutes.

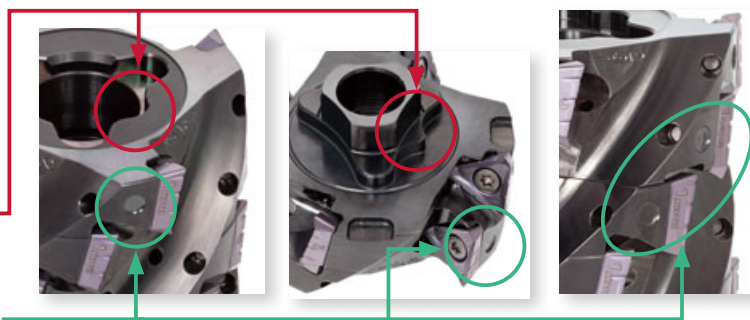


How to set a sub-unit

When setting a sub-unit on the main unit or another sub-unit, be sure to match the markings on the units. Sub-unit has a projection for error-proofing to avoid setting error.

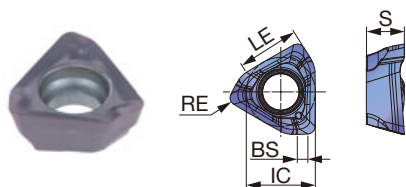
Projection for error-proofing
(Poka-yoke)

Marking

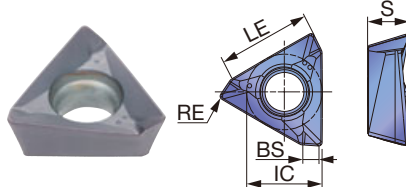


INSERTS

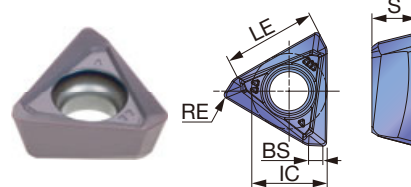
TOMT-MM



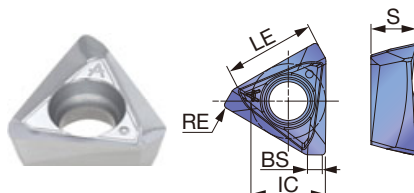
TOMT-MJ



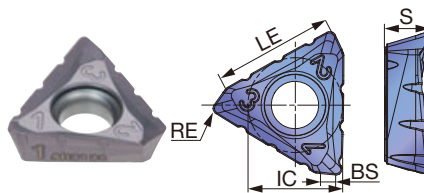
TOET-MJ (For precision machining)



TOGT-AJ



TOMT-NMJ



P Steel	☆	★	★		☆														
M Stainless		★	★		☆														
K Cast iron	★				★														
N Non-ferrous											★								
S Superalloys	★	☆	★	★															
H Hard materials				★															

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated						Un-coated	LE	IC	S	BS
			AH120	AH3135	AH3225	AH8015	T1215	T3225	KS05F				
TOMT040204PXER-MM	0.016	0.138	●		●	●				0.142	0.157	0.087	0.024
TOMT040208PXER-MM	0.031	0.138	●		●	●				0.142	0.157	0.087	0.008
TOMT060302PDER-MJ	0.008	0.236	●	●	●					0.244	0.220	0.126	0.055
TOMT060304PDER-MJ	0.016	0.236	●	●	●			●		0.244	0.220	0.126	0.047
TOMT060308PDER-MJ	0.031	0.236	●	●	●		●	●		0.244	0.220	0.126	0.031
TOGT060304PDFR-AJ	0.016	0.236							●	0.244	0.220	0.130	0.047
TOGT060308PDFR-AJ	0.031	0.236							●	0.244	0.220	0.130	0.031
TOET060302PDER-MJ	0.008	0.236		●	●					0.244	0.220	0.130	0.051
TOET060304PDER-MJ	0.016	0.236		●	●					0.244	0.220	0.130	0.043
TOMT100404PDER-MJ	0.016	0.394	●	●	●			●		0.413	0.339	0.185	0.059
TOMT100408PDER-MJ	0.031	0.394	●	●	●		●	●		0.413	0.339	0.185	0.043
TOMT100416PDER-MJ	0.063	0.394	●	●	●					0.413	0.339	0.185	0.008
TOGT100404PDFR-AJ	0.016	0.394							●	0.413	0.339	0.205	0.059
TOGT100408PDFR-AJ	0.031	0.394							●	0.413	0.339	0.201	0.043
TOET100404PDER-MJ	0.016	0.394		●	●					0.413	0.339	0.201	0.059
TOET100408PDER-MJ	0.031	0.394		●	●					0.413	0.339	0.201	0.043
TOMT150604PDER-MJ	0.016	0.591	●	●	●			●		0.618	0.500	0.236	0.087
TOMT150608PDER-MJ	0.031	0.591	●	●	●		●	●		0.618	0.500	0.236	0.075
TOMT150616PDER-MJ	0.063	0.591	●	●	●					0.618	0.500	0.236	0.043
TOMT150620PDER-MJ	0.079	0.591	●	●	●					0.618	0.500	0.236	0.028
TOMT150608PDER-NMJ	0.031	0.591	●	●	●			●		0.618	0.500	0.236	0.075
TOGT150604PDFR-AJ	0.016	0.591							●	0.618	0.492	0.220	0.083
TOGT150608PDFR-AJ	0.031	0.591							●	0.618	0.492	0.217	0.071
TOET150604PDER-MJ	0.016	0.591		●	●					0.618	0.492	0.220	0.087
TOET150608PDER-MJ	0.031	0.591		●	●					0.618	0.492	0.220	0.075

● : Line up



STANDARD CUTTING CONDITIONS

EPA04

ISO	Workpiece materials	Hardness	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, etc.	- 200 HB	AH3225	326 - 820	0.002 - 0.005
	Carbon steel and alloy steel 1055, etc.	- 300 HB	AH3225	326 - 755	0.002 - 0.005
	Prehardened steel NAK80, PX5, etc.	30 - 40 HRC	AH3225	326 - 591	0.002 - 0.004
M	Stainless steel 304SS, etc.	- 200 HB	AH3225	295 - 656	0.002 - 0.004
K	Gray cast iron Class 25, etc.	150 - 250 HB	AH120	326 - 984	0.002 - 0.005
	Ductile cast iron 65-45-12, etc.	150 - 250 HB	AH120	326 - 656	0.002 - 0.005
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	AH3225	66 - 197	0.002 - 0.004
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	AH8015	66 - 131	0.002 - 0.003
H	Hardened steel	H13, etc.	AH8015	164 - 492	0.002 - 0.003
		D2, etc.	AH8015	131 - 230	0.002 - 0.003

- Remove excessive chip accumulation with an air blast.
 - For an operation when the depth of cut varies (ex.casting skin) or machining of workpiece materials with interrupted surface, the feed per tooth (fz) should be set to the lower recommended value shown in the above table.
- Cutting conditions may be limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

T/E/HPA06, T/E/HPA10, T/EPA15

ISO	Workpiece Materials	Hardness	Priority	Chipbreakers	Grades	T/E/HPA06		T/E/HPA10		T/EPA15		
						Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)	
P	Low carbon steel 1015, etc.	- 200 HB	First Choice	MJ/NMJ	AH3225	330 - 726	0.0020 - 0.0059	330 - 825	0.0031 - 0.0079	330 - 990	0.0024 - 0.0087	0.0024 - 0.0059
			Wear Resistance	MJ/NMJ	T3225	330 - 825	0.0031 - 0.0039	330 - 990	0.0031 - 0.0047	330 - 990	0.0031 - 0.0059	0.0031 - 0.0059
	Carbon steel and alloy steel 1055, 4140, etc.	- 300 HB	First Choice	MJ/NMJ	AH3225	330 - 561	0.0020 - 0.0047	330 - 825	0.0024 - 0.0087	330 - 825	0.0024 - 0.0087	0.0024 - 0.0059
			Wear Resistance	MJ/NMJ	T3225	330 - 825	0.0020 - 0.0039	330 - 990	0.0020 - 0.0047	330 - 990	0.0020 - 0.0059	0.0020 - 0.0059
	Prehardened and tool steel NAK80, PX5, H13, etc.	30 - 40 HRC	First Choice	MJ/NMJ	AH3225	330 - 396	0.0020 - 0.0047	330 - 660	0.0024 - 0.0087	330 - 660	0.0024 - 0.0087	0.0024 - 0.0059
			Wear Resistance	MJ/NMJ	T3225	330 - 825	0.0020 - 0.0039	330 - 990	0.0020 - 0.0047	330 - 990	0.0020 - 0.0059	0.0020 - 0.0059
M	Stainless steel 304, etc.	- 200 HB	First Choice	MJ/NMJ	AH3135	264 - 495	0.0020 - 0.0059	264 - 660	0.0031 - 0.0079	297 - 660	0.0031 - 0.0079	0.0031 - 0.0059
			Wear Resistance	MJ/NMJ	T3225	297 - 660	0.0020 - 0.0039	297 - 825	0.0020 - 0.0047	297 - 825	0.0020 - 0.0059	0.0020 - 0.0059
K	Gray cast iron No.250B, etc.	150 - 250 HB	First Choice	MJ/NMJ	AH120	330 - 660	0.0020 - 0.0059	330 - 825	0.0020 - 0.0059	462 - 825	0.0031 - 0.0098	0.0031 - 0.0059
			Wear Resistance	MJ	T1215	495 - 825	0.0020 - 0.0047	495 - 990	0.0031 - 0.0079	660 - 990	0.0031 - 0.0071	-
	Ductile cast iron 65-45-12, etc.	150 - 250 HB	First Choice	MJ/NMJ	AH120	264 - 495	0.0020 - 0.0059	264 - 660	0.0031 - 0.0079	363 - 660	0.0031 - 0.0098	0.0031 - 0.0059
			Wear Resistance	MJ	T1215	330 - 660	0.0020 - 0.0047	429 - 825	0.0020 - 0.0059	495 - 825	0.0031 - 0.0071	-
N	Aluminum Si < 13%	-	First Choice	AJ	KS05F	990 - 2970	0.0031 - 0.0087	990 - 3300	0.0031 - 0.0087	990 - 3300	0.0031 - 0.0087	-
	Aluminum Si ≥ 13%	-	First Choice	AJ	KS05F	330 - 660	0.0031 - 0.0087	330 - 660	0.0031 - 0.0087	330 - 660	0.0031 - 0.0087	-
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First Choice	MJ/NMJ	AH3135	66 - 165	0.0020 - 0.0039	66 - 198	0.0020 - 0.0039	66 - 198	0.0031 - 0.0059	0.0031 - 0.0059
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	First Choice	MJ/NMJ	AH120	66 - 1155	0.0012 - 0.0031	66 - 132	0.0020 - 0.0051	66 - 132	0.0028 - 0.0059	0.0028 - 0.0059

- When you use the NMJ chipbreaker, please set up the feed less than 0.006 ipt.
 - Remove excessive chip accumulation with an air blast.
 - For the operation with depth of cut which varies (ex.casting skin) and machining of workpiece materials with interrupted surface, the feed per tooth (fz) should be set to the lower recommended value shown in the above table.
- Cutting conditions maybe limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

TLA (Roughing type)

ISO	Workpiece Materials	Hardness	Priority	Chip-breakers	Grades	TLA10		TLA15		
						Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)	
									MJ/AJ	NMJ
P	Low carbon steel 1015, etc	- 200 HB	First Choice	MJ/NMJ	AH3225	330 - 825	0.0031 - 0.0079	330 - 990	0.0024 - 0.0087	0.0024 - 0.0059
			Wear Resistance	MJ/NMJ	T3225	330 - 990	0.0031 - 0.0047	330 - 990	0.0031 - 0.0059	0.0031 - 0.0059
	Carbon steel and alloy steel 1055, 4140, etc.	- 300 HB	First Choice	MJ/NMJ	AH3225	330 - 825	0.0024 - 0.0087	330 - 825	0.0024 - 0.0087	0.0024 - 0.0059
			Wear Resistance	MJ/NMJ	T3225	330 - 990	0.0020 - 0.0047	330 - 990	0.0020 - 0.0059	0.0020 - 0.0059
	Prehardened and tool steel NAK80, PX5, H13, etc	30 - 40 HRC	First Choice	MJ/NMJ	AH3225	330 - 660	0.0024 - 0.0087	330 - 660	0.0024 - 0.0087	0.0024 - 0.0059
			Wear Resistance	MJ/NMJ	T3225	330 - 990	0.0020 - 0.0047	330 - 990	0.0020 - 0.0059	0.0020 - 0.0059
M	Stainless steel 304, etc.	- 200 HB	First Choice	MJ/NMJ	AH3135	264 - 660	0.0031 - 0.0079	297 - 660	0.0031 - 0.0079	0.0031 - 0.0059
			Wear Resistance	MJ/NMJ	T3225	297 - 825	0.0020 - 0.0047	297 - 825	0.0020 - 0.0059	0.0020 - 0.0059
K	Gray cast iron No.250B, etc.	150 - 250 HB	First Choice	MJ/NMJ	AH120	330 - 825	0.0020 - 0.0059	462 - 825	0.0031 - 0.0098	0.0031 - 0.0059
			Wear Resistance	MJ	T1215	495 - 990	0.0031 - 0.0079	660 - 990	0.0031 - 0.0071	-
	Ductile cast iron 65-45-12, etc.	150 - 250 HB	First Choice	MJ/NMJ	AH120	264 - 660	0.0031 - 0.0079	363 - 660	0.0031 - 0.0098	0.0031 - 0.0059
			Wear Resistance	MJ	T1215	429 - 825	0.0020 - 0.0059	495 - 825	0.0031 - 0.0071	-
N	Aluminum Si < 13%	-	First Choice	AJ	KS05F	990 - 3300	0.0031 - 0.0087	990 - 3300	0.0031 - 0.0087	-
	Aluminum Si ≥ 13%	-	First Choice	AJ	KS05F	330 - 660	0.0031 - 0.0087	330 - 660	0.0031 - 0.0087	-
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First Choice	MJ/NMJ	AH3135	66 - 198	0.0020 - 0.0039	66 - 198	0.0031 - 0.0059	0.0031 - 0.0059
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	First Choice	MJ/NMJ	AH120	66 - 132	0.0020 - 0.0051	66 - 132	0.0028 - 0.0059	0.0028 - 0.0059

· When using NMJ chipbreaker, please set up the feed not to exceed 0.006 ipt.

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

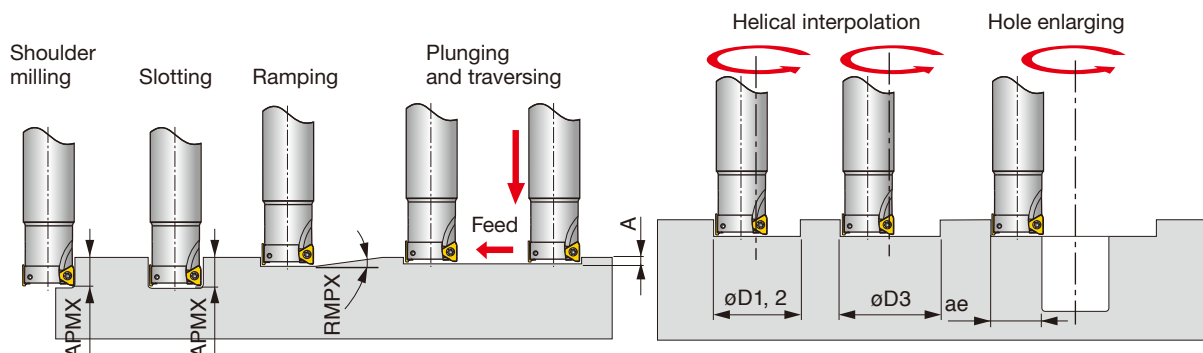
Tooling System

User's Guide

Index



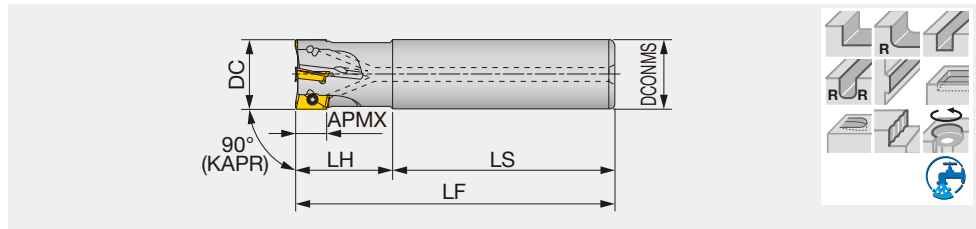
APPLICATION RANGE



			Max. depth of cut	Max. ramping angle	Max. plunging depth	Min. machining diameter	Max. machining diameter		Max. cutting width in enlarging
	Inch	DC	APMX	RMPX	A	øD1	øD2	øD3*	ae
Profile Milling	EPA06R050U...	0.500	0.236	5°	0.024	0.748	0.984	0.882	0.48
	EPA06R063U...	0.625	0.236	4°	0.024	0.984	1.234	1.132	0.605
	EPA06R075U...	0.750	0.236	3°	0.024	1.24	1.484	1.382	0.73
	EPA06R100U...	1.000	0.236	2°	0.024	1.752	1.984	1.882	0.98
	TPA06R200U...	2.000	0.236	0.7°	0.024	3.74	3.984	3.882	1.98
	EPA10R100U...	1.000	0.394	2°	0.024	1.689	1.984	1.882	0.98
	EPA10R125U...	1.250	0.394	2°	0.024	2.189	2.484	2.382	1.23
	EPA10R150U...	1.500	0.394	1.4°	0.024	2.689	2.984	2.882	1.48
	TPA10R200U...	2.000	0.394	0.8°	0.024	3.689	3.984	3.882	1.98
	TPA10R250U...	2.500	0.394	0.7°	0.024	4.689	4.984	4.882	2.48
Chamfering, Counterbore	TPA10R300U...	3.000	0.394	0.6°	0.024	5.689	5.984	5.882	2.98
	TPA10R400U...	4.000	0.394	0.5°	0.024	7.689	7.984	7.882	3.98
	EPA15R150U...	1.500	0.59	2.3°	0.031	2.547	2.969	2.823	1.461
	E/TPA15R200U...	2.000	0.59	1.7°	0.031	3.547	3.969	3.823	1.961
	TPA15R250U...	2.500	0.59	1.4°	0.031	4.547	4.969	4.823	2.461
	TPA15R300U...	3.000	0.59	1°	0.031	5.547	5.969	5.823	2.961
	TPA15R400U...	4.000	0.59	0.8°	0.031	7.547	7.969	7.823	3.961
	TPA15R500U...	5.000	0.59	0.6°	0.031	9.547	9.969	9.823	4.961
	TPA15R600U...	6.000	0.59	0.5°	0.031	11.547	11.969	11.823	5.961
Finish Face Milling									

* Flat bottom hole

Note: Corner RE for dimensions of øD1, øD2 and øD3: RE = 0.016" for EPA04, T/E/HPA06, T/E/HPA10 and RE = 0.031" for T/EPA15.



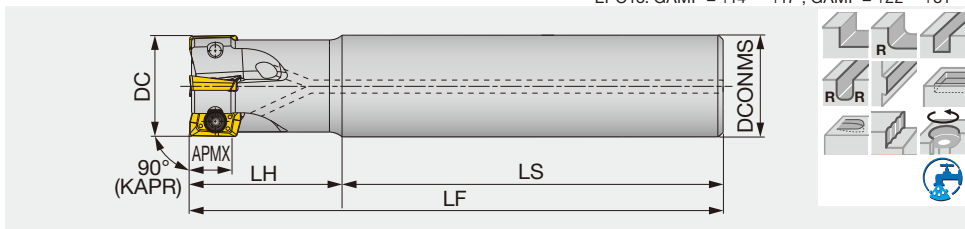
Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EPS11050RLU	0.417	0.500	1	0.625	3.750	1.250	5.000	0.350	With	AS*T11T3...
EPS11050RSU	0.417	0.500	1	0.625	2.362	0.984	3.346	0.240	With	AS*T11T3...
EPS11062RLU	0.417	0.625	2	0.625	4.250	1.500	5.750	0.440	With	AS*T11T3...
EPS11062RSU	0.417	0.625	2	0.625	2.362	0.984	3.346	0.240	With	AS*T11T3...
EPS11075RLU	0.417	0.750	2	0.750	5.250	2.000	7.250	0.790	With	AS*T11T3...
EPS11075RSBU	0.417	0.750	3	0.750	2.362	1.181	3.543	0.370	With	AS*T11T3...
EPS11100RLU	0.417	1.000	2	1.000	5.750	2.750	8.500	1.700	With	AS*T11T3...
EPS11100RSBU	0.417	1.000	4	1.000	2.362	1.378	3.740	0.700	With	AS*T11T3...
EPS11100RSBU-3/4	0.417	1.000	4	0.750	2.360	1.378	3.738	0.480	With	AS*T11T3...
EPS11125RLU	0.417	1.250	2	1.250	7.000	3.000	10.000	3.190	With	AS*T11T3...
EPS11125RSBU	0.417	1.250	5	1.250	2.362	1.378	3.740	1.120	With	AS*T11T3...

Designation	Clamping screw	Lubricant	Wrench
EPS11050RLU	CSPB-2.5	M-1000	IP-8D
EPS11050RSU	CSPB-2.5S	M-1000	IP-8D
EPS11062RLU	CSPB-2.5	M-1000	IP-8D
EPS11062RSU	CSPB-2.5S	M-1000	IP-8D
EPS11075RLU	CSPB-2.5	M-1000	IP-8D
EPS11075RSBU	CSPB-2.5S	M-1000	IP-8D
EPS11100RLU	CSPB-2.5	M-1000	IP-8D
EPS11100RSBU	CSPB-2.5	M-1000	IP-8D
EPS11100RSBU-3/4	CSPB-2.5	M-1000	IP-8D
EPS11125RLU	CSPB-2.5	M-1000	IP-8D
EPS11125RSBU	CSPB-2.5	M-1000	IP-8D

Recommended clamping torque: 0.96 lbs·ft



High precision square shoulder endmill, shank type, with screw clamp system



EPO07: GAMP = +7°, GAMF = +13°~ +18°
EPO11: GAMP = +8.7° ~ +18°, GAMF = -5.3° ~ -19.4°
EPO18: GAMP = +14° ~ +17°, GAMF = +22° ~ +31°

Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EPO07R050U0050-02	0.276	0.500	2	0.500	2.250	0.750	3.000	0.140	With	AO*T0702...
EPO07R063U0063-04	0.276	0.625	4	0.625	2.563	0.937	3.500	0.250	With	AO*T0702...
EPO07R075U0075-05	0.276	0.750	5	0.750	2.875	1.125	4.000	0.410	With	AO*T0702...
EPO07R100U0075-03	0.276	1.000	3	0.750	2.000	1.500	3.500	0.400	With	AO*T0702...
EPO07R100U0100W07	0.276	1.000	7	1.000	2.281	1.500	3.781	0.680	With	AO*T0702...
EPO18R100U0100W02	0.657	1.000	2	1.000	2.250	1.750	4.000	0.730	With	AO*T1805...
EPO18R100U0100W02L	0.657	1.000	2	1.000	2.250	2.750	5.000	0.910	With	AO*T1805...
EPO18R125U0125W03	0.657	1.250	3	1.250	2.250	2.250	4.500	1.320	With	AO*T1805...
EPO18R125U0125W03L	0.657	1.250	3	1.250	2.250	4.250	6.500	1.880	With	AO*T1805...
EPO18R150U0125W03L	0.657	1.500	3	1.250	2.250	4.250	6.500	2.420	With	AO*T1805...
EPO18R150U0125W04	0.657	1.500	4	1.250	2.250	2.250	4.500	1.460	With	AO*T1805...
EPO18R200U0125W05	0.657	2.000	5	1.250	2.250	2.250	4.500	1.680	With	AO*T1805...

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPO07R012M12.0-02	7	12	2	12	50	18	68	0.1	With	AO*T0702...
EPO07R012M12.0-02L	7	12	2	12	95	30	125	0.1	With	AO*T0702...
EPO11R012M16.0-01	10.6	12	1	16	60	25	85	0.11	With	AS*T11T3...
EPO11R012M16.0-01L	10.6	12	1	16	95	30	125	0.16	With	AS*T11T3...
EPO07R016M12.0-02	7	16	2	12	50	20	70	0.1	With	AO*T0702...
EPO07R016M16.0-02L	7	16	2	16	105	40	145	0.2	With	AO*T0702...
EPO07R016M16.0-04	7	16	4	16	60	24	84	0.1	With	AO*T0702...
EPO11R016M16.0-02	10.6	16	2	16	60	25	85	0.12	With	AS*T11T3...
EPO11R016M16.0-02L	10.6	16	2	16	105	40	145	0.2	With	AS*T11T3...
EPO07R018M16.0-02L	7	18	2	16	105	40	145	0.2	With	AO*T0702...
EPO07R018M16.0-04	7	18	4	16	60	24	84	0.1	With	AO*T0702...
EPO11R018M16.0-02	10.6	18	2	16	60	25	85	0.12	With	AS*T11T3...
EPO11R018M16.0-02L	10.6	18	2	16	105	40	145	0.21	With	AS*T11T3...
EPO07R020M16.0-03	7	20	3	16	60	30	90	0.1	With	AO*T0702...
EPO07R020M20.0-03L	7	20	3	20	135	50	185	0.4	With	AO*T0702...
EPO07R020M20.0-05	7	20	5	20	70	30	100	0.2	With	AO*T0702...
EPO11R020M20.0-02	10.6	20	2	20	70	30	100	0.22	With	AS*T11T3...
EPO11R020M20.0-02L	10.6	20	2	20	135	50	185	0.41	With	AS*T11T3...
EPO11R020M20.0-03	10.6	20	3	20	70	30	100	0.21	With	AS*T11T3...
EPO07R022M20.0-05	7	22	5	20	70	30	100	0.2	With	AO*T0702...
EPO11R022M20.0-02	10.6	22	2	20	70	30	100	0.22	With	AS*T11T3...
EPO11R022M20.0-02L	10.6	22	2	20	155	30	185	0.42	With	AS*T11T3...
EPO11R022M20.0-03	10.6	22	3	20	70	30	100	0.22	With	AS*T11T3...
EPO07R025M20.0-03	7	25	3	20	60	35	95	0.3	With	AO*T0702...
EPO07R025M25.0-03L	7	25	3	25	150	70	220	0.7	With	AO*T0702...
EPO07R025M25.0-07	7	25	7	25	80	35	115	0.4	With	AO*T0702...
EPO11R025M25.0-02L	10.6	25	2	25	150	70	220	0.76	With	AS*T11T3...
EPO11R025M25.0-03	10.6	25	3	25	80	35	115	0.39	With	AS*T11T3...
EPO11R025M25.0-04	10.6	25	4	25	80	35	115	0.38	With	AS*T11T3...
EPO18R025M25.0-02	16.7	25	2	25	80	35	115	0.4	With	AO*T1805...
EPO18R025M25.0-02L	16.7	25	2	25	150	70	220	0.8	With	AO*T1805...
EPO07R028M25.0-03L	7	28	3	25	150	70	220	0.7	With	AO*T0702...
EPO07R028M25.0-07	7	28	7	25	80	35	115	0.4	With	AO*T0702...
EPO11R028M25.0-02L	10.6	28	2	25	185	35	220	0.8	With	AS*T11T3...
EPO11R028M25.0-03	10.6	28	3	25	80	35	115	0.4	With	AS*T11T3...
EPO11R028M25.0-04	10.6	28	4	25	80	35	115	0.39	With	AS*T11T3...
EPO18R028M25.0-02	16.7	28	2	25	80	35	115	0.4	With	AO*T1805...
EPO18R028M25.0-02L	16.7	28	2	25	150	70	220	0.8	With	AO*T1805...
EPO11R030M25.0-02L	10.6	30	2	25	180	40	220	0.8	With	AS*T11T3...
EPO11R030M25.0-03	10.6	30	3	25	80	40	120	0.43	With	AS*T11T3...
EPO11R030M25.0-04	10.6	30	4	25	80	40	120	0.42	With	AS*T11T3...
EPO18R030M32.0-02	16.7	30	2	32	80	40	120	0.6	With	AO*T1805...

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPO18R030M32.0-02L	16.7	30	2	32	175	80	255	1.4	With	AO*T1805...
EPO18R030M32.0-03	16.7	30	3	32	80	40	120	0.6	With	AO*T1805...
EPO11R032M32.0-02L	10.6	32	2	32	175	80	255	1.48	With	AS*T11T3...
EPO11R032M32.0-03	10.6	32	3	32	80	40	120	0.68	With	AS*T11T3...
EPO11R032M32.0-05	10.6	32	5	32	80	40	120	0.67	With	AS*T11T3...
EPO18R032M32.0-02	16.7	32	2	32	80	40	120	0.7	With	AO*T1805...
EPO18R032M32.0-02L	16.7	32	2	32	175	80	255	1.5	With	AO*T1805...
EPO18R032M32.0-03	16.7	32	3	32	80	40	120	0.6	With	AO*T1805...
EPO11R035M32.0-02L	10.6	35	2	32	215	40	255	1.49	With	AS*T11T3...
EPO11R035M32.0-03	10.6	35	3	32	80	40	120	0.69	With	AS*T11T3...
EPO11R035M32.0-05	10.6	35	5	32	80	40	120	0.67	With	AS*T11T3...
EPO18R035M32.0-02	16.7	35	2	32	80	40	120	0.7	With	AO*T1805...
EPO18R035M32.0-02L	16.7	35	2	32	175	80	255	1.5	With	AO*T1805...
EPO18R035M32.0-03	16.7	35	3	32	80	40	120	0.7	With	AO*T1805...
EPO11R040M32.0-02L	10.6	40	2	32	205	50	255	1.53	With	AS*T11T3...
EPO11R040M32.0-04	10.6	40	4	32	80	40	120	0.72	With	AS*T11T3...
EPO11R040M32.0-06	10.6	40	6	32	80	40	120	0.71	With	AS*T11T3...
EPO18R040M32.0-02L	16.7	40	2	32	205	50	255	1.6	With	AO*T1805...
EPO18R040M32.0-03	16.7	40	3	32	80	40	120	0.7	With	AO*T1805...
EPO18R040M32.0-04	16.7	40	4	32	80	40	120	0.7	With	AO*T1805...
EPO18R040M42.0-02L	16.7	40	2	42	210	100	310	3	With	AO*T1805...
EPO11R050M32.0-05	10.6	50	5	32	80	40	120	0.83	With	AS*T11T3...
EPO11R050M32.0-07	10.6	50	7	32	80	40	120	0.82	With	AS*T11T3...
EPO11R050M42.0-03L	10.6	50	3	42	310	50	360	3.78	With	AS*T11T3...
EPO18R050M32.0-03	16.7	50	3	32	80	40	120	0.8	With	AO*T1805...
EPO18R050M32.0-05	16.7	50	5	32	80	40	120	0.8	With	AO*T1805...
EPO18R050M42.0-03L	16.7	50	3	42	310	50	360	3.8	With	AO*T1805...
EPO18R063M32.0-04	16.7	63	4	32	80	45	125	1	With	AO*T1805...
EPO18R063M32.0-06	16.7	63	6	32	80	45	125	1.1	With	AO*T1805...
EPO18R063M42.0-03L	16.7	63	3	42	310	50	360	4	With	AO*T1805...

EPO07:

- The APMX is the diameter when using MJ chipbreaker.
- The DC is the diameter when using MJ or AJ chipbreaker. With HJ chipbreaker, the tool diameter is (DC + 0.024" [0.6 mm]).
- The LF and L are the lengths when using MJ chipbreaker. With AJ chipbreaker, the length is (LF, L + 0.004" [0.1 mm]).
- With HJ chipbreaker, the length is (LF, L + 0.020" [0.5 mm]).

EPO11:

- The APMX is the diameter when using MJ, MS and AJ chipbreaker.

EPO18:

- The DC is the diameter when using MJ chipbreaker. With AJ chipbreaker, the tool diameter is (DC above + 0.008" [0.2 mm]).

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EPO07R050U0050-02 EPO07R012M...	SR 10503833-S	-	T-7DB
EPO07R063 - 100U... EPO07R016 - 028M...	CSTB-2.5L046	-	T-7DB
EPO11R012 - 022M...	CSPB-2.5S	M-1000	IP-8D
EPO11R025 - 050M...	CSPB-2.5	M-1000	IP-8D
EPO18R100U... EPO18R025 - 030M...	CSTB-4L085	-	T-15DB
EPO18R125 - 200U... EPO18R032 - 050M...	CSTB-4L093	-	T-15DB
EPO18R063M...	CSTB-4L120	-	T-15DB

Recommended clamping torque: SR 10503833-S, CSTB-2.5L046 = 0.66 lbs-ft, 0.9 N·m, CSPB-2.5, CSPB-2.5S = 0.96 lbs-ft, 1.3 N·m, CSTB-4L085, CSTB-4L093, CSTB-4L120 = 2.58 lbs-ft, 3.5 N·m

Reference pages: Inserts → **H166 - H167**

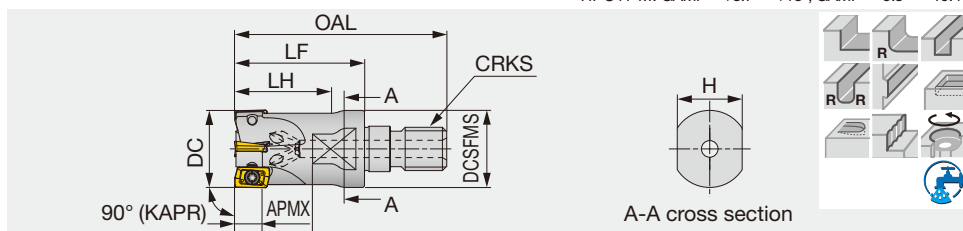


TUNGREC

HPO07/11-M

High precision square shoulder endmill, modular type (TungFlex)

HPO07-M: GAMP = +7°, GAMF = +13° ~ +18°
HPO11-M: GAMP = +8.7° ~ +18°, GAMF = -5.3° ~ -19.4°



Metric	APMX	DC	CICT	OAL	LF	LH	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPO07R012MM06-02	7	12	2	39.5	25	-	7	9.8	M6	0.01	With	AO*T0702...
HPO07R012MM08-02	7	12	2	42	25	20	10	12.8	M8	0.02	With	AO*T0702...
HPO07R016MM08-04	7	16	4	42	25	-	10	12.8	M8	0.03	With	AO*T0702...
HPO07R016MM10-04	7	16	4	49	30	20	15	17.8	M10	0.05	With	AO*T0702...
HPO07R020MM10-05	7	20	5	49	30	-	15	17.8	M10	0.06	With	AO*T0702...
HPO11R020MM10-02	10.6	20	2	49	30	-	15	17.8	M10	0.06	With	AS*T11T3...
HPO07R025MM12-07	7	25	7	57	35	-	17	20.8	M12	0.1	With	AO*T0702...
HPO11R025MM12-03	10.6	25	3	57	35	-	17	20.8	M12	0.1	With	AS*T11T3...
HPO11R032MM16-03	10.6	32	3	63	40	-	22	28.8	M16	0.2	With	AS*T11T3...

SPARE PARTS



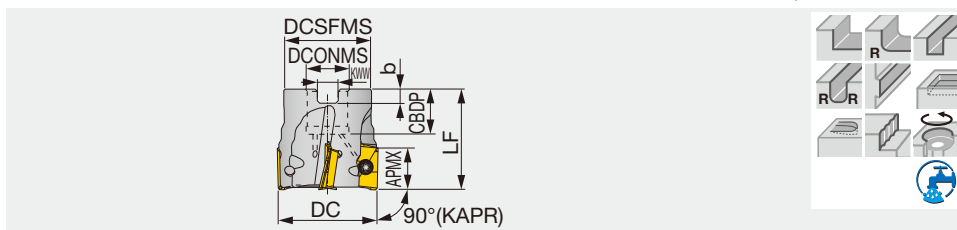
Designation	Clamping screw	Lubricant	Wrench
HPO07R012MM0*-02	SR 10503833-S	M-1000	T-7DB
HPO07R016 - 025...	CSTB-2.5L046	M-1000	T-7DB
HPO11R020MM10-02	CSPB-2.5S	M-1000	IP-8D
HPO11R025, 032...	CSPB-2.5	M-1000	IP-8D

Recommended clamping torque: SR 10503833-S, CSTB-2.5L046 = 0.9 N·m, CSPB-2.5, CSPB-2.5S = 1.3 N·m

Approach angle



Reference pages: Inserts → **H166 - H167**, TungFlex → **H038 - H039**



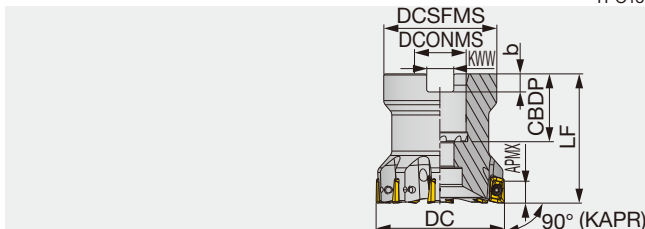
Inch	APMX	DC	CICT	DCSFMS	DCONMS	CDBP	LF	b	KWW	WT(lb)	Air hole	Insert
TPS11200RBU	0.417	2.000	7	1.693	0.750	0.750	1.575	0.197	0.315	0.88	With	AS*T11T3...
TPS11300RBU	0.417	3.000	10	2.283	1.000	1.024	1.969	0.236	0.374	2.64	With	AS*T11T3...
TPS11400RBU	0.417	4.000	11	3.150	1.500	1.457	2.480	0.394	0.626	5.29	With	AS*T11T3...

SPARE PARTS



Designation	Clamping screw	Lubricant	Wrench	Shell locking bolts (Optional parts)
TPS11200RBU	CSPB-2.5	M-1000	IP-8D	(C0.375x1.125H)
TPS11300RBU	CSPB-2.5	M-1000	IP-8D	(C0.500x1.375H)
TPS11400RBU	CSPB-2.5	M-1000	IP-8D	(TMBA-0.750H)

Recommended clamping torque: 0.96 lbs-ft



Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CDDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TPO07R200U0075A12	0.276	2.000	12	1.693	1.575	0.750	0.789	0.315	0.197	0.660	With	AO*T0702...	A
TPO18R200U0075A05	0.657	2.000	5	1.625	1.570	0.750	0.750	0.315	0.197	0.780	With	AO*T1805...	A
TPO18R250U0075A06	0.657	2.500	6	2.125	1.570	0.750	0.750	0.315	0.197	1.320	With	AO*T1805...	A
TPO18R300U0100A07	0.657	3.000	7	2.250	1.750	1.000	1.000	0.374	0.236	1.890	With	AO*T1805...	A
TPO18R400U0150A08	0.657	4.000	8	3.000	2.000	1.500	1.060	0.630	0.354	3.140	Without	AO*T1805...	B
TPO18R500U0150A09	0.657	5.000	9	4.000	2.000	1.500	1.060	0.630	0.354	6.270	Without	AO*T1805...	B
TPO18R600U0200A10	0.657	6.000	10	4.750	2.000	2.000	1.060	0.748	0.394	8.370	Without	AO*T1805...	B

Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CDDP	KWW	b	WT(kg)	Air hole	Insert
TPO07R032M16.0E08	7	32	8	30	40	16	21	8.4	5.6	0.1	With	AO*T0702...
TPO07R040M16.0E10	7	40	10	35	40	16	21	8.4	5.6	0.2	With	AO*T0702...
TPO07R050M22.0E12	7	50	12	41	40	22	22	10.4	6.3	0.3	With	AO*T0702...
TPO11R040M16.0E06	10.6	40	6	35	40	16	18	8.4	5.6	0.21	With	AS*T11T3...
TPO18R040M16.0-04	16.7	40	4	35	40	16	18	8.2	5.6	0.2	With	AO*T1805...
TPO18R040M16.0E04	16.7	40	4	35	40	16	18	8.4	5.6	0.2	With	AO*T1805...
TPO11R050M22.0E07	10.6	50	7	45	40	22	20	10.4	6.3	0.35	With	AS*T11T3...
TPO18R050M22.0-05	16.7	50	5	41	40	22	20	10	6	0.2	With	AO*T1805...
TPO18R050M22.0E05	16.7	50	5	41	40	22	20	10.4	6.3	0.3	With	AO*T1805...
TPO11R063M22.0E08	10.6	63	8	47	45	22	20	10.4	6.3	0.59	With	AS*T11T3...
TPO18R063M22.0-06	16.7	63	6	41	40	22	20	10	6	0.4	With	AO*T1805...
TPO18R063M22.0E06	16.7	63	6	41	40	22	20	10.4	6.3	0.5	With	AO*T1805...
TPO11R080M25.4-10	10.6	80	10	58	50	25.4	26	9.5	6	1.07	With	AS*T11T3...
TPO11R080M27.0E10	10.6	80	10	58	50	27	22	12.4	7	1.05	With	AS*T11T3...
TPO18R080M25.4-07	16.7	80	7	46	50	25.4	26	9.5	6	0.8	With	AO*T1805...
TPO18R080M27.0E07	16.7	80	7	50	50	27	22	12.4	7	10	With	AO*T1805...
TPO11R100M31.75-11	10.6	100	11	70	63	31.75	32	12.7	8	1.95	With	AS*T11T3...
TPO11R100M32.0E11	10.6	100	11	70	63	32	25	14.4	8	2.01	With	AS*T11T3...
TPO18R100M31.7-08	16.7	100	8	60	50	31.75	32	12.7	8	1.2	With	AO*T1805...
TPO18R100M32.0E08	16.7	100	8	60	50	32	28.5	14.4	8	1.4	With	AO*T1805...
TPO18R125M38.1-09	16.7	125	9	80	63	38.1	38	15.9	10	2.8	With	AO*T1805...
TPO18R125M40.0E09	16.7	125	9	71	63	40	32	16.4	9	2.8	With	AO*T1805...
TPO18R160M40.0E10	16.7	160	10	100	63	40	29	16.4	9	4.9	Without	AO*T1805...
TPO18R160M50.8-10	16.7	160	10	100	63	50.8	46	19	11	4.9	Without	AO*T1805...

TPO07:

- The APMX is the diameter when using MJ chipbreaker.
- The DC is the diameter when using MJ or AJ chipbreaker. With HJ chipbreaker, the tool diameter is (DC + 0.024" [0.6 mm]).
- The LF and L are the lengths when using MJ chipbreaker. With AJ chipbreaker, the length is (LF, L + 0.004" [0.1 mm]).
- With HJ chipbreaker, the length is (LF, L + 0.020" [0.5 mm]).

TPO11:

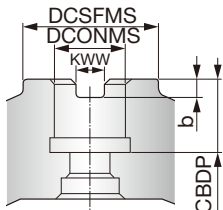
- The APMX is the diameter when using MJ, MS and AJ chipbreaker.

TPO18:

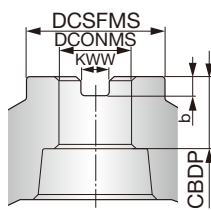
- The DC is the diameter when using MJ chipbreaker. With AJ chipbreaker, the tool diameter is (DC above + 0.008" [0.2 mm]).

Arbor type

Arbor type A



Arbor type B



Reference pages: Inserts → **H166 - H167**

INCH SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Shell locking bolt (Optional parts)	Wrench
TPO07R200U0075A12	CSTB-2.5L046	-	-	(C0.375X1.125H)	T-7DB
TPO18R200..., 250...	CSTB-4L093	H-TBS	BT15M	(C0.375X1.125H)	-
TPO18R300...	CSTB-4L120	H-TBS	BT15M	(C0.500X1.375H)	-
TPO18R400..., 500...	CSTB-4L120	H-TBS	BT15M	(TMBA-0.750H)	-
TPO18R600...	CSTB-4L120	H-TBS	BT15M	-	-

Recommended clamping torque: CSTB-2.5L046 = 0.66 lbs-ft, CSTB-4L093, CSTB-4L120 = 2.58 lbs-ft

METRIC SPARE PARTS

Designation	Clamping screw	Lubricant	Grip	Shell locking bolt 1	Shell locking bolt 2	Wrench	Torx bit
TPO07R032, 040...	CSTB-2.5L046	-	-	-	CM8X30H	T-7DB	-
TPO07R050M22.0E12	CSTB-2.5L046	-	-	-	CM10X30H	T-7DB	-
TPO11R040M16.0E06	CSPB-2.5	M-1000	-	-	CM8X30H	IP-8D	-
TPO11R050M, 063M...	CSPB-2.5	M-1000	-	-	CM10X30H	IP-8D	-
TPO11R080M25.4-10 TPO11R080M27.0E10	CSPB-2.5	M-1000	-	-	CM12X30H	IP-8D	-
TPO11R100M31.75-11	CSPB-2.5	M-1000	-	-	CM16X40H	IP-8D	-
TPO11R100M32.0E11	CSPB-2.5	M-1000	-	-	CM16X40H	IP-8D	-
TPO18R040M...	CSTB-4L093	-	H-TBS	-	FSHM8-30H	-	BT15M
TPO18R050M..., 063M...	CSTB-4L093	-	H-TBS	-	CM10X30H	-	BT15M
TPO18R080M...	CSTB-4L120	-	H-TBS	-	CM12X30H	-	BT15M
TPO18R100M...	CSTB-4L120	-	H-TBS	TMBA-M16H	-	-	BT15M
TPO18R125M...	CSTB-4L120	-	H-TBS	TMBA-M20H	-	-	BT15M
TPO18R160M...	CSTB-4L120	-	H-TBS	-	-	-	BT15M

Recommended clamping torque: CSTB-2.5L046 = 0.9 N·m, CSPB-2.5 = 1.3 N·m, CSTB-4L093, CSTB-4L120 = 3.5 N·m

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index

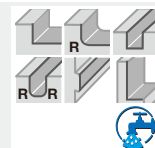
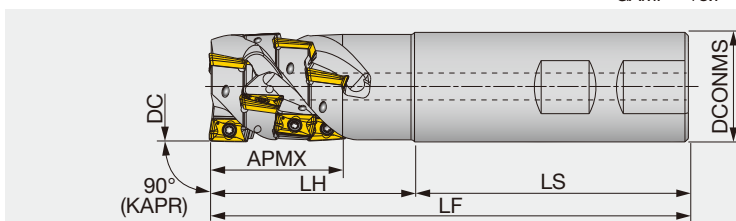


TUNGREC

ELS11

High efficiency roughing endmill, shank type

GAMP = +8.7° ~ +18°, GAMF = -5.3° ~ -19.4°



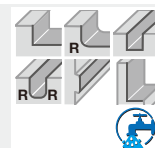
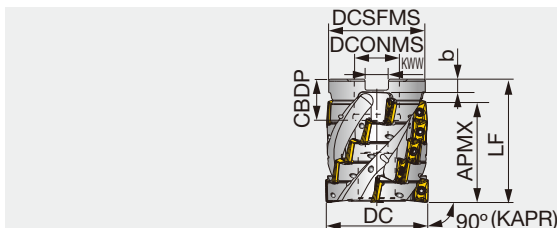
Inch	APMX	DC	ZEFP	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
ELS11R100U0100W02	1.197	1.000	2	6	1.000	2.250	1.500	3.750	0.670	With	AS*T11T3...
ELS11R125U0125W03	1.535	1.250	3	12	1.250	2.250	2.250	4.500	1.330	With	AS*T11T3...
ELS11R150U0125W03	1.575	1.500	3	12	1.250	2.329	2.171	4.500	1.330	With	AS*T11T3...

Metric	APMX	DC	ZEFP	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
ELS11R025M25.0W02	30.4	25	2	6	25	80	40	120	0.4	With	AS*T11T3...
ELS11R032M32.0W03	39.4	32	3	12	32	80	60	140	0.8	With	AS*T11T3...
ELS11R040M42.0W03	40	40	3	12	42	90	60	150	1.4	With	AS*T11T3...

TLS11

High efficiency square shoulder mill for roughing

GAMP = +8.7° ~ +18°, GAMF = -5.3° ~ -19.4°



Inch	APMX	DC	ZEFP	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert
TLS11R200U0075A04	1.921	2.000	4	20	1.875	2.356	0.750	0.750	0.315	0.197	1.330	With	AS*T11T3...
Metric	APMX	DC	ZEFP	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TLS11R050M22.0E04	48.8	50	4	20	47	60	22	20	10.4	6.3	0.5	With	AS*T11T3...

Note: Coolant needs to be supplied from the end of the arbor inlay. Coolant cannot be supplied from the set bolt.

SPARE PARTS

Designation	Clamping screw	Lubricant	Shell locking bolt	Wrench
ELS11...	CSPB-2.5	M-1000	-	IP-8D
TLS11R200U0075A04	CSPB-2.5	M-1000	C0.375X1.125H	IP-8D
TLS11R050M22.0E04	CSPB-2.5	M-1000	CM10X40H	IP-8D

Recommended clamping torque: 0.96 lbs-ft, 1.3 N·m

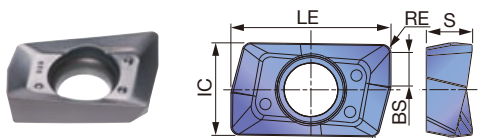
Reference pages: Inserts → **H166 - H167**

H

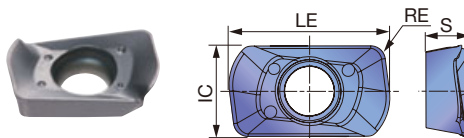


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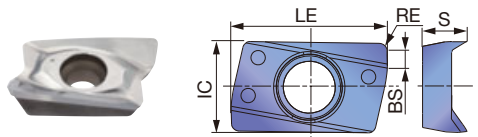
AOMT07-MJ



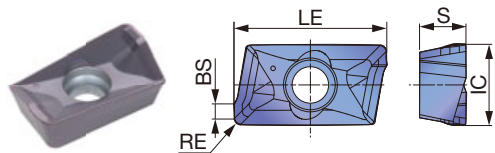
AOMT07-HJ



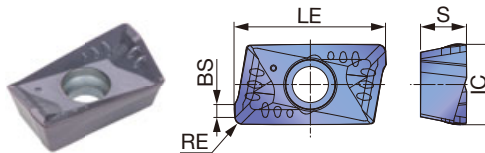
AOGT07-AJ



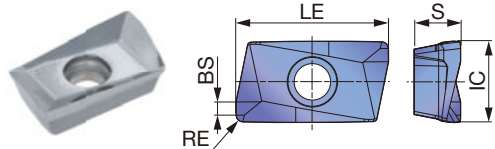
ASMT11-MJ



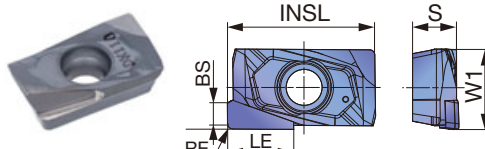
ASMT11-MS



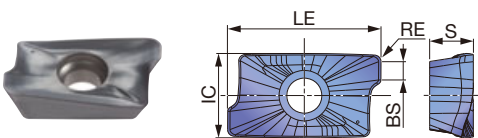
ASGT11-AJ



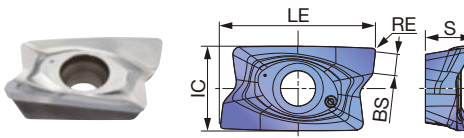
ASGW11-D



AOMT18-MJ



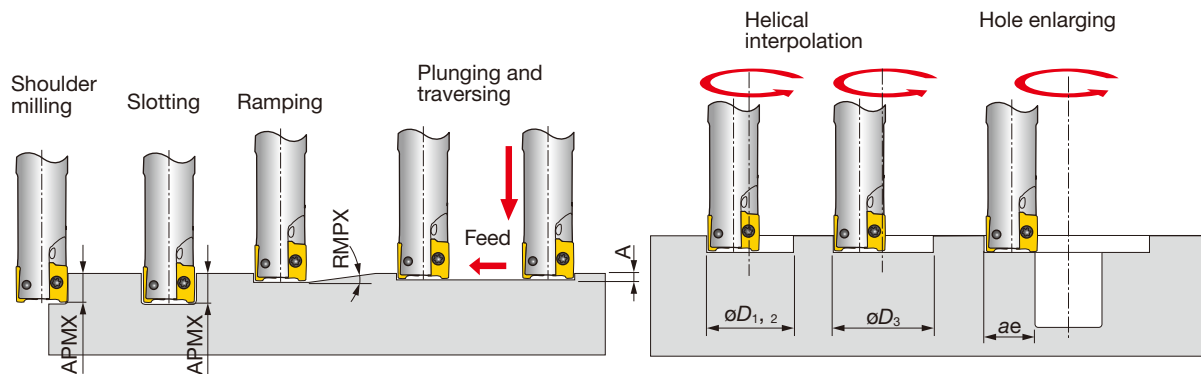
AOGT18-AJ



★ : First choice
☆ : Second choice

Caution : The contour radius when using the tool is smaller than the RE value. ● : Line up
If RE is 0.047" or more, it will be about 10% smaller than RE.
PCD inserts listed above are not designed to be re-ground and re-used.

APPLICATION RANGE

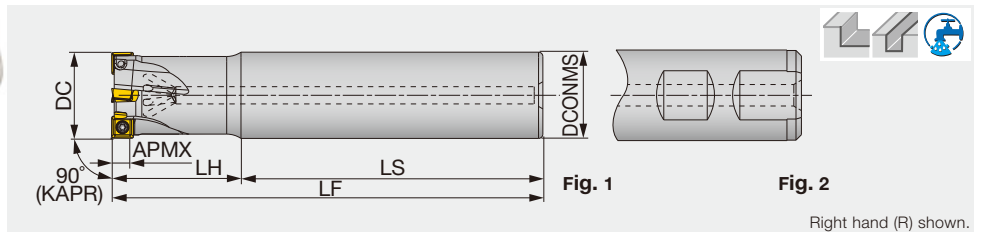


	Tool dia.	Chipbreaker	Max. depth of cut	Max. ramping angle	Max. plunging depth	Min. machining	Max. machining		Max. cutting width in enlarging
	Inch	DC	APMX	RMPX	A	øD1	øD2	øD3*	ae
EPO07R050U0050-02		0.500	MJ, AJ	0.276	7.5	0.020	0.750	0.862	0.480
		0.524	HJ	0.031	4.5	0.030	0.786	-	0.406
EPO07R063U0063-04		0.625	MJ, AJ	0.276	5	0.020	0.938	1.112	0.610
		0.649	HJ	0.031	4	0.030	0.974	-	0.531
EPO07R075U0075-05		0.750	MJ, AJ	0.276	3.5	0.020	1.125	1.362	0.730
		0.774	HJ	0.031	2.5	0.030	1.161	-	0.656
EPO07R100U...		1.000	MJ, AJ	0.276	2.4	0.020	1.500	1.862	0.980
		1.024	HJ	0.031	2	0.030	1.536	-	0.906
EPS11050...		0.500	MJ, MS, AJ	0.417	6	0.020	0.590	0.882	0.480
EPS11062...		0.625	MJ, MS, AJ	0.417	5	0.020	0.790	1.332	0.610
EPS11075...		0.750	MJ, MS, AJ	0.417	3	0.020	1.100	1.382	0.730
EPS11100...		1.000	MJ, MS, AJ	0.417	2	0.020	1.500	1.882	0.980
EPS11125...		1.250	MJ, MS, AJ	0.417	1.5	0.020	2.050	2.382	1.230
EPO18R100U...		1.000	MJ, AJ	0.657	5.5	0.039	1.272	1.764	0.961
EPO18R125U...		1.250	MJ, AJ	0.657	3.5	0.039	1.772	2.264	1.211
EPO18R150U...		1.500	MJ, AJ	0.657	2.7	0.039	2.272	2.764	1.461
T/EPO18R200U...		2.000	MJ, AJ	0.657	1.9	0.039	3.272	3.764	1.961

	Tool dia.	Chipbreaker	Max. depth of cut	Max. ramping angle	Max. plunging depth	Min. machining	Max. machining		Max. cutting width in enlarging
	Inch	DC	APMX	RMPX	A	øD1	øD2	øD3*	ae
TPO07R200U0075A12		2.000	MJ, AJ	0.276	0.9	0.020	3.000	3.960	1.980
		2.024	HJ	0.031	0.6	0.030	3.036	4.008	1.906
TPS11200RBU		2.000	MJ, MS, AJ	0.417	0.7	0.020	3.460	3.900	1.950
TPS11300RBU		3.000	MJ, MS, AJ	0.417	0.4	0.020	5.830	6.260	3.130
TPS11400RBU		4.000	MJ, MS, AJ	0.417	0.3	0.020	7.400	7.830	3.920
TPO18R250U0075A06		2.500	MJ, AJ	0.657	1.4	0.039	4.272	4.921	2.461
TPO18R300U0100A07		3.000	MJ, AJ	0.657	1.1	0.039	5.272	5.921	2.961
TPO18R400U0150A08		4.000	MJ, AJ	0.657	0.8	0.039	7.272	7.921	3.961
TPO18R500U0150A09		5.000	MJ, AJ	0.657	0.6	0.039	9.272	9.921	4.961
TPO18R600U0200A10		6.000	MJ, AJ	0.657	0.5	0.039	11.272	11.921	5.961

*Flat bottom hole

Corner RE for dimensions of øD1, øD2, and øD3: RE = 0.016" for EPO07 / EPO11 and RE = 0.031" for EPO18.

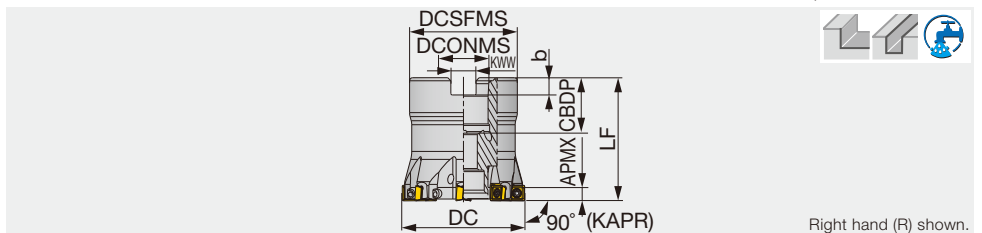


Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Shank	Insert	Shank type
EPD05R050U0050-02	0.157	0.500	2	0.500	1.780	1.220	3.000	0.220	With	Straight	SD*T0502...	Fig .1
EPD05R063U0063-03	0.157	0.625	3	0.625	2.000	1.500	3.500	0.440	With	Straight	SD*T0502...	Fig .1
EPD05R075U0075W04	0.157	0.750	4	0.750	2.030	1.720	3.750	0.440	With	Weldon	SD*T0502...	Fig .2
EPD05R100U0100W05	0.157	1.000	5	1.000	2.280	1.720	4.000	0.660	With	Weldon	SD*T0502...	Fig .2
EPD05R125U0100W06	0.157	1.000	6	1.250	2.280	1.720	4.000	1.100	With	Weldon	SD*T0502...	Fig .2

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Shank	Insert	Shank type
EPD05R012M12.0-02	4	12	2	12	62	18	80	0.1	With	Straight	SD*T0502...	Fig .1
EPD05R016M16.0-03	4	16	3	16	90	20	110	0.2	With	Straight	SD*T0502...	Fig .1
EPD05R020M20.0W04	4	20	4	20	80	25	105	0.2	With	Weldon	SD*T0502...	Fig .2
EPD05R025M20.0W05	4	25	5	20	90	25	115	0.3	With	Weldon	SD*T0502...	Fig .2
EPD05R032M25.0W06	4	32	6	25	98	32	130	0.5	With	Weldon	SD*T0502...	Fig .2
EPD05R040M32.0W08	4	40	8	32	100	40	140	0.8	With	Weldon	SD*T0502...	Fig .2

TPD05

High density square shoulder mill, with screw clamp system



Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDB	KWW	b	WT(lb)	Air hole	Insert
TPD05R150U0075A08	0.157	1.500	8	1.461	1.570	0.750	0.750	0.313	0.170	0.220	With	SD*T0502...
TPD05R200U0075A10	0.157	2.000	10	1.750	1.570	0.750	0.750	0.313	0.170	0.440	With	SD*T0502...

Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDB	KWW	b	WT(kg)	Air hole	Insert
TPD05R032M16.0E06	4	32	6	30	32	16	20	8.4	5.6	0.1	With	SD*T0502...
TPD05R040M22.0E08	4	40	8	38	40	22	22	10.4	6.3	0.2	With	SD*T0502...

SPARE PARTS

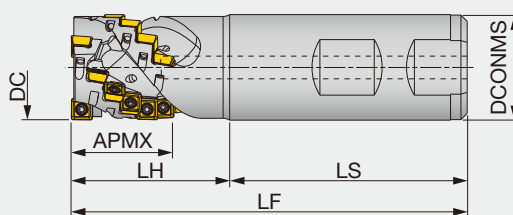


Designation	Clamping screw	Shell locking bolt	Wrench	Shell locking bolt (Optional parts)
EPD05...	CSPB-2L043	-	IP-6DB	-
TPD05R**U...	CSPB-2L043	-	IP-6DB	(C0.375X1.125H)
TPD05R032M16.0E06	CSPB-2L043	CM8X30H	IP-6DB	-
TPD05R040M22.0E08	CSPB-2L043	CM10X30H	IP-6DB	-

Recommended clamping torque: 0.52 lbs·ft, 0.7 N·m



GAMP = +5°. GAMF = -3°



Inch	APMX	DC	ZEFP	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
ELD05R075U0075W02	0.799	0.750	2	10	0.750	2.031	1.219	3.250	0.440	With	SD*T0502...
ELD05R100U0100W03	0.953	1.000	3	18	1.000	2.250	1.500	3.750	0.670	With	SD*T0502...

Metric	APMX	DC	ZEFP	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
ELD05R020M20.0W02	20.3	20	2	10	20	53	32	85	0.2	With	SD*T0502...
ELD05R025M25.0W03	24.2	25	3	18	25	59	36	95	0.3	With	SD*T0502...

SPARE PARTS

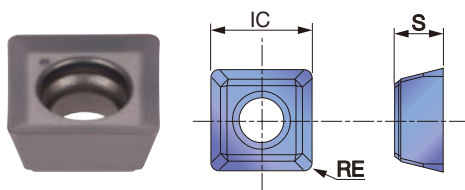


Designation	Clamping screw	Wrench
ELD05...	CSPB-2L043	IP-6DB

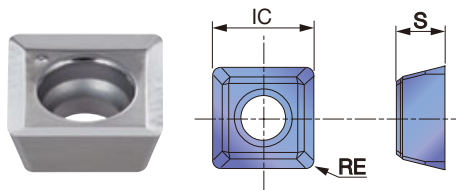
Recommended clamping torque: 0.52 lbs·ft. 0.7 N·m

■ INSERT

SDMT05-MJ



SDHT05-AJ



P	Steel		★			
M	Stainless	★	☆			
K	Cast iron		★			
N	Non-ferrous			★		
S	Superalloys		★			
H	Hard materials					

★ : First choice
☆ : Second choice

[illegible]

● : Line up

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



EPD05

e-catalog



TPD05

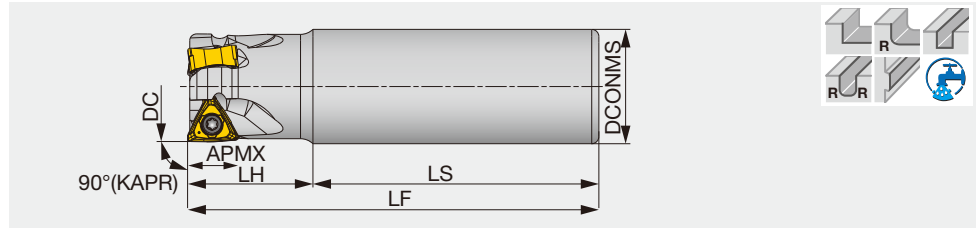
e-catalog



ELD05

Square shoulder endmill, with screw clamp system

GAMP = +4.2° ~ +4.7°, GAMF = -15.4° ~ -11.2°



Inch	APMX	DC	CICT	DCONMS	LS	LH ⁽¹⁾	LF ⁽¹⁾	WT(lb)	Air hole	Insert
EPTN07U0.75C0.75R02	0.256	0.750	2	0.750	2.500	1.000	3.500	0.370	With	TN MU07...
EPTN07U0.75C0.75R02L	0.256	0.750	2	0.750	4.750	1.670	6.420	0.710	With	TN MU07...
EPTN07U1.00C1.00R03	0.256	1.000	3	1.000	3.000	1.500	4.500	0.880	With	TN MU07...
EPTN07U1.00C1.00R03L	0.256	1.000	3	1.000	5.700	3.000	8.700	1.720	With	TN MU07...
EPTN07U1.00C1.00R04	0.256	1.000	4	1.000	3.000	1.500	4.500	0.880	With	TN MU07...
EPTN07U1.25C1.25R04	0.256	1.250	4	1.250	3.000	1.500	4.500	1.390	With	TN MU07...
EPTN07U1.25C1.25R05	0.256	1.250	5	1.250	3.000	1.500	4.500	1.390	With	TN MU07...
EPTN12U1.25C1.25R03N	0.433	1.250	3	1.250	3.000	1.500	4.500	1.560	Without	TN*U12...
EPTN07U1.50C1.25R06	0.256	1.500	6	1.250	2.250	2.250	4.500	1.460	With	TN MU07...
EPTN12U1.50C1.25R04N	0.433	1.500	4	1.250	3.000	1.500	4.500	1.780	Without	TN*U12...

Metric	APMX	DC	CICT	DCONMS	LS	LH ⁽¹⁾	LF ⁽¹⁾	WT(kg)	Air hole	Insert
EPTN07M018C16.0R02	6.5	18	2	16	60	25	85	0.13	With	TN MU07...
EPTN07M020C20.0R02	6.5	20	2	20	70	30	100	0.22	With	TN MU07...
EPTN07M020C20.0R02L	6.5	20	2	20	135	50	185	0.41	With	TN MU07...
EPTN07M020C20.0R03	6.5	20	3	20	70	30	100	0.215	With	TN MU07...
EPTN07M025C25.0R03	6.5	25	3	25	80	35	115	0.41	With	TN MU07...
EPTN07M025C25.0R03L	6.5	25	3	25	150	70	220	0.78	With	TN MU07...
EPTN07M025C25.0R04	6.5	25	4	25	80	35	115	0.41	With	TN MU07...
EPTN07M032C32.0R04	6.5	32	4	32	80	35	115	0.66	With	TN MU07...
EPTN07M032C32.0R05	6.5	32	5	32	80	35	115	0.67	With	TN MU07...
EPTN12M032C32.0R02N	11	32	2	32	80	35	115	0.7	Without	TN*U12...
EPTN12M032C32.0R03N	11	32	3	32	80	35	115	0.7	Without	TN*U12...
EPTN12M040C32.0R03N	11	40	3	32	80	35	115	0.8	Without	TN*U12...
EPTN12M040C32.0R04N	11	40	4	32	80	35	115	0.8	Without	TN*U12...

(1) The value is true with R0.8 mm (0.031") insert. For other Corner R, please refer to page H173.

SPARE PARTS

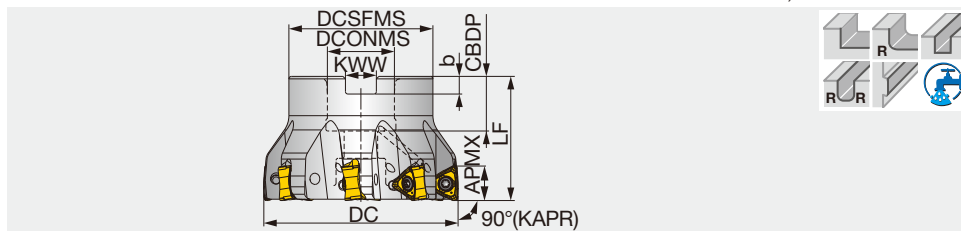
Designation	Clamping screw	Grip	Wrench	Torx bit	Lubricant
EPTN07...	CSPB-2.5SH	-	IP-7D	-	-
EPTN12...	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000

Recommended clamping torque: CSPB-2.5SH = 0.81 lbs-ft, 1.1 N-m, CSPB-3.5 = 2.58 lbs-ft, 3.5 N-m



Square shoulder mill, with screw clamp system

GAMP = +4.2° ~ +4.7°, GAMF = -15.4° ~ -11.2°



Inch	APMX	DC	CICT	DCSFMS	LF ⁽¹⁾	DCONMS	CB DP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TPTN07U2.00B0.75R08	0.256	2.000	8	1.850	1.575	0.750	0.750	0.315	0.197	0.93	With	TN MU07...	A
TPTN12U2.00B0.75R05	0.433	2.000	5	1.850	1.575	0.750	0.750	0.315	0.197	0.89	With	TN*U12...	A
TPTN12U2.50B0.75R06	0.433	2.500	6	1.850	1.575	0.750	0.750	0.315	0.197	1.33	With	TN*U12...	A
TPTN12U3.00B1.00R08	0.433	3.000	8	2.835	1.969	1.000	1.024	0.374	0.236	2.44	With	TN*U12...	A
TPTN12U4.00B1.50R10	0.433	4.000	10	3.150	1.969	1.500	1.181	0.626	0.394	3.11	With	TN*U12...	B
TPTN12U5.00B1.50R12	0.433	5.000	12	3.150	2.480	1.500	1.181	0.626	0.394	5.33	With	TN*U12...	B
TPTN12U6.00B2.00R12N	0.433	6.000	12	3.858	2.48	2.000	1.496	0.748	0.433	8.82	Without	TN*U12...	B

Metric	APMX	DC	CICT	DCSFMS	LF ⁽¹⁾	DCONMS	CB DP	KWW	b	WT(kg)	Air hole	Insert	
TPTN07M040B16.0R06	6.5	40	6	35	40	16	18	8.4	5.6	0.24	With	TN MU07...	
TPTN07M050B22.0R08	6.5	50	8	47	40	22	20	10.4	6.3	0.41	With	TN MU07...	
TPTN12M050B22.0R04	11	50	4	47	40	22	20	10.4	6.3	0.4	With	TN*U12...	
TPTN12M050B22.0R05	11	50	5	47	40	22	20	10.4	6.3	0.4	With	TN*U12...	
TPTN12M063B22.0R05	11	63	5	47	40	22	20	10.4	6.3	0.6	With	TN*U12...	
TPTN12M063B22.0R06	11	63	6	47	40	22	20	10.4	6.3	0.6	With	TN*U12...	
TPTN12J080B25.4R06	11	80	6	58	50	25.4	26	9.5	6	1.1	With	TN*U12...	
TPTN12J080B25.4R08	11	80	8	58	50	25.4	26	9.5	6	1.1	With	TN*U12...	
TPTN12M080B27.0R06	11	80	6	58	50	27	22	12.4	7	1.1	With	TN*U12...	
TPTN12M080B27.0R08	11	80	8	58	50	27	22	12.4	7	1.1	With	TN*U12...	
TPTN12J100B31.7R07	11	100	7	67	50	31.75	32	12.7	8	1.4	With	TN*U12...	
TPTN12J100B31.7R10	11	100	10	67	50	31.75	32	12.7	8	1.4	With	TN*U12...	
TPTN12M100B32.0R07	11	100	7	67	50	32	28.5	14.4	8	1.4	With	TN*U12...	
TPTN12M100B32.0R10	11	100	10	67	50	32	28.5	14.4	8	1.4	With	TN*U12...	
TPTN12J125B38.1R08	11	125	8	71	63	38.1	38	15.9	10	2.4	With	TN*U12...	
TPTN12J125B38.1R12	11	125	12	71	63	38.1	38	15.9	10	2.5	With	TN*U12...	
TPTN12M125B40.0R08	11	125	8	71	63	40	32	16.4	9	2.3	With	TN*U12...	
TPTN12M125B40.0R12	11	125	12	71	63	40	32	16.4	9	2.4	With	TN*U12...	
TPTN12M160B40.0R10N	11	160	10	100	63	40	29	16.4	9	4.5	Without	TN*U12...	
TPTN12J160B50.8R10N	11	160	10	100	63	50.8	41	19	11	4.5	Without	TN*U12...	

(1) The value is true with R0.8 mm (0.031") insert. For other Corner R, please refer to page **H173**.

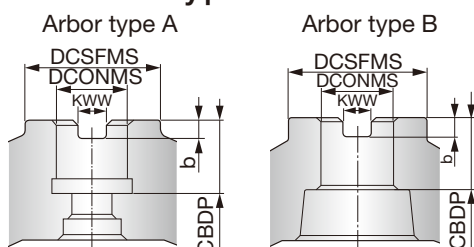
SPARE PARTS



Designation	Clamping screw	Grip	Wrench	Torx bit	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Shell locking bolt 3 (Optional parts)
TPTN07U2.00B0.75R08	CSPB-2.5SH	-	IP-7D	-	M-1000	-	-	(C0.375X1.125H)
TPTN12U2.00, 2.50B...	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	-	-	(C0.375X1.125H)
TPTN12U3.00B1.00R08	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	-	-	(C0.500X1.375H)
TPTN12U4.00, 5.00B...	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	-	-	(TMBA-0.750H)
TPTN12U6.00B2.00R12N	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	-	-	-
TPTN07M040B16.0R06	CSPB-2.5SH	-	IP-7D	-	-	-	CM8X30H	-
TPTN07M050B22.0R08	CSPB-2.5SH	-	IP-7D	-	-	-	CM10X30H	-
TPTN12M050, 063B...	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	-	CM10X30H	-
TPTN12*080B...	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	-	CM12X30H	-
TPTN12*100B...	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	TMBA-M16H	-	-
TPTN12*125B...	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	TMBA-M20H	-	-
TPTN12*160B...	CSPB-3.5	H-TB2W	-	BLDIP15/S7	M-1000	-	-	-

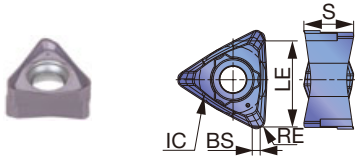
Recommended clamping torque: CSPB-2.5SH = 0.81 lbs-ft, 1.1 N-m, CSPB-3.5 = 2.58 lbs-ft, 3.5 N-m

Arbor type



Reference pages: Standard cutting conditions → **H174**

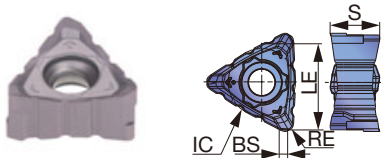
TNMU07-MJ



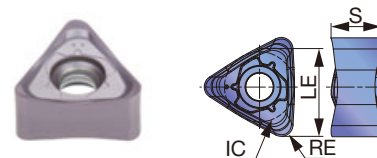
TNGU12-MJ/TNMU12-MJ



TNMU12-NMJ



TNMU12-R-MJ



P Steel	☆	★	☆	☆
M Stainless		☆	★	☆
K Cast iron	★	☆		☆
N Non-ferrous				
S Superalloy	★		☆	
H Hard materials				

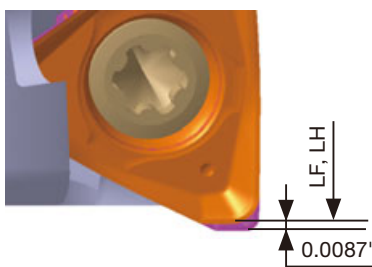
★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated					LE	IC	S	BS
			AH120	AH3225	AH3135	T1215	T3225				
TNMU070304PER-MJ	0.016	0.256	●	●	●			0.256	0.224	0.161	0.024
TNMU070308PER-MJ	0.031	0.256	●	●	●			0.256	0.224	0.161	0.024
TNGU120708PER-MJ	0.031	0.433	●	●	●	●		0.472	0.375	0.277	0.046
TNMU120708PER-MJ	0.031	0.433	●	●	●	●	●	0.472	0.375	0.280	0.046
TNMU120708PER-NMJ	0.031	0.433	●	●	●			0.472	0.375	0.280	0.046
TNMU1207R16PER-MJ	0.063	0.433	●	●	●			0.472	0.375	0.271	-
TNMU1207R20PER-MJ	0.079	0.433	●	●	●	●		0.472	0.375	0.265	-

● : Line up

Notes

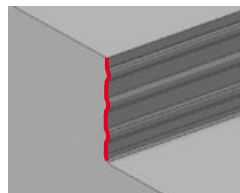
■ LF and LH dimensions for R0.016", size 07 insert



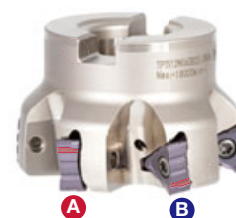
Add 0.0087" to LH and LF measurements when R0.016" insert is used.

■ Serrated size 12 insert (NMJ)

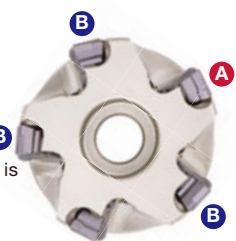
To obtain good wall accuracy, the serrated inserts must be arranged in alternative orders on the cutter so that the same serrated edge will not cut the same surface twice, generating steps on the wall. One of the serration grooves (marked in red) on the cutting edge has a irregular shape, and this must be placed alternatively as shown below by A and B.



Check the insert orientations if steps are produced on the wall surface.



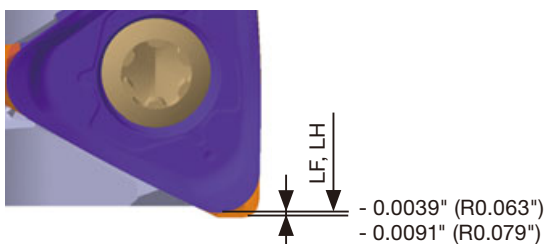
The groove in red is asymmetric for easy identification



This position is A or B

Insert orientation for odd number of teeth

■ LF and LH dimensions for R0.063" / 0.079", size 12 insert



Subtract 0.0039" (R0.063") or 0.0091" (R0.079") to LH and LF measurements when R0.063" or R0.079" insert is used.



STANDARD CUTTING CONDITIONS

Size 07 inserts

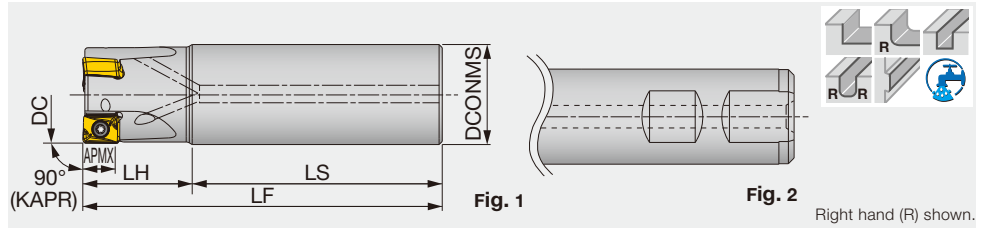
ISO	Workpiece material	Hardness	Priority	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Carbon steel 1018, 1026, etc.	- 200 HB	First choice	AH3225	328 - 820	0.003 - 0.008
			For fracture resistance	AH3135	328 - 820	0.003 - 0.008
	High Carbon steel, Alloy steel 1045, 4140, etc.	- 300 HB	First choice	AH3225	328 - 755	0.003 - 0.006
			For fracture resistance	AH3135	328 - 755	0.003 - 0.006
	Prehardened steel H-13, P-20, etc.	30 - 40 HRC	First choice	AH3225	328 - 591	0.003 - 0.006
			For fracture resistance	AH3135	328 - 591	0.003 - 0.006
M	Stainless steel 304, 316, etc.	- 200 HB	First choice	AH3135	295 - 656	0.003 - 0.006
			For wear resistance	AH3225	295 - 656	0.003 - 0.006
K	Gray cast iron Class 25, Class 30, etc.	150 - 250 HB	First choice	AH120	459 - 820	0.003 - 0.008
			For fracture resistance	AH3225	459 - 820	0.003 - 0.008
	Ductile cast iron 60-40-18, 80-55-06, etc.	150 - 250 HB	First choice	AH120	361 - 656	0.003 - 0.006
			For fracture resistance	AH3225	361 - 656	0.003 - 0.006
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH3135	66 - 197	0.003 - 0.006
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	First choice	AH120	66 - 131	0.003 - 0.004

Size 12 inserts

ISO	Workpiece material	Hardness	Priority	Grade	Chipbreaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Carbon steel 1018, 1026, etc.	- 200 HB	First choice	AH3225	MJ	328 - 820	0.003 - 0.012
			For fracture resistance	AH3135	MJ	328 - 820	0.003 - 0.012
			For wear resistance	T3225	MJ	328 - 984	0.003 - 0.012
			Low cutting force	AH3225	NMJ	328 - 820	0.003 - 0.006
	High Carbon steel, Alloy steel 1045, 4140, etc.	- 300 HB	First choice	AH3225	MJ	328 - 755	0.003 - 0.012
			For fracture resistance	AH3135	MJ	328 - 755	0.003 - 0.012
			For wear resistance	T3225	MJ	328 - 919	0.003 - 0.012
			Low cutting force	AH3225	NMJ	328 - 755	0.003 - 0.006
	Prehardened steel H-13, P-20, etc.	30 - 40 HRC	First choice	AH3225	MJ	328 - 591	0.003 - 0.010
			For fracture resistance	AH3135	MJ	328 - 591	0.003 - 0.010
			For wear resistance	T3225	MJ	328 - 656	0.003 - 0.010
			Low cutting force	AH3225	NMJ	328 - 591	0.003 - 0.006
M	Stainless steel 304, 316, etc.	- 200 HB	First choice	AH3135	MJ	295 - 656	0.003 - 0.010
			For wear resistance	T3225	MJ	295 - 820	0.003 - 0.010
			Low cutting force	AH3135	NMJ	295 - 656	0.003 - 0.006
K	Gray cast iron Class 25, Class 30, etc.	150 - 250 HB	First choice	AH120	MJ	459 - 820	0.003 - 0.012
			For fracture resistance	AH3225	MJ	459 - 820	0.003 - 0.012
			For wear resistance	T1215	MJ	459 - 984	0.003 - 0.012
			Low cutting force	AH120	NMJ	459 - 820	0.003 - 0.006
	Ductile cast iron 60-40-18, 80-55-06, etc.	150 - 250 HB	First choice	AH120	MJ	361 - 656	0.003 - 0.010
			For fracture resistance	AH3225	MJ	361 - 656	0.003 - 0.010
			For wear resistance	T1215	MJ	361 - 820	0.003 - 0.010
			Low cutting force	AH120	NMJ	361 - 656	0.003 - 0.006
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH3135	MJ	66 - 197	0.003 - 0.008
			Low cutting force	AH3135	NMJ	66 - 197	0.003 - 0.006
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	First choice	AH120	MJ	66 - 131	0.003 - 0.007
			Low cutting force	AH120	NMJ	66 - 131	0.003 - 0.006

Note: For NMJ chipbreaker, use a feed rate that satisfies the following theoretical chip thickness:

Designation	Chip thickness (in)
TNMMU120708PER-NMJ	< 0.008"



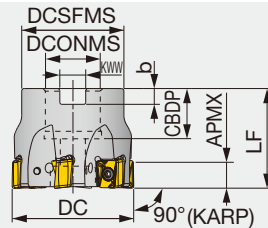
Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert	Shank type
EPQ11R100U0100W02	0.354	1.000	2	1.000	2.280	1.220	3.500	0.750	With	LQMU1107...	Fig.2
EPQ11R125U0125W03	0.354	1.250	3	1.250	2.500	1.500	4.000	1.540	With	LQMU1107...	Fig.2
EPQ11R150U0125W04	0.354	1.500	4	1.250	2.250	1.750	4.000	1.650	With	LQMU1107...	Fig.2

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert	Shank type
EPQ11R025M25.0-02	9	25	2	25	70	30	100	0.3	With	LQMU1107...	Fig.1
EPQ11R032M32.0-03	9	32	3	32	80	35	115	0.7	With	LQMU1107...	Fig.1
EPQ11R040M32.0-04	9	40	4	32	80	35	115	0.8	With	LQMU1107...	Fig.1
EPQ18R040M32.0W03	16	40	3	32	75	35	110	0.7	With	LQMU1808...	Fig.2
EPQ11R050M32.0-05	9	50	5	32	80	40	120	0.9	With	LQMU1107...	Fig.1
EPQ18R050M32.0W04	16	50	4	32	75	40	115	0.9	With	LQMU1808...	Fig.2
EPQ11R063M32.0-06	9	63	6	32	80	40	120	1.1	With	LQMU1107...	Fig.1
EPQ11R080M32.0-07	9	80	7	32	80	40	120	1.4	With	LQMU1107...	Fig.1

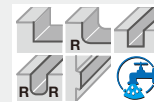
SPARE PARTS

Designation	Clamping screw	Grip 1	Grip 2	Torx bit	Wrench
EPQ11...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	T-10D
EPQ18...	SR14-591	-	H-TB	BT20M	T-20D

Recommended clamping torque : CSTB-3.5L115 = 1.84 lbs-ft, 2.5 N·m, SR14-591 = 3.69 lbs-ft, 5 N·m



GAMP = +4° ~ +5°, GAMF = +13° ~ +15°

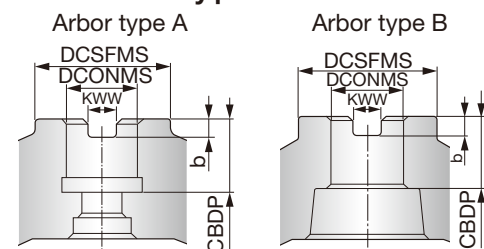


Right hand (R) shown.

Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TPQ11R200U0075A06	0.354	2.000	6	1.693	1.575	0.750	0.787	0.320	0.187	0.880	With	LQMU1107...	A
TPQ11R250U0075A07	0.354	2.500	7	1.693	1.575	0.750	0.787	0.320	0.187	1.320	With	LQMU1107...	A
TPQ11R300U0100A10	0.354	3.000	10	2.165	1.969	1.000	1.024	0.383	0.219	2.310	With	LQMU1107...	A
TPQ11R400U0150A12	0.354	4.000	12	3.150	1.969	1.500	1.496	0.633	0.375	4.410	With	LQMU1107...	B
TPQ18R200U0075A03	0.630	2.000	3	1.772	1.575	0.750	0.750	0.320	0.187	0.880	With	LQMU1808...	A
TPQ18R250U0100A04	0.630	2.500	4	2.165	1.969	1.000	1.024	0.383	0.219	1.760	With	LQMU1808...	A
TPQ18R300U0100A05	0.630	3.000	5	2.165	1.969	1.000	1.024	0.383	0.219	2.430	With	LQMU1808...	A
TPQ18R400U0150A06	0.630	4.000	6	3.150	1.969	1.500	1.496	0.633	0.375	3.750	With	LQMU1808...	B
TPQ18R500U0150A08	0.630	5.000	8	3.150	2.480	1.500	1.693	0.626	0.394	6.170	With	LQMU1808...	B
TPQ18R600U0200A09	0.630	6.000	9	3.937	2.480	2.000	1.811	0.758	0.437	9.040	Without	LQMU1808...	B

Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	
TPQ11R040M16.0E04	9	40	4	35	40	16	20	8.4	5.6	0.2	With	LQMU1107...	
TPQ11R050M22.0E06	9	50	6	41	40	22	20	10.4	6.3	0.4	With	LQMU1107...	
TPQ18R050M22.0E03	16	50	3	47	40	22	20	10.4	6.3	0.4	With	LQMU1808...	
TPQ11R063M22.0E07	9	63	7	47	40	22	20	10.4	6.3	0.5	With	LQMU1107...	
TPQ18R063M25.4-04	16	63	4	55	50	25.4	26	9.5	6	0.7	With	LQMU1808...	
TPQ18R063M27.0E04	16	63	4	58	50	27	26	12.4	7	0.5	With	LQMU1808...	
TPQ11R080M25.4-10	9	80	10	55	50	25.4	26	9.5	6	1.1	With	LQMU1107...	
TPQ11R080M27.0E10	9	80	10	58	50	27	26	12.4	7	1	With	LQMU1107...	
TPQ18R080M25.4-05	16	80	5	55	50	25.4	26	9.5	6	0.9	With	LQMU1808...	
TPQ18R080M27.0E05	16	80	5	58	50	27	26	12.4	7	0.9	With	LQMU1808...	
TPQ11R100M31.7-12	9	100	12	66	50	31.75	32	12.95	8	1.6	With	LQMU1107...	
TPQ11R100M32.0E12	9	100	12	66	50	32	32	14.4	8	1.6	With	LQMU1107...	
TPQ18R100M31.7-06	16	100	6	70	50	31.75	32	12.95	8	1.4	With	LQMU1808...	
TPQ18R100M32.0E06	16	100	6	66	50	32	32	14.4	8	1.4	With	LQMU1808...	
TPQ18R125M38.1-08	16	125	8	80	63	38.1	38	15.9	10	2.9	With	LQMU1808...	
TPQ18R125M40.0E08	16	125	8	82	63	40	38	16.4	9	2.9	With	LQMU1808...	
TPQ18R160M50.8-09	16	160	9	100	63	50.8	38	19	11	4.1	Without	LQMU1808...	
TPQ18R160M40.0E09	16	160	9	100	63	40	38	16.4	9	4.1	Without	LQMU1808...	

Arbor type



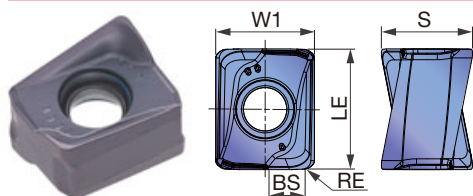
SPARE PARTS

Designation	Clamping screw	Grip 1	Grip 2	Torx bit	Shell locking bolt	Shell locking bolt (Optional parts)
TPQ11R200, 250U..., TPQ18R200, 250U...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	-	(C0.375X1.125H)
TPQ11R300U..., TPQ18R300U...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	-	(C0.500X1.375H)
TPQ11R400U..., TPQ18R400, 500U...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	-	(TMBA-0.750H)
TPQ18R600U0200A09	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	-	-
TPQ11R040M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	CM8×30H	-
TPQ11R050, 063M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	CM10×30H	-
TPQ11R080M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	CM12×30H	-
TPQ11R100M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	TMBA-M16H	-
TPQ18R050M...	SR14-591	-	H-TB	BT20M	CM10×30H	-
TPQ18R063, 080M...	SR14-591	-	H-TB	BT20M	CM12×30H	-
TPQ18R100M...	SR14-591	-	H-TB	BT20M	TMBA-M16H	-
TPQ18R125M...	SR14-591	-	H-TB	BT20M	TMBA-M20H	-
TPQ18R160M...	SR14-591	-	H-TB	BT20M	-	-

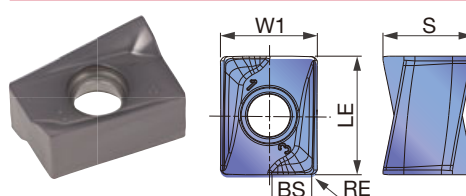
Recommended clamping torque : CSTB-3.5L115 = 1.84 lbs-ft, 2.5 N·m, SR14-591 = 3.69 lbs-ft, 5 N·m

INSERT

LQMU11-PXER-MJ (Available for multi function)



LQMU11/18-PNER-MJ



P Steel	☆	★	★	
M Stainless		★	☆	★
K Cast iron	★		☆	
N Non-ferrous				
S Superalloys	★		★	☆
H Hard materials				

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated				LE	S	W1	BS
			AH120	AH140	AH725	AH3135				
LQMU110704PNER-MJ	0.016	0.354	●	●	●		0.433	0.331	0.354	0.059
LQMU110708PNER-MJ	0.031	0.354	●	●	●		0.433	0.327	0.354	0.043
LQMU110708PXER-MJ	0.031	0.354	●			●	0.433	0.327	0.354	0.043
LQMU110716PNER-MJ	0.063	0.354	●	●	●		0.433	0.323	0.354	0.012
LQMU110720PNER-MJ	0.079	0.354	●				0.433	0.319	0.354	-
LQMU180804PNER-MJ	0.016	0.630	●	●	●		0.689	0.429	0.453	0.079
LQMU180808PNER-MJ	0.031	0.630	●	●	●		0.689	0.429	0.453	0.063
LQMU180816PNER-MJ	0.630	0.630	●	●	●		0.689	0.429	0.453	0.031
LQMU180824PNER-MJ	0.094	0.630	●	●	●		0.689	0.421	0.453	-

● : Line up



STANDARD CUTTING CONDITIONS

LQMU11-PXER-MJ

ISO	Workpiece material	Hardness	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, etc.	- 200HB	AH3135	330 - 820	0.004 - 0.010*
	Alloy steel 1055, etc.	- 300HB	AH3135	325 - 755	0.004 - 0.008*
	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	AH3135	325 - 750	0.004 - 0.008*
M	Stainless steel 304SS, etc.	- 200HB	AH3135	295 - 590	0.004 - 0.010*
K	Gray cast iron Class 25, etc.	150 - 250HB	AH120	455 - 820	0.004 - 0.010*
	Ductile cast iron 60-40-18, etc.	150 - 250HB	AH120	360 - 655	0.004 - 0.010*
S	Titanium alloys Ti-6Al-4V, etc.	- 40HRC	AH120	95 - 195	0.0032 - 0.008*
	Superalloys Inconel 718, etc.	- 40HRC	AH120	65 - 160	0.0024 - 0.004*
H	Hardened steel	H13, etc.	AH120	145 - 225	0.004 - 0.006*
		D2, etc.	AH120	130 - 210	0.0024 - 0.004*

LQMU11/18-PNER-MJ

ISO	Workpiece material	Hardness	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1018, 1020, 1026, etc.	- 200HB	AH725	330 - 800	0.004 - 0.010*
	High carbon steel 1045, 1055, etc.	200 - 300HB	AH725	330 - 750	0.004 - 0.008*
	Alloyed steel 4140, 8620, etc.	- 300HB	AH725	330 - 750	0.004 - 0.008*
	Tool steel H13, D2, etc.	- 300HB	AH725	330 - 600	0.004 - 0.008*
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	- 200HB	AH140	300 - 600	0.004 - 0.010*
K	Gray cast iron Class 25, Class 30, etc.	150 - 250HB	AH120	450 - 800	0.004 - 0.010*
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 - 250HB	AH120	450 - 800	0.004 - 0.010*
S	Heat-resistant alloy Inconel 718, etc.	- 40HRC	AH725	65 - 160	0.003 - 0.008*

* When using LQMU11 inserts, see page **H179** for proper feed per tooth setting.

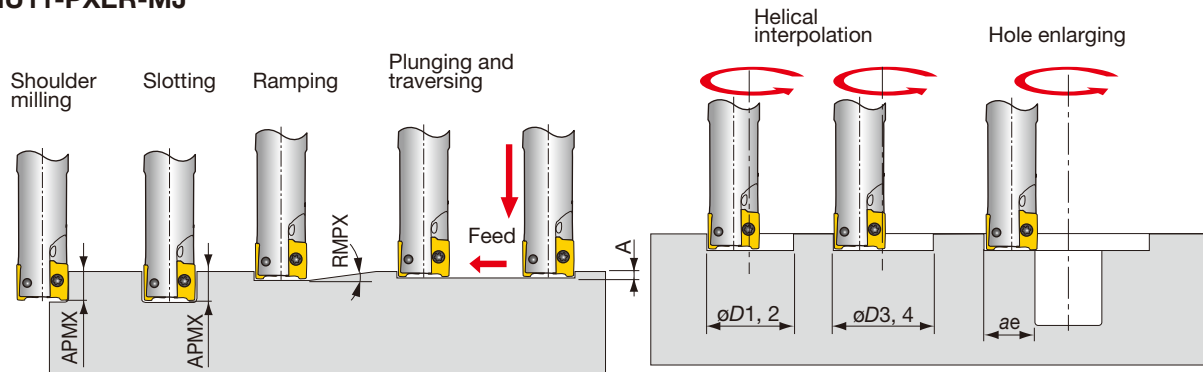
• For applications with poor chip evacuation, use air gun to remove chips from the machining area to avoid chip re-cutting and part damage.

• To machine cast surface with unstable cutting depths or interruptions, it is recommended to lower the feed rate (fz) to the lowest parameter in the recommended range.

• Rigidity of the machine and/or workpiece and the spindle power capability greatly influence the cutting conditions. For applications with large cutting width/depth and/or long tool overhang, start with a Vc and fz in the lower range of the recommended cutting parameters and monitor the machine stability.

APPLICATION RANGE

LQMU11-PXER-MJ



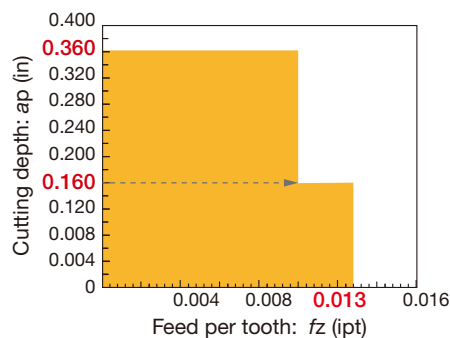
Inch	DC	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging A	Min. machining øD1	Max. machining				Max. cutting width in enlarging ae
						øD2*	øD3	øD4*	RE	
EPQ11R100...	1.00	0.354	1.8°	0.023	1.41	1.87	1.96	1.94	0.031	0.96
EPQ11R125...	1.25	0.354	1.3°	0.023	1.91	2.37	2.46	2.44	0.031	1.21
TPQ11R150...	1.50	0.354	0.9°	0.023	2.41	2.87	2.96	2.94	0.031	1.46
TPQ11R200...	2.00	0.354	0.7°	0.023	3.41	3.87	3.96	3.94	0.031	1.96
TPQ11R250...	2.50	0.354	0.5°	0.023	4.41	4.87	4.96	4.94	0.031	2.46
TPQ11R300...	3.00	0.354	0.4°	0.023	5.41	5.87	5.96	5.94	0.031	2.96
TPQ11R400...	4.00	0.354	0.3°	0.023	7.41	7.87	7.96	7.94	0.031	3.96

*For a flat bottom

NOTE WHEN USING LQMU11 INSERTS

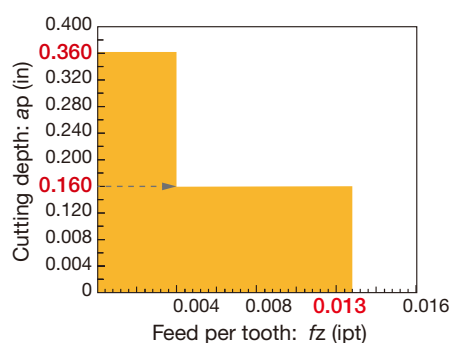
Maximum feed rate per tooth varies depending on the cutting depth and width.
Use proper feed rate as described below.
Use caution. Tool may damage if the parameters are not properly set.

Applicable feed rate (for $ae < 10\%$ of tool diameter)



Cutter : TPQ11R200U0075A06 (DC = 2.000", z = 6)
Insert : LQMU110708PXER-MJ
Grade : AH3135
Workpiece material : 1055 (200HB)
Cutting Speed : $V_c = 660$ sfm
Cutting width : $ae = 0.200$ "
Coolant : Dry
Machine : Vertical M/C, 22 HP

Applicable feed rate (for $ae > 10\%$ of tool diameter)



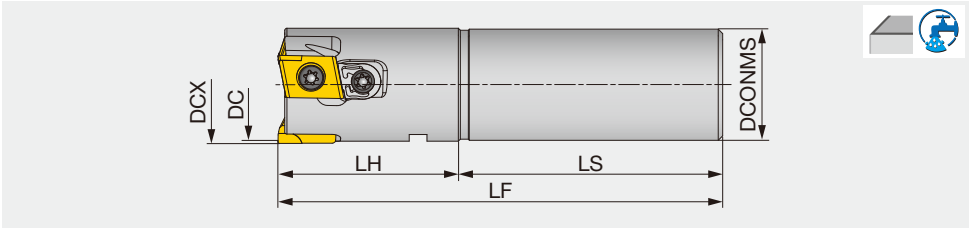
Cutter : TPQ11R200U0075A06 (DC = 2.000", z = 6)
Insert : LQMU110708PXER-MJ
Grade : AH3125
Workpiece material : 1055 (200HB)
Cutting Speed : $V_c = 660$ sfm
Cutting width : $ae = 1.673$ "
Coolant : Dry
Machine : Vertical M/C, 22 HP



TUNGSMILL

EPYP12

High speed PCD endmill for non ferrous metal



Metric	DC	DCX	CICT	DCONMS	LF	LH	LS	WT(kg)	Air hole	Insert
EPYP12M025C25.0R03	25	26.4	3	25	100	50	50	0.4	With	YPEB12X3-*P...
EPYP12M032C25.0R05	32	33.4	5	25	100	45	55	0.5	With	YPEB12X3-*P...

DCX: Outside diameter
DC: Diameter with 01 type insert

SPARE PARTS

Designation	Clamping screw	Wrench 1	Wrench 2	Wedge fixing screw	Wedge
EPYP12M025C25.0R03	VX040024A	T-15F	T-8F	VX040028A	RSFTC1011
EPYP12M032C25.0R05	VX040024A	T-15F	T-8F	RSRGR7M40	RSFTC1009

Recommended clamping torque: 4.5 N·m

Approach angle

7°-25°

41°-45°

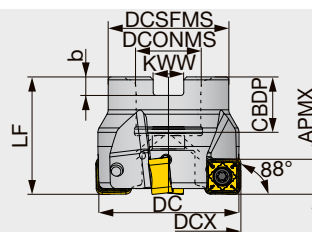
60°-70°

85-88°

90°

Others

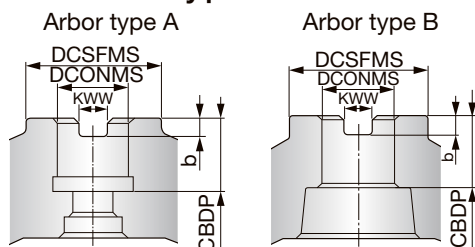
Reference pages: Inserts, Standard cutting conditions → **H109**



Inch	APMX	DC	DCX	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Insert	Arbor type
THSN12U2.00B0.75R04	0.374	2.000	2.024	4	1.850	1.575	0.750	0.750	0.315	0.197	0.920	With	SNMU1206...	A
THSN12U2.00B0.75R05	0.374	2.000	2.024	5	1.850	1.575	0.750	0.750	0.315	0.197	0.910	With	SNMU1206...	A
THSN12U2.50B0.75R04	0.374	2.500	2.524	4	1.850	1.575	0.750	0.750	0.315	0.197	1.220	With	SNMU1206...	A
THSN12U2.50B0.75R06	0.374	2.500	2.524	6	1.850	1.575	0.750	0.750	0.315	0.197	1.220	With	SNMU1206...	A
THSN12U3.00B1.00R05	0.374	3.000	3.024	5	1.969	1.969	1.000	1.024	0.374	0.236	2.120	With	SNMU1206...	A
THSN12U3.00B1.00R08	0.374	3.000	3.024	8	1.969	1.969	1.000	1.024	0.374	0.236	2.090	With	SNMU1206...	A
THSN12U4.00B1.50R06	0.374	4.000	4.024	6	3.150	1.969	1.500	1.299	0.626	0.394	3.640	Without	SNMU1206...	B
THSN12U4.00B1.50R08	0.374	4.000	4.024	8	3.150	1.969	1.500	1.299	0.626	0.394	3.550	Without	SNMU1206...	B

Metric	APMX	DC	DCX	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
THSN12M050B22.0R04	9.5	50	50.6	4	41	40	22	20	10.4	6.3	0.32	With	SNMU1206...
THSN12M050B22.0R05	9.5	50	50.6	5	41	40	22	20	10.4	6.3	0.32	With	SNMU1206...
THSN12M063B22.0R04	9.5	63	63.6	4	47	40	22	20	10.4	6.3	0.54	With	SNMU1206...
THSN12M063B22.0R06	9.5	63	63.6	6	47	40	22	20	10.4	6.3	0.52	With	SNMU1206...
THSN12J080B25.4R05	9.5	80	80.6	5	58	50	25.4	26	9.5	6	1.13	With	SNMU1206...
THSN12J080B25.4R08	9.5	80	80.6	8	58	50	25.4	26	9.5	6	1.15	With	SNMU1206...
THSN12M080B27.0R05	9.5	80	80.6	5	58	50	27	22	12.4	7	1.17	With	SNMU1206...
THSN12M080B27.0R08	9.5	80	80.6	8	58	50	27	22	12.4	7	1.14	With	SNMU1206...
THSN12J100B31.7R06	9.5	100	100.6	6	60	50	31.75	32	12.7	8	1.43	With	SNMU1206...
THSN12J100B31.7R08	9.5	100	100.6	8	60	50	31.75	32	12.7	8	1.39	With	SNMU1206...
THSN12M100B32.0R06	9.5	100	100.6	6	60	50	32	28.5	14.4	8	1.4	With	SNMU1206...
THSN12M100B32.0R08	9.5	100	100.6	8	60	50	32	28.5	14.4	8	1.38	With	SNMU1206...

Arbor type



SPARE PARTS

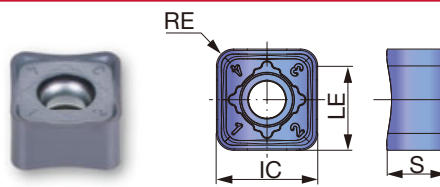
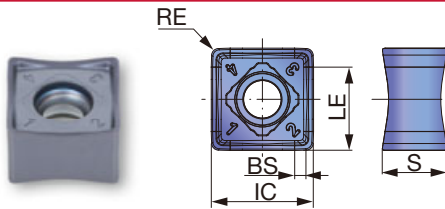
Designation	Clamping screw	Torx bit	Grip	Shell locking bolt	Shell locking bolt (Optional parts)
THSN12U2.00, 2.50...	CSPB-4	BLD IP15/S7	H-TB2W	-	(C0.375X1.125H)
THSN12U3.00...	CSPB-4	BLD IP15/S7	H-TB2W	-	(C0.500X1.375H)
THSN12U4.00...	CSPB-4	BLD IP15/S7	H-TB2W	-	(TMBA-0.750H)
THSN12M050, 063...	CSPB-4	BLD IP15/S7	H-TB2W	CM10x30H	-
THSN12J080..., THSN12M080...	CSPB-4	BLD IP15/S7	H-TB2W	CM12X30H	-
THSN12J100..., THSN12M100...	CSPB-4	BLD IP15/S7	H-TB2W	TMBA-M16H	-

Recommended clamping torque: 2.58 lbs·ft, 3.5 N·m

INSERTS

SNMU120608HNEN-MM

SNMU120612/20EN-MM



P	Steel	☆	★	☆	★
M	Stainless		☆	★	★
K	Cast iron	★	☆	★	
N	Non-ferrous				
S	Superalloys	★		☆	
H	Hard materials				

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated					LE	S	IC	BS
			AH120	AH3225	AH3135	T1215	T3225				
SNMU120608HNEN-MM	0.031	0.374	●	●	●	●	●	0.386	0.295	0.472	0.055
SNMU120612EN-MM	0.047	0.374	●	●	●	●	●	0.425	0.285	0.472	-
SNMU120620EN-MM	0.079	0.374	●	●	●	●	●	0.394	0.276	0.472	-

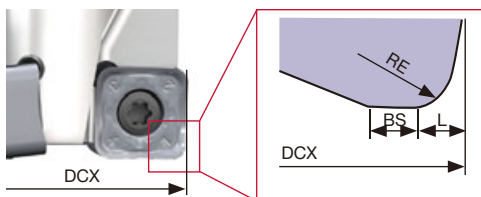
● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness	Priority	Grades	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, etc.	- 200HB	First choice	AH3225	MM	328 - 820	0.002 - 0.012
			For wear resistance	T3225	MM	656 - 1148	0.002 - 0.010
	High carbon and alloy steel 1055, 4140, etc.	- 300HB	First choice	AH3225	MM	328 - 820	0.002 - 0.012
			For wear resistance	T3225	MM	591 - 984	0.002 - 0.010
M	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	First choice	AH3225	MM	328 - 656	0.002 - 0.010
			For wear resistance	T3225	MM	492 - 820	0.002 - 0.008
	Austenitic stainless steel 304, 316, etc.	- 200HB	First choice	AH3135	MM	328 - 656	0.002 - 0.010
			For wear resistance	T3225	MM	328 - 820	0.002 - 0.008
K	Cast stainless steel 1.4849, etc.	-	First choice	T3225	MM	197 - 394	0.002 - 0.008
			For fracture resistance	AH3135	MM	197 - 394	0.002 - 0.008
	Gray cast iron Class 25, etc.	150 - 250HB	First choice	T1215	MM	328 - 1148	0.002 - 0.012
			For fracture resistance	AH120	MM	328 - 820	0.002 - 0.012
S	Ductile cast iron 65-45-12, etc.	150 - 250HB	First choice	T1215	MM	328 - 1148	0.002 - 0.010
			For fracture resistance	AH120	MM	262 - 656	0.002 - 0.012
	Titanium alloys Ti-6Al-4V, etc.	- 40HRC	First choice	AH3135	MM	98 - 197	0.002 - 0.008
			First choice	AH120	MM	33 - 131	0.002 - 0.006
H	Heat-resistant alloys Inconel718, etc.	- 40HRC	First choice	AH120	MM	33 - 131	0.002 - 0.006
	Hardened steel H13, etc.	40 - 50HRC	First choice	AH3225	MM	262 - 427	0.002 - 0.006
	Hardened steel D2, etc.	50 - 60HRC	First choice	AH120	MM	164 - 230	0.001 - 0.003

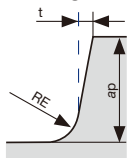
Tool offset

To eliminate uncut amount in face milling operation, adjust the programming according to the offset (L) listed below.

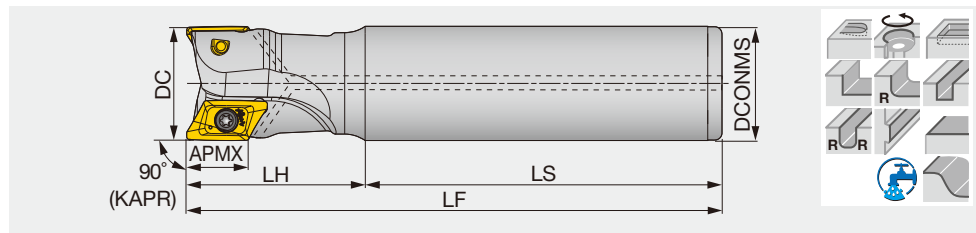


Inch	RE	BS	L
SNMU120608HNEN-MM	0.031	0.055	0.051
SNMU120612EN-MM	0.047	-	0.067
SNMU120620EN-MM	0.079	-	0.098

The following table shows the amount overcut (t) when the cutter is used as a shoulder milling cutter.



Inch	ap (in)									
	0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354	0.374
SNMU120608HNEN-MM	0.0004	0.0016	0.0020	0.0020	0.0028	0.0035	0.0055	0.0079	0.0106	0.0106
SNMU120612EN-MM	-	0	0	0.0004	0.0008	0.0020	0.0035	0.0059	0.0087	0.0098
SNMU120620EN-MM	-	0	0	0	0.0008	0.0020	0.0035	0.0059	0.0087	0.0098



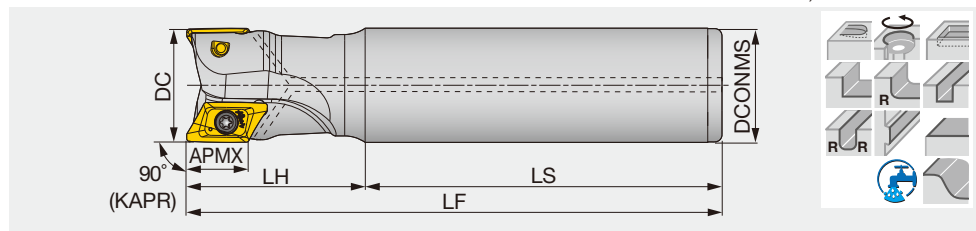
Inch	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Max. RPM (min ⁻¹)	Insert
EPXV16U1.00W1.00R02	1.000	2	1.000	3.000	2.000	5.000	0.820	With	51,400	XVCT16**-AM
EPXV16U1.00W1.00R02L	1.000	2	1.000	4.000	3.000	7.000	1.170	With	51,400	XVCT16**-AM
EPXV16U1.25W1.25R03	1.250	3	1.250	4.000	2.000	6.000	1.680	With	46,000	XVCT16**-AM
EPXV16U1.25W1.25R03L	1.250	3	1.250	5.000	3.000	8.000	2.270	With	46,000	XVCT16**-AM
EPXV16U1.50W1.25R03	1.500	3	1.250	5.000	2.000	7.000	2.080	With	42,000	XVCT16**-AM

Metric	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Max. RPM (min ⁻¹)	Insert
EPXV16M025C25.0R02	25	2	25	70	55	125	0.37	With	52,000	XVCT16**-AM
EPXV16M025C25.0R02L	25	2	25	100	70	170	0.53	With	52,000	XVCT16**-AM
EPXV16M032C32.0R03	32	3	32	100	50	150	0.76	With	46,000	XVCT16**-AM
EPXV16M032C32.0R03L	32	3	32	120	80	200	1.03	With	46,000	XVCT16**-AM
EPXV16M040C32.0R03	40	3	32	115	55	170	0.94	With	41,200	XVCT16**-AM

EPV16

90° shoulder endmill for aluminum machining, shank type, with screw clamp system

GAMP = +6° ~ +10°, GAMF = -12° ~ -9°



Inch	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Max. RPM (min ⁻¹)	Insert
EPV16R100U0100W02	1.000	2	1.000	3.000	2.000	5.000	0.820	With	38,000	XVCT1605...
EPV16R100U0100W02L	1.000	2	1.000	4.000	3.000	7.000	1.170	With	38,000	XVCT1605...
EPV16R125U0125W02	1.250	2	1.250	4.000	2.000	6.000	1.690	With	34,000	XVCT1605...
EPV16R125U0125W02L	1.250	2	1.250	5.000	3.000	8.000	2.280	With	34,000	XVCT1605...
EPV16R125U0125W03	1.250	3	1.250	4.000	2.000	6.000	1.680	With	34,000	XVCT1605...
EPV16R125U0125W03L	1.250	3	1.250	5.000	3.000	8.000	2.270	With	34,000	XVCT1605...
EPV16R150U0125W03	1.500	3	1.250	5.000	2.000	7.000	2.080	With	30,000	XVCT1605...
EPV16R150U0125W03L	1.500	3	1.250	8.000	2.000	10.000	3.140	With	30,000	XVCT1605...

Metric	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Max. RPM (min ⁻¹)	Insert
EPV16R025M25.0-02	25	2	25	70	55	125	0.37	With	38,000	XVCT1605...
EPV16R025M25.0-02L	25	2	25	100	70	170	0.53	With	38,000	XVCT1605...
EPV16R032M32.0-02	32	2	32	100	50	150	0.77	With	34,000	XVCT1605...
EPV16R032M32.0-02L	32	2	32	120	80	200	1.03	With	34,000	XVCT1605...
EPV16R032M32.0-03	32	3	32	100	50	150	0.76	With	34,000	XVCT1605...
EPV16R032M32.0-03L	32	3	32	120	80	200	1.03	With	34,000	XVCT1605...
EPV16R040M32.0-03	40	3	32	115	55	170	0.94	With	30,000	XVCT1605...
EPV16R040M32.0-03L	40	3	32	195	55	250	1.43	With	30,000	XVCT1605...

SPARE PARTS

Designation	Clamping screw	Grip	Torx bit
EPXV16U1.00W..., EPXV16M025..., EPV16R100U..., EPV16R025M...	TS40085I/HG	H-TBS	BT15S
EPXV16U1.25W..., EPXV16U1.50W..., EPXV16M032..., EPXV16M040..., EPV16R125, 150U..., EPV16R032, 040M...	TS40093I/HG	H-TBS	BT15S

Recommended clamping torque: 3.32 lbs-ft, 4.5 N-m

Reference pages: Inserts, Standard cutting conditions → **H186**

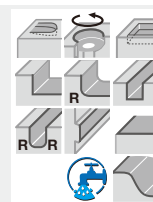
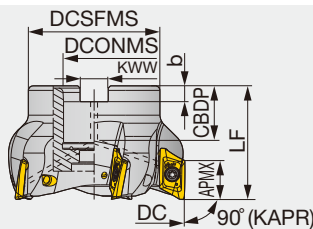


TUNG-ALUMILL

TPXV16

90° shoulder mill for aluminium machining, with screw clamp system

GAMP = +10° ~ +11°, GAMF = -9° ~ -5.5°



Inch	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(lb)	Air hole	Max. RPM (min ⁻¹)	Insert
TPXV16U1.50B0.75R03	1.500	3	1.421	0.750	0.750	2.000	0.170	0.315	0.440	With	42,000	XVCT16**-AM
TPXV16U2.00B0.75R04	2.000	4	1.890	0.750	0.750	2.000	0.170	0.315	0.890	With	36,400	XVCT16**-AM
TPXV16U2.50B1.00R05	2.500	5	2.165	1.000	0.750	2.000	0.197	0.375	1.340	With	32,500	XVCT16**-AM
TPXV16U3.00B1.00R05	3.000	5	2.362	1.000	0.750	2.000	0.197	0.375	1.920	With	29,700	XVCT16**-AM
TPXV16U4.00B1.50R06	4.000	6	3.150	1.500	1.059	2.500	0.319	0.625	4.280	With	25,700	XVCT16**-AM
TPXV16U5.00B1.50R07	5.000	7	3.740	1.500	1.059	2.500	0.319	0.625	6.700	With	23,000	XVCT16**-AM

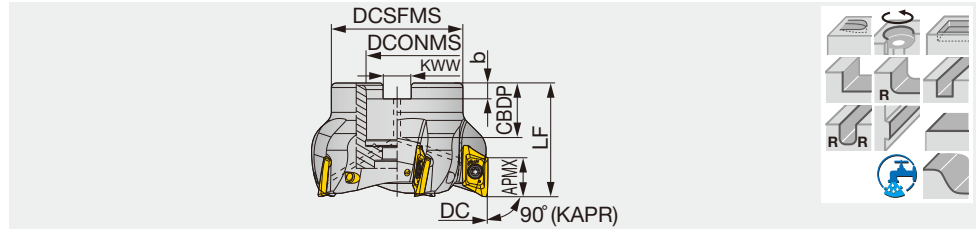
Metric	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Max. RPM (min ⁻¹)	Insert
TPXV16M040B16.0R03	40	3	38	16	20	50	5.6	8.4	0.23	With	41,200	XVCT16**-AM
TPXV16M050B22.0R04	50	4	45	22	22	50	6.3	10.4	0.33	With	36,800	XVCT16**-AM
TPXV16M063B22.0R05	63	5	47	22	22	50	6.3	10.4	0.54	With	32,700	XVCT16**-AM
TPXV16M080B27.0R05	80	5	58	27	28	50	7	12.4	0.86	With	29,000	XVCT16**-AM
TPXV16M100B32.0R06	100	6	66	32	26	63	8	14.4	1.55	With	26,000	XVCT16**-AM
TPXV16M125B40.0R07	125	7	85	40	32	63	9	16.4	2.53	With	23,200	XVCT16**-AM

SPARE PARTS

Designation	Clamping screw	Grip	Shell locking bolt	Torx bit
TPXV16U1.50..., TPXV16M040...	TS40093I/HG	H-TBS	SHM8X1.25X35-C	BT15S
TPXV16U2.00..., TPXV16U2.50..., TPXV16M050..., TPXV16M063...	TS40093I/HG	H-TBS	SHM10X1.5X30-C	BT15S
TPXV16U3.00..., TPXV16M080...	TS40093I/HG	H-TBS	LHM12X1.75X30-C	BT15S
TPXV16U4.00..., TPXV16M100...	TS40093I/HG	H-TBS	SHM16X2X35-C	BT15S
TPXV16U5.00..., TPXV16M125...	TS40093I/HG	H-TBS	SHM20X2.5X40-C	BT15S

Recommended clamping torque: 3.32 lbs-ft, 4.5 N-m

Reference pages: Inserts, Standard cutting conditions → **H186**



Inch	DC	CICT	DCSFMS	DCONMS	CDDP	LF	b	KWW	WT(lb)	Air hole	Max. RPM (min ⁻¹)	Insert
TPV16R150U0075A03	1.500	3	1.421	0.750	0.750	2.000	0.315	0.170	0.440	With	30,000	XVCT1605...
TPV16R200U0075A04	2.000	4	1.890	0.750	0.750	2.000	0.315	0.170	0.890	With	27,000	XVCT1605...
TPV16R250U0100A05	2.500	5	2.165	1.000	0.750	2.000	0.375	0.197	1.340	With	24,000	XVCT1605...
TPV16R300U0100A05	3.000	5	2.362	1.000	0.750	2.000	0.375	0.197	1.920	With	21,000	XVCT1605...
TPV16R400U0150A06	4.000	6	3.150	1.500	1.059	2.500	0.625	0.319	4.280	With	19,000	XVCT1605...
TPV16R500U0150A07	5.000	7	3.740	1.500	1.059	2.500	0.625	0.319	6.700	With	17,000	XVCT1605...

Metric	DC	CICT	DCSFMS	DCONMS	CDDP	LF	b	KWW	WT(kg)	Air hole	Max. RPM (min ⁻¹)	Insert
TPV16R040M16.0E03	40	3	38	16	20	50	5.6	8.4	0.23	With	30,000	XVCT1605...
TPV16R050M22.0E04	50	4	45	22	22	50	6.3	10.4	0.33	With	27,000	XVCT1605...
TPV16R063M22.0E05	63	5	47	22	22	50	6.3	10.4	0.54	With	24,000	XVCT1605...
TPV16R080M27.0E05	80	5	58	27	28	50	7	12.4	0.86	With	21,000	XVCT1605...
TPV16R100M32.0E06	100	6	66	32	26	63	8	14.4	1.55	With	19,000	XVCT1605...
TPV16R125M40.0E07	125	7	85	40	32	63	9	16.4	2.53	With	17,000	XVCT1605...

SPARE PARTS



Designation	Clamping screw	Grip	Shell locking bolt	Torx bit
TPV16R150U0075A03	TS40093I/HG	H-TBS	TCS 9.525-35-I	BT15S
TPV16R200U0075A04	TS40093I/HG	H-TBS	SD06-46	BT15S
TPV16R250, 300U...	TS40093I/HG	H-TBS	SD08-47	BT15S
TPV16R400, 500U...	TS40093I/HG	H-TBS	SD12-82	BT15S
TPV16R040M16.0E03	TS40093I/HG	H-TBS	SHM8X1.25X35-C	BT15S
TPV16R050, 063M...	TS40093I/HG	H-TBS	SHM10X1.5X30-C	BT15S
TPV16R080M27.0E05	TS40093I/HG	H-TBS	LHM12X1.75X30-C	BT15S
TPV16R100M32.0E06	TS40093I/HG	H-TBS	SHM16X2X35-C	BT15S
TPV16R125M40.0E07	TS40093I/HG	H-TBS	SHM20X2.5X40-C	BT15S

Recommended clamping torque: 3.32 lbs-ft, 4.5 N·m

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness HB	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
N	Aluminum alloy	60	TH10	AJ	984 - 16404	0.006 - 0.014
		100	TH10	AJ	656 - 6562	0.004 - 0.010
	Cast aluminum alloy Si ≤ 12%	75	TH10	AJ	656 - 6562	0.006 - 0.012
		90	TH10	AJ	656 - 4921	0.004 - 0.010
	Cast aluminum alloy Si > 12%	130	TH10	AJ	656 - 3281	0.003 - 0.006
	Copper alloys Pb > 1%	110	TH10	AJ	656 - 2625	0.003 - 0.006
		90	TH10	AJ	984 - 3281	0.004 - 0.006
	Copper alloys	100	TH10	AJ	984 - 2625	0.004 - 0.006
		-	TH10	AJ	328 - 1640	0.004 - 0.006
	Duroplastics, fiber plastics	-	TH10	AJ	328 - 984	0.004 - 0.006

Safety guidelines

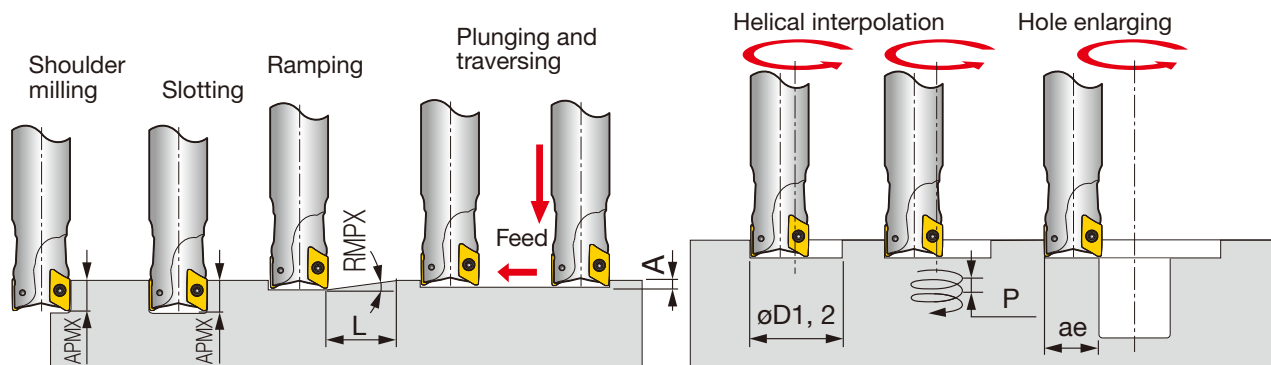
1. Use only the original inserts, cutters and spare parts.
2. Insert pocket must be cleaned before clamping the insert.
3. Clamp torque of screw should be 3.32 lbs-ft.
4. For safety reasons, use a new screw when changing the insert.
5. Maximum RPM values are determined based on the burst test. Using RPM beyond maximum values may cause insert breakage, machine damage or personal injury.
6. XVCT insert has sharp cutting edges. Always wear gloves for protection from injury when handling.

Grade
Insert
Ext. Toolholder
Int. Toolholder
Threading
Grooving
Miniature tool
Milling cutter
Endmill
Drilling tool
Tooling System
User's Guide
Index





APPLICATION RANGE



	Tool	Corner radius	Max. depth of cut	Max. ramping angle	Min. length	Max. plunging depth	Min. machining	Helical ramp down		Max. pitch/rev	Max. machining	Hole enlarging
								Min. pitch/rev	Max. pitch/rev			
Inch	DC	RE	APMX	RMPX	L	A	øD1	P	øD2	P	ae	
EPV16R100...	1.000	0.016, 0.031	0.630	22°	1.570	0.166	1.150	0.173	1.970	0.535	0.886	
EPV16R100...	1.000	0.047	0.610	22°	1.570	0.166	1.150	0.173	1.970	0.535	0.886	
EPV16R100...	1.000	0.063	0.591	22°	1.500	0.146	1.150	0.173	1.970	0.520	0.886	
EPV16R100...	1.000	0.079	0.571	22°	1.500	0.146	1.150	0.173	1.970	0.520	0.886	
EPV16R100...	1.000	0.118, 0.126	0.551	21°	1.500	0.098	1.150	0.165	1.970	0.484	0.886	
EPV16R100...	1.000	0.157, 0.197	0.512	18.5°	1.570	0.090	1.150	0.146	1.970	0.484	0.886	
EPV16R125...	1.250	0.016, 0.031	0.630	16.5°	2.130	0.158	1.690	0.346	2.520	0.535	1.134	
EPV16R125...	1.250	0.047	0.610	16.5°	2.130	0.158	1.690	0.346	2.520	0.535	1.134	
EPV16R125...	1.250	0.063	0.591	16°	2.130	0.138	1.690	0.335	2.520	0.520	1.134	
EPV16R125...	1.250	0.079	0.571	16°	2.130	0.138	1.690	0.335	2.520	0.520	1.134	
EPV16R125...	1.250	0.118, 0.126	0.551	15°	2.130	0.118	1.700	0.311	2.520	0.484	1.134	
EPV16R125...	1.250	0.157, 0.197	0.512	13.5°	2.200	0.098	1.700	0.280	2.520	0.484	1.134	
T/EPV16R150...	1.500	0.016, 0.031	0.630	11.5°	3.110	0.158	2.330	0.409	3.150	0.535	1.417	
T/EPV16R150...	1.500	0.047	0.610	11.5°	3.110	0.158	2.330	0.409	3.150	0.535	1.417	
T/EPV16R150...	1.500	0.063	0.591	11°	3.150	0.138	2.330	0.390	3.150	0.520	1.417	
T/EPV16R150...	1.500	0.079	0.571	11°	3.150	0.138	2.330	0.390	3.150	0.520	1.417	
T/EPV16R150...	1.500	0.118, 0.126	0.551	10°	3.230	0.118	2.330	0.354	3.150	0.484	1.417	
T/EPV16R150...	1.500	0.157, 0.197	0.512	8.5°	3.540	0.098	2.330	0.299	3.150	0.484	1.417	
TPV16R200...	2.000	0.016, 0.031	0.630	9.5°	3.780	0.158	3.110	0.512	3.940	0.535	1.772	
TPV16R200...	2.000	0.047	0.610	9.5°	3.780	0.158	3.110	0.512	3.940	0.535	1.772	
TPV16R200...	2.000	0.063	0.591	9°	3.860	0.138	3.110	0.484	3.940	0.520	1.772	
TPV16R200...	2.000	0.079	0.571	9°	3.860	0.138	3.110	0.484	3.940	0.520	1.772	
TPV16R200...	2.000	0.118, 0.126	0.551	8°	4.060	0.118	3.110	0.429	3.940	0.484	1.772	
TPV16R200...	2.000	0.157, 0.197	0.512	7°	4.330	0.098	3.110	0.374	3.940	0.484	1.772	
TPV16R250...	2.500	0.016, 0.031	0.630	7°	5.120	0.158	4.130	0.535	4.960	0.535	2.232	
TPV16R250...	2.500	0.047	0.610	7°	5.120	0.158	4.130	0.535	4.960	0.535	2.232	
TPV16R250...	2.500	0.063	0.591	6.5°	5.350	0.138	4.130	0.504	4.960	0.520	2.232	
TPV16R250...	2.500	0.079	0.571	6.5°	5.350	0.138	4.130	0.504	4.960	0.520	2.232	
TPV16R250...	2.500	0.118, 0.126	0.551	6°	5.350	0.118	4.140	0.465	4.960	0.484	2.232	
TPV16R250...	2.500	0.157, 0.197	0.512	5.5°	5.510	0.098	4.140	0.425	4.960	0.484	2.232	
TPV16R300...	3.000	0.016, 0.031	0.630	5°	7.200	0.158	5.470	0.535	6.300	0.535	2.835	
TPV16R300...	3.000	0.047	0.610	5°	7.200	0.158	5.470	0.535	6.300	0.535	2.835	
TPV16R300...	3.000	0.063	0.591	4.5°	7.760	0.138	5.470	0.488	6.300	0.520	2.835	
TPV16R300...	3.000	0.079	0.571	4.5°	7.760	0.138	5.470	0.488	6.300	0.520	2.835	
TPV16R300...	3.000	0.118, 0.126	0.551	4°	8.150	0.118	5.480	0.433	6.300	0.484	2.835	
TPV16R300...	3.000	0.157, 0.197	0.512	3.5°	8.700	0.098	5.480	0.378	6.300	0.484	2.835	
TPV16R400...	4.000	0.016, 0.031	0.630	3.5°	10.310	0.158	7.040	0.508	7.870	0.535	3.543	
TPV16R400...	4.000	0.047	0.610	3.5°	10.310	0.158	7.040	0.508	7.870	0.535	3.543	
TPV16R400...	4.000	0.063	0.591	3°	11.650	0.138	7.040	0.437	7.870	0.520	3.543	
TPV16R400...	4.000	0.079	0.571	3°	11.650	0.138	7.040	0.437	7.870	0.520	3.543	
TPV16R400...	4.000	0.118, 0.126	0.551	2.5°	13.070	0.118	7.050	0.362	7.870	0.484	3.543	
TPV16R400...	4.000	0.157, 0.197	0.512	2.5°	12.170	0.098	7.050	0.362	7.870	0.457	3.543	
TPV16R500...	5.000	0.016, 0.031	0.630	2.5°	14.450	0.158	9.020	0.476	9.840	0.535	4.429	
TPV16R500...	5.000	0.047	0.610	2.5°	14.450	0.158	9.020	0.476	9.840	0.535	4.429	
TPV16R500...	5.000	0.063	0.591	2°	17.480	0.138	9.020	0.382	9.840	0.520	4.429	
TPV16R500...	5.000	0.079	0.571	2°	17.480	0.138	9.020	0.382	9.840	0.520	4.429	
TPV16R500...	5.000	0.118, 0.126	0.551	1.5°	21.810	0.118	9.020	0.287	9.840	0.343	4.429	
TPV16R500...	5.000	0.157, 0.197	0.512	1.5°	20.310	0.098	9.020	0.287	9.840	0.343	4.429	

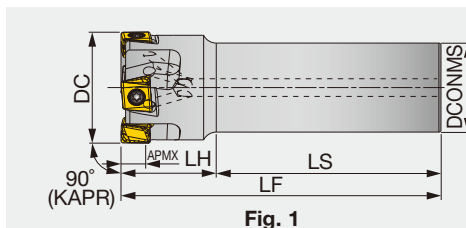


Fig. 1

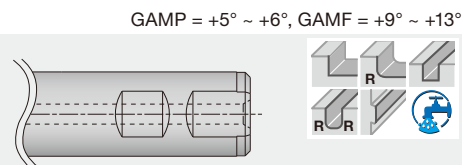


Fig. 2

Right hand (R) shown.

Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert	Fig.
EPM11R125U0125W03	0.381	1.250	3	1.250	2.250	1.750	4.000	0.66	With	LMMU1107...	2
EPM11R150U0125W04	0.381	1.500	4	1.250	2.250	1.750	4.000	1.10	With	LMMU1107...	2

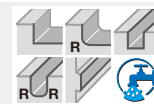
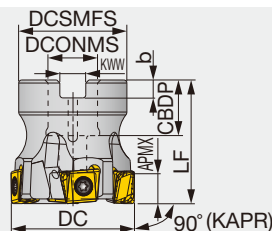
Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert	Fig.
EPM11R032M32.0-03	9.7	32	3	32	80	35	115	0.6	With	LMMU1107...	1
EPM11R040M32.0-04	9.7	40	4	32	80	35	115	0.7	With	LMMU1107...	1
EPM11R050M32.0-04	9.7	50	4	32	80	40	120	0.9	With	LMMU1107...	1
EPM11R063M32.0-06	9.7	63	6	32	80	40	120	1.2	With	LMMU1107...	1
EPM11R080M32.0-07	9.7	80	7	32	80	40	120	1.6	With	LMMU1107...	1

SPARE PARTS



Designation	Clamping screw	Wrench
EPM11...	SM35-114-H0	T-15DF

Recommended clamping torque : 2.58 lbs-ft, 3.5 N-m

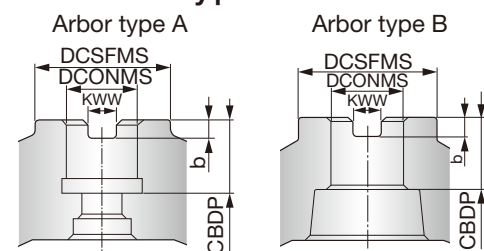


Right hand (R) shown.

Inch	APMX	DC	CICT	DCSMFS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TPM11R200U0075A05	0.381	2.000	5	1.772	1.570	0.750	0.750	0.315	0.197	0.660	With	LMMU1107...	A
TPM11R250U0075A06	0.381	2.500	6	1.772	1.570	0.750	0.750	0.315	0.197	1.100	With	LMMU1107...	A
TPM11R300U0100A06	0.381	3.000	6	2.165	1.970	1.000	0.750	0.374	0.236	1.980	With	LMMU1107...	A
TPM11R300U0100A08	0.381	3.000	8	2.165	1.970	1.000	0.750	0.374	0.236	2.200	With	LMMU1107...	A
TPM16R300U0100A05	0.594	3.000	5	2.165	1.970	1.000	0.750	0.374	0.236	2.200	With	LMMU1107...	A
TPM11R400U0150A08	0.381	4.000	8	3.071	1.970	1.500	1.063	0.626	0.394	3.090	With	LMMU1107...	B
TPM11R400U0150A11	0.381	4.000	11	3.071	1.970	1.500	1.063	0.626	0.394	3.310	With	LMMU1107...	B
TPM16R400U0150A06	0.594	4.000	6	3.071	1.970	1.500	1.063	0.626	0.394	3.530	With	LMMU1107...	B
TPM16R500U0150A07	0.594	5.000	7	3.071	2.480	1.500	1.063	0.626	0.394	6.610	With	LMMU1107...	B

Metric	APMX	DC	CICT	DCSMFS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TPM11R050M22.0-05	9.7	50	5	41	40	22	20	10	6	0.3	With	LMMU1107...
TPM11R050M22.0E05	9.7	50	5	41	40	22	20	10.4	6.3	0.3	With	LMMU1107...
TPM11R063M22.0-06	9.7	63	6	41	40	22	20	10	6	0.5	With	LMMU1107...
TPM11R063M22.0E06	9.7	63	6	41	40	22	20	10.4	6.3	0.5	With	LMMU1107...
TPM11R080M25.4-07	9.7	80	7	46	50	25.4	26	9.5	6	0.9	With	LMMU1107...
TPM11R080M25.4-09	9.7	80	9	46	50	25.4	26	9.5	6	1	With	LMMU1107...
TPM11R080M27.0E07	9.7	80	7	50	50	27	22	12.4	7	1	With	LMMU1107...
TPM11R080M27.0E09	9.7	80	9	50	50	27	22	12.4	7	1	With	LMMU1107...
TPM16R080M25.4-05	15.1	80	5	46	50	25.4	26	9.5	6	1	With	LMMU1609...
TPM16R080M27.0E05	15.1	80	5	50	50	27	22	12.4	7	1	With	LMMU1609...
TPM11R100M31.7-08	9.7	100	8	60	50	31.75	32	12.7	8	1.4	With	LMMU1107...
TPM11R100M31.7-11	9.7	100	11	60	50	31.75	32	12.7	8	1.5	With	LMMU1107...
TPM11R100M32.0E08	9.7	100	8	60	50	32	28.5	14.4	8	1.4	With	LMMU1107...
TPM11R100M32.0E11	9.7	100	11	60	50	32	28.5	14.4	8	1.5	With	LMMU1107...
TPM16R100M31.7-06	15.1	100	6	60	50	31.75	32	12.7	8	1.6	With	LMMU1609...
TPM16R100M32.0E06	15.1	100	6	60	50	32	28.5	14.4	8	1.5	With	LMMU1609...
TPM16R125M38.1-07	15.1	125	7	80	63	38.1	38	15.9	10	3	With	LMMU1609...
TPM16R125M40.0E07	15.1	125	7	71	63	40	32	16.4	9	2.7	With	LMMU1609...

Arbor type



SPARE PARTS

Designation	Clamping screw	Wrench	Shell locking bolt 1	Shell locking bolt 2	Torx bit	Shell locking bolt 3 (Optional parts)
TPM11R200, 250U...	SM35-114-H0	T-15DF	-	-	-	(C0.375X1.125H)
TPM11R300U...	SM35-114-H0	T-15DF	-	-	-	(C0.500X1.375H)
TPM11R400U...	SM35-114-H0	T-15DF	-	-	-	(TMBA-0.750H)
TPM16R300U...	CSTB-5L159	-	-	-	BT20S	(C0.500X1.375H)
TPM16R400, 500U...	CSTB-5L159	-	-	-	BT20S	(TMBA-0.750H)
TPM11R050, 063M...	SM35-114-H0	T-15DF	-	CM10X30H	-	-
TPM11R080M...	SM35-114-H0	T-15DF	-	CM12X30H	-	-
TPM11R100M...	SM35-114-H0	T-15DF	TMBA-M16H	-	-	-
TPM16R080M...	CSTB-5L159	-	-	CM12X30H	BT20S	-
TPM16R100M...	CSTB-5L159	-	TMBA-M16H	-	BT20S	-
TPM16R125M...	CSTB-5L159	-	TMBA-M20H	-	BT20S	-

Recommended clamping torque : SM35-114-H0 = 2.58 lbs-ft, 3.5 N-m, CSTB-5L159 = 3.69 lbs-ft, 5 N-m

Reference pages: Inserts → **H192**, Standard cutting conditions → **H193**

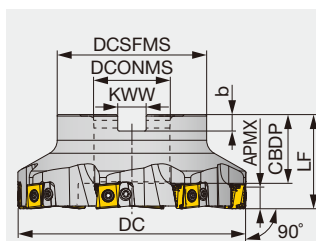


Fig.1

TPM16R160M40.0E...

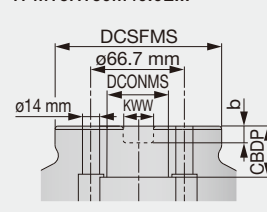


Fig.2

GAMP = +4.9° ~ +5°, GAMF = -17.5°

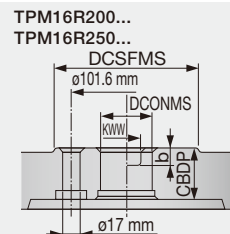


Fig.3

Right hand (R) shown.

Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Fig.
TPM16R160M50.8-08SA	15.1	160	8	100	63	50.8	46	19	11	4.6	Without	LMMU1609...	1
TPM16R160M40.0E08SA	15.1	160	8	100	63	40	29	16.4	9	4.37	Without	LMMU1609...	2
TPM16R200M47.6-10SA	15.1	200	10	130	63	47.625	38	25.4	14	6.4	Without	LMMU1609...	3
TPM16R200M60.0E10SA	15.1	200	10	130	63	60	38	25.7	14	5.9	Without	LMMU1609...	3
TPM16R250M47.6-12SA	15.1	250	12	130	63	47.625	38	25.4	14	13.2	Without	LMMU1609...	3
TPM16R250M60.0E12SA	15.1	250	12	130	63	60	38	25.7	14	12.7	Without	LMMU1609...	3

TGM16-SA

60° face mill (shell mill)

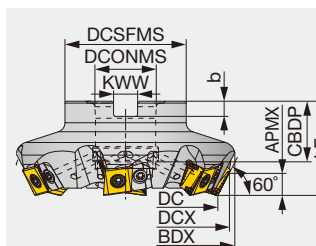


Fig.1

TGM16R160M40.0E...

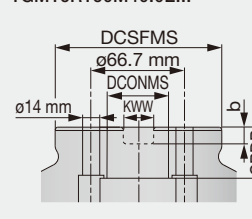


Fig.2

GAMP = +11.4° ~ +11.5°, GAMF = -13.5°

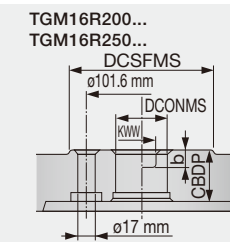


Fig.3

Right hand (R) shown.

Metric	APMX*	DC*	DCX*	BDX	CICT	DCSFMS	LF*	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Fig.
TGM16R100M31.7-06SA	12.4	100	115.3	115.5	6	64	50	31.75	32	12.7	8	1.8	With	LMMU1609...	1
TGM16R100M32.0E06SA	12.4	100	115.3	115.5	6	66	50	32	28.5	14.4	8	1.8	With	LMMU1609...	1
TGM16R125M38.1-07SA	12.4	125	140.3	140.6	7	80	63	38.1	38	15.9	10	3.5	With	LMMU1609...	1
TGM16R125M40.0E07SA	12.4	125	140.3	140.6	7	85	63	40	32	16.4	9	3.4	With	LMMU1609...	1
TGM16R160M50.8-08SA	12.4	160	175.3	174.9	8	100	63	50.8	46	19	11	5.8	Without	LMMU1609...	1
TGM16R160M40.0E08SA	12.4	160	175.3	174.9	8	100	63	40	29	16.4	9	5.5	Without	LMMU1609...	2
TGM16R200M47.6-10SA	12.4	200	215.3	217.2	10	130	63	47.625	38	25.4	14	7.7	Without	LMMU1609...	3
TGM16R200M60.0E10SA	12.4	200	215.3	217.2	10	130	63	60	38	25.7	14	7.2	Without	LMMU1609...	3
TGM16R250M47.6-12SA	12.4	250	265.3	267	12	130	63	47.625	38	25.4	14	14.8	Without	LMMU1609...	3
TGM16R250M60.0E12SA	12.4	250	265.3	267	12	130	63	60	38	25.7	14	14.4	Without	LMMU1609...	3

*The dimensions are true with 1.6 mm-radius inserts

SPARE PARTS

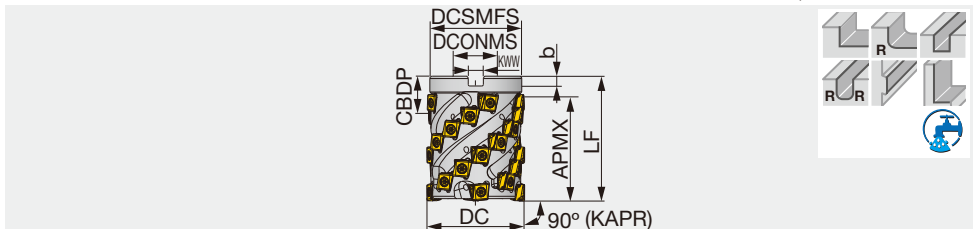
Designation	Clamping screw	Shim	Shim screw	Grip	Torx bit	Shell locking bolt
TPM16....	CSTB-5L159	SA-LMMU1609R	CSTB-5L159	H-TB	BT20S	-
TGM16R160...~250...	CSTB-5L159	SA-LMMU1609R	CSTB-5L159	H-TB	BT20S	TMBA-M16H
TGM16R100...	CSTB-5L159	SA-LMMU1609R	CSTB-5L159	H-TB	BT20S	TMBA-M20H

Recommended clamping torque : 5 N·m



Square shoulder mill for roughing, with screw clamp system

GAMP = +5° ~ +6°, GAMF = +9° ~ +13°



Inch	APMX	DC	ZEFP	CICT	DCSMFS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert
TLM11R200U0075A03	2.303	2.000	3	21	1.850	2.750	0.750	0.750	0.315	0.157	1.780	With	LMMU1107...
TLM11R250U0100A04	2.634	2.500	4	32	2.323	3.250	1.000	1.024	0.374	0.236	3.330	With	LMMU1107...

Metric	APMX	DC	ZEFP	CICT	DCSMFS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TLM11R050M22.0E03	58.5	50	3	21	47	70	22	20	10.4	6.3	0.8	With	LMMU1107...
TLM11R063M25.4-04	66.9	63	4	32	59	80	25.4	26	9.5	6	1.4	With	LMMU1107...
TLM11R063M27.0E04	66.9	63	4	32	59	80	27	22	12.4	7	1.4	With	LMMU1107...

Note: Coolant needs to be supplied from the end of the arbor inlay. Coolant cannot be supplied from the set bolt.

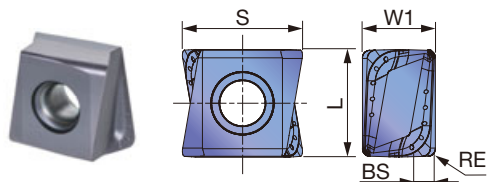
SPARE PARTS

Designation	Clamping screw	Wrench	Shell locking bolt
TLM11R200U0075A03	SM35-114-H0	T-15DF	SD06-A2
TLM11R250U0100A04	SM35-114-H0	T-15DF	SD08-52
TLM11R050M22.0E03	SM35-114-H0	T-15DF	SD06-A3
TLM11R063M...	SM35-114-H0	T-15DF	SD08-98

Recommended clamping torque : 2.58 lbs-ft, 3.5 N·m

INSERT

LMMU11/16-MJ



P	Steel	★	☆			☆
M	Stainless	★		☆		
K	Cast iron		★		☆	
N	Non-ferrous					
S	Superalloys	☆	★	☆		
H	Hard materials		★			

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated						S	L	W1	BS
			AH3135	AH725	AH120	AH140	T1215	T3225				
LMMU110708PNER-MJ	0.031	0.382	●	●	●	●	●	●	0.461	0.413	0.280	0.079
LMMU110716PNER-MJ	0.063	0.382	●	●	●	●	●	●	0.453	0.413	0.280	0.047
LMMU110724PNER-MJ	0.094	0.382		●	●	●			0.445	0.413	0.280	0.016
LMMU110732PNER-MJ	0.126	0.382		●	●	●			0.437	0.413	0.280	-
LMMU160908PNER-MJ	0.031	0.594	●	●	●	●	●	●	0.681	0.630	0.374	0.094
LMMU160916PNER-MJ	0.063	0.594	●	●	●	●			0.673	0.630	0.374	0.063
LMMU160924PNER-MJ	0.094	0.594		●	●	●			0.665	0.630	0.374	0.031
LMMU160932PNER-MJ	0.126	0.594		●	●	●			0.661	0.630	0.374	-

● : Line up

STANDARD CUTTING CONDITIONS

Bore, shank type

ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)	
							TPM16...	TGM16...
P	Low carbon steel 1015, etc.		- 200HB	First choice	AH3135	262 - 820	0.003 - 0.012	0.004 - 0.016
				Wear resistance	T3225	328 - 1148	0.003 - 0.012	0.004 - 0.016
	Carbon steel and alloy steel 1055, 4140, etc.		- 300HB	First choice	AH3135	262 - 820	0.003 - 0.012	0.004 - 0.016
				Wear resistance	T3225	328 - 1148	0.003 - 0.012	0.004 - 0.016
M	Prehardend steel NAK80, PX5, etc.		30 - 40HRC	First choice	AH3135	262 - 820	0.002 - 0.010	0.003 - 0.012
K	Stainless steel S30400, etc.		- 200HB	First choice	AH3135	262 - 656	0.002 - 0.010	0.003 - 0.012
				Wear resistance	T3225	328 - 820	0.002 - 0.010	0.003 - 0.012
	Gray cast iron No.250B, etc.		150 - 250HB	First choice	T1215	328 - 1148	0.003 - 0.012	0.004 - 0.016
				Fracture resistance	AH120	262 - 820	0.003 - 0.012	0.004 - 0.016
S	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250HB	First choice	AH120	262 - 820	0.002 - 0.012	0.004 - 0.016
				Wear resistance	T1215	328 - 1148	0.003 - 0.012	0.004 - 0.016
H	Titanium alloys Ti-6Al-4V, etc.		- 45HRC	First choice	AH3135	98 - 197	0.002 - 0.008	0.003 - 0.010
				Wear resistance	AH725	98 - 197	0.002 - 0.008	0.003 - 0.010
	Superalloys Inconel718, etc.		- 45HRC	First choice	AH725	66 - 164	0.0016 - 0.006	0.002 - 0.007
H	Hardened steel	H13, etc.	40 - 55HRC	First choice	AH3135	164 - 427	0.0012 - 0.007	0.002 - 0.008
				Wear resistance	AH725	164 - 427	0.0012 - 0.007	0.002 - 0.008
	Hardened steel	D2, etc.	55 - 60HRC	First choice	AH725	131 - 230	0.0012 - 0.004	0.0016 - 0.005

Roughing type

ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1015, etc.		- 200 HB	First choice	AH3135	328 - 820	0.004 - 0.010
				Wear resistance	T3225	492 - 1148	0.004 - 0.008
	Carbon steel and alloy steel 1055, 4140, etc.		- 300 HB	First choice	AH3135	328 - 656	0.004 - 0.008
				Wear resistance	T3225	492 - 984	0.004 - 0.008
M	Prehardend steel NAK80, PX5, etc.		30 - 40 HRC	First choice	AH3135	328 - 656	0.004 - 0.008
				Wear resistance	T3225	394 - 984	0.004 - 0.008
K	Stainless steel S30400, etc.		- 200 HB	First choice	AH3135	295 - 492	0.004 - 0.010
	Gray cast iron No.250B, etc.		150 - 250 HB	First choice	AH120	328 - 820	0.004 - 0.010
				Wear resistance	T1215	394 - 1148	0.004 - 0.010
S	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250 HB	First choice	AH120	328 - 656	0.004 - 0.010
				Wear resistance	T1215	394 - 1148	0.004 - 0.010
H	Titanium alloys Ti-6Al-4V, etc.		- 45HRC	First choice	AH725	66 - 164	0.002 - 0.006
	Superalloys Inconel718, etc.		- 45HRC	First choice	AH725	66 - 131	0.002 - 0.004
H	Hardened steel	H13, etc.	40 - 50 HRC	First choice	AH725	98 - 197	0.003 - 0.006
		D2, etc.	50 - 60 HRC	First choice	AH725	82 - 180	0.002 - 0.004

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

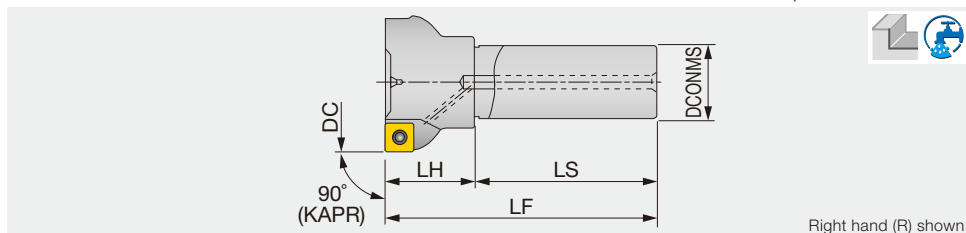
User's Guide

Index



Square shoulder endmill, shank type, with screw clamp system

GAMP = +11.5°, GAMF = -13° ~ -10.5°



Right hand (R) shown.

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPW13R032M32.0-02	10	32	2	32	80	35	115	0.6	With	SW*T1304...
EPW13R040M32.0-03	10	40	3	32	80	35	115	0.7	With	SW*T1304...
EPW13R050M32.0-03	10	50	3	32	80	40	120	0.9	With	SW*T1304...
EPW13R050M32.0-04	10	50	4	32	80	40	120	0.9	With	SW*T1304...
EPW13R063M32.0-04	10	63	4	32	80	40	120	1	With	SW*T1304...
EPW13R063M32.0-05	10	63	5	32	80	40	120	1	With	SW*T1304...
EPW13R080M32.0-04	10	80	4	32	80	40	120	1.3	With	SW*T1304...
EPW13R080M32.0-06	10	80	6	32	80	40	120	0.8	With	SW*T1304...

SPARE PARTS

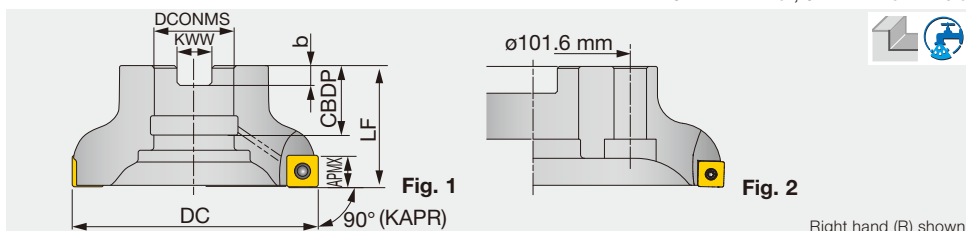
Designation	Clamping screw	Lubricant	Shim screw	Shim	Wrench	Wrench
EPW13R032, 040...	CSPB-3.5	M-1000	-	-	IP-15D	-
EPW13R050 - 080...	CSPB-3.5	M-1000	DTS5-3.5SS	FSSP1102	IP-15D	P-3.5

Recommended clamping torque : 3.5 N·m

TPW13

Square shoulder mill, with screw clamp system

GAMP = +11.5°, GAMF = -13° ~ -10.5°



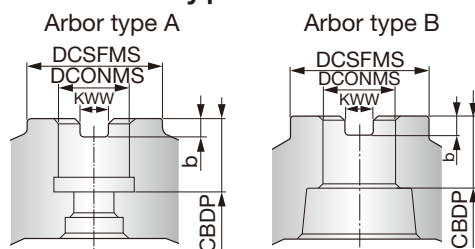
Right hand (R) shown.

Inch	APMX	DC	CICT	LF	DCONMS	CDBP	KWW	b	WT(lb)	Air hole	Insert	Arbor type	Fig.
TPW13R200U0075A03	0.394	2.000	3	1.575	0.750	0.750	0.315	0.197	0.660	With	SW*T1304...	A	1
TPW13R200U0075A04	0.394	2.000	4	1.575	0.750	0.750	0.315	0.197	0.660	With	SW*T1304...	A	1
TPW13R200U0075A05	0.394	2.000	5	1.575	0.750	0.750	0.315	0.197	0.660	With	SW*T1304...	A	1
TPW13R300U0100A04	0.394	3.000	4	1.969	1.000	1.024	0.374	0.236	1.760	With	SW*T1304...	A	1
TPW13R300U0100A06	0.394	3.000	6	1.969	1.000	1.024	0.374	0.236	1.540	With	SW*T1304...	A	1
TPW13R300U0100A08	0.394	3.000	8	1.969	1.000	1.024	0.374	0.236	1.760	With	SW*T1304...	A	1
TPW13R400U0150A05	0.394	4.000	5	1.969	1.500	1.378	0.626	0.394	3.530	With	SW*T1304...	B	1
TPW13R400U0150A07	0.394	4.000	7	1.969	1.500	1.378	0.626	0.394	3.310	With	SW*T1304...	B	1
TPW13R400U0150A10	0.394	4.000	10	1.969	1.500	1.378	0.626	0.394	3.310	With	SW*T1304...	B	1
TPW13R500U0150A06	0.394	5.000	6	2.480	1.500	1.457	0.626	0.394	5.510	With	SW*T1304...	B	1
TPW13R500U0150A08	0.394	5.000	8	2.480	1.500	1.457	0.626	0.394	5.290	With	SW*T1304...	B	1
TPW13R500U0150A12	0.394	5.000	12	2.480	1.500	1.457	0.626	0.394	5.510	With	SW*T1304...	B	1
TPW13R600U0200A08	0.394	6.000	8	2.480	2.000	1.496	0.748	0.433	7.940	Without	SW*T1304...	B	1
TPW13R600U0200A12	0.394	6.000	12	2.480	2.000	1.496	0.748	0.433	8.160	Without	SW*T1304...	B	1
TPW13R600U0200A15	0.394	6.000	15	2.480	2.000	1.496	0.748	0.433	8.160	Without	SW*T1304...	B	1

Reference pages: Inserts → **H196**

Metric	APMX	DC	CICT	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Fig.
TPW13R050M22.0-03	10	50	3	40	22	20	10	6	0.3	With	SW*T1304...	1
TPW13R050M22.0-04	10	50	4	40	22	20	10	6	0.3	With	SW*T1304...	1
TPW13R050M22.0E04	10	50	4	40	22	20	10.4	6.3	0.3	With	SW*T1304...	1
TPW13R050M22.0E05	10	50	5	40	22	20	10.4	6.3	0.3	With	SW*T1304...	1
TPW13R063M22.0-04	10	63	4	40	22	20	10	6	0.5	With	SW*T1304...	1
TPW13R063M22.0-05	10	63	5	40	22	20	10	6	0.5	With	SW*T1304...	1
TPW13R063M22.0E05	10	63	5	40	22	20	10.4	6.3	0.4	With	SW*T1304...	1
TPW13R063M22.0E06	10	63	6	40	22	20	10.4	6.3	0.4	With	SW*T1304...	1
TPW13R080M25.4-04	10	80	4	50	25.4	26	9.5	6	0.8	With	SW*T1304...	1
TPW13R080M25.4-06	10	80	6	50	25.4	26	9.5	6	0.8	With	SW*T1304...	1
TPW13R080M27.0E06	10	80	6	50	27	22	12.4	7	0.8	With	SW*T1304...	1
TPW13R080M27.0E08	10	80	8	50	27	22	12.4	7	0.8	With	SW*T1304...	1
TPW13R100M31.7-05	10	100	5	50	31.75	38	12.7	8	1.2	With	SW*T1304...	1
TPW13R100M31.7-07	10	100	7	50	31.75	38	12.7	8	1.2	With	SW*T1304...	1
TPW13R100M32.0E07	10	100	7	50	32	28.5	14.4	8	1.2	With	SW*T1304...	1
TPW13R100M32.0E10	10	100	10	50	32	28.5	14.4	8	1.2	With	SW*T1304...	1
TPW13R125M38.1-06	10	125	6	63	38.1	38	15.9	10	2.4	With	SW*T1304...	1
TPW13R125M38.1-08	10	125	8	63	38.1	38	15.9	10	2.4	With	SW*T1304...	1
TPW13R125M40.0E08	10	125	8	63	40	32	16.4	9	2.4	With	SW*T1304...	1
TPW13R125M40.0E12	10	125	12	63	40	32	16.4	9	2.5	With	SW*T1304...	1
TPW13R160M50.8-08	10	160	8	63	50.8	38	19	11	4	Without	SW*T1304...	1
TPW13R160M50.8-12	10	160	12	63	50.8	38	19	11	4	Without	SW*T1304...	1
TPW13R200M47.6-10	10	200	10	63	47.625	38	25.4	14	7.4	Without	SW*T1304...	2

Arbor type



SPARE PARTS

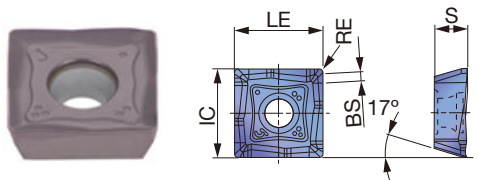
Designation	Clamping screw	Lubricant	Shim screw	Shell locking bolt 1	Shell locking bolt 2	Shim	Wrench 1	Wrench 2
TPW13R200U...	CSPB-3.5	M-1000	DTS5-3.5SS	-	C0.375X1.125H	FSSP1102	IP-15D	P-3.5
TPW13R300U...	CSPB-3.5	M-1000	DTS5-3.5SS	-	C0.500X1.375H	FSSP1102	IP-15D	P-3.5
TPW13R400, 500U...	CSPB-3.5	M-1000	DTS5-3.5SS	-	TMBA-0.750H	FSSP1102	IP-15D	P-3.5
TPW13R600U...	CSPB-3.5	M-1000	DTS5-3.5SS	-	-	FSSP1102	IP-15D	P-3.5
TPW13R050, 063M...	CSPB-3.5	M-1000	DTS5-3.5SS	-	CM10X30H	FSSP1102	IP-15D	P-3.5
TPW13R080M...	CSPB-3.5	M-1000	DTS5-3.5SS	-	CM12X30H	FSSP1102	IP-15D	P-3.5
TPW13R100M...	CSPB-3.5	M-1000	DTS5-3.5SS	TMBA-M16H	-	FSSP1102	IP-15D	P-3.5
TPW13R125M...	CSPB-3.5	M-1000	DTS5-3.5SS	TMBA-M20H	-	FSSP1102	IP-15D	P-3.5
TPW13R160, 200M...	CSPB-3.5	M-1000	DTS5-3.5SS	-	-	FSSP1102	IP-15D	P-3.5

Recommended clamping torque : 2.58 lbs-ft, 3.5 N-m

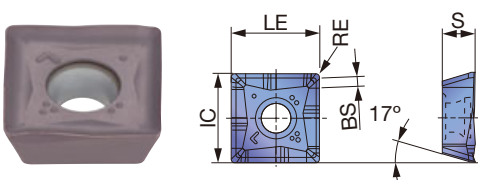


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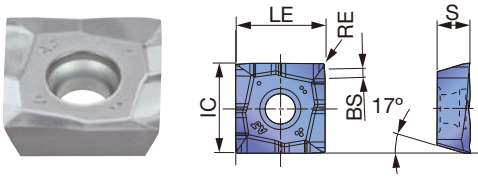
SWGT1304-MJ



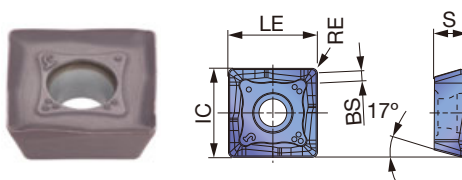
SWMT1304-ML



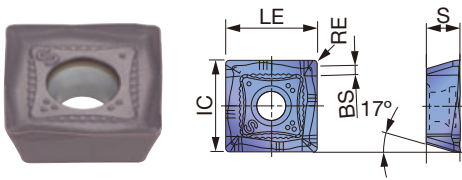
SWGT1304-AJ



SWMT1304-MJ



SWMT1304-MS



P	Steel	☆			★			☆	☆	★				
M	Stainless		★	☆	★				☆					
K	Cast iron	★				☆	★							
N	Non-ferrous								★			★		
S	Superalloys	★	☆											
H	Hard materials													

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated							Cermet	Uncoated								
			AH120	AH130	AH140	AH3135	T1115	T1215	T3130	T3225	DS1100	NS740	KS05F						
SWGT1304PDPR-MJ	0.031	0.394	●								●					0.535	0.535	0.197	0.055
SWMT1304PDPR-MJ	0.031	0.394	●	●	●	●	●	●	●	●	●					0.535	0.535	0.197	0.055
SWMT1304PDER-ML	0.031	0.394	●			●										0.535	0.535	0.197	0.055
SWMT1304PDPR-MS	0.031	0.394		●	●											0.535	0.535	0.197	0.055
SWGT1304PDFR-AJ	0.000	0.394								●		●				0.535	0.535	0.197	0.063

● : Line up

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



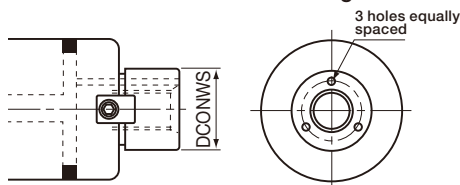
EPW13

e-catalog



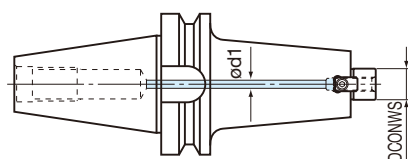
TPW13

Face mill arbors with center through-coolant hole



Cutter diameter DC (in)	2.000	3.000	4.000 5.000	6.000
Nominal diameter DCONWS (in)	0.750	1.000	1.500	2.000

Notes on arbors: when using TAW13 or TPW13 type, use through center air.

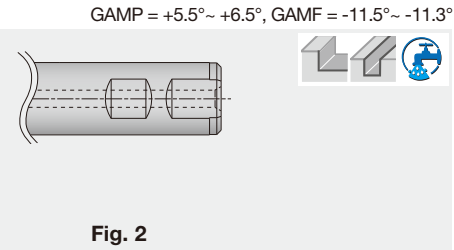
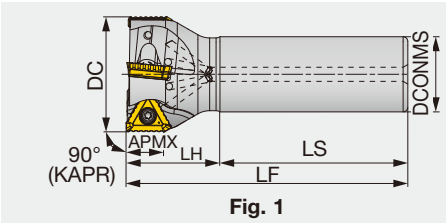


Nominal diameter DCONWS (in)	0.750	1.000	1.500	2.000
Applicable arbor types	FMC SM1	FMA FMC	FMA	FMA
Through hole diameter ød1 (in)	0.20 ~ 0.30	0.25 ~ 0.35	0.40 ~ 0.60	0.40 ~ 0.60

When using the TAW13 or TPW13 type with through center air (coolant or mist), the correct arbor must be used with through center air supplying.

Cautionary notes in use

- In slotting or pocketing, when chips are likely to remain in the cutting zone, internal air supplying or air blow is recommended to prevent chip recutting.
- Use of inserts other than those specified, can result in poor cutting and cause damage to the cutter body. Therefore, specified inserts from the Tungaloy catalogue must be used.
- Before changing or indexing the inserts, remove chips or other foreign matter from the insert, insert pocket and cutter body by using an air blast or cloth.
- The inserts should be clamped by using the wrench supplied with the TAC Mill.
- After a long period of use, the clamping screws and wrench may become deformed or damaged. These elements must be replaced as soon as possible.



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert	Fig.
EPTC16U2.00W1.25R04	0.630	2.000	4	1.250	2.250	2.250	4.500	1.700	With	TC*T16...	2

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert	Fig.
EPTC16M050C32.0R04	16	50	4	32	80	40	120	0.8	With	TC*T16...	1
EPTC16M050C42.0R02L	16	50	2	42	310	50	360	3.8	With	TC*T16...	1

SPARE PARTS

SPARE PARTS

				
Designation	Clamping screw	Grip	Lubricant	Torx bit
EPTC16...	TS 40B100I	H-TB2W	M-1000	BT15S

Recommended clamping torque: 2.58 lbs-ft, 3.5 N-m

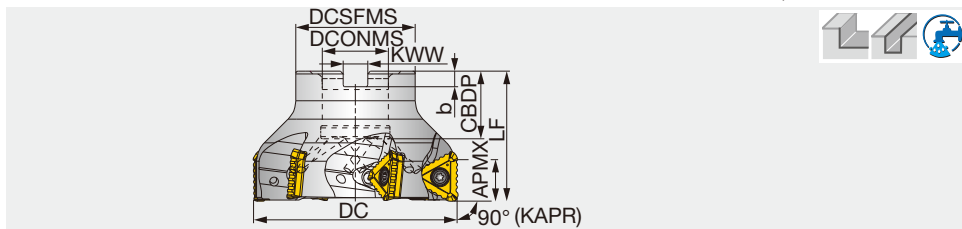


TUNG T^{RI}SHRED

TPTC16

Square shoulder mill, with screw clamp system, for shred inserts

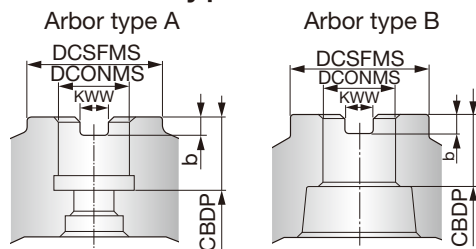
GAMP = +5.5° ~ +6.5°, GAMF = -11.5° ~ -11.3°



Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TPTC16U2.00B0.75R04	0.630	2.000	4	1.625	1.570	0.750	0.750	0.315	0.197	0.710	With	TC*T16...	A
TPTC16U2.50B0.75R05	0.630	2.500	5	2.125	1.570	0.750	0.750	0.315	0.197	1.260	With	TC*T16...	A
TPTC16U3.00B1.00R06	0.630	3.000	6	2.250	1.752	1.000	1.024	0.374	0.236	1.810	With	TC*T16...	A
TPTC16U4.00B1.50R07	0.630	4.000	7	3.000	2.000	1.500	1.193	0.626	0.394	3.170	With	TC*T16...	B

Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Arbor type
TPTC16M050B22.0R04	16	50	4	41	40	22	20	10.4	6.3	0.29	With	TC*T16...	A
TPTC16M063B22.0R05	16	63	5	41	40	22	20	10.4	6.3	0.44	With	TC*T16...	A
TPTC16J080B25.4R06	16	80	6	46	50	25.4	26	9.5	6	0.88	With	TC*T16...	A
TPTC16M080B27.0R06	16	80	6	50	50	27	22	12.4	7	0.9	With	TC*T16...	A
TPTC16J100B31.7R07	16	100	7	60	50	31.75	32	12.7	8	1.38	With	TC*T16...	A
TPTC16M100B32.0R07	16	100	7	60	50	32	28.5	14.4	8	1.35	With	TC*T16...	A

Arbor type

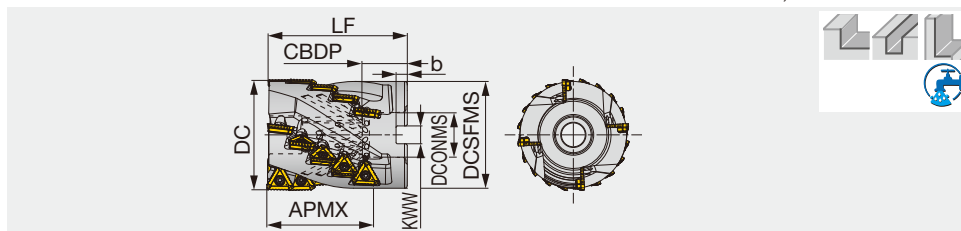


SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Torx bit	Shell locking bolt 3 (Optional parts)
TPTC16U2.00B0.75R04	TS 40B100I	H-TB2W	M-1000	-	TCS9.525-35-I	BT15S	-
TPTC16U2.50B0.75R05	TS 40B100I	H-TB2W	M-1000	-	-	BT15S	(C0.375X1.125H)
TPTC16U3.00B1.00R06	TS 40B100I	H-TB2W	M-1000	-	-	BT15S	(C0.500X1.375H)
TPTC16U4.00B1.50R07	TS 40B100I	H-TB2W	M-1000	-	-	BT15S	(TMBA-0.750H)
TPTC16M050B22.0R04	TS 40B100I	H-TB2W	M-1000	-	FSHM10-40H	BT15S	-
TPTC16M063B22.0R05	TS 40B100I	H-TB2W	M-1000	-	CM10X30H	BT15S	-
TPTC16*080B...	TS 40B100I	H-TB2W	M-1000	-	CM12X30H	BT15S	-
TPTC16*100B...	TS 40B100I	H-TB2W	M-1000	TMBA-M16H	-	BT15S	-

Recommended clamping torque : 2.58 lbs·ft, 3.5 N·m

Reference pages: Inserts, Standard cutting conditions → **H200**



Inch	APMX	DC	ZEFP	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert
LPTC16U2.50B1.00L2.4R03	2.402	2.500	3	12	2.350	3.350	1.000	1.024	0.374	0.236	2.820	With	TC*T16...
LPTC16U3.00B1.25L3.0R04	2.992	3.000	4	20	2.839	4.000	1.250	1.260	0.500	0.315	4.670	With	TC*T16...

Metric	APMX	DC	ZEFP	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
LPTC16J063B25.4L061R03	61	63	3	12	59	85	25.4	26	9.5	6	1.25	With	TC*T16...
LPTC16M063B27.0L061R03	61	63	3	12	59	85	27	22	12.4	7	1.24	With	TC*T16...
LPTC16J080B31.7L076R04	76	80	4	20	76	100	31.75	32	12.7	8	2.44	With	TC*T16...
LPTC16M080B32.0L076R04	76	80	4	20	76	100	32	25	14.4	8	2.46	With	TC*T16...

Note: Coolant needs to be supplied from the end of the arbor inlay. Coolant cannot be supplied from the set bolt.

SPARE PARTS



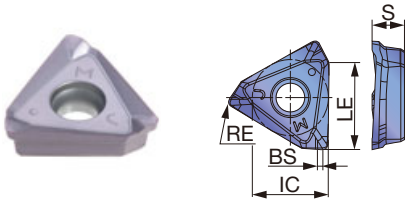
Designation	Clamping screw	Grip	Lubricant	Shell locking bolt	Torx bit
LPTC16U2.50B1.00L2.4R03	TS 40B100I	H-TB2W	M-1000	SD-08-C8	BT15S
LPTC16U3.00B1.25L3.0R04	TS 40B100I	H-TB2W	M-1000	SD-10-54	BT15S
LPTC16*063B...	TS 40B100I	H-TB2W	M-1000	CAP-CM12X1.75X50	BT15S
LPTC16*080B...	TS 40B100I	H-TB2W	M-1000	CM16X75	BT15S

Recommended clamping torque: 2.58 lbs-ft, 3.5 N-m

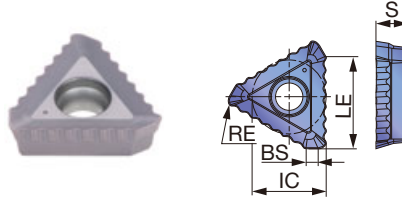


INSERT

TCGT-MJ



TCMT-NMJ



P	Steel	☆	★	☆
M	Stainless		★	
K	Cast iron	★		☆
N	Non-ferrous			
S	Superalloys	★	☆	
H	Hard materials			

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated				LE	IC	S	BS
			AH120	AH3135	T1215	T3225				
TCGT160608PDER-MJ	0.031	0.630	●	●			0.630	0.539	0.228	0.039
TCMT160620PDER-NMJ	0.079	0.630	●	●	●	●	0.630	0.524	0.228	0.079

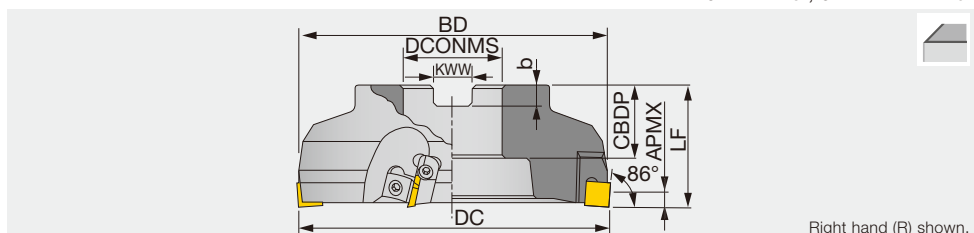
● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steels 1015, 1020, etc.	- 300 HB	First choice	AH3135	NMJ*	330 - 820	0.003 - 0.006
			Wear resistance	T3225	NMJ*	330 - 990	0.003 - 0.006
			For finishing	AH3135	MJ	330 - 820	0.003 - 0.008
	Carbon steels, Alloy steels 1055, 4140, etc.	- 300 HB	First choice	AH3135	NMJ*	330 - 760	0.003 - 0.006
			Wear resistance	T3225	NMJ*	330 - 920	0.003 - 0.006
			For finishing	AH3135	MJ	330 - 760	0.003 - 0.008
	Prehardened steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3135	NMJ*	330 - 590	0.003 - 0.006
			Wear resistance	T3225	NMJ*	330 - 200	0.003 - 0.006
			For finishing	AH3135	MJ	330 - 590	0.003 - 0.008
M	Stainless steels 304, 316, etc.	- 250 HB	First choice	AH3135	NMJ*	300 - 660	0.003 - 0.006
			Wear resistance	T3225	NMJ*	300 - 820	0.003 - 0.006
			For finishing	AH3135	MJ	300 - 660	0.003 - 0.008
K	Gray cast irons No.25, No.30, etc.	150 - 250 HB	First choice	AH120	NMJ*	460 - 820	0.003 - 0.006
			Wear resistance	T1215	NMJ*	490 - 980	0.003 - 0.006
			For finishing	AH120	MJ	460 - 820	0.003 - 0.010
	Ductile cast irons 60-40-18, 80-55-06, etc.	150 - 250 HB	First choice	AH120	NMJ*	460 - 820	0.003 - 0.006
			Wear resistance	T1215	NMJ*	490 - 980	0.003 - 0.006
			For finishing	AH120	MJ	460 - 820	0.003 - 0.010
S	Titanium alloys Ti-6Al-4V, etc.	-	First choice	AH120	NMJ*	70 - 200	0.003 - 0.006
			For finishing	AH120	MJ	70 - 200	0.003 - 0.007
	Heat-resistant alloys Inconel718, etc.	-	First choice	AH120	NMJ*	70 - 130	0.003 - 0.005
			For finishing	AH120	MJ	70 - 130	0.003 - 0.006

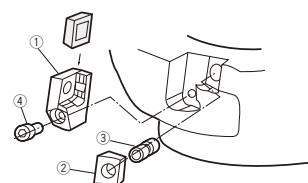
* When using the -NMJ chipbreaker, do not feed higher than 0.006 ipt.

86° face mill for aluminum machining, with wedge clamp system, for positive square inserts



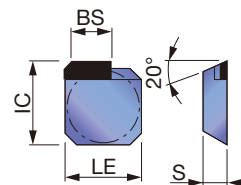
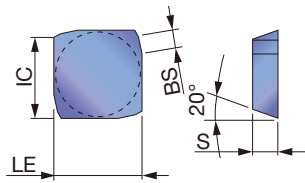
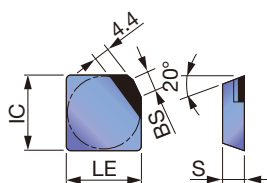
SPARE PARTS

Recommended clamping torque : 8 N·m



 INSERT

SECN42ZFR-DIA



P	Steel				
M	Stainless				
K	Cast iron				
N	Non-ferrous	★		★	
S	Superalloys				
H	Hard materials				

Designation	APMX	Uncoated	PCD									LE	IC	S	BS
		TH10	DX140												
SECN42ZFR-DIA	0.138		●									0.500	0.500	0.125	0.098
SECN42ZFR	0.236	●										0.500	0.500	0.125	0.098
SEEN42ZFR	0.236	●										0.500	0.500	0.125	0.098
WECN42ZFR-DIA	0.020		●									0.488	0.509	0.125	0.236

T-DIA is a diamond-based ultra high pressure sintered body. Available in 1-corner type.

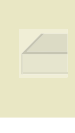
● : Line up

STANDARD CUTTING CONDITIONS

Please scan below.



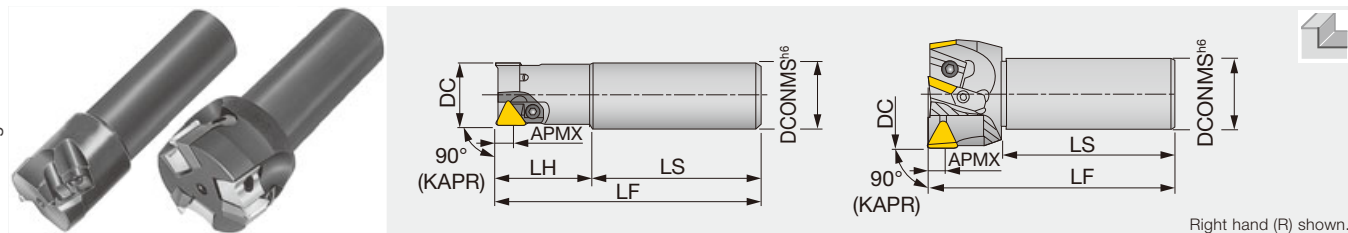
EPO07

High Feed
MillingFace
MillingShoulder
MillingSlot
MillingProfile
MillingChamfering,
CounterboreFinish
Face
Milling

ESE3000R

Square shoulder endmill, shank type, with wedge clamp system

GAMP = +17°, GAMF = +5°



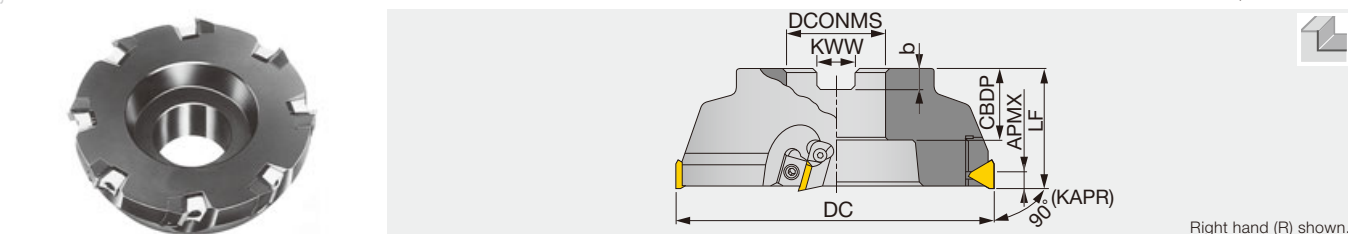
Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	Insert
ESE3020R	8	20	1	20	70	30	100	TE*N32/TEKR1603...
ESE3025R	8	25	1	25	80	35	115	TE*N32/TEKR1603...
ESE3030R	8	30	2	32	80	45	125	TE*N32/TEKR1603...
ESE3035R	8	35	2	32	80	45	125	TE*N32/TEKR1603...
ESE3040R	8	40	2	32	80	45	125	TE*N32/TEKR1603...
ESE3050R	8	50	3	32	80	-	115	TE*N32/TEKR1603...
ESE3063R	8	63	4	32	80	-	115	TE*N32/TEKR1603...

Note: The items do not have variable pitch.

TSE3000R

Square shoulder mill, with wedge clamp system

GAMP = +17°, GAMF = +5°



Metric	APMX	DC	CICT	LF	DCONMS	CBBDP	KWW	b	WT(kg)	Insert
TSE3050R	8	50	3	40	22	20	10	6	0.3	TE*N32/TEKR1603...
TSE3050R-E	8	50	3	40	22	20	10.4	6.3	0.3	TE*N32/TEKR1603...
TSE3063R	8	63	3	40	22	20	10	6	0.5	TE*N32/TEKR1603...
TSE3063RE	8	63	3	40	22	20	10.4	6.3	0.5	TE*N32/TEKR1603...
TSE3003RIA	8	80	4	50	25.4	26	9.5	6	1	TE*N32/TEKR1603...
TSE3003RIAE	8	80	4	50	27	26	12.4	7	1	TE*N32/TEKR1603...
TSE3004RIA	8	100	6	63	31.75	32	12.7	8	2	TE*N32/TEKR1603...
TSE3004RIA-E	8	100	6	63	32	32	14.4	8	2	TE*N32/TEKR1603...
TSE3005RIA	8	125	6	63	38.1	38	15.9	10	3.1	TE*N32/TEKR1603...
TSE3006RIA	8	160	8	63	50.8	38	19	11	5.2	TE*N32/TEKR1603...

TSE3050R/L and TSE3063R/L do not have variable pitch.

Approach
angle

SPARE PARTS

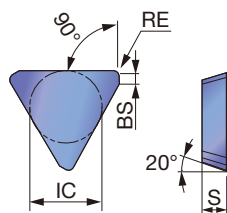
Designation	Clamp set	Locator	Wedge fixing screw	Locator fixing screw	Wedge1	Wedge 2	Wrench 1	Wrench 2
TSE3050R..., 63R... ESE3020R - ESE3040R	CSL-4	-	-	-	-	-	-	P-3
TSE300*RIA (E/-E)	-	LE303R	FDS-8S	CM4X0.7X12	WF330R	-	TP-4	-
ESE3050R, ESE3063R	-	LE302R	DS-8S	SHCM4-10	-	WP302R	TP-4	-

Recommended clamping torque : 8 N·m

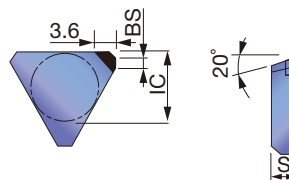
Reference pages: Inserts → **H174**

INSERT

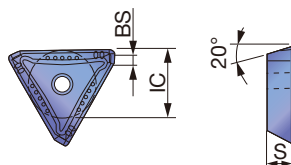
TECN/TEEN 32Z



TECN32ZFR-DIA



TEKR16-MS



P Steel	★			☆	☆		☆	★		☆	★	☆	☆					
M Stainless		★	☆					★		☆								
K Cast iron	★						☆			★								
N Non-ferrous															★	★		
S Superalloys	★	☆																
H Hard materials																		

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated										Cermet	Uncoated	PCD	IC	S	BS
			AH120	AH130	AH140	AH330	GH330	T1115	T3130	AH3135	T1215	T3225	NS740	N308	UX30	TH10	DX140	
TECN32ZFR	-	0.315														●		0.375 0.125 0.054
TECN32ZTR	0.031	0.315											●	●	●			0.375 0.125 0.039
TEEN32ZFR	-	0.315														●		0.375 0.125 0.054
TEEN32ZTR	0.031	0.315	●	●	●	●	●	●	●	●	●	●	●	●	●			0.375 0.125 0.039
TECN32ZFR-DIA	-	0.098														●		0.375 0.125 0.054
TEKR1603PEPR-MS	-	0.315		●														0.375 0.125 0.059

Note: T-DIA is a diamond-based ultra high pressure sintered body. Available in 1-corner type.

● : Line up
DX140: 1 piece per package

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



ESE3000R

e-catalog



TSE3000R

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

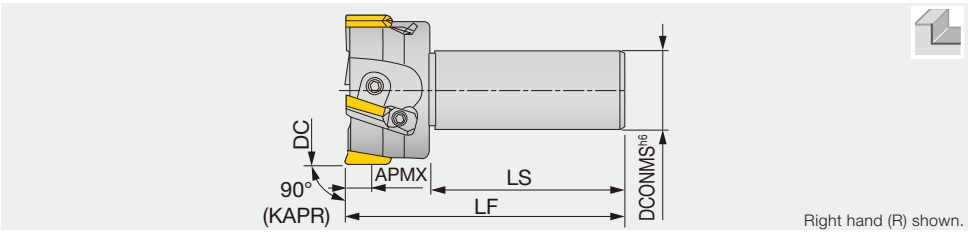
Index



ESE4000R

Square shoulder endmill, shank type, with wedge clamp system

GAMP = +17°, GAMF = +1° ~ +4°



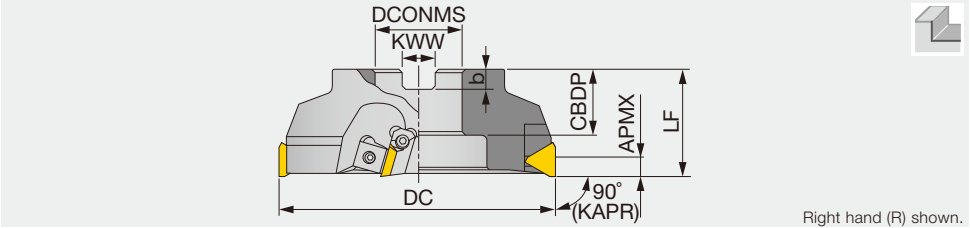
Metric	APMX	DC	CICT	DCONMS	LS	LF	Insert
ESE4050RA	10	50	3	32	80	115	TE*N43/TEKR2204...
ESE4063RA	10	63	4	32	80	115	TE*N43/TEKR2204...
ESE4003RIA-S32	10	80	4	32	80	120	TE*N43/TEKR2204...

ESE4050RA and ESE4063RA do not have variable pitch.

TSE4000RIAU

Square shoulder mill, with wedge clamp system

GAMP = +17°, GAMF = +5°



Inch	APMX	DC	CICT	LF	DCONMS	CBDP	KWW	b	WT(lb)
TSE4003RIAU	0.394	3.150	4	1.970	1.000	1.020	0.375	0.236	2.20
TSE4004RIAU	0.394	4.000	6	2.480	1.500	1.260	0.500	0.394	4.19
TSE4005RIAU	0.394	4.920	6	2.480	1.500	1.500	0.625	0.394	6.39
TSE4006RIAU	0.394	6.300	8	2.480	2.000	1.500	0.750	0.433	10.80
TSE4008RIA	0.394	7.870	10	2.480	2.500	1.500	1.000	0.551	16.31
TSE4010RIA	0.394	9.840	12	2.480	2.500	1.500	1.000	0.551	30.42
TSE4012RIA	0.394	12.400	14	2.480	2.500	1.500	1.000	0.551	48.72

SPARE PARTS

Designation	Locator	Wedge fixing screw	Locator fixing screw	Wedge	Wrench	Shell locking bolt	Shell locking bolt (Optional parts)
ESE4050RA	LE402AR	DS-8S	-	WT402R	TP-4	SHCM4-10	-
ESE4063RA	LE402AR	DS-8	-	WT402R	TP-4	SHCM4-10	-
ESE4003RIA-S32	LE403R	FDS-8S	CM4X0.7X14	WF330N	TP-4	-	-
TSE4003RIAU	LE403R	FDS-8S	CM4X0.7X14	WF330N	TP-4	-	(C0.500X1.375H)
TSE4004RIAU	LE403R	FDS-8S	CM4X0.7X14	WF330N	TP-4	-	(TMBA-0.750H)
TSE4005RIAU	LE405R	FDS-8S	CM4X0.7X14	WF500R	TP-4	-	(TMBA-0.750H)
TSE4006 - 4012...	LE405R	FDS-8S	CM4X0.7X14	WF500R	TP-4	-	-

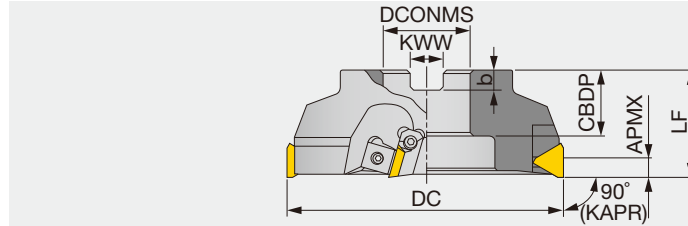
Recommended clamping torque : 5.9 lbs-ft, 8 N·m

Reference pages: Inserts → **H206**

TSE4000RIA

Square shoulder mill, with wedge clamp system

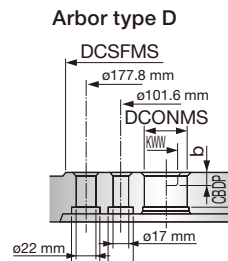
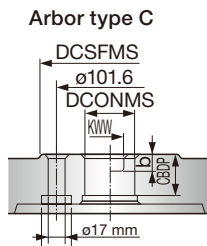
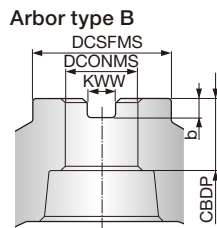
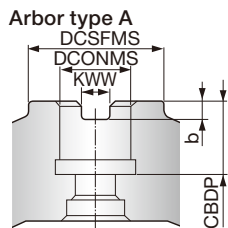
GAMP = +17°, GAMF = +5°



Right hand (R) shown.

Metric	APMX	DC	CICT	LF	DCONMS	CDBP	KWW	b	WT(kg)	Arbor type
TSE4003RIA	10	80	4	50	25.4	22	9.5	60	1	A
TSE4004RIA	10	100	6	63	31.75	32	12.7	80	1.9	A
TSE4005RIA	10	125	6	63	38.1	38	15.9	100	2.9	B
TSE4006RIA	10	160	8	63	50.8	38	19	110	4.9	B
TSE4008RIA	10	200	10	63	47.625	38	25.4	140	7.4	C
TSE4010RIA	10	250	12	63	47.625	38	25.4	140	13.8	C
TSE4012RIA	10	315	14	63	47.625	38	25.4	140	22.1	D
TSE4003RIAE	10	80	4	50	27	26	12.4	70	1	A
TSE4004RIAE	10	100	6	63	32	32	14.4	80	1.9	A
TSE4005RIAE	10	125	6	63	40	32	16.4	90	2.9	B
TSE4006RIAE	10	160	8	63	40	29	16.4	90	4.9	B

Arbor type



SPARE PARTS

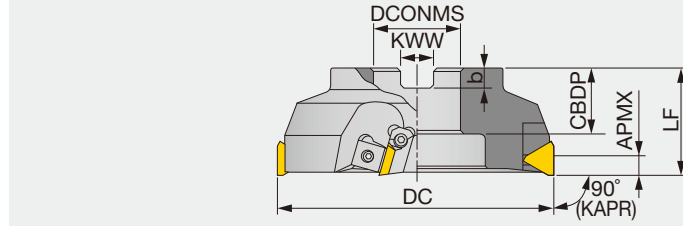
Designation	Locator	Wedge fixing screw	Locator fixing screw	Shell locking bolt	Wedge	Wrench
TSE4003RIA	LE403R	FDS-8SS	CM4X0.7X14	CAP-CM12X1.75X30	WF330N	TP-4
TSE4004RIA	LE403R	FDS-8S	CM4X0.7X14	CAP-CM16X2.0X40	WF330N	TP-4
TSE4005 - 12...	LE405R	FDS-8S	CM4X0.7X14	-	WF500R	TP-4
TSE4003RIAE, TSE4004RIAE	LE403R	FDS-8S	CM4X0.7X14	-	WF330N	TP-4
TSE4005RIAE, TSE4006RIAE	LE405R	FDS-8S	CM4X0.7X14	-	WF500R	TP-4

Recommended clamping torque : 8 N·m

TSP4000RIA-U

Square shoulder mill, with wedge clamp system, for positive triangular inserts

GAMP = +5°, GAMF = 0°



Right hand (R) shown.

Inch	APMX	DC	CICT	LF	DCONMS	CBDP	KWW	b	WT(lb)	Insert
TSP4003RIA-U	0.394	3.150	4	1.970	1.000	1.020	0.375	0.236	2.43	TP*N43 / TP*R...
TSP4004RIA-U	0.394	4.000	6	2.480	1.500	1.260	0.625	0.394	4.41	TP*N43 / TP*R...
TSP4005RIA-U	0.394	4.920	6	2.480	1.500	1.500	0.625	0.394	6.83	TP*N43 / TP*R...
TSP4006RIA-U	0.394	6.300	8	2.480	2.000	1.500	0.750	0.433	11.24	TP*N43 / TP*R...
TSP4008RIA-U	0.394	7.870	10	2.480	2.500	1.500	1.000	0.551	16.98	TP*N43 / TP*R...
TSP4010RIA	0.394	9.840	12	2.480	2.500	1.500	1.000	0.551	31.08	TP*N43 / TP*R...
TSP4012RIA	0.394	12.400	14	2.480	2.500	1.500	1.000	0.551	49.82	TP*N43 / TP*R...

SPARE PARTS



Designation	Locator	Wedge	Wedge fixing screw	Locator fixing screw	Wrench	Shell locking bolt (Optional parts)
TSP4003RIA-U	LP403R	WF330N	FDS-8S	CM4X0.7X14	TP-4	(C0.500X1.375H)
TSP4004RIA-U	LP403R	WF330N	FDS-8S	CM4X0.7X14	TP-4	(TMBA-0.750H)
TSP4005RIA-U	LP405R	WF500R	FDS-8S	CM4X0.7X14	TP-4	(TMBA-0.750H)
TSP4006 - 4012...	LP405R	WF500R	FDS-8S	CM4X0.7X14	TP-4	-

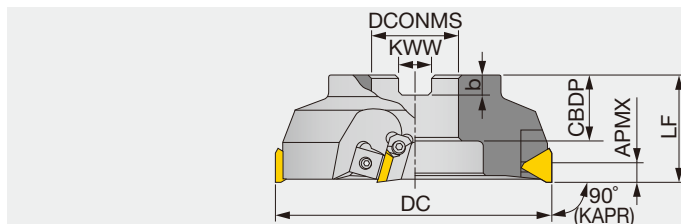
Recommended clamping torque : 5.9 lbs-ft



TSP4000IA

Square shoulder mill, with wedge clamp system

GAMP = +5°, GAMF = 0°



Right hand (R) shown.

Metric	APMX	DC	CICT	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
TSP4003RIA	10	80	4	50	25.4	26	9.5	6	1.1	TP*N43 / TP*R...
TSP4004RIA	10	100	6	63	31.75	32	12.7	8	2	TP*N43 / TP*R...
TSP4005RIA	10	125	6	63	38.1	38	15.9	10	3.1	TP*N43 / TP*R...
TSP4006RIA	10	160	8	63	50.8	38	19	11	5.1	TP*N43 / TP*R...
TSP4008RIA	10	200	10	63	47.625	38	25.4	14	7.7	TP*N43 / TP*R...
TSP4010RIA	10	250	12	63	47.625	38	25.4	14	14.1	TP*N43 / TP*R...
TSP4012RIA	10	315	14	63	47.625	38	25.4	14	22.6	TP*N43 / TP*R...

SPARE PARTS



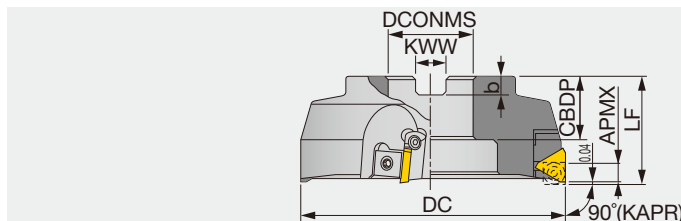
Designation	Locator	Wedge fixing screw	Locator fixing screw	Shell locking bolt	Wedge	Wrench
TSP4003RIA	LP403R	FDS-8S	CM4X0.7X14	CAP-CM12X1.75X30	WF330N	TP-4
TSP4004RIA	LP403R	FDS-8S	CM4X0.7X14	CAP-CM16X2.0X40	WF330N	TP-4
TSP40**RIA	LP405R	FDS-8S	CM4X0.7X14	-	WF500R	TP-4

Recommended clamping torque : 8 N·m

TFP4000IA

Square shoulder mill with finisher

GAMP = +5°, GAMF = 0°



Right hand (R) shown.

Metric	APMX	DC	CICT	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
TFP4004RIA	10	100	5	63	31.75	32	12.7	8	2	TP*N43 / TP*R...
TFP4005RIA	10	125	6	63	38.1	38	15.9	10	3.1	TP*N43 / TP*R...
TFP4006RIA	10	160	8	63	50.8	38	19	11	5.2	TP*N43 / TP*R...
TFP4008RIA	10	200	10	63	47.625	38	25.4	14	7.9	TP*N43 / TP*R...

A SPARE PARTS FOR FINISHING INSERT



Designation	Clamping screw	Locator	Wedge fixing screw	Locator fixing screw1	Locator fixing screw2	Wedge	Wrench 1	Wrench 2
TFP40...	CSTA-5S	LW400R	FDS-8S	CM4X0.7X14	CM5X0.8X16	FW-305	T-15D	TP-4

Recommended clamping torque : 8 N·m

B SPARE PARTS FOR REGULAR INSERT

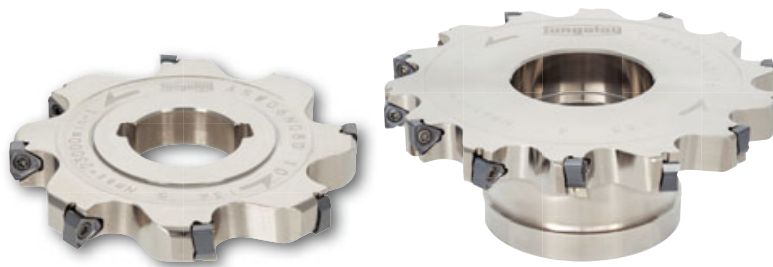


Designation	Clamping screw	Wedge fixing screw	Locator fixing screw	Wedge	Wrench
TFP4004RIA	LP403R	FDS-8S	CM4X0.7X14	WF330N	TP-4
TFP4005 - 08...	LP405R	FDS-8S	CM4X0.7X14	WF500R	TP-4

Recommended clamping torque : 8 N·m



TUNGUSLOT^{NIVERSAL}

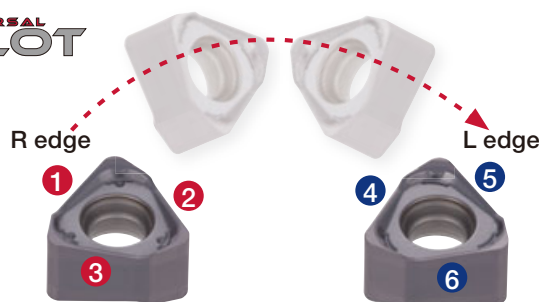


High economy by 6-corner insert with wiper
Machining stability with the cutter design for optimum chip evacuation

High economy by 6-corner insert

6-corner insert provides economical advantage. Self-wiper edge delivers good surface quality.

TUNGUSLOT
6 corners
with wiper



ASW / TSW
CW = 0.394", 0.472", 0.551", 0.630"

Excellent chip evacuation even in deep slot milling - optimum pocket design

TUNGUSLOT

OK



Optimum chipbreaker and big gullets create compact chip formation and smooth evacuation!

Competitor

X



Unformed chip and narrow gullet cause chip packing.

TUNGUSLOT ASW / TSW type

P Steel 1055 (200HB)
Edge width: CW = 0.394", Dry
Corner radius: RE = 0.031"

Cutter	Depth of slot: ae (in)		
	0.394"	0.787"	1.181"
TUNGUSLOT	○	○	○
Competitor A	○	○	✗

Chips at ae = 1.181" depth

TUNGUSLOT



Competitor A

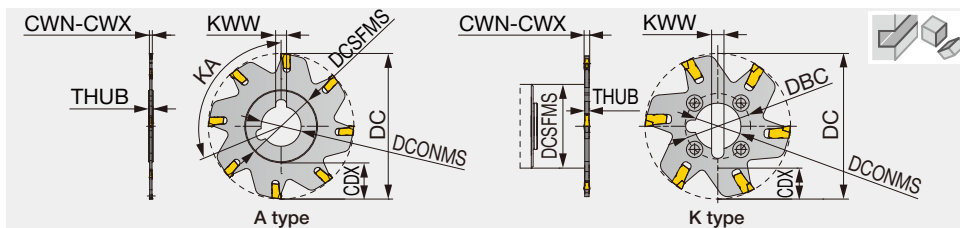


Packed chips



Chips are packed because of bad chip control and flow.

Reference pages: **H217 - H219**



Metric	CW	CWN*	CWX	DC	CICT	Seat size	CDX	DCONMS	THUB	DCSFMS	DBC	KA	KWW	SS	SS	Drive flange	Key	Insert
SSG01R063-E1.6	1.6	1.5	1.79	63	6	1	14	10	2.4	32	22	-	3	SW25-32	SW1.00-32	-	K	SSM1*N/SSS1*N
SSG02R063-E2	2.2	1.8	2.69	63	6	2	15	10	2.4	32	22	-	3	SW25-32	SW1.00-32	-	K	SSM2*N/SSS2*N
SSG03R063-E3	3.1	2.7	3.53	63	5	3	15	10	2.4	32	22	-	3	SW25-32	SW1.00-32	-	K	SSM3*N/SSS3*N
SSG04R063-E4	4.1	3.54	4.52	63	5	4	15	10	3.2	32	22	-	3	SW25-32	SW1.00-32	-	K	SSM4*N/SSS4*N
ASG01N076-1.6	1.6	1.5	1.79	76.2	8	1	14	25.4	2.4	39	-	112.5	6.35	-	-	-	A	SSM1*N/SSS1*N
ASG02N076-2	2.2	1.8	2.69	76.2	8	2	17	25.4	2.4	39	-	112.5	6.35	-	-	-	A	SSM2*N/SSS2*N
ASG01N080-E1.6	1.6	1.5	1.79	80	8	1	16	22	2.4	39	-	112.5	6	-	-	-	A	SSM1*N/SSS1*N
ASG02N080-E2	2.2	1.8	2.69	80	8	2	20	22	2.4	39	-	112.5	6	-	-	-	A	SSM2*N/SSS2*N
SSG03R080-3	3.1	2.7	3.53	80	6	3	16	25.4	2.4	46	36	-	6.35	SW32-25.4-46-J	SW1.25-46	R1.00-46	K	SSM3*N/SSS3*N
SSG03R080-E3	3.1	2.7	3.53	80	6	3	19 ⁽²⁾	22	2.4	40 ⁽¹⁾	32	-	6	SW32-40	-	R 22-46	K	SSM3*N/SSS3*N
SSG04R080-4	4.1	3.54	4.52	80	6	4	16	25.4	3.2	46	36	-	6.35	SW32-25.4-46-J	SW1.25-46	R1.00-46	K	SSM4*N/SSS4*N
SSG04R080-E4	4.1	3.54	4.52	80	6	4	19 ⁽²⁾	22	3.2	40 ⁽¹⁾	32	-	6	SW32-40	-	R 22-46	K	SSM4*N/SSS4*N
ASG01N100-1.6	1.6	1.5	1.79	100	10	1	30	25.4	2.4	39	-	90	6.35	-	-	-	A	SSM1*N/SSS1*N
ASG01N100-E1.6	1.6	1.5	1.79	100	10	1	30	22	2.4	39	-	90	6	-	-	-	A	SSM1*N/SSS1*N
ASG02N100-2	2.2	1.8	2.69	100	10	2	30	25.4	2.4	39	-	90	6.35	-	-	-	A	SSM2*N/SSS2*N
ASG02N100-E2	2.2	1.8	2.69	100	10	2	30	22	2.4	39	-	90	6	-	-	-	A	SSM2*N/SSS2*N
SSG03R100-3	3.1	2.7	3.53	100	6	3	26	25.4	2.4	46	36	-	6.35	SW32-25.4-46-J	SW1.25-46	R1.00-46	K	SSM3*N/SSS3*N
SSG03R100-E3	3.1	2.7	3.53	100	6	3	29 ⁽³⁾	22	2.4	40 ⁽¹⁾	32	-	6	SW32-40	-	R 22-46	K	SSM3*N/SSS3*N
SSG04R100-4	4.1	3.54	4.52	100	6	4	26	25.4	3.2	46	36	-	6.35	SW32-25.4-46-J	SW1.25-46	R1.00-46	K	SSM4*N/SSS4*N
SSG04R100-E4	4.1	3.54	4.52	100	6	4	29 ⁽³⁾	22	3.2	40 ⁽¹⁾	32	-	6	SW32-40	-	R 22-46	K	SSM4*N/SSS4*N
ASG01N125-1.6 ⁽⁴⁾	1.6	1.5	1.79	125	12	1	30	31.75	2.4	64	-	75	7.92	-	-	-	A	SSM1*N/SSS1*N
ASG01N125-E1.6 ⁽⁴⁾	1.6	1.5	1.79	125	12	1	30	27	2.4	64	-	75	7	-	-	-	A	SSM1*N/SSS1*N
ASG02N125-2 ⁽⁴⁾	2.2	1.8	2.69	125	12	2	32	31.75	2.4	60	-	75	7.92	-	-	-	A	SSM2*N/SSS2*N
ASG02N125-E2 ⁽⁴⁾	2.2	1.8	2.69	125	12	2	32	27	2.4	60	-	75	7	-	-	-	A	SSM2*N/SSS2*N
SSG03R125-3 ⁽⁴⁾	3.1	2.7	3.53	125	8	3	34	31.75	2.4	55	45	-	7.92	-	-	R1.25-55	K	SSM3*N/SSS3*N
SSG03R125-E3 ⁽⁴⁾	3.1	2.7	3.53	125	8	3	34	32	2.4	55	45	-	8	S32-55	-	R 32-55	K	SSM3*N/SSS3*N
SSG04R125-4 ⁽⁴⁾	4.1	3.54	4.52	125	8	4	34	31.75	3.2	55	45	-	7.92	-	-	R1.25-55	K	SSM4*N/SSS4*N

- (1) When using a drive flange, DCSFMS = 46 mm
 (2) When using a drive flange, CDX = 16 mm
 (3) When using a drive flange, CDX = 26 mm
 (4) Cutters ø125 mm, only one keyway.

CW = When standard inserts are mounted.
 CWN, CWX = When special inserts are mounted.
 Since a single insert cuts the full groove width, use the insert whose width is equal to the groove width in the application.
 CWN** and CWX** shows the min and Max width of insert that can be positioned on the cutter. The CW dimension depends on the insert width chosen.

Tolerance of slot width*

±0.1

*Just for reference

SPARE PARTS

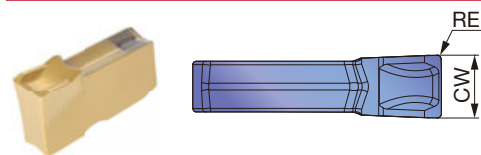
Designation	Grip	Extractor
SSG01/02..., ASG01/02...	ESG0.5	-
SSG03/04...	-	ESG1

Reference pages: Inserts, Standard cutting conditions → **H212**

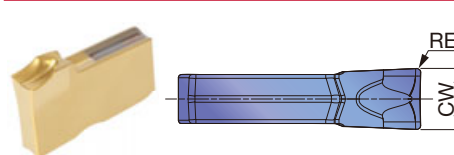


INSERT

SSM



SSS



P	Steel	★
M	Stainless	★
K	Cast iron	★
N	Non-ferrous	
S	Superalloys	
H	Hard materials	

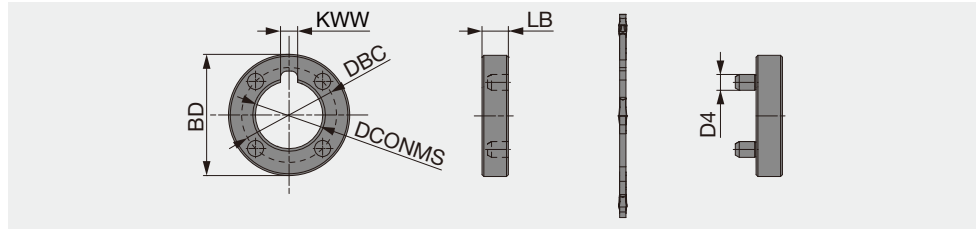
★ : First choice
☆ : Second choice

Designation	RE	Coated										CW±0.0016"
		GH130										
SSM22N	0.008	●										0.087
SSM31N	0.008	●										0.122
SSM41N	0.010	●										0.161
SSS16N	0.006	●										0.063
SSS22N	0.008	●										0.087
SSS31N	0.008	●										0.122
SSS41N	0.010	●										0.161

● : Line up

STANDARD CUTTING CONDITIONS

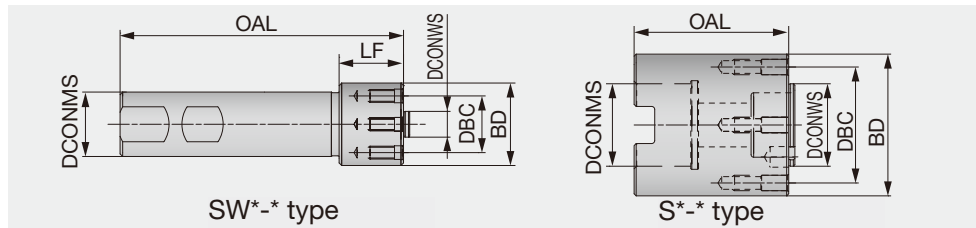
ISO	Workpiece material	Hardness (HB)	Insert	Cutting speed Vc (sfm)	Chip thickness t (in)
P	Low carbon steel 1015, etc.	- 200	SSM...	490 - 760	0.0020 - 0.006
	High carbon steel 1045, etc.	200 - 300	SSM...	330 - 560	0.0016 - 0.005
	Alloy steel 4140, etc.	150 - 300	SSM...	300 - 530	0.0016 - 0.005
	Tool steel D2, etc.	- 300	SSM...	230 - 390	0.0016 - 0.005
M	Stainless steel 304, etc.	- 200	SSS...	300 - 660	0.0016 - 0.005
K	Gray cast iron No250B, etc.	150 - 250	SSM...	330 - 660	0.0020 - 0.006
	Ductile cast iron 65-45-12, etc.	150 - 250	SSM...	260 - 430	0.0020 - 0.006



Inch	DCONMS	BD	D4	DBC	LB	KWW
R1.00-46	1.000	1.811	0.197	1.417	0.394	0.250
R1.25-55	1.250	2.165	0.236	1.772	0.394	0.236
Metric	DCONMS	BD	D4	DBC	LB	KWW
R22-46	22	46	6	32	10	6
R1.00-46	25.4	46	5	36	10	6.35
R1.25-55	31.75	55	6	45	10	7.92
R32-55	32	55	6	45	10	8

SW

Drive shank for side cutters



Inch	DCONMS	DCONMS	DCONWS	BD	DBC	LF	OAL
SW1.00-32	1.000	-	0.394	1.260	0.866	1.000	4.331
SW1.25-46	1.250	-	1.000	1.811	1.417	1.181	4.724
S1.25-55	-	1.250	1.250	2.165	1.772	-	2.362
Metric	DCONMS	DCONMS	DCONWS	BD	DBC	LF	OAL
SW25-32	25	-	10	32	22	25	110
SW1.00-32	25.4	-	10	32	22	25.4	110
SW1.25-46	31.75	-	25.4	46	36	30	120
SW32-40	32	-	22	40	32	30	120
SW32-25.4-46-J	32	-	25.4	46	36	30	120
S32-55	-	32	32	55	45	-	60

SPARE PARTS



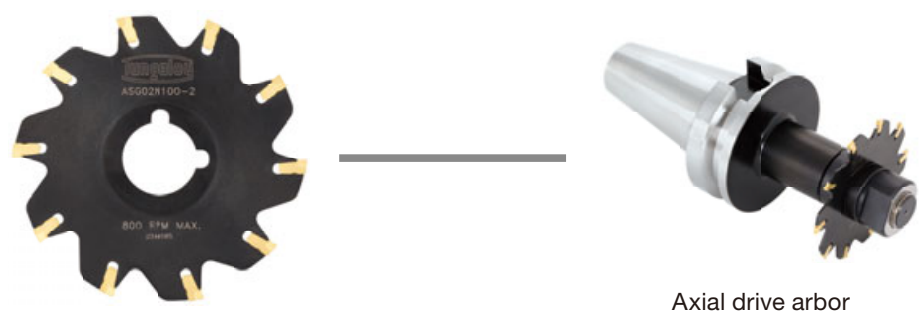
Designation	Screw	Mono block type	Wrench Torx bit	Grip
SW1.00-32	SR76-961	SETT-15/5	-	-
SW1.25-46	SR76-963	SETT-15/5	-	-
S1.25-55	SR76-943	-	BT20M	H-TB
SW25-32, SW1.00-32	SR76-961	SETT-15/5	-	-
SW32-40, SW32-25.4-46-J, SW1.25-46	SR76-963	SETT-15/5	-	-
S32-55	SR76-943	-	BT20M	H-TB



COMBINATION OF ARBORS / ATTACHMENTS

Cutter bodies : “A” type

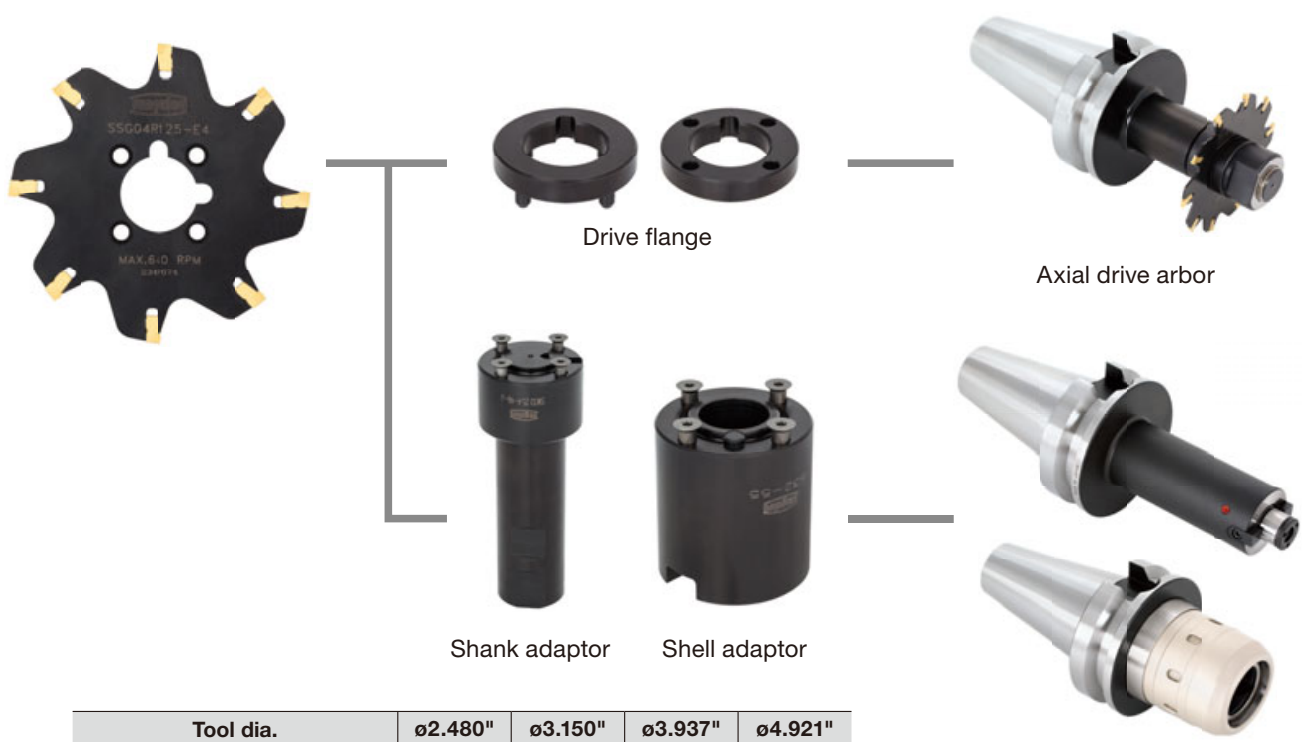
A-type disk cutters are without clamping holes on the hub and can be mounted only by using axial drive arbors.



Axial drive arbor

Cutter bodies : “K” type

K-type disk cutters are with clamping holes on the hub and can be mounted by using intermediate shanks or shell adaptors, making it possible to use endmills / shell mill arbors.



Drive flange

Axial drive arbor

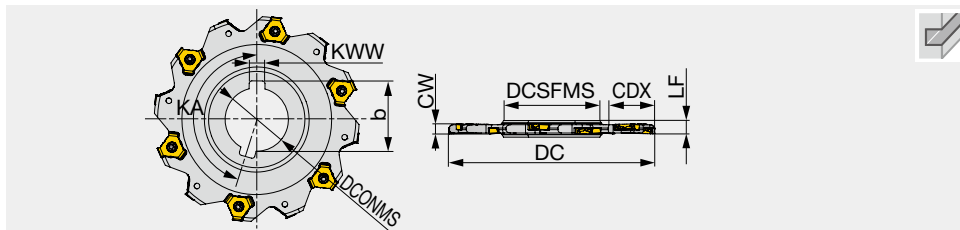
Shank adaptor

Shell adaptor

Shell mill / Endmill arbor

Tool dia.	ø2.480"	ø3.150"	ø3.937"	ø4.921"
Drive flange	-	✓	✓	✓
Shank / Shell adaptor	✓	✓	✓	✓

Axial drive slot mill, for tangentially mounted inserts



Inch	CW*	DC	ZEFP/CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	KA	Insert
ASV04N300-U025	0.250	3.000	4/8	1.614	1.000	0.394	1.102	0.250	0.595	157.5	TVKX04H3...
ASV05N300-U031	0.313	3.000	4/8	1.614	1.000	0.472	1.102	0.250	0.595	157.5	TVKX0504...
ASV04N400-U025	0.250	4.000	5/10	1.890	1.250	0.394	1.386	0.312	0.957	162	TVKX04H3...
ASV05N400-U031	0.313	4.000	5/10	1.890	1.250	0.472	1.386	0.312	0.957	162	TVKX0504...
ASV04N500-U025	0.250	5.000	6/12	2.283	1.500	0.394	1.665	0.375	1.260	165	TVKX04H3...
ASV05N500-U031	0.313	5.000	6/12	2.283	1.500	0.472	1.665	0.375	1.260	165	TVKX0504...
ASV04N600-U025	0.250	6.000	8/16	2.283	1.500	0.394	1.665	0.375	1.760	168.75	TVKX04H3...
ASV05N600-U031	0.313	6.000	8/16	2.283	1.500	0.472	1.665	0.375	1.760	168.75	TVKX0504...
ASV04N800-U025	0.250	8.000	10/20	2.717	2.000	0.394	2.197	0.500	2.543	171	TVKX04H3...
ASV05N800-U031	0.313	8.000	10/20	2.717	2.000	0.472	2.197	0.500	2.543	171	TVKX0504...

Metric	CW*	DC	ZEFP/CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	KA	Insert
ASV02N080-4	4	80	5/10	41	25.4	6	28	6.35	15	162	TVKX0202...
ASV02N080-E4	4	80	5/10	41	27	6	29.8	7	15	162	TVKX0202...
ASV03N080-5	5	80	5/10	41	25.4	6.5	28	6.35	15	162	TVKX03X3...
ASV03N080-E5	5	80	5/10	41	27	6.5	29.8	7	15	162	TVKX03X3...
ASV04N080-6	6	80	4/8	41	25.4	8	28	6.35	17	157.5	TVKX04H3...
ASV04N080-E6	6	80	4/8	41	27	8	29.8	7	17	157.5	TVKX04H3...
ASV05N080-8	8	80	4/8	41	25.4	10	28	6.35	17	157.5	TVKX0504...
ASV05N080-E8	8	80	4/8	41	27	10	29.8	7	17	157.5	TVKX0504...
ASV02N100-4	4	100	6/12	48	31.75	6	35.2	7.92	20	165	TVKX0202...
ASV02N100-E4	4	100	6/12	47	32	6	34.8	8	20	165	TVKX0202...
ASV03N100-5	5	100	6/12	48	31.75	6.5	35.2	7.92	20	165	TVKX03X3...
ASV03N100-E5	5	100	6/12	47	32	6.5	34.8	8	20	165	TVKX03X3...
ASV04N100-6	6	100	5/10	48	31.75	8	35.2	7.92	23.5	162	TVKX04H3...
ASV04N100-E6	6	100	5/10	47	32	8	34.8	8	23.5	162	TVKX04H3...
ASV05N100-8	8	100	5/10	48	31.75	10	35.2	7.92	23.5	162	TVKX0504...
ASV05N100-E8	8	100	5/10	47	32	10	34.8	8	23.5	162	TVKX0504...
ASV02N125-4	4	125	8/16	58	38.1	6	42.3	9.52	30	168.75	TVKX0202...
ASV02N125-E4	4	125	8/16	55	40	6	43.5	10	30	168.75	TVKX0202...
ASV03N125-5	5	125	8/16	58	38.1	6.5	42.3	9.52	30	168.75	TVKX03X3...
ASV03N125-E5	5	125	8/16	55	40	6.5	43.5	10	30	168.75	TVKX03X3...
ASV04N125-6	6	125	6/12	58	38.1	8	42.3	9.52	31	165	TVKX04H3...
ASV04N125-E6	6	125	6/12	55	40	8	43.5	10	32.5	165	TVKX04H3...
ASV05N125-8	8	125	6/12	58	38.1	10	42.3	9.52	31	165	TVKX0504...
ASV05N125-E8	8	125	6/12	55	40	10	43.5	10	32.5	165	TVKX0504...
ASV02N160-4	4	160	10/20	58	38.1	6	42.3	9.52	45	171	TVKX0202...
ASV02N160-E4	4	160	10/20	55	40	6	43.5	10	45	171	TVKX0202...
ASV03N160-5	5	160	10/20	58	38.1	6.5	42.3	9.52	45	171	TVKX03X3...
ASV03N160-E5	5	160	10/20	55	40	6.5	43.5	10	45	171	TVKX03X3...
ASV04N160-6	6	160	8/16	58	38.1	8	42.3	9.52	48.5	168.75	TVKX04H3...
ASV04N160-E6	6	160	8/16	55	40	8	43.5	10	50	168.75	TVKX04H3...
ASV05N160-8	8	160	8/16	58	38.1	10	42.3	9.52	48.5	168.75	TVKX0504...
ASV05N160-E8	8	160	8/16	55	40	10	43.5	10	50	168.75	TVKX0504...
ASV04N200-6	6	200	10/20	69	50.8	8	55.8	12.7	63	171	TVKX04H3...
ASV04N200-E6	6	200	10/20	69	50	8	53.5	12	63	171	TVKX04H3...
ASV05N200-8	8	200	10/20	69	50.8	10	55.8	12.7	63	171	TVKX0504...
ASV05N200-E8	8	200	10/20	69	50	10	53.5	12	63	171	TVKX0504...

CW*: CW of the cutter can be altered by using a special Insert in the same pocket. with in a range

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit	Mono block type Torx bit
ASV02/03N...	SR114-018-L3.40	-	M-1000	-	T-6D
ASV04N...	SR14-500-L5.1	H-TB2W	M-1000	BT15S	-
ASV05N...	SR 14-500-L7.0	H-TB2W	M-1000	BT15S	-

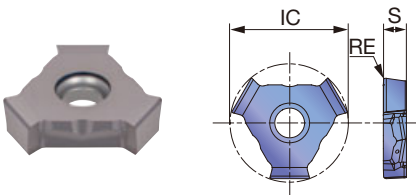
Recommended clamping torque: SR114-018-L3.40 = 0.52 lbs-ft, 0.7 N·m, SR14-500-L5.1, SR 14-500-L7.0 = 2.58 lbs-ft, 3.5 N·m

Reference pages: Inserts, Standard cutting conditions → **H216**



INSERT

TVKX-MJ



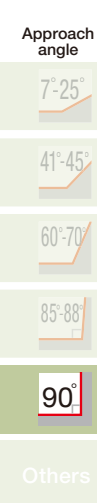
P	Steel	☆		★	★
M	Stainless		★	☆	☆
K	Cast iron	★		☆	☆
N	Non-ferrous				
S	Superalloys	★	☆	★	★
H	Hard materials				

★ : First choice
☆ : Second choice

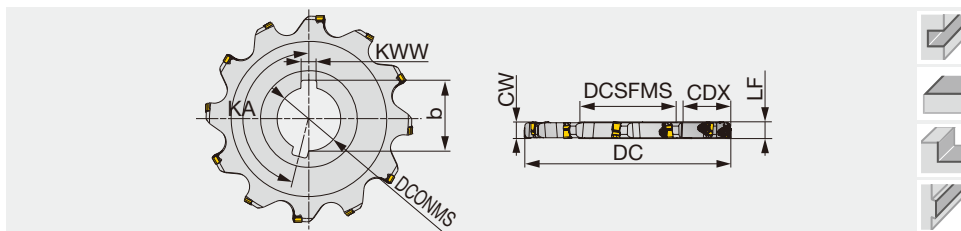
Designation	RE	Coated				S	IC
		AH120	AH130	AH725	SH725		
TVKX020202TN-MJ	0.008	●		●		0.094	0.370
TVKX020202FN-MJ	0.008				●	0.094	0.370
TVKX020204TN-MJ	0.016	●		●		0.094	0.370
TVKX03X302TN-MJ	0.008	●		●		0.126	0.370
TVKX03X302FN-MJ	0.008				●	0.126	0.370
TVKX03X304TN-MJ	0.016	●		●		0.126	0.370
TVKX04H302FN-MJ	0.008				●	0.138	0.665
TVKX04H304TN-MJ	0.016	●	●	●		0.138	0.665
TVKX04H308TN-MJ	0.031	●	●	●		0.138	0.665
TVKX050402FN-MJ	0.008				●	0.177	0.665
TVKX050404TN-MJ	0.016	●	●	●		0.177	0.665
TVKX050408TN-MJ	0.031	●	●	●		0.177	0.665

● : Line up

STANDARD CUTTING CONDITIONS



ISO	Workpiece material	Hardness	Priority	Grade	Cutting speed Vc (sfm)	Feed per edge line: fz (ipt)			
						ASV			
						ae / DC (in)			
						10%	20%	30%	≤ 50%
P	Low carbon steels 1015, etc.	- 200 HB	First choice	AH725	300 - 590	0.0031 - 0.0098	0.0024 - 0.0075	0.0020 - 0.0063	0.0020 - 0.0059
			Fracture resistance	AH130	300 - 590	0.0031 - 0.0098	0.0024 - 0.0075	0.0020 - 0.0063	0.0020 - 0.0059
	High carbon steels 1045, etc.	200 - 300 HB	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
			Fracture resistance	AH130	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
	Alloy steels 4140, etc.	150 - 300 HB	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
			Fracture resistance	AH130	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
	Tool steels D2, etc.	- 300 HB	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
			Fracture resistance	AH130	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
M	Stainless steel 304, etc.	- 200 HB	-	AH130	300 - 660	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
K	Gray cast irons No250B, etc.	150 - 250 HB	-	AH120	390 - 760	0.0031 - 0.0098	0.0024 - 0.0075	0.0020 - 0.0063	0.0020 - 0.0059
	Ductile cast irons 65-45-12, etc.	150 - 250 HB	-	AH120	300 - 490	0.0031 - 0.0098	0.0024 - 0.0075	0.0020 - 0.0063	0.0020 - 0.0059
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH725	100 - 130	0.0028 - 0.0047	0.0020 - 0.0035	0.0016 - 0.0028	0.0016 - 0.0028
			Fracture resistance	AH130	100 - 130	0.0028 - 0.0047	0.0020 - 0.0035	0.0016 - 0.0028	0.0016 - 0.0028
	Nickel-based alloys Inconel 718, etc.	- 40 HRC	First choice	AH725	70 - 120	0.0028 - 0.0047	0.0020 - 0.0035	0.0016 - 0.0028	0.0016 - 0.0028
			Fracture resistance	AH130	70 - 120	0.0028 - 0.0047	0.0020 - 0.0035	0.0016 - 0.0028	0.0016 - 0.0028



Inch	CW	DC	ZEFP/CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	KA	Insert
ASW06N300-U037	0.375	3.000	4/8	1.614	1.000	0.375	1.102	0.250	0.654	157.5	WNGU0603...
ASW06N400-U037	0.375	4.000	5/10	1.890	1.250	0.375	1.386	0.312	1.016	162	WNGU0603...
ASW07N400-U050	0.500	4.000	5/10	1.890	1.250	0.500	1.386	0.312	1.016	162	WNGU07T3...
ASW06N500-U037	0.375	5.000	6/12	2.283	1.500	0.375	1.665	0.375	1.319	165	WNGU0603...
ASW07N500-U050	0.500	5.000	6/12	2.283	1.500	0.500	1.665	0.375	1.319	165	WNGU07T3...
ASW06N600-U037	0.375	6.000	7/14	2.283	1.500	0.375	1.665	0.375	1.819	167.14	WNGU0603...
ASW07N600-U050	0.500	6.000	7/14	2.283	1.500	0.500	1.665	0.375	1.819	167.14	WNGU07T3...
ASW09N600-U062	0.625	6.000	7/14	2.283	1.500	0.625	1.665	0.375	1.819	167.14	WNGU0904...

Metric	CW	DC	ZEFP/CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	KA	Insert
ASW06N080-10	10	80	4/8	41	25.4	10	28	6.35	18.5	157.5	WNGU0603...
ASW06N080-E10	10	80	4/8	41	27	10	29.8	7	18.5	157.5	WNGU0603...
ASW06N100-10	10	100	5/10	48	31.75	10	35.2	7.92	25	162	WNGU0603...
ASW06N100-E10	10	100	5/10	47	32	10	34.8	8	25.5	162	WNGU0603...
ASW07N100-12	12	100	5/10	48	31.75	12	35.2	7.92	25	162	WNGU07T3...
ASW07N100-E12	12	100	5/10	47	32	12	34.8	8	25.5	162	WNGU07T3...
ASW09N100-14	14	100	5/10	48	31.75	14	35.2	7.92	25	162	WNGU0904...
ASW09N100-E14	14	100	5/10	47	32	14	34.8	8	25.5	162	WNGU0904...
ASW07N125-12	12	125	6/12	58	38.1	12	42.3	9.52	32.5	165	WNGU07T3...
ASW07N125-E12	12	125	6/12	55	40	12	43.5	10	34	165	WNGU07T3...
ASW06N125-10	10	125	6/12	58	38.1	10	42.3	9.52	32.5	165	WNGU0603...
ASW06N125-E10	10	125	6/12	55	40	10	43.5	10	34	165	WNGU0603...
ASW06N160-10	10	160	7/14	58	38.1	10	42.3	9.52	50	167.14	WNGU0603...
ASW06N160-E10	10	160	7/14	55	40	10	43.5	10	51.5	167.14	WNGU0603...
ASW07N160-12	12	160	7/14	58	38.1	12	42.3	9.52	50	167.14	WNGU07T3...
ASW07N160-E12	12	160	7/14	55	40	12	43.5	10	51.5	167.14	WNGU07T3...
ASW09N160-14	14	160	7/14	58	38.1	14	42.3	9.52	50	167.14	WNGU0904...
ASW09N160-E14	14	160	7/14	55	40	14	43.5	10	51.5	167.14	WNGU0904...
ASW09N160-16	16	160	7/14	58	38.1	16	42.3	9.52	50	167.14	WNGU0904...
ASW09N160-E16	16	160	7/14	55	40	16	43.5	10	51.5	167.14	WNGU0904...

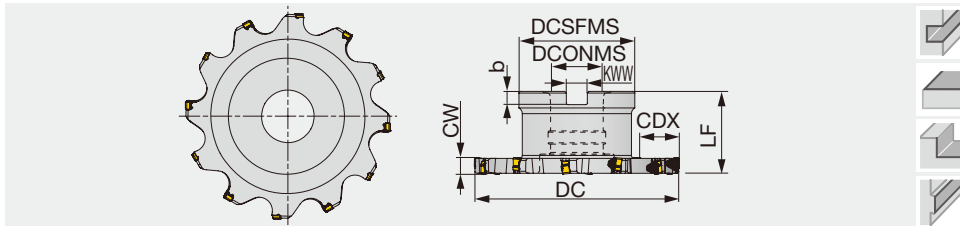
SPARE PARTS

Designation	Clamping screw1	Clamping screw2	Grip 1	Grip 2	Lubricant	Torx bit	Wrench
ASW06N...	-	CSPB-2.5	-	-	M-1000	-	IP-8D
ASW07N400, 500-U..., ASW07N100/125-...	-	CSPD-3	-	SW6-SD	M-1000	BLD IP10/S7	-
ASW07N600-U..., ASW07N160-...	-	CSPD-3	-	-	M-1000	-	IP-10D
ASW09N100-...	CSPB-3.5	-	H-TB2W	-	M-1000	BLDIP15/S7	-
ASW09N600-U..., ASW09N160-...	CSPB-3.5	-	-	-	M-1000	-	IP-15D

Recommended clamping torque: CSPB-2.5 = 0.96 lbs·ft, 1.3 N·m, CSPB-3.5 = 2.58 lbs·ft, 3.5 N·m, CSPD-3 = 1.84 lbs·ft, 2.5 N·m



Radial drive slot mill



Inch	CW	DC	ZEFP/CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	Insert
TSW06R400-U037	0.375	4.000	5/10	1.969	1.000	1.969	0.236	0.374	0.976	WNGU0603...
TSW07R400-U050	0.500	4.000	5/10	1.969	1.000	1.969	0.236	0.374	0.976	WNGU07T3...
TSW06R500-U037	0.375	5.000	6/12	2.756	1.250	1.969	0.315	0.500	1.083	WNGU0603...
TSW07R500-U050	0.500	5.000	6/12	2.756	1.250	1.969	0.315	0.500	1.083	WNGU07T3...
TSW06R600-U037	0.375	6.000	7/14	3.937	1.500	2.480	0.394	0.626	0.992	WNGU0603...
TSW07R600-U050	0.500	6.000	7/14	3.937	1.500	2.480	0.394	0.626	0.992	WNGU07T3...
TSW09R600-U062	0.625	6.000	7/14	3.937	1.500	2.480	0.394	0.626	0.992	WNGU0904...

Metric	CW	DC	ZEFP/CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	Insert
TSW06R100-10	10	100	5/10	50	25.4	50	6	9.5	24	WNGU0603...
TSW06R100-E10	10	100	5/10	58	27	50	7	12.4	20	WNGU0603...
TSW07R100-12	12	100	5/10	50	25.4	50	6	9.5	24	WNGU07T3...
TSW07R100-E12	12	100	5/10	58	27	50	7	12.4	20	WNGU07T3...
TSW06R125-10	10	125	6/12	70	31.75	50	8	12.7	26.5	WNGU0603...
TSW06R125-E10	10	125	6/12	66	32	50	8	14.4	28.5	WNGU0603...
TSW07R125-12	12	125	6/12	70	31.75	50	8	12.7	26.5	WNGU07T3...
TSW07R125-E12	12	125	6/12	66	32	50	8	14.4	28.5	WNGU07T3...
TSW06R160-10	10	160	7/14	100	38.1	63	10	15.9	29	WNGU0603...
TSW06R160-E10	10	160	7/14	82	40	63	9	16.4	38	WNGU0603...
TSW07R160-12	12	160	7/14	100	38.1	63	10	15.9	29	WNGU07T3...
TSW07R160-E12	12	160	7/14	82	40	63	9	16.4	38	WNGU07T3...
TSW09R160-16	16	160	7/14	100	38.1	63	10	15.9	29	WNGU0904...
TSW09R160-E16	16	160	7/14	82	40	63	9	16.4	38	WNGU0904...

INCH
SPARE PARTS

Designation	Clamping screw1	Clamping screw2	Grip	Lubricant	Torx bit	Mono block type Torx bit	Shell locking bolt (Optional parts)
TSW06R400-U037	-	CSPB-2.5	-	M-1000	-	IP-8D	(C0.500X1.375H)
TSW07R400-U050	-	CSPD-3	SW6-SD	M-1000	BLD IP10/S7	-	(C0.500X1.375H)
TSW06R500-U037	-	CSPD-3	-	M-1000	-	IP-8D	-
TSW07R500-U050	-	CSPD-3	SW6-SD	M-1000	BLD IP10/S7	-	-
TSW06R600-U037	-	CSPD-3	-	M-1000	-	IP-8D	(TMBA-0.750H)
TSW07R600-U050	-	CSPD-3	-	M-1000	-	IP-10D	(TMBA-0.750H)
TSW09R600-U062	CSPB-3.5	-	-	M-1000	-	IP-15D	(TMBA-0.750H)

Recommended clamping torque: CSPB-2.5 = 0.96 lbs·ft, CSPB-3.5 = 2.58 lbs·ft, CSPD-3 = 1.84 lbs·ft

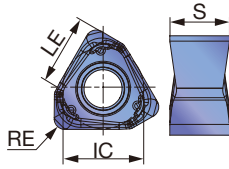
METRIC
SPARE PARTS

Designation	Clamping screw1	Clamping screw2	Grip	Lubricant	Torx bit	Mono block type Torx bit
TSW06R...	-	CSPB-2.5	-	M-1000	-	IP-8D
TSW07R100/125-...	-	CSPD-3	SW6-SD	M-1000	BLD IP10/S7	-
TSW07R160-...	-	CSPD-3	-	M-1000	-	IP-10D
TSW09R160-...	CSPB-3.5	-	-	M-1000	-	IP-15D

Recommended clamping torque: CSPB-2.5 = 1.3 N·m, CSPB-3.5 = 3.5 N·m, CSPD-3 = 2.5 N·m

INSERT

WNGU-MJ



P	Steel	☆	★	★
M	Stainless		★	☆
K	Cast iron	★	☆	
N	Non-ferrous			
S	Superalloys	★	☆	★
H	Hard materials			

★ : First choice
☆ : Second choice

Designation	RE	Coated				LE	IC	S
		AH120	AH130	AH725	AH3135			
WNGU060304TN-MJ	0.016	●			●	0.220	0.240	0.173
WNGU060308TN-MJ	0.031	●	●	●	●	0.220	0.240	0.173
WNGU060310TN-MJ	0.039	●			●	0.220	0.240	0.173
WNGU060316TN-MJ	0.063	●	●	●		0.220	0.240	0.173
WNGU060320TN-MJ	0.079	●			●	0.220	0.240	0.173
WNGU07T304TN-MJ	0.016	●			●	0.268	0.291	0.217
WNGU07T308TN-MJ	0.031	●	●	●		0.268	0.291	0.217
WNGU07T310TN-MJ	0.039	●			●	0.268	0.291	0.217
WNGU07T316TN-MJ	0.063	●	●	●		0.268	0.291	0.217
WNGU07T320TN-MJ	0.079	●			●	0.268	0.291	0.217
WNGU090404TN-MJ	0.016	●			●	0.335	0.339	0.256
WNGU090408TN-MJ	0.031	●	●	●		0.335	0.339	0.256
WNGU090410TN-MJ	0.039	●			●	0.335	0.339	0.256
WNGU090416TN-MJ	0.063	●	●	●		0.335	0.339	0.256
WNGU090420TN-MJ	0.079	●			●	0.335	0.339	0.256

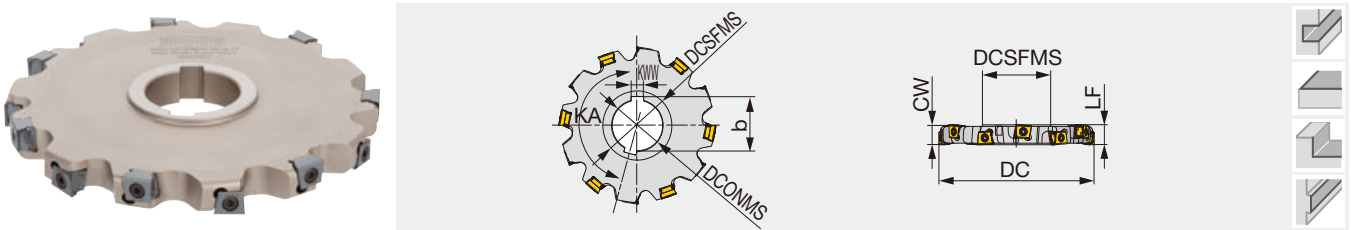
● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	Priority	Grade	Cutting speed Vc (sfm)	Feed per edge line: fz (ipt)			
						TSW / ASW			
						ae / DC (in)			
						10%	20%	30%	≤ 50%
P	Low carbon steels 1015, etc.	- 200 HB	First choice	AH725	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
			Fracture resistance	AH130	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
	High carbon steels 1045, etc.	200 - 300 HB	First choice	AH725	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
			Fracture resistance	AH130	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
	Alloy steels 4140, etc.	150 - 300 HB	First choice	AH725	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
			Fracture resistance	AH130	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
M	Tool steels D2, etc.	- 300 HB	First choice	AH725	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
			Fracture resistance	AH130	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
K	Stainless steel 304, etc.	- 200 HB	-	AH130	300 - 660	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
K	Gray cast irons No250B, etc.	150 - 250 HB	-	AH120	390 - 760	0.0047 - 0.0165	0.0035 - 0.0122	0.0028 - 0.0106	0.0028 - 0.0098
	Ductile cast irons 65-45-12, etc.	150 - 250 HB	-	AH120	300 - 490	0.0047 - 0.0165	0.0035 - 0.0122	0.0028 - 0.0106	0.0028 - 0.0098
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH725	100 - 130	0.0039 - 0.0067	0.0031 - 0.0051	0.0024 - 0.0043	0.0024 - 0.0039
			Fracture resistance	AH130	100 - 130	0.0039 - 0.0067	0.0031 - 0.0051	0.0024 - 0.0043	0.0024 - 0.0039
	Nickel-based alloys Inconel 718, etc.	- 40 HRC	First choice	AH725	70 - 120	0.0039 - 0.0067	0.0031 - 0.0051	0.0024 - 0.0043	0.0024 - 0.0039
			Fracture resistance	AH130	70 - 120	0.0039 - 0.0067	0.0031 - 0.0051	0.0024 - 0.0043	0.0024 - 0.0039



Axial drive slot mill, for tangentially mounted inserts

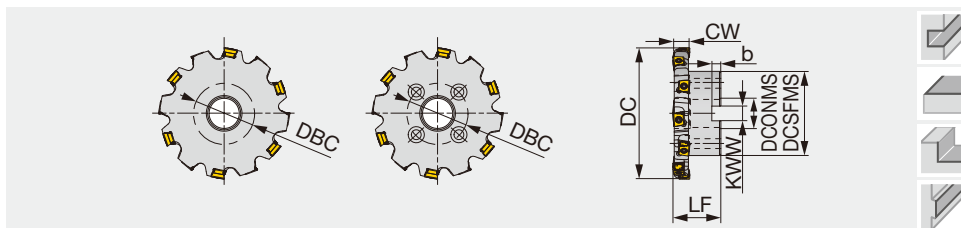


	Metric	CW	DC	ZEFP	CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	KA	Insert
Slot Milling	ASN10R100M31.7-16-05	16	100	5	10	48	31.75	16	35.2	7.92	25	162	LMEU1008**ZNEN-MJ
	ASN10R100M32.0E16-05	16	100	5	10	47	32	16	34.8	8	25.5	162	LMEU1008**ZNEN-MJ
	ASN12R100M31.7-19-05	19	100	5	10	48	31.75	19	35.2	7.92	25	162	LMEU1206**ZNEN-MJ
	ASN12R100M32.0E19-05	19	100	5	10	47	32	19	34.8	8	25.5	162	LMEU1208**ZNEN-MJ
Profile Milling	ASN10R125M38.1-16-06	16	125	6	12	58	38.1	16	42.3	9.52	32.5	165	LMEU1008**ZNEN-MJ
	ASN10R125M40.0E16-06	16	125	6	12	55	40	16	43.5	10	34	165	LMEU1008**ZNEN-MJ
	ASN12R125M38.1-19-06	19	125	6	12	58	38.1	19	42.3	9.52	32.5	165	LMEU1206**ZNEN-MJ
	ASN12R125M40.0E19-06	19	125	6	12	55	40	19	43.5	10	34	165	LMEU1208**ZNEN-MJ
Chamfering, Counterbore	ASN15R125M38.1-25-05	25	125	5	10	58	38.1	25	42.3	9.52	32.5	162	LMEU1509**ZNEN-MJ
	ASN15R125M40.0E25-05	25	125	5	10	55	40	25	43.5	10	34	165	LMEU1509**ZNEN-MJ
	ASN10R160M38.1-16-07	16	160	7	14	58	38.1	16	42.3	9.52	50	167.14	LMEU1008**ZNEN-MJ
	ASN10R160M40.0E16-07	16	160	7	14	55	40	16	43.5	10	51.5	167.14	LMEU1008**ZNEN-MJ
	ASN12R160M38.1-19-07	19	160	7	14	58	38.1	19	42.3	9.52	50	167.14	LMEU1206**ZNEN-MJ
	ASN12R160M40.0E19-07	19	160	7	14	55	40	19	43.5	10	51.5	167.14	LMEU1208**ZNEN-MJ
Finish Face Milling	ASN15R160M38.1-25-06	25	160	6	12	58	38.1	25	42.3	9.52	50	165	LMEU1509**ZNEN-MJ
	ASN15R160M40.0E25-06	25	160	6	12	55	40	25	43.5	10	51.5	167.14	LMEU1509**ZNEN-MJ
	ASN10R200M50.0E16-08	16	200	8	16	69	50	16	53.6	12	64.5	168.75	LMEU1008**ZNEN-MJ
	ASN12R200M50.0E19-08	19	200	8	16	69	50	19	53.6	12	64.5	168.75	LMEU1208**ZNEN-MJ
	ASN12R250M50.0E19-09	19	250	9	18	84	50	19	53.6	12	82	170	LMEU1208**ZNEN-MJ
	ASN15R200M50.0E25-07	25	200	7	14	69	50	25	53.6	12	64.5	168.75	LMEU1509**ZNEN-MJ
	ASN15R250M50.0E25-08	25	250	8	16	84	50	25	53.6	12	82	170	LMEU1509**ZNEN-MJ

SPARE PARTS

Designation	Clamping screw	Grip	Torx bit
ASN10/12R...	SM40-143-H0	H-TB	BT15S
ASN15R...	CSTB-5L159	H-TB	BT20S

Recommended clamping torque: SM40-143-H0 = 2.58 lbs·ft, 3.5 N·m, CSTB-5L159 = 3.69 lbs·ft, 5 N·m



Metric	CW	DC	ZEFP	CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	DBC	Insert
TSN10R100M25.4-16-05	16	100	5	10	50	25.4	50	6	9.5	24	-	LMEU1008**ZNEN-MJ
TSN10R100M27.0E16-05	16	100	5	10	58	27	50	7	12.4	20	-	LMEU1008**ZNEN-MJ
TSN12R100M25.4-19-05	19	100	5	10	50	25.4	50	6	9.5	24	-	LMEU1208**ZNEN-MJ
TSN12R100M27.0E19-05	19	100	5	10	58	27	50	7	12.4	20	-	LMEU1208**ZNEN-MJ
TSN10R125M31.7-16-06	16	125	6	12	70	31.75	50	8	12.7	26.5	-	LMEU1008**ZNEN-MJ
TSN10R125M32.0E16-06	16	125	6	12	66	32	50	8	14.4	28.5	-	LMEU1008**ZNEN-MJ
TSN12R125M31.7-19-06	19	125	6	12	70	31.75	50	8	12.7	26.5	-	LMEU1208**ZNEN-MJ
TSN12R125M32.0E19-06	19	125	6	12	66	32	50	8	14.4	28.5	-	LMEU1208**ZNEN-MJ
TSN15R125M31.7-25-05	25	125	5	10	70	31.75	50	8	12.7	26.5	-	LMEU1509**ZNEN-MJ
TSN15R125M32.0E25-05	25	125	5	10	66	32	50	8	14.4	28.5	-	LMEU1509**ZNEN-MJ
TSN10R160M38.1-16-07	16	160	7	14	100	38.1	63	10	15.9	29	-	LMEU1008**ZNEN-MJ
TSN10R160M40.0E16-07	16	160	7	14	82	40	63	9	16.4	38	-	LMEU1008**ZNEN-MJ
TSN12R160M38.1-19-07	19	160	7	14	100	38.1	63	10	15.9	29	-	LMEU1208**ZNEN-MJ
TSN12R160M40.0E19-07	19	160	7	14	82	40	63	9	16.4	38	-	LMEU1208**ZNEN-MJ
TSN15R160M38.1-25-06	25	160	6	12	100	38.1	63	10	15.9	29	-	LMEU1509**ZNEN-MJ
TSN15R160M40.0E25-06	25	160	6	12	82	40	63	9	16.4	38	-	LMEU1509**ZNEN-MJ
TSN10R200M40.0E16-08	16	200	8	16	95	40	63	9	16.4	55	66.7	LMEU1008**ZNEN-MJ
TSN10R200M47.6-16-08	16	200	8	16	135	47.625	63	14	25.4	31.5	101.6	LMEU1008**ZNEN-MJ
TSN12R200M40.0E19-08	19	200	8	16	95	40	63	9	16.4	55	66.7	LMEU1208**ZNEN-MJ
TSN12R200M47.6-19-08	19	200	8	16	135	47.625	63	14	25.4	31.5	101.6	LMEU1208**ZNEN-MJ
TSN15R200M40.0E25-07	25	200	7	14	95	40	63	9	16.4	55	66.7	LMEU1509**ZNEN-MJ
TSN15R200M47.6-25-07	25	200	7	14	135	47.625	63	14	25.4	31.5	101.6	LMEU1509**ZNEN-MJ
TSN15R200M50.8-25-07	25	200	7	14	135	50.8	63	14	25.4	31.5	101.6	LMEU1509**ZNEN-MJ
TSN12R250M47.6-19-09	19	250	9	18	140	47.625	63	14	25.4	54	101.6	LMEU1208**ZNEN-MJ
TSN12R250M60.0E19-09	19	250	9	18	135	60	63	14	25.7	60	101.6	LMEU1208**ZNEN-MJ
TSN15R250M47.6-25-08	25	250	8	16	140	47.625	63	14	25.4	54	101.6	LMEU1509**ZNEN-MJ
TSN15R250M60.0E25-08	25	250	8	16	135	60	63	14	25.7	60	101.6	LMEU1509**ZNEN-MJ
TSN15R250M63.5-25-08	25	250	8	16	140	63.5	63	14	25.4	54	101.6	LMEU1509**ZNEN-MJ

SPARE PARTS

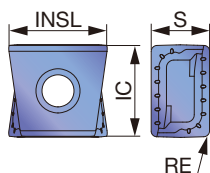
Designation	Clamping screw	Grip	Torx bit	Shell locking bolt (Optional parts)
TSN10R100M25.4-16-05	SM40-143-H0	H-TB	BT15S	(C0.500X1.375H)
TSN10/12R125, 200M..., TSN12R125, 250M...	SM40-143-H0	H-TB	BT15S	-
TSN10/12R160M...	SM40-143-H0	H-TB	BT15S	(TMBA-0.750H)
TSN15R125, 200, 250M...	CSTB-5L159	H-TB	BT20S	-
TSN15R160M38.1-25-06	CSTB-5L159	H-TB	BT20S	(TMBA-0.750H)

Recommended clamping torque: SM40-143-H0 = 3.5 N·m, CSTB-5L159 = 5 N·m



INSERT

LMEU-MJ



P Steel	☆	☆	☆	★
M Stainless		☆	☆	★
K Cast iron	★		☆	
N Non-ferrous				
S Superalloys	★		★	
H Hard materials				

★ : First choice
☆ : Second choice

Designation	RE	Coated				INSL	IC	S
		AH120	AH140	AH725	AH3135			
LMEU100808ZNEN-MJ	0.031	●	●	●	●	0.500	0.413	0.315
LMEU100810ZNEN-MJ	0.039	●			●	0.500	0.413	0.315
LMEU100816ZNEN-MJ	0.063	●	●	●		0.492	0.413	0.315
LMEU100820ZNEN-MJ	0.079	●			●	0.488	0.413	0.315
LMEU100824ZNEN-MJ	0.094	●	●	●	●	0.488	0.413	0.315
LMEU100830ZNEN-MJ	0.118	●			●	0.480	0.413	0.315
LMEU100832ZNEN-MJ	0.126	●	●	●	●	0.480	0.413	0.315
LMEU120808ZNEN-MJ	0.031	●	●	●	●	0.535	0.500	0.315
LMEU120816ZNEN-MJ	0.063	●	●	●	●	0.528	0.500	0.315
LMEU120820ZNEN-MJ	0.079	●			●	0.524	0.500	0.315
LMEU120824ZNEN-MJ	0.094	●	●	●	●	0.520	0.500	0.315
LMEU120830ZNEN-MJ	0.118	●			●	0.516	0.500	0.315
LMEU120832ZNEN-MJ	0.126	●	●	●	●	0.516	0.500	0.315
LMEU150908ZNEN-MJ	0.031	●	●	●	●	0.614	0.591	0.374
LMEU150916ZNEN-MJ	0.063	●	●	●	●	0.606	0.591	0.374
LMEU150920ZNEN-MJ	0.079	●			●	0.606	0.591	0.374
LMEU150924ZNEN-MJ	0.094	●	●	●	●	0.602	0.591	0.374
LMEU150930ZNEN-MJ	0.118	●			●	0.598	0.591	0.374
LMEU150932ZNEN-MJ	0.126	●	●	●	●	0.594	0.591	0.374
LMEU150940ZNEN-MJ*	0.157	●			●	0.587	0.591	0.374
LMEU150950ZNEN-MJ*	0.197	●			●	0.579	0.591	0.374

* Please note that LMEU150940 and LMEU150950 inserts are for special cutter bodies only and do not fit standard versions.

● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	Priority	Grade	Cutting speed Vc (sfm)	Feed per edge line: fz (ipt)			
						TSN / ASN			
						ae / DC (in)			
P	Low carbon steels 1015, etc.	- 200 HB	First choice	AH3135	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
			Fracture resistance	AH725	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
	High carbon steels 1045, etc.	200 - 300 HB	First choice	AH3135	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
			Fracture resistance	AH725	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
	Alloy steels 4140, etc.	150 - 300 HB	First choice	AH3135	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
			Fracture resistance	AH725	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
M	Tool steels D2, etc.	- 300 HB	First choice	AH3135	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
			Fracture resistance	AH725	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
M	Stainless steel 304, etc.	- 200 HB	-	AH3135	300 - 660	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
K	Gray cast irons No250B, etc.	150 - 250 HB	-	AH120	390 - 760	0.0087 - 0.0200	0.0063 - 0.0150	0.0055 - 0.0126	0.0051 - 0.0118
	Ductile cast irons 65-45-12, etc.	150 - 250 HB	-	AH120	300 - 490	0.0087 - 0.0130	0.0063 - 0.0098	0.0055 - 0.0083	0.0051 - 0.0079
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH725	100 - 130	0.0047 - 0.0087	0.0035 - 0.0063	0.0028 - 0.0055	0.0028 - 0.0051
	Nickel-based alloys Inconel 718, etc.	- 40 HRC	First choice	AH725	70 - 120	0.0047 - 0.0087	0.0035 - 0.0063	0.0028 - 0.0055	0.0028 - 0.0051

H



ADD^{FORCE}BARREL



Barrel-shaped inserts for profile milling with productivity boost!

Large R cutting edge and multi-flute design for unparalleled productivity



Large R
for small
cusp height



Close pitch design

ADD^{FORCE}BARREL

DCX = 20 mm (0.787"),
PRFRAD = 30 mm (1.181")



Large
pitch

Cusp height

Ball endmill

DCX = 20 mm (0.787"),
R = 10 mm (0.394")

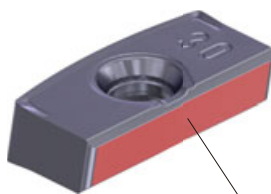


Small
pitch

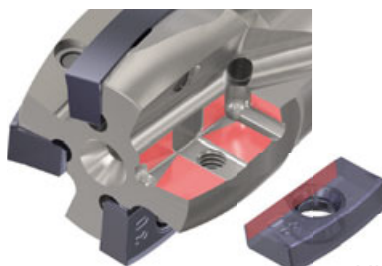
Cusp height

AddForceBarrel reduces the number of passes by 40% compared to ball endmill with 10 mm (0.394") radius without compromising the surface quality (cusp height).

Excellent clamping reliability with dove-tail back support



Wide contact surface

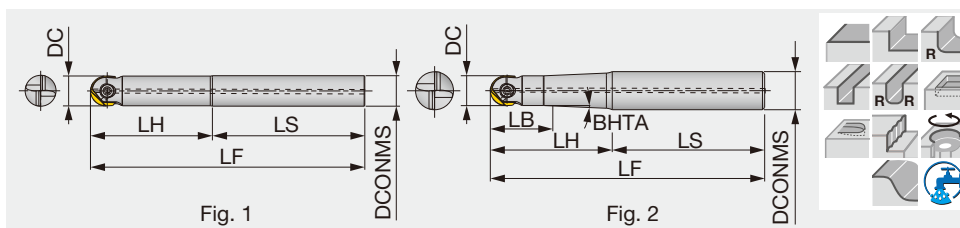


High clamping rigidity



Dove-tail clamping

Reference pages: **H231 - H232**



Inch	DC	DCONMS	LS	LH	LF	LB	BHTA	Air hole	Fig.	Shank material	Insert
EBFU037T050S0400	0.375	0.500	3.000	1.000	4.000	0.625	9.0°	With	2	Steel	ZF*U037
EBFU037S037C0550	0.375	0.375	2.500	3.000	5.500	-	-	Without	1	Carbide	ZF*U037
EBFU037T062S0600	0.375	0.625	3.500	2.500	6.000	0.625	3.5°	With	2	Steel	ZF*U037
EBFU037S037C0875	0.375	0.375	3.250	5.500	8.750	-	-	Without	1	Carbide	ZF*U037
EBFU050S050S0437	0.500	0.500	3.187	1.188	4.375	-	-	With	1	Steel	ZF*U050
EBFU050S050C0637	0.500	0.500	2.750	3.625	6.375	-	-	Without	1	Carbide	ZF*U050
EBFU050T062S0637	0.500	0.625	4.000	2.375	6.375	1.000	2.5°	With	2	Steel	ZF*U050
EBFU050S050C0875	0.500	0.500	2.750	6.000	8.750	-	-	Without	1	Carbide	ZF*U050
EBFU062T075S0500	0.625	0.750	3.000	2.000	5.000	0.563	2.0°	With	2	Steel	ZF*U062
EBFU062S062C0637	0.625	0.625	3.375	3.000	6.375	-	-	Without	1	Carbide	ZF*U062
EBFU062T075S0637	0.625	0.750	3.625	2.750	6.375	0.563	1.5°	With	2	Steel	ZF*U062
EBFU062S062C0875	0.625	0.625	2.750	6.000	8.750	-	-	Without	1	Carbide	ZF*U062
EBFU075T100S0700	0.750	1.000	4.000	3.000	7.000	1.563	4.5°	With	2	Steel	ZF*U075
EBFU075S075C0875	0.750	0.750	4.000	4.750	8.750	-	-	Without	1	Carbide	ZF*U075
EBFU075T100S0875	0.750	1.000	4.000	4.750	8.750	1.000	1.5°	With	2	Steel	ZF*U075
EBFU075S075C1200	0.750	0.750	3.250	8.750	12.000	-	-	Without	1	Carbide	ZF*U075
EBFU100T125S0800	1.000	1.250	4.000	4.000	8.000	1.250	2.5°	With	2	Steel	ZF*U100
EBFU100S100C0875	1.000	1.000	4.000	4.750	8.750	-	-	Without	1	Carbide	ZF*U100
EBFU100T125S1000	1.000	1.250	4.000	6.000	10.000	1.188	1.4°	With	2	Steel	ZF*U100
EBFU100S100C1200	1.000	1.000	3.250	8.750	12.000	-	-	Without	1	Carbide	ZF*U100
EBFU125S125S1000	1.250	1.250	6.000	4.000	10.000	-	-	With	1	Steel	ZF*U125
EBFU125S125C1200	1.250	1.250	3.250	8.750	12.000	-	-	Without	1	Carbide	ZF*U125

Metric	DC	DCONMS	LS	LH	LF	LB	BHTA	Air hole	Fig.	Shank material	Insert
EBFM08T12S100	8	12	80	20	100	10	9.5°	With	2	Steel	ZFBM080...
EBFM08S08C100	8	8	70	30	100	-	-	Without	1	Carbide	ZFBM080...
EBFM08S08C140	8	8	75	65	140	-	-	Without	1	Carbide	ZFBM080...
EBFM10T12S100	10	12	75	25	100	15	5°	With	2	Steel	ZFBM100...
EBFM10S10C140	10	10	65	75	140	-	-	Without	1	Carbide	ZFBM100...
EBFM10S10C220	10	10	80	140	220	-	-	Without	1	Carbide	ZFBM100...
EBFM12S12S110	12	12	80	30	110	-	-	With	1	Steel	ZF*M120..., ZFCBM120...
EBFM12S12C160	12	12	70	90	160	-	-	Without	1	Carbide	ZF*M120..., ZFCBM120...
EBFM12S12C220	12	12	70	150	220	-	-	Without	1	Carbide	ZF*M120..., ZFCBM120...
EBFM16T20S130	16	20	80	50	130	15.5	1.5°	With	2	Steel	ZF*M160..., ZFCBM160...
EBFM16S16C160	16	16	80	80	160	-	-	Without	1	Carbide	ZF*M160..., ZFCBM160...
EBFM16S16C220	16	16	70	150	220	-	-	Without	1	Carbide	ZF*M160..., ZFCBM160...
EBFM20T25S180	20	25	100	80	180	24	2.5°	With	2	Steel	ZF*M200..., ZFCBM200...
EBFM20S20C220	20	20	100	120	220	-	-	Without	1	Carbide	ZF*M200..., ZFCBM200...
EBFM20S20C300	20	20	80	220	300	-	-	Without	1	Carbide	ZF*M200..., ZFCBM200...
EBFM25T32S200	25	32	100	100	200	32	1.5°	With	2	Steel	ZFBM250..., ZFCBM250...
EBFM25S25C220	25	25	100	120	220	-	-	Without	1	Carbide	ZFBM250..., ZFCBM250...
EBFM25S25C300	25	25	80	220	300	-	-	Without	1	Carbide	ZFBM250..., ZFCBM250...
EBFM30T32S220	30	32	120	100	220	35	0.5°	With	2	Steel	ZFBM300..., ZFCBM300...
EBFM30S32C250	30	32	100	150	250	-	-	Without	1	Carbide	ZFBM300..., ZFCBM300...
EBFM30S32C350	30	32	100	250	350	-	-	Without	1	Carbide	ZFBM300..., ZFCBM300...
EBFM32S32S250	32	32	150	100	250	-	-	With	1	Steel	ZFBM320...
EBFM32S32C300	32	32	80	220	300	-	-	Without	1	Carbide	ZFBM320...

Metric dimension heads can fit the imperial bodies and vice-versa, but body projections causing interference need to be checked before using.



INCH SPARE PARTS

Designation	Clamping screw	Torx bit	Grip	Wrench
EBFU037...	TS30F100A	-	-	T10D
EBFU050...	TS40F120A	-	-	T15D
EBFU062...	TS50F160A	-	-	T-T20
EBFU075...	TS60F200A	BLDT25/M7	SW6-T	-
EBFU100...	TS70F250A	BLDT25/M7	SW6-T	-
EBFU125...	TS70F300A	-	-	T-T30

Recommended clamping torque: TS 30F100A = 1.84 lbs·ft, TS 40F120A = 2.58 lbs·ft, TS 50F160A = 3.69 lbs·ft, TS 60F200A = 5.16 lbs·ft, TS 70F250A = 5.16 lbs·ft

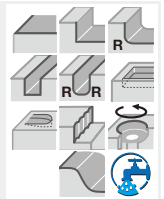
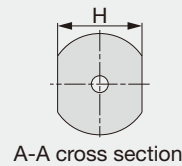
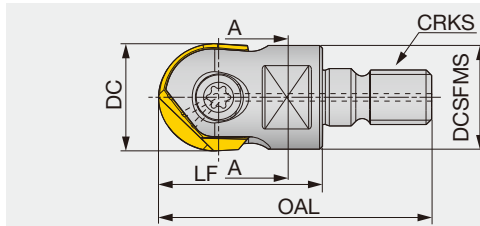
METRIC SPARE PARTS

Designation	Clamping screw	Torx bit	Grip	Wrench
EBFM08...	TS 25F080A	-	-	T-8D
EBFM10...	TS 30F100A	-	-	T-10D
EBFM12...	TS 40F120A	-	-	T-15D
EBFM16...	TS 50F160A	BT20S	H-TB2W	-
EBFM20...	TS 60F200A	BLDT25/M7	H-TB2W	-
EBFM25...	TS 70F250A	BLDT25/M7	H-TB2W	-
EBFM30...	TS 80F300A	-	-	T-T30
EBFM32...	TS 80F300A	-	-	T-T30

Recommended clamping torque: TS 25F080A = 1.3 N·m, TS 30F100A = 2.5 N·m, TS 40F120A = 3.5 N·m, TS 50F160A = 5 N·m, TS 60F200A, TS 70F250A = 7 N·m, TS 80F300A = 10 N·m

BALLFINISH HBFM

High precision finishing endmill, modular type (TungFlex), with screw clamp system



Metric	DC	OAL	LF	H	DCSFMS	CRKS	Air hole	Insert
HBFM10M06	10	34.5	20	7	9.7	M6	With	ZFBM100...
HBFM12M06	12	37.5	23	7	11.5	M6	With	ZF*M120..., ZFCBM120...
HBFM12M08	12	40	23	10	13	M8	With	ZF*M120..., ZFCBM120...
HBFM16M08	16	47	30	10	13	M8	With	ZF*M160..., ZFCBM160...
HBFM20M10	20	49	30	15	19	M10	With	ZF*M200..., ZFCBM200...
HBFM25M12	25	57	35	17	24	M12	With	ZFBM250..., ZFCBM250...
HBFM30M16	30	66	43	22	29	M16	With	ZFBM300..., ZFCBM300...
HBFM32M16	32	66	43	22	29.5	M16	With	ZFBM320...

SPARE PARTS

Designation	Clamping screw	Torx bit	Grip	Wrench
HBFM10...	TS 30F100A	-	-	T-10D
HBFM12...	TS 40F120A	-	-	T-15D
HBFM16...	TS 50F160A	BT20S	H-TB2W	-
HBFM20...	TS 60F200A	BLDT25/M7	H-TB2W	-
HBFM25...	TS 70F250A	BLDT25/M7	H-TB2W	-
HBFM30..., HBFM32...	TS 80F300A	-	-	T-T30

Recommended clamping torque: TS 25F080A = 1.3 N·m, TS 30F100A = 2.5 N·m, TS 40F120A = 3.5 N·m, TS 50F160A = 5 N·m, TS 60F200A, TS 70F250A = 7 N·m, TS 80F300A = 10 N·m

Metric dimension heads can fit the imperial bodies and vice-versa, but body projections causing interference need to be checked before using.

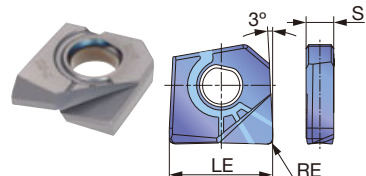
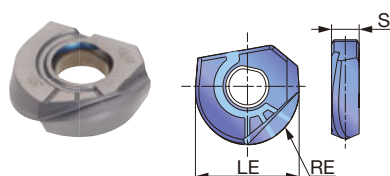
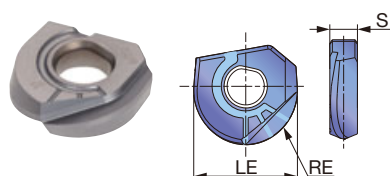
Reference pages: Inserts → **H227 - H228**, Standard cutting conditions → **H229 - H230**, TungFlex → **H038 - H039**

INSERT

ZFBU-MJ

ZFBU-ML

ZFRU-MJ



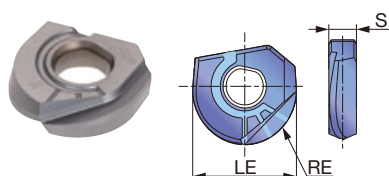
Inch	Material		Coated										LE	S
	Designation	RE	AH725											
	ZFBU037R00-MJ	0.188	●										0.375	0.114
	ZFBU050R00-MJ	0.250	●										0.500	0.134
	ZFBU062R00-MJ	0.313	●										0.625	0.173
	ZFBU075R00-MJ	0.375	●										0.750	0.213
	ZFBU062R00-MJ	0.313	●										0.625	0.173
	ZFBU100R00-MJ	0.500	●										1.000	0.252
	ZFBU075R00-MJ	0.375	●										0.750	0.213
	ZFBU125R00-MJ	0.625	●										1.250	0.291
	ZFBU037R00-ML	0.188	●										0.375	0.114
	ZFBU050R00-ML	0.250	●										0.500	0.134
	ZFBU062R00-ML	0.313	●										0.625	0.173
	ZFBU075R00-ML	0.375	●										0.750	0.213
	ZFBU100R00-ML	0.500	●										1.000	0.252
	ZFBU125R00-ML	0.625	●										1.250	0.291
	ZFRU037R003-MJ	0.031	●										0.375	0.114
	ZFRU050R003-MJ	0.031	●										0.500	0.134
	ZFRU050R006-MJ	0.062	●										0.500	0.134
	ZFRU050R012-MJ	0.125	●										0.500	0.134
	ZFRU062R003-MJ	0.031	●										0.625	0.173
	ZFRU062R006-MJ	0.062	●										0.625	0.173
	ZFRU062R012-MJ	0.125	●										0.625	0.173
	ZFRU075R003-MJ	0.031	●										0.750	0.213
	ZFRU075R006-MJ	0.062	●										0.750	0.213
	ZFRU075R012-MJ	0.125	●										0.750	0.213
	ZFRU100R003-MJ	0.031	●										1.000	0.252
	ZFRU100R006-MJ	0.062	●										1.000	0.252
	ZFRU100R012-MJ	0.125	●										1.000	0.252
	ZFRU125R003-MJ	0.031	●										1.250	0.291
	ZFRU125R006-MJ	0.062	●										1.250	0.291
	ZFRU125R012-MJ	0.125	●										1.250	0.291

● : Line up

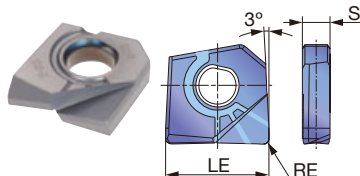
ZFBU037 / 050 / 062... : 5 piece per package
 ZFBU075 / 100 / 125... : 1 piece per package
 ZFRU037 / 050 / 062... : 5 piece per package
 ZFRU075 / 100 / 125... : 1 piece per package



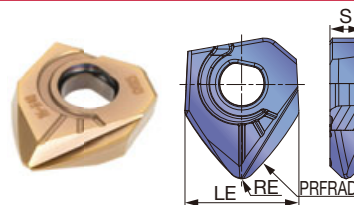
ZFBM-MJ



ZFRM-MJ



ZFCBM-MM



Metric	P	Steel	★	☆	★												
	M	Stainless	★		☆												
	K	Cast iron	★	★	☆												
	N	Non-ferrous	☆		☆												
	S	Superalloys	★		★												
	H	Hard materials	★	★	☆												
	★ : First choice ☆ : Second choice																
Designation	PRFRAD	RE	Coated													LE	S
			CH315	AH710	AH725												
ZFBM080R00-MJ	-	4		●	●											8	2.4
ZFBM100R00-MJ	-	5		●	●											10	2.9
ZFBM120R00-MJ	-	6		●	●											12	3.4
ZFBM160R00-MJ	-	8		●	●											16	4.4
ZFBM200R00-MJ	-	10		●	●											20	5.4
ZFBM250R00-MJ	-	12.5		●	●											25	6.4
ZFBM300R00-MJ	-	15		●	●											30	7.4
ZFBM320R00-MJ	-	16		●	●											32	7.4
ZFRM120R05-MJ	-	0.5		●	●											12	3.4
ZFRM120R10-MJ	-	1		●	●											12	3.4
ZFRM160R05-MJ	-	0.5		●	●											16	4.4
ZFRM160R10-MJ	-	1		●	●											16	4.4
ZFRM160R15-MJ	-	1.5		●	●											16	4.4
ZFRM200R10-MJ	-	1		●	●											20	5.4
ZFRM200R15-MJ	-	1.5		●	●											20	5.4
ZFCBM120R300-MM	30	1.5	●													12	3.4
ZFCBM160R400-MM	40	2	●													16	4.4
ZFCBM200R500-MM	50	2.5	●													20	5.4
ZFCBM250R625-MM	62.5	3	●													25	6.4
ZFCBM300R750-MM	75	3.5	●													30	7.4

With ZFCBM insert, the functional length (LF) of the EBFM and HBFM cutters becomes longer for the amount as indicated below:
 For E/HBFM12, +2.6 mm; E/HBFM16, +4 mm; E/HBFM20, +4.4 mm; E/HBFM25, +5.8 mm; and E/HBFM30, +5.9 mm.
 ZFBM080/100/120/160... : 5 piece per package, ZFBM200/250/300/320... : 1 piece per package
 ZFRM120/160... : 5 piece per package, ZFRM200... : 1 piece per package

●: Line up

STANDARD CUTTING CONDITIONS

ZF*M-MJ

ISO	Workpiece materials	Hardness	Priority	Grades	Max. depth of cut (in)	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)							
							D0.315	D0.394	D0.490	D0.653	D0.816	D0.984	D1.181	D1.260
P	Low carbon steel, alloy steel	85 - 180 HB	First choice	AH725	≤0.04D	590 - 850	0.006	0.008	0.008	0.010	0.010	0.012	0.014	0.014
		85 - 180 HB	Wear resistance	AH710	≤0.04D	590 - 850	0.006	0.008	0.008	0.010	0.010	0.012	0.014	0.014
	High carbon steel, alloy steel	180 - 280 HB	First choice	AH725	≤0.03D	490 - 750	0.006	0.008	0.008	0.010	0.010	0.012	0.014	0.014
		180 - 280 HB	Wear resistance	AH710	≤0.03D	490 - 750	0.006	0.008	0.008	0.010	0.010	0.012	0.014	0.014
	Prehardened steel Die & mold tool steel	40 - 48 HRC	First choice	AH710	≤0.03D	590 - 980	0.006	0.006	0.008	0.008	0.010	0.010	0.012	0.012
		40 - 48 HRC	Fracture resistance	AH725	≤0.03D	590 - 980	0.006	0.006	0.008	0.008	0.010	0.010	0.012	0.012
M	Stainless steel	135 - 200 HB	First choice	AH725	≤0.03D	330 - 820	0.004	0.006	0.008	0.008	0.010	0.010	0.012	0.012
K	Cast iron	150 - 240 HB	First choice	AH710	≤0.04D	300 - 1150	0.008	0.008	0.010	0.012	0.012	0.014	0.016	0.016
		150 - 240 HB	Fracture resistance	AH725	≤0.04D	300 - 1150	0.008	0.008	0.010	0.012	0.012	0.014	0.016	0.016
N	Aluminum	-	First choice	AH725	≤0.03D	660 - 1310	0.010	0.010	0.014	0.014	0.014	0.016	0.016	0.018
S	Titanium alloy	- 40 HRC	First choice	AH725	≤ 0.03D	98 - 262	0.003	0.003	0.004	0.005	0.006	0.007	0.008	0.008
	Heat-resistant alloys	- 40 HRC	First choice	AH725	≤ 0.03D	98 - 328	0.003	0.003	0.004	0.005	0.006	0.007	0.008	0.008
H	High hardened steel	48 - 65 HRC	First choice	AH710	≤0.02D	330 - 720	0.003	0.003	0.004	0.005	0.006	0.008	0.008	0.010

· Remove excessive chip accumulation with an air blast.
· For the operation with depth of cut which varies (ex. casting skin) and machining of workpiece materials with interrupted surface, the feed per tooth (fz) should be set to the lower recommended value shown in the above table.

· Cutting conditions may be limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

How to clamp the insert

1. Clear chips and dust from the pocket.
2. Place the insert in the pocket. The insert can be placed only in one direction.
3. Tighten the screw while pressing the insert into the pocket.

How to check the run-out

1. Clamp the insert on the shank.
2. Clamp the shank on a high-precision arbor.
3. Measure the run-out on tool presetter or by dial gauge.

Notes:

1. Due to the helical cutting edge, it is important that the run-out is inspected with the insert clamped on the shank.
2. Do not use micrometer or caliper to inspect the insert diameter as inaccurate dimensions may be provided.

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

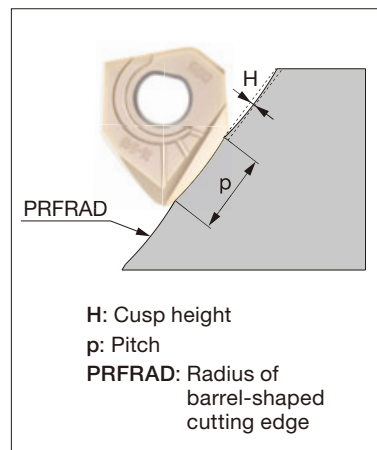
Index



ZFCBM-MM

ISO	Workpiece materials	Hardness	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	Width of cut ae (in)
P	Low carbon steel 1020, etc.	- 200HB	328 - 1969	0.002 - 0.012	< 0.012
	Carbon steel 1045, etc.	- 300HB	328 - 1969	0.002 - 0.012	< 0.012
	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	328 - 1969	0.002 - 0.012	< 0.012
M	Austenitic stainless steel 304SS, etc.	- 200HB	328 - 1969	0.002 - 0.012	< 0.012
	Precipitation hardening stainless steel 17-4 PH, etc.	- 45HRC	328 - 984	0.002 - 0.01	< 0.008
K	Gray cast iron Class 25, etc.	150 - 250HB	328 - 1969	0.002 - 0.012	< 0.012
	Ductile cast iron 60-40-18, etc.	150 - 250HB	328 - 1969	0.002 - 0.012	< 0.012
S	Titanium alloys Ti-6Al-4V, etc.	- 45HRC	131 - 394	0.002 - 0.008	< 0.008
	Superalloys Inconel718, etc.	- 45HRC	66 - 262	0.002 - 0.008	< 0.008
H	Hardened steel H-13, etc.	40 - 55HRC	164 - 984	0.002 - 0.008	< 0.008

■ Cusp height and pitch



To obtain the pitch (p) from the given cusp height (H)

H (in)	0.00004	0.00008	0.00012	0.00016	0.00020	0.00039	0.00059	0.00079
PRFRAD (in)								
30 (ZFCBM120R300...)	0.019	0.027	0.033	0.039	0.043	0.061	0.075	0.086
40 (ZFCBM160R400...)	0.022	0.031	0.039	0.044	0.050	0.070	0.086	0.100
50 (ZFCBM200R500...)	0.025	0.035	0.043	0.050	0.056	0.079	0.096	0.111
62.5 (ZFCBM250R625...)	0.028	0.039	0.048	0.056	0.062	0.088	0.108	0.124
75 (ZFCBM300R750...)	0.030	0.043	0.053	0.061	0.068	0.096	0.118	0.136

$$p = \sqrt{8 \times H \times \text{PRFRAD}}$$

(mm)

To obtain the cusp height (H) from the given pitch (p)

p (in)	0.020	0.030	0.039	0.049	0.059	0.069	0.079
PRFRAD (in)							
30 (ZFCBM120R300...)	0.00004	0.00008	0.00016	0.00028	0.00035	0.00051	0.00067
40 (ZFCBM160R400...)	0.00004	0.00008	0.00010	0.00020	0.00028	0.00039	0.00051
50 (ZFCBM200R500...)	0.00004	0.00004	0.00010	0.00016	0.00024	0.00032	0.00039
62.5 (ZFCBM250R625...)	0.00004	0.00004	0.00008	0.00010	0.00020	0.00024	0.00032
75 (ZFCBM300R750...)	< 0.00004	0.00004	0.00008	0.00010	0.00016	0.00020	0.00028

$$H = \frac{p^2}{8 \times \text{PRFRAD}}$$

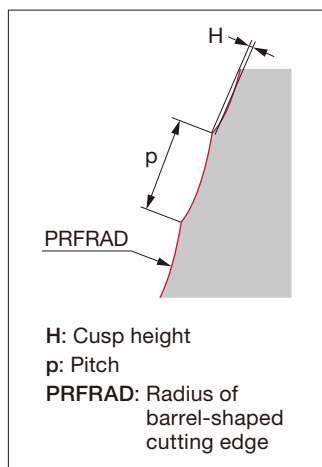
(mm)



STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	Width of cut ae (in)
P	Low carbon steel 1020, etc.	- 200HB	328 - 1969	0.002 - 0.012	< 0.016
	Carbon steel 1045, etc.	- 300HB	328 - 1969	0.002 - 0.012	< 0.012
	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	328 - 1969	0.002 - 0.012	< 0.012
M	Austenitic stainless steel 304SS, etc.	- 200HB	328 - 1640	0.002 - 0.012	< 0.012
	Precipitation hardening stainless steel 17-4 PH, etc.	- 45HRC	328 - 984	0.002 - 0.01	< 0.008
K	Gray cast iron Class 25, etc.	150 - 250HB	328 - 1969	0.002 - 0.012	< 0.012
	Ductile cast iron 60-40-18, etc.	150 - 250HB	328 - 1969	0.002 - 0.012	< 0.012
S	Titanium alloys Ti-6Al-4V, etc.	- 45HRC	131 - 394	0.002 - 0.008	< 0.008
	Superalloys Inconel718, etc.	- 45HRC	66 - 262	0.002 - 0.008	< 0.008
H	Hardened steel H-13, etc.	40 - 55HRC	164 - 984	0.002 - 0.008	< 0.008

Cusp height and pitch



To obtain the pitch (p) from the given cusp height (H)

H (in)	0.00004	0.00008	0.00012	0.00016	0.00020	0.00039	0.00059	0.00079
PRFRAD (in)								
20 (ZNHU1003R20...)	0.016	0.022	0.027	0.031	0.035	0.050	0.061	0.070
30 (ZNHU1003R30...)	0.020	0.027	0.033	0.039	0.043	0.061	0.075	0.086

$$p = \sqrt{8 \times H \times \text{PRFRAD}}$$

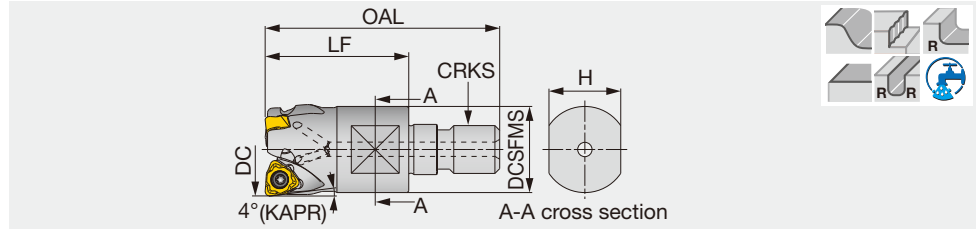
(mm)

To obtain the cusp height (H) from the given pitch (p)

p (in)	0.020	0.030	0.039	0.049	0.059	0.069	0.079
PRFRAD (in)							
20 (ZNHU1003R20...)	0.00008	0.00016	0.00024	0.00039	0.00055	0.00075	0.00098
30 (ZNHU1003R30...)	0.00004	0.00008	0.00016	0.00028	0.00035	0.00051	0.00067

$$H = \frac{p^2}{8 \times \text{PRFRAD}}$$

(mm)



Metric	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HFWX04M016M08R02	16	2	42	25	10	13	M8	0.03	With	WXHU04...
HFWX04M020M10R03	20	3	49	30	15	18	M10	0.05	With	WXHU04...
HFWX04M025M12R04	25	4	52	30	17	21	M12	0.09	With	WXHU04...

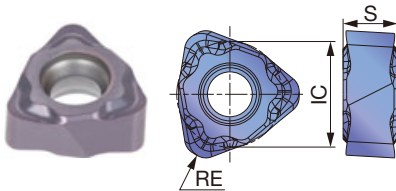
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
HFWX04M...	SR34-514	M-1000	T-7F

Recommended clamping torque: 0.9 N·m

INSERT

WXHU-MJ



P	Steel	★	
M	Stainless		
K	Cast iron		
N	Non-ferrous		
S	Superalloys		
H	Hard materials	★	

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated	IC	S
WXHU040305R-MJ	0.020	0.020	●	0.250	0.125
WXHU040310R-MJ	0.039	0.039	●	0.250	0.125

* For plunging, the maximum cutting width is 0.079".

●: Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	High carbon steel 1045, 1055, etc.	200 - 300 HB	AH110	328 - 984	0.004 - 0.012
	Alloy steel 4140, etc.	150 - 300 HB	AH110	328 - 984	0.004 - 0.012
	Prehardened steel NAK80, PX5, etc.	30 - 40 HRC	AH110	328 - 984	0.002 - 0.012
H	Hardened steel	H13, etc.	AH110	262 - 427	0.004 - 0.012
		D2, etc.	AH110	164 - 328	0.002 - 0.006

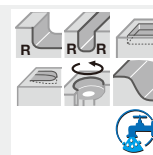
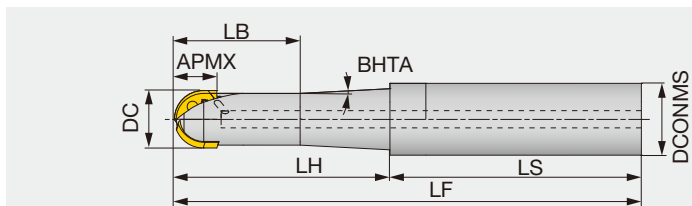
Reference pages: TungFlex → **H038 - H039**



BALL NOSE

EBRU..., EBRM...

Ball nose endmill for semi-roughing, shank type, with screw clamp system

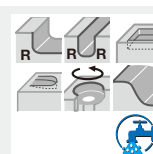
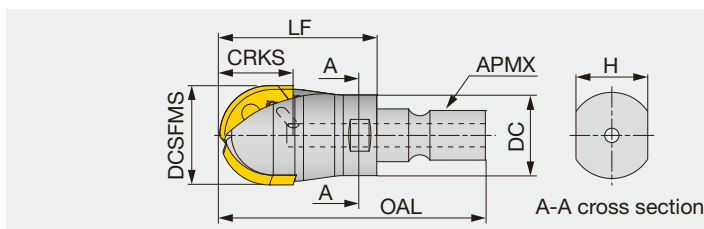


Inch	APMX	DC	CICT	DCONMS	LS	LF	LH	LB	BHTA	WT(lb)	Air hole	Insert
EBRU062SW062S0475	0.470	0.625	2	0.625	3.375	4.748	1.373	0.331	3.000	0.330	With	ZRBU062...
EBRU075SW075S0600	0.510	0.750	2	0.750	4.000	6.000	2.000	0.606	3.000	0.610	With	ZRBU075...
EBRU100SW100S0600	0.690	1.000	2	1.000	3.250	6.000	2.750	1.080	3.000	1.080	With	ZRBU100...

Metric	APMX	DC	CICT	DCONMS	LS	LF	LH	LB	BHTA	WT(kg)	Air hole	Insert
EBRM16T20S130	11.8	16	2	20	70	130	60	35	3	0.235	With	ZRBM160...
EBRM16T20S200	11.8	16	2	20	140	200	60	35	3	0.395	With	ZRBM160...
EBRM20T25S160	13.6	20	2	25	85	160	75	45	3	0.455	With	ZRBM200...
EBRM20T25S220	13.6	20	2	25	135	220	85	60	5	0.655	With	ZRBM200...
EBRM25T32S200	17.7	25	2	32	115	200	85	55	6	0.965	With	ZRBM250...
EBRM25T32S300	17.7	25	2	32	180	300	120	70	4	1.505	With	ZRBM250...

HBRM...

Ball nose endmill for semi-roughing, modular type (TungFlex), with screw clamp system



Metric	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HBRM16M08	11.8	16	2	42.5	25	10	13	M8	0.025	With	ZRBM160...
HBRM20M10	13.6	20	2	50	30	15	18	M10	0.05	With	ZRBM200...
HBRM25M12	17.7	25	2	57	35	17	21	M12	0.08	With	ZRBM250...

SPARE PARTS

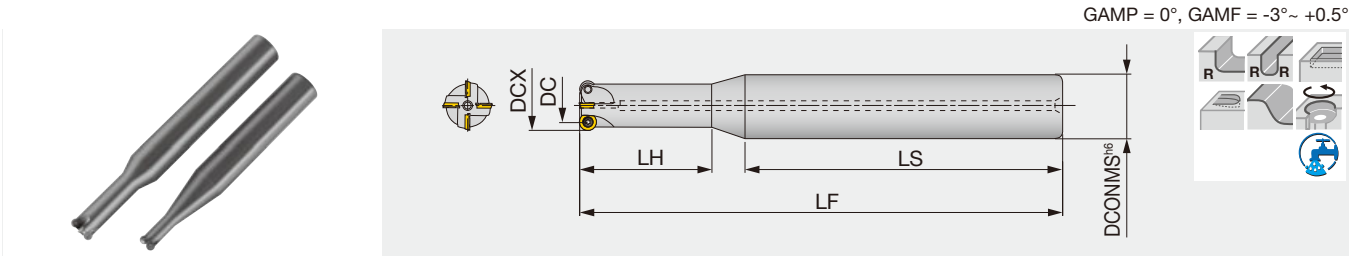
Designation	Clamping screw	Wrench
EBRU062..., EBRM16..., HBRM16...	TS25064I	T-8D
EBRU075...	TS30C72I	T-9D
EBRM20..., HBRM20...	TS30085I/HG	T-9D
EBRU100..., EBRM25..., HBRM25...	TS35085I/HG	T-15D

Recommended clamping torque: TS25064I = 0.96 lbs·ft, 1.3 N·m,
TS30C72I, TS30085I/HG = 1.70 lbs·ft, 2.3 N·m, TS35085I/HG = 2.58 lbs·ft, 3.5 N·m



EWD05/07/10

Endmill, shank type

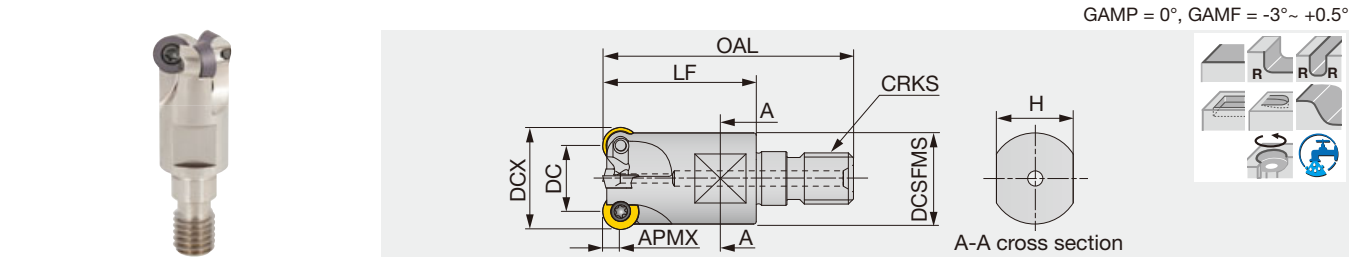


Inch	APMX	DCX	CICT	DC	DCONMS	LS	LH	LF	Air hole	Insert
EWD05050RU	0.098	0.500	2	0.304	0.750	3.250	0.750	5.000	With	RDMW05...
EWD05075RU	0.098	0.750	3	0.554	1.000	5.000	1.500	7.000	With	RDMW05...
EWD07075RU	0.138	0.750	4	0.475	1.000	5.000	1.500	7.000	With	RDMW07...
EWD07100RU	0.138	1.000	5	0.725	1.250	5.250	1.750	8.000	With	RDMW07...
EWD10100RU	0.196	1.000	3	0.606	1.250	5.250	1.750	8.000	With	RDMW10...
EWD07125RU	0.138	1.250	3	0.975	1.500	5.500	1.750	9.000	With	RDMW07...
EWD10125RU	0.196	1.250	5	0.856	1.500	5.500	1.750	9.000	With	RDMW10...

Metric	APMX	DCX	CICT	DC	DCONMS	LS	LH	LF	Air hole	Insert
EWD05010R	2.5	10	2	5	20	80	20	130	With	RDMW05...
EWD05012R	2.5	12	3	7	20	80	20	130	With	RDMW05...
EWD07015R	3.5	15	3	8	20	100	40	150	With	RDMW07...
EWD05015R	2.5	15	4	10	20	100	40	150	With	RDMW05...
EWD10020R	5.0	20	2	10	25	120	40	170	With	RDMW10...
EWD07020R	3.5	20	4	13	25	120	40	170	With	RDMW07...
EWD05020R	2.5	20	5	15	25	120	40	170	With	RDMW05...
EWD10025R	5.0	25	3	15	32	125	45	195	With	RDMW10...
EWD07025R	3.5	25	5	18	32	125	45	195	With	RDMW07...

HWD07-M

Endmill, modular type (TungFlex)



Metric	APMX	DCX	CICT	DC	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole
HWD07R015MM08-03	3.5	15	3	8	42	25	10	12.8	M8	0.03	With
HWD07R020MM10-04	3.5	20	4	13	49	30	15	17.8	M10	0.06	With
HWD07R025MM12-05	3.5	25	5	18	57	35	17	20.8	M12	0.1	With
HWD07R030MM16-05	3.5	30	5	23	63	40	22	28.8	M16	0.2	With

SPARE PARTS

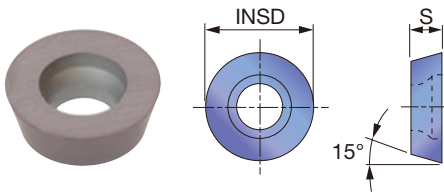
Designation	Clamping screw	Lubricant	Wewnch
EWD05**RU	CSTD-1.8	-	T-6D
EWD07**RU	CSTB-2.5S	-	T-8D
EWD10**RU	CSTB-3.5H	-	T-15D
EWD050**R	CSTD-1.8	M-1000	T-6D
EWD070**R, HWD07**M...	CSTB-2.5S	M-1000	T-8D
EWD100**R	CSTB-3.5H	M-1000	T-15D

Recommended clamping torque: CSTD-1.8 = 0.52 lbs-ft, 0.7 N-m, CSTB-2.5S = 0.96 lbs-ft, 1.3 N-m, CSTB-3.5H = 2.58 lbs-ft, 3.5 N-m

Reference pages: TungFlex → **H038 - H039**

INSERT

RDMW05/07/10



P	Steel	★
M	Stainless	
K	Cast iron	★
N	Non-ferrous	
S	Superalloys	★
H	Hard materials	

★ : First choice
☆ : Second choice

Designation	APMX	Coated								INSD	S
		AH120									
RDMW0501M0	0.098	●								0.197	0.055
RDMW0702M0	0.138	●								0.276	0.094
RDMW1003M0	0.196	●								0.394	3.180

● : Line up

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



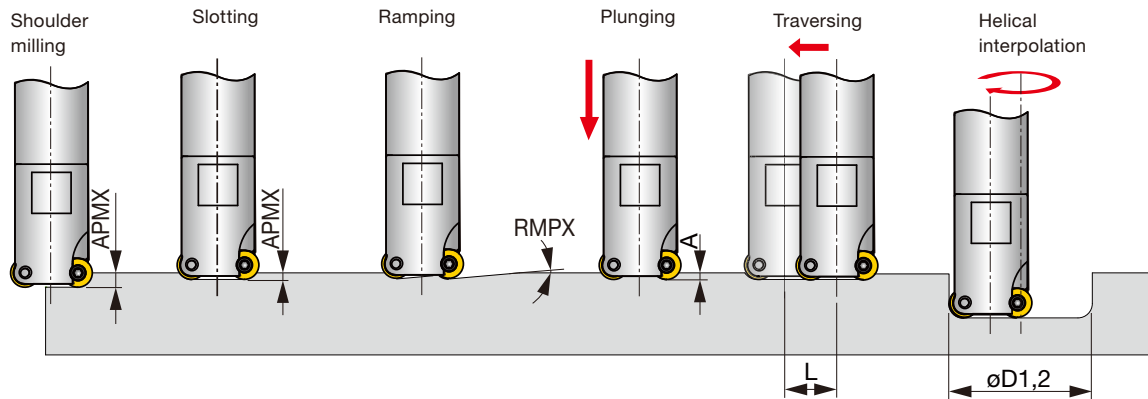
EWD05/07/10

e-catalog



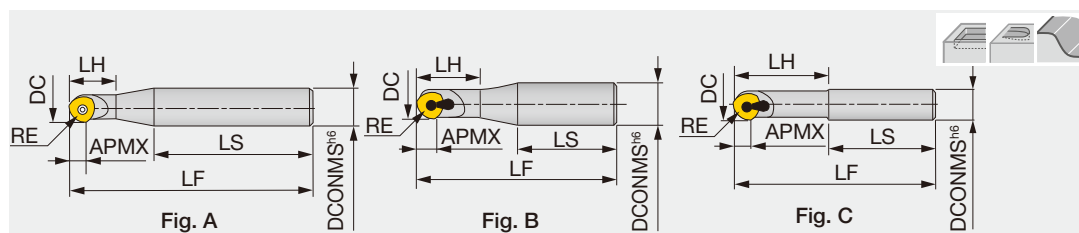
HWD07-M

APPLICATION RANGE



	Tool-ø	Max. depth of cut	Max. ramping	Max. plunging depth	Machining length for removing uncut portion	Max. machining	*Max. machining
Inch	DCX	APMX	RMPX	A	L	øD1	øD2
EWD05050RU	0.500	0.098	12.5°	0.060	0.342	0.804	0.921
EWD05075RU	0.750	0.098	4°	0.040	0.592	1.304	1.421
EWD07075RU	0.750	0.137	12°	0.080	0.513	1.225	1.421
EWD07100RU	1.000	0.137	7.5°	0.090	0.763	1.725	1.921
EWD07125RU	1.250	0.137	5°	0.080	1.013	2.225	2.421
EWD10100RU	1.000	0.196	15°	0.120	0.645	1.607	1.921
EWD10125RU	1.250	0.196	9.5°	0.120	0.895	2.107	2.421

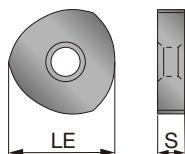
*For flat bottom hole



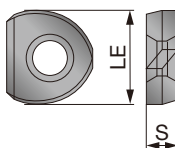
SPARE PARTS

Recommended clamping torque: CSTB-2.5B = 1.3 N·m, CSTB-3S = 2.3 N·m, CSTB-4S/CSTA-5S/CSTA-5SS = 3.5 N·m

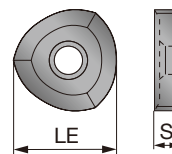
ZNCA-FN



ZNCA-FN2



ZNMM-EN



P	Steel	★			
M	Stainless				
K	Cast iron		★		
N	Non-ferrous				
S	Superalloys				
H	Hard materials				

★ : First choice
☆ : Second choice

[illegible]

●: Line up

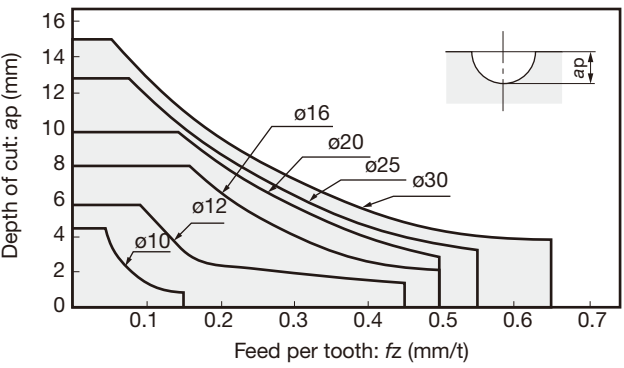
STANDARD CUTTING CONDITIONS

Please scan below.



TBN1000

GUIDELINES FOR SELECTING DEPTH OF CUT AND FEED



Workpiece material: Carbon steel (S55C, C55)
Insert grade: UX30
Machine power: $\phi 10$ - $\phi 16$: 7.5 kW
 $\phi 20$ - $\phi 30$: 22.5 kW
No. of revolutions: $\phi 10$ - $\phi 16$: 2000 min⁻¹
 $\phi 20$ - $\phi 30$: 1500 min⁻¹
(Unit: mm)

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

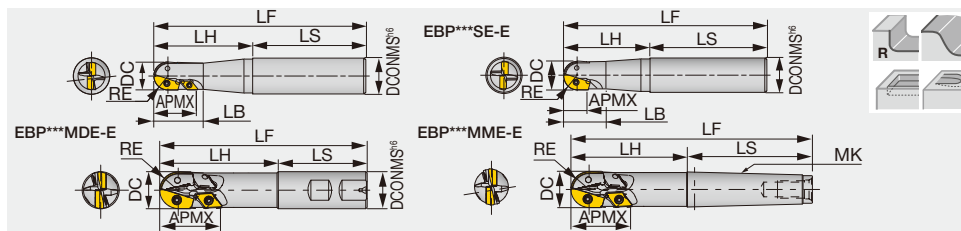
User's Guide

Index



EBP

Ball nose endmill for semi-finishing



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	LB	RE	MK	Insert 1	Insert 2
EBP075MWU	0.625	0.750	2	1.000	2.280	2.750	5.030	1.250	0.375	-	ZPET075U-MJ	-
EBP075LWEU	1.140	0.750	2+2	1.000	2.280	3.750	6.030	1.250	0.375	MK2	ZPET075U-MJ	DCMW070204TN
EBP100MWU	0.827	1.000	2	1.000	2.280	3.250	5.530	-	0.500	-	ZPET100U-MJ	-
EBP100LWEU	1.610	1.000	2+2	1.000	2.280	4.250	6.530	-	0.500	-	ZPET100U-MJ	DCMW11T304TN
EBP125MWU	1.000	1.250	2	1.250	2.280	3.750	6.030	-	0.625	-	ZPET125U-MJ	-
EBP125LWEU	1.810	1.250	2+2	1.250	2.280	4.750	7.030	-	0.625	-	ZPET125U-MJ	DCMW11T304TN
Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	LB	RE	MK	Insert 1	Insert 2
EBP020SD-E	16	20	2	20	56	60	116	-	10	-	ZPET2004-MJ	-
EBP020SS	16	20	2	25	80	60	140	30	10	-	ZPET2004-MJ	-
EBP020MDE-E	29.5	20	2 (4)	20	56	70	126	-	10	-	ZPET2004-MJ	DCMW070204TN
EBP020MME-E	29.5	20	2 (4)	-	69	70	139	-	10	MK2	ZPET2004-MJ	DCMW070204TN
EBP020MSE	29.5	20	2 (4)	25	80	70	150	35	10	-	ZPET2004-MJ	DCMW070204TN
EBP020LSE	29.5	20	2 (4)	25	180	70	250	35	10	-	ZPET2004-MJ	DCMW070204TN
EBP025SD-E	21	25	2	25	60	70	130	-	12.5	-	ZPET2505-MJ	-
EBP025SS	21	25	2	32	80	70	150	35	12.5	-	ZPET2505-MJ	-
EBP025MDE-E	41	25	2 (4)	25	60	80	140	-	12.5	-	ZPET2505-MJ	DCMW11T304TN
EBP025MME-E	41	25	2 (4)	-	86	-	166	-	12.5	MK3	ZPET2505-MJ	DCMW11T304TN
EBP025MSE	41	25	2 (4)	32	100	80	180	50	12.5	-	ZPET2505-MJ	DCMW11T304TN
EBP025LSE	41	25	2 (4)	32	220	80	300	50	12.5	-	ZPET2505-MJ	DCMW11T304TN
EBP030SS	24	30	2	32	80	80	160	40	15	-	ZPET3006-MJ	-
EBP030MSE	45	30	2 (4)	32	100	100	200	55	15	-	ZPET3006-MJ	DCMW11T304TN
EBP030LSE	45	30	2 (4)	32	250	100	350	55	15	-	ZPET3006-MJ	DCMW11T304TN
EBP032SD-E	25	32	2	32	60	-	140	-	16	-	ZPET3206-MJ	-
EBP032MDE-E	46	32	2 (4)	32	60	100	160	-	16	-	ZPET3206-MJ	DCMW11T304TN
EBP032MME-E	46	32	2 (4)	-	109	100	209	-	16	MK4	ZPET3206-MJ	DCMW11T304TN

INCH SPARE PARTS

Designation	Clamping screw for Insert 1	Clamping screw for Insert 2	Lubricant	Wrench 1 for Insert 1	Wrench 2 for Insert 2
EBP075MWU	CSTD-3T	-	M-1000	T-10D	-
EBP075LWEU	CSTD-3T	CSTB-2.5S	M-1000	T-10D	T-8D
EBP100MWU	CSTB-4S	-	M-1000	T-15D	-
EBP100LWEU	CSTB-4S	CSTB-4S	M-1000	T-15D	T-15D
EBP125MWU	CSTB-5S	-	M-1000	T-20D	-
EBP125LWEU	CSTB-5S	CSTB-4S	M-1000	T-20D	T-15D

Recommended clamping torque: CSTB-2.5S = 0.96 lbs-ft, CSTD-3T = 1.84 lbs-ft, CSTB-4S = 2.58 lbs-ft, CSTB-5S = 3.69 lbs-ft

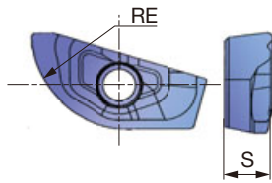
METRIC SPARE PARTS

Designation	Clamping screw for Insert 1	Clamping screw for Insert 2	Lubricant	Wewnch 1 for Insert 1	Wewnch 2 for Insert 2
EBP020SS/SD-E	CSTD-3T	-	M-1000	T-10D	-
EBP020*SE/M*E-E	CSTD-3T	CSTB-2.5S	M-1000	T-10D	T-8D
EBP025SS/SD-E, EBP025*SE/M*E-E	CSTB-4S	-	M-1000	T-15D	-
EBP030SS/032SD-E	CSTB-5S	-	M-1000	T-20D	-
EBP030*SE/032M*E-E	CSTB-5S	CSTB-4S	M-1000	T-20D	T-15D

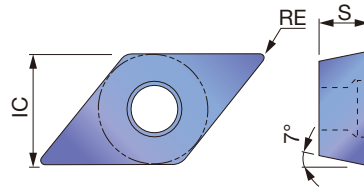
Recommended clamping torque: CSTB-2.5S = 1.3 N-m, CSTD-3T = 2.5 N-m, CSTB-4S = 3.5 N-m, CSTB-5S = 5 N-m

INSERT

ZPET-MJ (For R edge)



DCMW-TN (For P edge)



Inch

P	Steel	☆	★	
M	Stainless			
K	Cast iron	★		
N	Non-ferrous			
S	Superalloys			
H	Hard materials	☆		

★ : First choice
☆ : Second choice

Designation	RE	Coated		IC	S
		AH120	AH330		
ZPET075U-MJ	0.375	●	●	-	0.169
ZPET100U-MJ	0.500	●	●	-	0.228
ZPET125U-MJ	0.625	●	●	-	0.276
DCMW21.51TN	0.016	●	●	0.252	0.094
DCMW32.51TN	0.016	●	●	0.374	0.156

● : Line up
ZPET125U... : 5 piece per package

Metric

P	Steel	☆	★	
M	Stainless			
K	Cast iron	★		
N	Non-ferrous			
S	Superalloys			
H	Hard materials	☆		

★ : First choice
☆ : Second choice

Designation	RE	Coated		IC	S
		AH120	AH330		
ZPET2004-MJ	10	●	●	-	4.5
ZPET2505-MJ	12.5	●	●	-	5.63
ZPET3006-MJ	15	●	●	-	6.75
DCMW070204TN	0.4	●	●	6.4	2.4
DCMW11T304TN	0.4	●	●	9.5	4

● : Line up
ZPET30... : 5 piece per package

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog

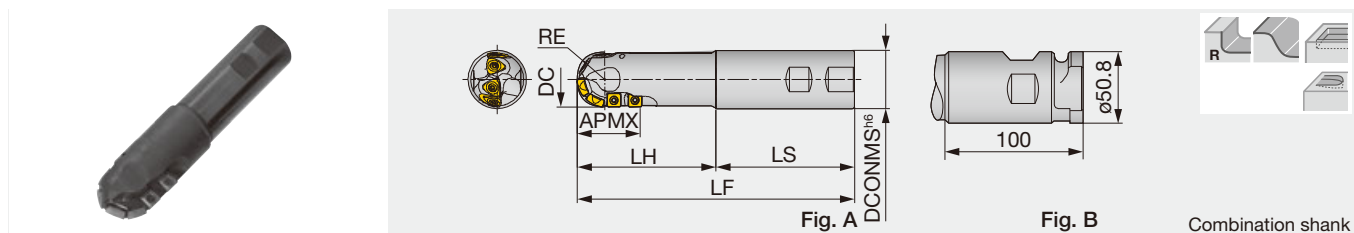


Machining types

(1) Grooving	(2) Shouldering at shallow depth of cut	(3) Shouldering at deep depth of cut

EBD

Ball nose endmill for roughing



Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	RE	Fig.	Insert R	Insert P
EBD040SSE	45	40	4 (7)	42	100	100	200	20	A	ZDMT4005-MJ	SCMT09T308-23
EBD040MSE	45	40	4 (7)	42	100	150	250	20	A	ZDMT4005-MJ	SCMT09T308-23
EBD050SSE	59	50	4 (7)	42	100	100	200	25	A	ZDMT5006-MJ	SCMT120408-23
EBD050MSE	59	50	4 (7)	42	100	150	250	25	A	ZDMT5006-MJ	SCMT120408-23
EBD050SCE	59	50	4 (7)	50.8	100	100	200	25	B	ZDMT5006-MJ	SCMT120408-23
EBD050MCE	59	50	4 (7)	50.8	100	150	250	25	B	ZDMT5006-MJ	SCMT120408-23

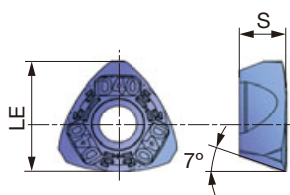
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EBD040*SE	CSTB-4M	M-1000	T-15T
EBD050*-E	CSTB-5	M-1000	T-20T

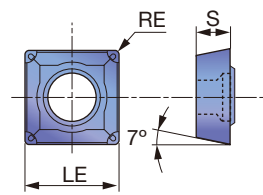
Recommended clamping torque : CSTB-4M = 3.5 N·m, CSTB-5 = 5 N·m

INSERT

ZDMT-MJ (For R edge)



SCMT-23 (For P edge)



P	Steel	☆
M	Stainless	
K	Cast iron	★
N	Non-ferrous	
S	Superalloys	
H	Hard materials	☆

★ : First choice
☆ : Second choice

Designation	RE	Coated	LE	S
		AH120		
ZDMT4005-MJ	-	●	0.512	0.217
ZDMT5006-MJ	-	●	0.638	0.256
SCMT09T308-23	0.031	●	0.375	0.156
SCMT120408-23	0.031	●	0.500	0.187

●: Line up

STANDARD CUTTING CONDITIONS

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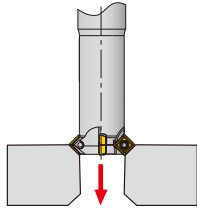
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EBD

CUTTING PERFORMANCE

Chamfering & countersinking

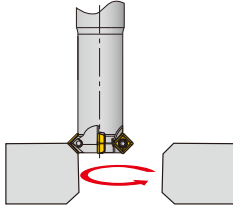


■ C2.5 (45° x 0.098")

Workpiece material: 1055

Designation	Cutting speed Vc (sfm)	Feed rate fz (ipt)
EASD05M006C12.0R01	262 - 394	0.001 - 0.003
EASD05M008C12.0R02	262 - 394	0.001 - 0.003
EASD05M016C16.0R04 (*z=2)	262 - 394	0.001 - 0.003

Interpolated chamfering

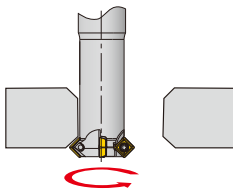


■ C2.5 (45° x 0.098")

Workpiece material: 1055

Designation	Cutting speed Vc (sfm)	Feed rate fz (ipt)
EASD05M006C12.0R01	262 - 394	0.003 - 0.005
EASD05M008C12.0R02	262 - 394	0.003 - 0.005
EASD05M016C16.0R04	262 - 394	0.003 - 0.005

Back chamfering



■ C1.0 (45° x 0.039")

Workpiece material: 1055

Designation	Cutting speed Vc (sfm)	Feed rate fz (ipt)
EASD05M006C12.0R01	262 - 394	0.003 - 0.005
EASD05M008C12.0R02	262 - 394	0.003 - 0.005
EASD05M016C16.0R04	262 - 394	0.003 - 0.005

STANDARD CUTTING CONDITIONS

■ Interpolated or back chamfering type

ISO	Workpiece material	Brinell hardness (HB)	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1018, 1020, 1026, etc.	- 200	AH725	755 - 1050	0.002 - 0.004
	High carbon steel 1045, 1055, etc.	200 - 300	AH725	492 - 755	0.002 - 0.004
	Alloyed steel 4140, 8620, etc.	150 - 300	AH725	492 - 755	0.002 - 0.004
	Tool steel W1-8, etc.	- 300	AH725	361 - 427	0.001 - 0.004
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	-	AH140	328 - 656	0.001 - 0.004
K	Gray cast iron Class 25, Class 30, etc.	150 - 250	AH725	492 - 820	0.002 - 0.005
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 - 250	AH725	328 - 591	0.002 - 0.005
N	Aluminum alloys Si < 13%	-	TH10	1148 - 1640	0.002 - 0.006
	Copper alloys	-	TH10	328 - 656	0.002 - 0.006

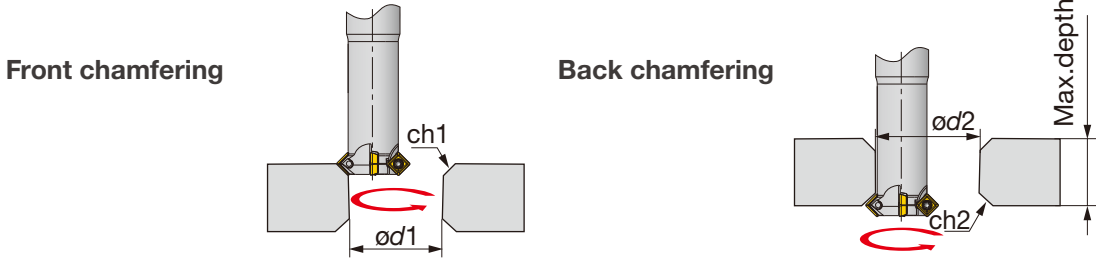


■ Front chamfering type

ISO	Workpiece material	Brinell hardness (HB)	Grade	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Low carbon steel 1018, 1020, 1026, etc.	- 200	AH725	525 - 722	0.002 - 0.004
	High carbon steel 1045, 1055, etc.	200 - 300	AH725	361 - 525	0.002 - 0.004
	Alloyed steel 4140, 8620, etc.	150 - 300	AH725	361 - 525	0.002 - 0.004
	Tool steel W1-8, etc.	- 300	AH725	262 - 295	0.001 - 0.004
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	-	AH140	230 - 459	0.001 - 0.004
K	Gray cast iron Class 25, Class 30, etc.	150 - 250	AH725	361 - 591	0.002 - 0.005
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 - 250	AH725	230 - 427	0.002 - 0.005
N	Aluminum alloys Si < 13%	-	TH10	820 - 1148	0.002 - 0.006
	Copper alloys	-	TH10	230 - 459	0.002 - 0.006

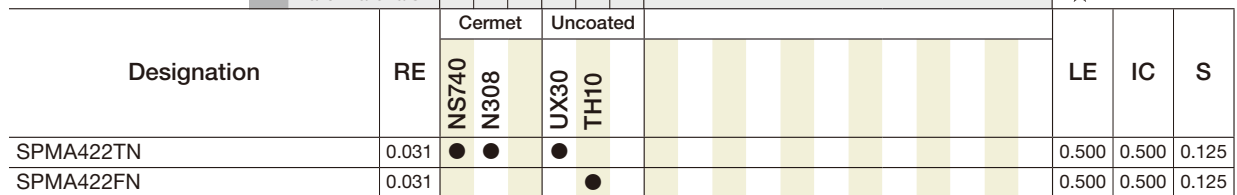
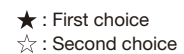
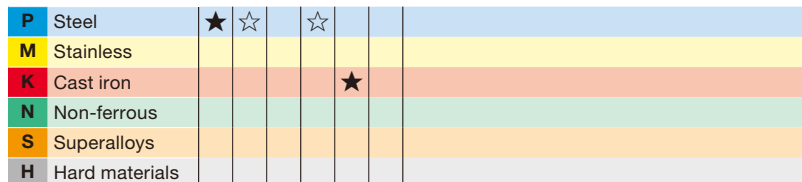
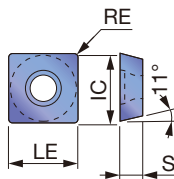
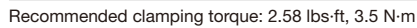
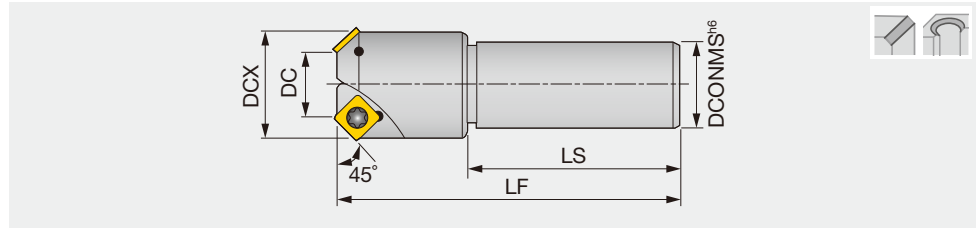
* When chamfering over C1.0 (45° x 0.039"), decrease the cutting parameters to 70% of the above parameters.

■ APPLICATION RANGE



Designation	Minimum hole diameter to be chamfered (in)		Maximum chamfer dimension (at 45°) (in)		Maximum reachable hole distance when back chamfering (in)
	Front-chamfer ød1	Back-chamfer ød2	Front ch1	Back ch2	Max. depth
EASD05M006C12.0R01	0.224	0.492	0.114 x 0.114	0.079 x 0.079	0.717
EASD05M008C12.0R02	0.307	0.571	0.114 x 0.114	0.059 x 0.059	1.307
EASD05M016C16.0R04	0.622	0.886	0.114 x 0.114	0.110 x 0.110	1.701

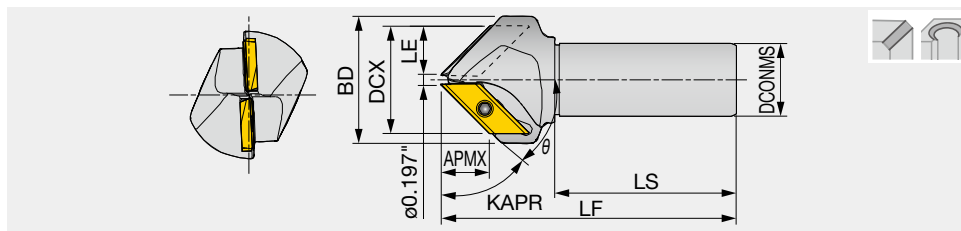
Chamfering endmill, screw clamp system, for square inserts





ECC31

Chamfering endmill, screw clamp system, for large parallelogram inserts



Inch	DCX	CICT	KAPR	θ	BD	LE	APMX	DCONMS	LS	LF	Insert
ECC31005RU-30	1.338	1	60°	30°	1.575	0.197	1.004	1.000	2.281	4.250	XCET3104...
ECC31005RU-41	1.698	2	49°	41°	2.205	0.197	0.866	1.000	2.281	4.250	XCET3104...
ECC31005RU-45	1.846	2	45°	45°	2.205	0.197	0.827	1.000	2.281	4.250	XCET3104...
ECC31005RU-60	2.204	2	30°	60°	2.834	0.197	0.571	1.000	2.281	4.250	XCET3104...

Metric	DCX	CICT	KAPR	θ	BD	LE	APMX	DCONMS	LS	LF	Insert
ECC31005R-30	34	1	60°	30°	40	14.5	25.5	32	80	130.2	XCET3104...
ECC31005R-45	46	2	45°	45°	56	20.5	20.5	32	80	130.1	XCET3104...
ECC31005R-60	55	2	30°	60°	72	25.5	14.5	32	80	130.1	XCET3104...

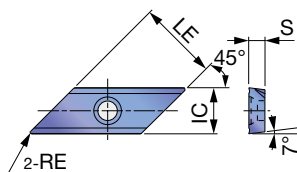
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
ECC31...	CSTB-5S	M-1000	T-20D

Recommended clamping torque: 3.69 lbs-ft, 5 N-m

INSERT

XCET31



P	Steel	★	☆	☆	★			☆
M	Stainless	★	★					
K	Cast iron		★	★				
N	Non-ferrous					★		
S	Superalloys							
H	Hard materials	☆						

★ : First choice
☆ : Second choice

Designation	RE	Coated				Cermet		Un-coated		LE	IC	S
		AH3135	AH330	AH120	NS740	TH10	UX30					
XCET310404ER	0.016	●	●	●	●	●	●			0.866	0.500	0.177

●: Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness (HB)	Grade	No. of revolutions: n (min-1)	Feed per tooth: f_z (ipt)
P	Carbon steels 1055, etc. Alloy steels 4140, etc.	< 300	NS740	1000 - 3000 - 7000	0.004 - 0.010
			UX30	700 - 2000 - 4900	0.004 - 0.010
	Die steels H13, etc.	< 300	AH3135	1000 - 3000 - 7000	0.004 - 0.008
M	Stainless steels S30400, etc.	< 250	AH3135	1000 - 3000 - 7000	0.004 - 0.010
K	Cast irons No.250B, etc.	150 - 250	AH330	1000 - 3000 - 7000	0.004 - 0.010

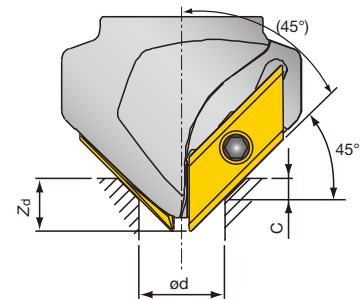
- When the hole diameter to be chamfered is small or the cutting edges near the front end of tool are used, use at higher side of the revolution range shown in the Table.
In contrast, when the hole diameter to be chamfered is large or the cutting edges far from the tool's front end are used, use the lower side of the revolution range shown in the Table.

- When chamfering a small diameter hole (smaller than $\phi 0.400''$) in a plungemilling mode, peck-feeding should not be used.
- When the hole diameter to be chamfered is smaller than $\phi 0.400''$ or the cutting edges near the tool's front end are used, the feed should be set within 0.006 ipt.

Guidelines for programming

Z-axis plunging depth Z_d (in) in 45° chamfering of hole

Hole dia. ød (in)	Size of chamfering C (in)						
0.020	0.020	0.039	0.059	0.079	0.118	0.157	0.197
0.197	0.028	0.047	0.067	0.087	0.126	-	-
0.236	0.047	0.067	0.087	0.106	0.146	-	-
0.268	0.063	0.083	0.102	0.122	0.161	-	-
0.315	0.087	0.106	0.126	0.146	0.185	-	-
0.335	0.094	0.114	0.134	0.154	0.193	-	-
0.394	0.126	0.146	0.165	0.185	0.224	0.264	0.303
0.402	0.130	0.150	0.169	0.189	0.228	0.268	0.307
0.472	0.165	0.185	0.205	0.224	0.264	0.303	0.343
0.551	0.205	0.224	0.244	0.264	0.303	0.343	0.382
0.630	0.244	0.264	0.283	0.303	0.343	0.382	0.421
0.689	0.272	0.291	0.311	0.331	0.370	0.408	0.449
0.787	0.323	0.343	0.362	0.382	0.421	0.461	0.500
0.827	0.343	0.362	0.382	0.402	0.441	0.480	0.520
0.945	0.402	0.421	0.441	0.461	0.500	0.539	0.579
1.181	0.520	0.539	0.559	0.579	0.618	0.657	0.697
1.299	0.579	0.598	0.618	0.638	0.677	0.717	0.756
1.417	0.638	0.657	0.677	0.697	0.736	0.776	-
1.654	0.756	0.776	0.795	-	-	-	-

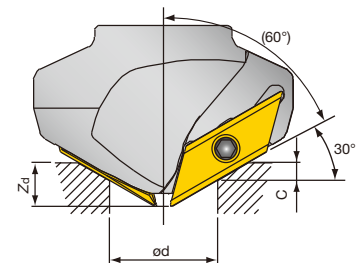


Tool: ECC31005R-45

When the hole depth is smaller than the Z-axis plunging depth (Z_d), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

Z-axis plunging depth Z_d (in) in 30° chamfering of hole

Hole dia. ød (in)	Size of chamfering C (in)						
0.020	0.020	0.039	0.059	0.079	0.098	0.118	0.138
0.197	0.024	0.043	0.063	0.083	-	-	-
0.236	0.035	0.055	0.075	0.094	-	-	-
0.268	0.043	0.063	0.083	0.102	-	-	-
0.315	0.055	0.075	0.094	0.114	-	-	-
0.335	0.063	0.083	0.102	0.122	-	-	-
0.394	0.079	0.098	0.118	0.138	0.157	0.177	0.197
0.402	0.083	0.102	0.122	0.142	0.161	0.181	0.201
0.472	0.102	0.122	0.142	0.161	0.181	0.201	0.220
0.551	0.146	0.165	0.185	0.205	0.224	0.244	0.264
0.630	0.165	0.185	0.205	0.224	0.244	0.264	0.283
0.689	0.193	0.213	0.232	0.252	0.272	0.291	0.311
0.787	0.205	0.224	0.244	0.264	0.283	0.303	0.323
0.827	0.240	0.260	0.280	0.299	0.319	0.339	0.358
0.945	0.307	0.327	0.346	0.366	0.386	0.406	0.45
1.181	0.343	0.362	0.382	0.402	0.421	0.441	0.461
1.299	0.374	0.394	0.413	0.433	0.453	0.472	0.492
1.417	0.398	0.417	0.437	0.457	0.476	0.496	0.516
1.654	0.441	0.461	0.480	0.500	0.520	0.539	0.559
1.811	0.488	0.508	0.528	0.547	0.567	-	-
1.890	0.512	0.531	0.551	0.571	-	-	-
2.047	0.555	-	-	-	-	-	-

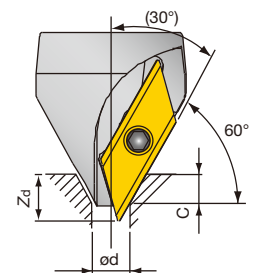


Tool: ECC31005R-60

When the hole depth is smaller than the Z-axis plunging depth (Z_d), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

Z-axis plunging depth Z_d (in) in 60° chamfering of hole

Hole dia. ød (in)	Size of chamfering C (in)							
0.020	0.020	0.039	0.059	0.079	0.098	0.118	0.138	0.157
0.197	0.031	0.051	0.071	0.091	0.110	-	-	-
0.236	0.067	0.087	0.106	0.126	0.146	-	-	-
0.268	0.094	0.114	0.134	0.154	0.173	-	-	-
0.315	0.134	0.154	0.173	0.193	0.213	-	-	-
0.335	0.150	0.169	0.189	0.209	0.228	-	-	-
0.394	0.201	0.220	0.240	0.260	0.280	0.299	0.319	0.339
0.402	0.209	0.228	0.248	0.268	0.287	0.307	0.327	0.346
0.472	0.272	0.291	0.311	0.331	0.350	0.370	0.390	0.409
0.551	0.406	0.425	0.445	0.465	0.484	0.504	0.524	0.543
0.630	0.457	0.476	0.496	0.516	0.535	0.555	0.575	0.594
0.689	0.539	0.559	0.579	0.598	0.618	0.638	0.657	0.677
0.787	0.575	0.594	0.614	0.634	0.654	0.673	0.693	0.713
0.827	0.677	0.697	0.717	0.736	0.756	0.776	0.795	0.815
0.945	0.882	0.902	0.921	0.941	0.961	0.980	1.000	-
1.181	0.980	1.000	-	-	-	-	-	-



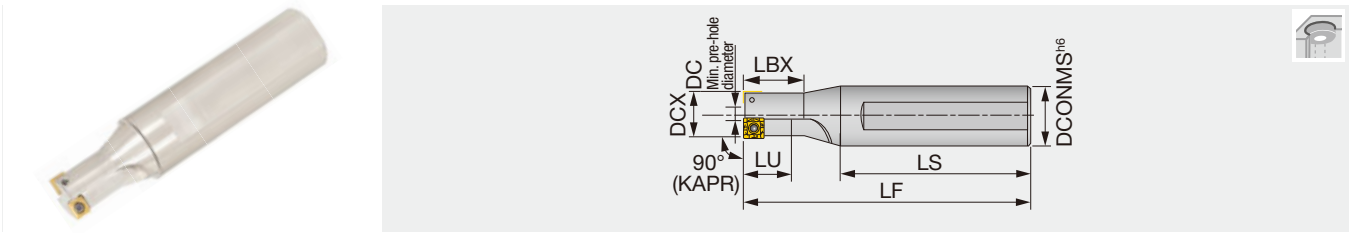
Tool: ECC31005R-30

When the hole depth is smaller than the Z-axis plunging depth (Z_d), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.



TCB

Counterboring endmill, monoblock type



Metric	DCX	CICT	DC	LU	LBX	LF	LS	DCONMS	Insert
TCB100F16	10	1	2.8	13	17	86	60	16	SPMP771...
TCB110F16	11	1	2.8	14	18.7	87	60	16	SPMP771...
TCB120F20	12	1	3.6	15	20.5	89	60	20	SPMP771...
TCB130F20	13	2	4.5	16	22.2	91	60	20	SPMP771...
TCB-140	14	1	4	11	18	117	80	25	SPMP831...
TCB140F25	14	2	5.5	18	24	113	80	25	SPMP771...
TCB150F25	15	2	6.5	19	25.7	114	80	25	SPMP771...
TCB160F25	16	2	7.5	20	27.5	116	80	25	SPMP771...
TCB170F25	17	2	6.6	13	21	114	80	25	SPMP831...
TCB175F25	17.5	2	7.1	14	22	115	80	25	SPMP831...
TCB180F25	18	2	7.5	15	23	116	80	25	SPMP831...
TCB190F25	19	2	8.5	15	24	118	80	25	SPMP831...
TCB-200	20	2	8.2	16	25	120	80	25	SPMP042...
TCB200F25	20	2	8.2	16	25	120	80	25	SPMP042...
TCB210F25	21	2	9	17	26	122	80	25	SPMP042...
TCB220F25	22	2	10	18	28	124	80	25	SPMP042...
TCB-230	23	2	11	19	29	126	80	25	SPMP042...
TCB230F25	23	2	11	19	29	126	80	25	SPMP042...
TCB240F25	24	2	12	20	-	128	80	25	SPMP042...
TCB250F25	25	2	13	25	-	130	80	25	SPMP042...
TCB-260	26	2	14	21	33	132	80	32	SPMP042...
TCB-290	29	2	14	23	36	138	80	32	SPMM322...
TCB-320	32	2	16.9	40	-	144	80	32	SPMM322...
TCB-350	35	2	14	43	-	150	80	32	SPMM432...
TCB-390	39	2	17.9	48	-	158	80	32	SPMM432...
TCB-430	43	2	21.7	53	-	171	85	42	SPMM432...

Tool diameter tolerance	Applicable tolerance range of hole diameter
+0.2 / 0	+0.3 / 0

Countersink dimensions of bolt hole

	Thread size	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27
øD (mm)		11	14	17.5	20	23	26	29	32	35	39	43
H (mm)		6.5	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29
ød (mm)		6	9	11	14	16	18	20	22	24	26	30
Applicable tool		TCB110	TCB140	TCB175	TCB200	TCB230	TCB260	TCB290	TCB320	TCB350	TCB390	TCB430

SPARE PARTS

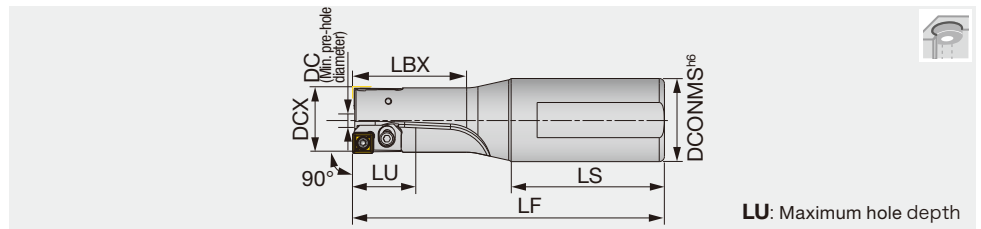
Designation	Clamping screw	Wrench
TCB100... - TCB160...	CSTB-2L040	T-6D
TCB-140...	CSTB-2.2S	T-7D
TCB170... - TCB190...	CSTB-2.2	T-7D
TCB200... - TCB260...	CSTA-NO3	T-9D
TCB-290 - TCB-320	CSTA-NO5	T-9D
TCB-350 - TCB-430	CSTA-4	T-15D

Recommended clamping torque: CSTB-2L040 = 0.7 N·m, CSTB-2.2S / CSTB-2.2 = 1 N·m, CSTA-NO3 / CSTA-NO5 = 2.3 N·m, CSTA-4 = 3.5 N·m

Reference pages: Inserts → [H253](#), Standard cutting conditions → [H253 - H254](#)

TCB

Counterboring endmill, cartridge type

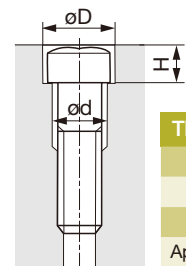


Metric	DCX*	DCONMS	DC*	LU	LS	LBX	LF	WT(kg)	Cartridge set Designation	Shim plate Designation	Shim plate Thickness	Insert
TCB260-290F32	26	32	13.2	40	59	43	120	0.6	TCB04CA-26-29	-	-	SPMP042...
TCB260-290F32	27	32	14.2	40	59	43	120	0.6	TCB04CA-26-29	AP16050	0.5	SPMP042...
TCB260-290F32	28	32	15.2	40	59	43	120	0.6	TCB04CA-26-29	AP16100	1	SPMP042...
TCB260-290F32	29	32	16.2	40	59	43	120	0.6	TCB04CA-26-29	AP16150	1.5	SPMP042...
TCB300-340F32	30	32	14.2	45	59	55	130	0.6	TCB32CA-30-39	-	-	SPMM322...
TCB300-340F32	31	32	15.2	45	59	55	130	0.6	TCB32CA-30-39	AP16050	0.5	SPMM322...
TCB300-340F32	32	32	16.2	45	59	55	130	0.6	TCB32CA-30-39	AP16100	1	SPMM322...
TCB300-340F32	33	32	17.2	45	59	55	130	0.6	TCB32CA-30-39	AP16150	1.5	SPMM322...
TCB300-340F32	34	32	18.2	45	59	55	130	0.6	TCB32CA-30-39	AP16200	2	SPMM322...
TCB350-390F32	35	32	19	50	59	70	140	0.7	TCB32CA-30-39	-	-	SPMM322...
TCB350-390F32	36	32	20	50	59	70	140	0.7	TCB32CA-30-39	AP16050	0.5	SPMM322...
TCB350-390F32	37	32	21	50	59	70	140	0.7	TCB32CA-30-39	AP16100	1	SPMM322...
TCB350-390F32	38	32	22	50	59	70	140	0.7	TCB32CA-30-39	AP16150	1.5	SPMM322...
TCB350-390F32	39	32	23	50	59	70	140	0.7	TCB32CA-30-39	AP16200	2	SPMM322...
TCB400-440F32	40	32	18	55	59	80	150	1	TCB43CA-40-59	-	-	SPMM432...
TCB400-440F32	41	32	19	55	59	80	150	1	TCB43CA-40-59	AP21050	0.5	SPMM432...
TCB400-440F32	42	32	20	55	59	80	150	1	TCB43CA-40-59	AP21100	1	SPMM432...
TCB400-440F32	43	32	21	55	59	80	150	1	TCB43CA-40-59	AP21150	1.5	SPMM432...
TCB400-440F32	44	32	22	55	59	80	150	1	TCB43CA-40-59	AP21200	2	SPMM432...
TCB450-490F32	45	32	23	65	59	90	160	1.2	TCB43CA-40-59	-	-	SPMM432...
TCB450-490F32	46	32	24	65	59	90	160	1.2	TCB43CA-40-59	AP21050	0.5	SPMM432...
TCB450-490F32	47	32	25	65	59	90	160	1.2	TCB43CA-40-59	AP21100	1	SPMM432...
TCB450-490F32	48	32	26	65	59	90	160	1.2	TCB43CA-40-59	AP21150	1.5	SPMM432...
TCB450-490F32	49	32	27	65	59	90	160	1.2	TCB43CA-40-59	AP21200	2	SPMM432...
TCB500-540F32	50	32	28	70	59	97	165	1.5	TCB43CA-40-59	-	-	SPMM432...
TCB500-540F32	51	32	29	70	59	97	165	1.5	TCB43CA-40-59	AP21050	0.5	SPMM432...
TCB500-540F32	52	32	30	70	59	97	165	1.5	TCB43CA-40-59	AP21100	1	SPMM432...
TCB500-540F32	53	32	31	70	59	97	165	1.5	TCB43CA-40-59	AP21150	1.5	SPMM432...
TCB500-540F32	54	32	32	70	59	97	165	1.5	TCB43CA-40-59	AP21200	2	SPMM432...
TCB550-590F32	55	32	33	75	59	105	175	1.9	TCB43CA-40-59	-	-	SPMM432...
TCB550-590F32	56	32	34	75	59	105	175	1.9	TCB43CA-40-59	AP21050	0.5	SPMM432...
TCB550-590F32	57	32	35	75	59	105	175	1.9	TCB43CA-40-59	AP21100	1	SPMM432...
TCB550-590F32	58	32	36	75	59	105	175	1.9	TCB43CA-40-59	AP21150	1.5	SPMM432...
TCB550-590F32	59	32	37	75	59	105	175	1.9	TCB43CA-40-59	AP21200	2	SPMM432...

* - Dimensions shown are for min diameter setting. DC dimension changes when shims are added for larger diameter counterboring.
The cartridge sets and shim plates are included.

Tool diameter tolerance	Applicable tolerance range of hole diameter
+0.2 / 0	+0.3 / 0

Countersink dimensions of bolt hole



Thread size	M16	M18	M20	M22	M24	M27	M30	M33	M36
øD (mm)	26	29	32	35	39	43	48	54	58
H (mm)	17.5	19.5	21.5	23.5	25.5	29	32	35	38
ød (mm)	18	20	22	24	26	30	33	36	39
Applicable tool	TCB260	TCB290	TCB320	TCB350	TCB390	TCB430	TCB480	TCB540	TCB580

Reference pages: Inserts → [H253](#), Standard cutting conditions → [H253 - H254](#)



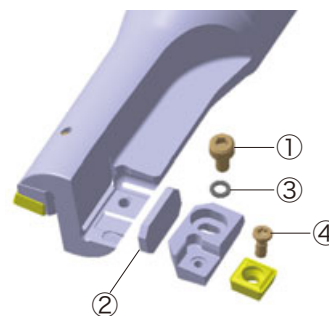
Body SPARE PARTS

Designation	① Cartridge screw	② Shim plate	② Shim plate	② Shim plate	② Shim plate	Wrench for cartridge	③ Washer
TCB260-290F32	CM3×0.5×6	AP16050	AP16100	AP16150		P-2.5	3.2X6X0.5
TCB300-340F32	CM3×0.5×6	AP16050	AP16100	AP16150	AP16200	P-2.5	3.2X6X0.5
TCB350-390F32	CM3×0.5×6	AP16050	AP16100	AP16150	AP16200	P-2.5	3.2X6X0.5
TCB400-440F32	CM4×0.7×10	AP21050	AP21100	AP21150	AP21200	P-3	4.3X8X0.5
TCB450-490F32	CM4×0.7×10	AP21050	AP21100	AP21150	AP21200	P-3	4.3X8X0.5
TCB500-540F32	CM4×0.7×10	AP21050	AP21100	AP21150	AP21200	P-3	4.3X8X0.5
TCB550-590F32	CM4×0.7×10	AP21050	AP21100	AP21150	AP21200	P-3	4.3X8X0.5

Cartridge set SPARE PARTS

Designation	④ Insert screw	Wrench
TCB04CA-26-29	CSTA-NO3	T-9D
TCB32CA-30-39	CSTA-NO5	T-9D
TCB32CA-30-39	CSTA-NO5	T-9D
TCB43CA-40-59	CSTA-4	T-15D
TCB43CA-40-59	CSTA-4	T-15D
TCB43CA-40-59	CSTA-4	T-15D
TCB43CA-40-59	CSTA-4	T-15D

Recommended clamping torque: CSTA-NO3 / CSTA-NO5 = 2.3 N·m, CSTA-4 = 3.5 N·m



Fine adjustment shim plates (sold separately)

SPARE PARTS

Designation	Thickness
AP16005	0.05
AP16020	0.2
AP21005	0.05
AP21020	0.2

Cautions in preparing the cartridge type cutter

- Firmly press the cartridge in the arrowed direction while tightening the screw to install the cartridge on the cutter body. (Fig.1)
- Ensure that the shim plates thickness are always the same on both sides to equalize the tool diameter. (Fig.2)
- Ensure to locate the shim plate fit within the cartridge pocket. (Fig.2)
- Use thin shim plates (not included) for fine diameter adjustments in $\phi 0.1$ mm increments.
- When using multiple shim plates in one pocket for a diameter adjustment, always use the thinnest shim plates at the bottom to prevent them from dislocating during machining. (Fig.3)
- Ensure that the top shim is always in contact with the rim of the cartridge pocket to prevent it from dislocation during machining. (Fig.4)



Fig.1



Fig.2

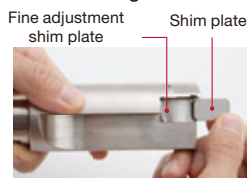


Fig.3



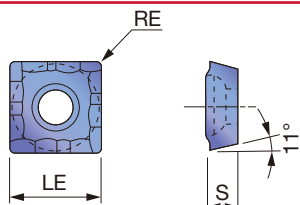
Fig.4

CUSTOM-BUILT TOOL SERVICE

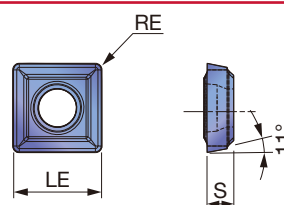
Tungaloy also designs and fabricates semi-standard or tailor-made tools with the TCB inserts according to the desired tool specifications. Contact your Tungaloy representative for further details.

INSERT

SPMP/SPMM



SPMP/SPMM-CG



P	Steel	☆	★	★
M	Stainless	☆	★	★
K	Cast iron	☆	★	★
N	Non-ferrous	☆	☆	☆
S	Superalloys	☆	☆	☆
H	Hard materials	☆	☆	☆

★ : First choice
☆ : Second choice

Designation	RE	Coated										LE	S
		T313W	AH6030	AH6225									
SPMP771-CG	0.016	▲	●									0.213	0.063
SPMP831-CG	0.016	▲	●									0.250	0.094
SPMP831DS	0.016	●										0.250	0.094
SPMP832-CG	0.031		●									0.250	0.094
SPMP041ER-CG	0.016		●									0.313	0.125
SPMP042ER-CG	0.031	▲	●									0.313	0.125
SPMP042ERD	0.031	●										0.313	0.125
SPMM321ER-CG	0.016		●									0.375	0.125
SPMM322ER-CG	0.031	▲	●									0.375	0.125
SPMM322ERD	0.031	●										0.375	0.125
SPMM431ER-CG	0.016		●									0.500	0.187
SPMM432ER-CG	0.031	▲	●									0.500	0.187
SPMM432ERD	0.031	●										0.500	0.187

● : Line up
▲ : To be discontinued

STANDARD CUTTING CONDITIONS

Counterboring

ISO	Workpiece material	Hardness	Cutting speed Vc (sfm)	Feed : f (ipr)	
				ø10 - 12 mm (z = 1)	ø13 - 59 mm (z = 2)
P	Carbon steel	- 300 HB	260 - 660	0.001 - 0.003	0.004 - 0.012
M	Stainless steel	- 200 HB	260 - 490	0.001 - 0.002	0.002 - 0.006
K	Gray cast iron	150 - 250 HB	260 - 660	0.002 - 0.004	0.004 - 0.016
N	Non-ferrous	-	330 - 980	0.002 - 0.008	0.004 - 0.016
S	Superalloys	- 40 HRC	160 - 260	0.001 - 0.002	0.002 - 0.006
H	Hard materials	- 50 HRC	160 - 260	0.001 - 0.002	0.002 - 0.006

Milling

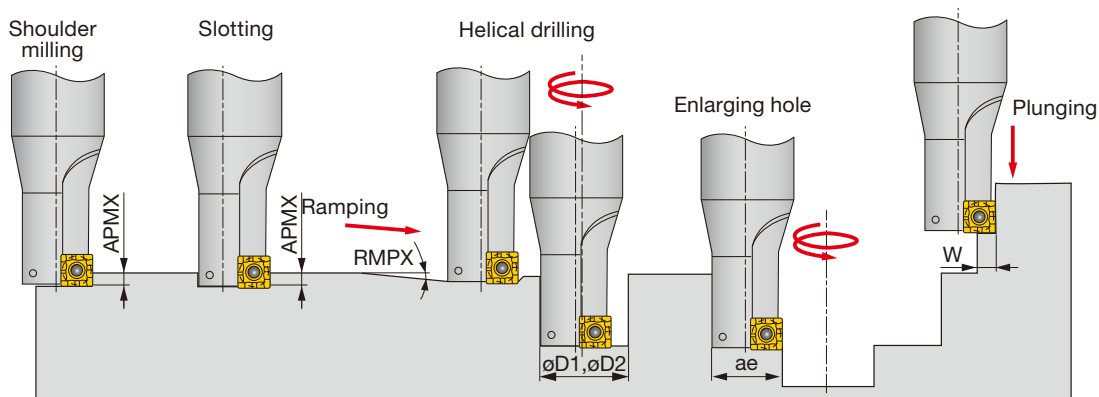
ISO	Workpiece material	Hardness	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
P	Carbon steel	- 300 HB	260 - 660	0.002 - 0.006
M	Stainless steel	- 200 HB	260 - 490	0.002 - 0.004
K	Gray cast iron	150 - 250 HB	260 - 660	0.002 - 0.008
N	Non-ferrous	-	330 - 980	0.004 - 0.008
S	Superalloys	- 40 HRC	160 - 260	0.002 - 0.003
H	Hard materials	- 50 HRC	160 - 260	0.002 - 0.003



Internal boring (With one cutting edge)

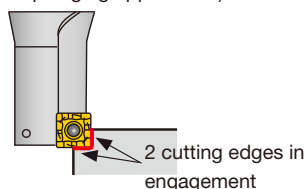
ISO	Workpiece material	Hardness	Cutting speed Vc (sfm)	Depth of cut ap (in)	Feed : f (ipr)
P	Carbon steel	- 300 HB	260 - 660	0.020 -	0.002 - 0.006
M	Stainless steel	- 200 HB	260 - 490	0.020 -	0.002 - 0.004
K	Gray cast iron	150 - 250 HB	260 - 660	0.020 -	0.002 - 0.008
N	Non-ferrous	-	330 - 980	0.020 -	0.004 - 0.008
S	Superalloys	- 40 HRC	160 - 260	0.020 -	0.002 - 0.003
H	Hard materials	- 50 HRC	160 - 260	0.020 -	0.002 - 0.003

APPLICATION



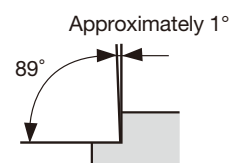
Metric	Tool dia. DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. cutting width in plunging W	Min. machinable hole dia. øD1	Max. machinable hole dia. øD2	Max. cutting width in enlarging hole ae
TCB100F16	10	4	-	4	-	-	-
TCB110F16	11	4	2.1°	4	12	20	10
TCB120F20	12	4	2.1°	4	14	22	11
TCB130F20	13	4	2.1°	4	17	24	12
TCB-140	14	5	3°	5	20	25	13
TCB140F25	14	4	1.9°	4	19	26	13
TCB150F25	15	4	1.6°	4	21	28	14
TCB160F25	16	4	1.3°	4	23	30	15
TCB170F25	17	5	2.5°	5	25	32	16
TCB175F25	17.5	5	2.2°	5	25.5	33	16.5
TCB180F25	18	5	2°	5	26	34	17
TCB190F25	19	5	1.5°	5	27	36	18
TCB200F25	20	6	3°	6	29	38	19
TCB210F25	21	6	2.5°	6	30	40	20
TCB220F25	22	6	2°	6	31	42	21
TCB230F25	23	6	1.6°	6	32	44	22
TCB240F25	24	6	1.3°	6	33	46	23
TCB250F25	25	6	1.1°	6	34	48	24.5
TCB-260	26	6	1°	6	35	50	25
TCB-290	29	8	3°	8	37	56	28
TCB-320	32	8	2.5°	8	40	62	31
TCB-350	35	10	2.5°	10	45	68	34
TCB-390	39	10	2°	10	49	76	38
TCB-430	43	10	1.5°	10	53	84	42

The insert can be used for a maximum 2 indexings.
(full 4 indexing for a plunging application.)



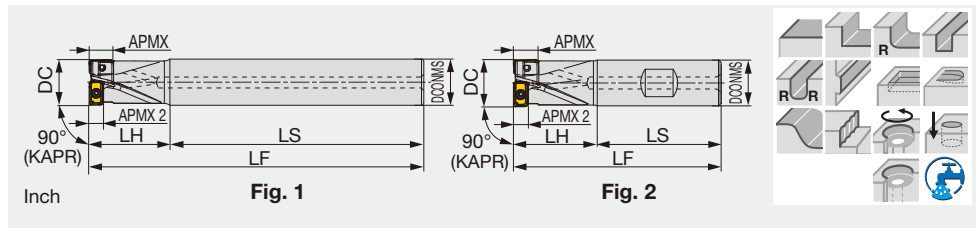
Cautions in shouldering operation

The cutter is design so that the insert provides 1° taper relief on the periphery. The wall, therefore, will be 89° when milled.



Multi-functional square shoulder milling cutter,
with screwed-on inserts and center cutting edge

GAMP: Center insert $-2.6^{\circ} \sim -4.4^{\circ}$, Peripheral insert $+6.1^{\circ} \sim +7.1^{\circ}$
GAMF: Center insert $+0.2^{\circ} \sim +1.3^{\circ}$, Peripheral insert $-15.7^{\circ} \sim -15^{\circ}$



Inch	APMX	APMX 2	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert	Fig.
EVLX06U0.50W0.50R02	0.197	0.110	0.500	2	0.500	1.781	0.756	2.537	0.110	With	LXMU06...	2
EVLX06U0.50C0.50R02L	0.197	0.110	0.500	2	0.500	3.000	1.500	4.500	0.220	With	LXMU06...	1
EVLX08U0.62W0.62R02	0.276	0.157	0.625	2	0.625	1.910	1.250	3.160	0.100	With	LXMU08...	2
EVLX08U0.62C0.62R02L	0.276	0.157	0.625	2	0.625	5.000	2.000	7.000	0.240	With	LXMU08...	1
EVLX10U0.787W0.75R02	0.354	0.157	0.787	2	0.750	2.030	1.380	3.410	0.160	With	LXMU10...	2
EVLX10U0.787C0.75R02L	0.354	0.157	0.787	2	0.750	5.000	2.380	7.380	0.370	With	LXMU10...	1
EVLX12U1.00W1.00R02	0.433	0.236	1.000	2	1.000	2.280	1.750	4.030	0.340	With	LXMU12...	2
EVLX12U1.00C1.00R02L	0.433	0.236	1.000	2	1.000	6.000	3.000	9.000	0.810	With	LXMU12...	1
EVLX16U1.25W1.25R02	0.571	0.276	1.250	2	1.250	2.281	2.000	4.281	1.210	With	LXMU16...	2
EVLX16U1.25C1.25R02L	0.571	0.276	1.250	2	1.250	6.500	3.500	10.000	3.060	With	LXMU16...	1
EVLX19U1.50W1.25R02	0.709	0.394	1.500	2	1.250	2.281	2.250	4.531	1.650	With	LXMU19...	2
EVLX19U1.50C1.25R02L	0.709	0.394	1.500	2	1.250	7.750	2.250	10.000	3.510	With	LXMU19...	1
Metric	APMX	APMX 2	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert	Fig.
EVLX06M012C12.0R02	5	2.8	12	2	12	60	20	80	0.06	With	LXM/GU06...	1
EVLX06M012C12.0R02L	5	2.8	12	2	12	85	35	120	0.09	With	LXM/GU06...	1
EVLX06M013C12.0R02L	5	2.8	13	2	12	95	25	120	0.09	With	LXM/GU06...	1
EVLX08M016C16.0R02	7	4	16	2	16	100	30	130	0.18	With	LXM/GU08...	1
EVLX08M016C16.0R02L	7	4	16	2	16	130	50	180	0.25	With	LXM/GU08...	1
EVLX08M017C16.0R02L	7	4	17	2	16	155	25	180	0.26	With	LXM/GU08...	1
EVLX10M020C20.0R02	9	4	20	2	20	110	35	145	0.31	With	LXM/GU10...	1
EVLX10M020C20.0R02L	9	4	20	2	20	130	60	190	0.41	With	LXM/GU10...	1
EVLX10M021C20.0R02L	9	4	21	2	20	160	30	190	0.42	With	LXM/GU10...	1
EVLX12M025C25.0R02	11	6	25	2	25	105	45	150	0.51	With	LXM/GU12...	1
EVLX12M025C25.0R02L	11	6	25	2	25	150	75	225	0.77	With	LXM/GU12...	1
EVLX12M026C25.0R02L	11	6	26	2	25	190	35	225	0.8	With	LXM/GU12...	1
EVLX16M032C32.0R02	14.5	7	32	2	32	100	50	150	0.83	With	LXM/GU16...	1
EVLX16M032C32.0R02L	14.5	7	32	2	32	165	90	255	1.45	With	LXM/GU16...	1
EVLX16M033C32.0R02L	14.5	7	33	2	32	205	50	255	1.5	With	LXM/GU16...	1
EVLX19M040C32.0R02	18	10	40	2	32	100	55	155	1.03	With	LXM/GU19...	1
EVLX19M040C32.0R02L	18	10	40	2	32	200	55	255	1.6	With	LXM/GU19...	1

SPARE PARTS



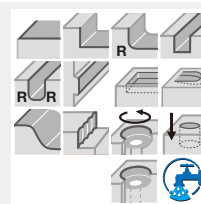
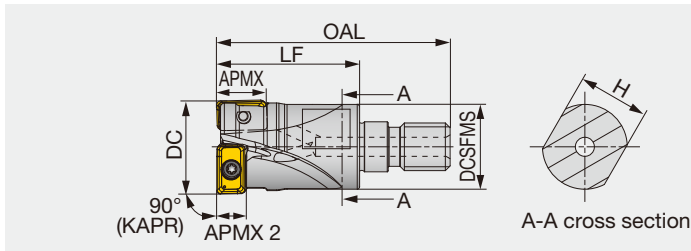
Designation	Clamping screw	Wrench
EVLX06...	CSPB-1.8FL4.3	IP-6DB
EVLX08...	CSPB-2.2	IP-7D
EVLX10...	SR M2.5X0.45-L6 IP7	IP-7D
EVLX12...	TS30100/HG-P	IP-9D
EVLX16...	CSTB-4L090	T-15D
EVLX19...	CSTB-5	T-20D

Recommended clamping torque: CSPB-1.8FL4.3 = 0.37 lbs-ft, 0.5 N-m,
CSPB-2.2, SR M2.5X0.45-L6 IP7 = 0.74 lbs-ft, 1 N-m, TS30100/HG-P = 1.48
lbs-ft, 2 N-m, CSTB-4L090 = 2.58 lbs-ft, 3.5 N-m, CSTB-5 = 3.69 lbs-ft, 5 N-m



Multi-functional square shoulder modular milling cutter
(TungFlex), with screwed-on inserts and center cutting edge

GAMP: Center insert -2.6° ~ -4.4°, Peripheral insert +6.1° ~ +7.1°
GAMF: Center insert +0.2° ~ +1.3°, Peripheral insert -15.7° ~ -15°



Metric	APMX	APMX 2	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HVLX06M012M06R02	5	2.8	12	2	34.5	20	7	10	M6	0.02	With	LXM/GU06...
HVLX06M013M06R02	5	2.8	13	2	34.5	20	7	10	M6	0.02	With	LXM/GU06...
HVLX08M016M08R02	7	4	16	2	42	25	10	14.5	M8	0.03	With	LXM/GU08...
HVLX08M017M08R02	7	4	17	2	42	25	10	14.5	M8	0.04	With	LXM/GU08...
HVLX10M020M10R02	9	4	20	2	49	30	15	17.8	M10	0.05	With	LXM/GU10...
HVLX10M021M10R02	9	4	21	2	49	30	15	17.8	M10	0.06	With	LXM/GU10...
HVLX12M025M12R02	11	6	25	2	57	35	17	23	M12	0.1	With	LXM/GU12...
HVLX12M026M12R02	11	6	26	2	57	35	17	23	M12	0.1	With	LXM/GU12...
HVLX16M032M16R02	14.5	7	32	2	63	40	22	28.8	M16	0.21	With	LXM/GU16...
HVLX16M033M16R02	14.5	7	33	2	63	40	22	28.8	M16	0.21	With	LXM/GU16...

SPARE PARTS



Designation	Clamping screw	Wrench
HVLX06...	CSPB-1.8FL4.3	IP-6DB
HVLX08...	CSPB-2.2	IP-7D
HVLX10...	SR M2.5X0.45-L6 IP7	IP-7D
HVLX12...	TS30100/HG-P	IP-9D
HVLX16...	CSTB-4L090	T-15D

Recommended clamping torque: CSPB-1.8FL4.3 = 0.37 lbs-ft, 0.5 N-m,
CSPB-2.2, SR M2.5X0.45-L6 IP7 = 0.74 lbs-ft, 1 N-m, TS30100/HG-P =
1.48 lbs-ft, 2 N-m, CSTB-4L090 = 2.58 lbs-ft, 3.5 N-m

Approach angle

7°-25°

41°-45°

60°-70°

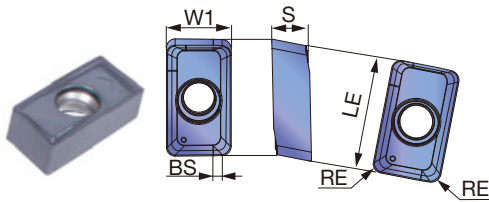
85-88°

90°

Others

INSERT

LXMU-MM



P	Steel	★	☆		
M	Stainless	★			
K	Cast iron		☆	★	
N	Non-ferrous				
S	Superalloys	☆		★	
H	Hard materials			★	

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated			LE	W1	S	BS
			AH3225	AH120	AH8015				
LXMU060204PER-MM	0.0157	0.197	●	●		0.236	0.154	0.091	0.024
LXMU080304PER-MM	0.016	0.276	●	●	●	0.303	0.197	0.110	0.031
LXMU10T304PER-MM	0.016	0.354	●	●	●	0.394	0.236	0.126	0.047
LXMU10T308PER-MM	0.031	0.354	●	●	●	0.394	0.236	0.126	0.031
LXMU120404PER-MM	0.016	0.433	●	●	●	0.480	0.280	0.165	0.047
LXMU120408PER-MM	0.031	0.433	●	●	●	0.480	0.280	0.165	0.031
LXMU160504PER-MM	0.0157	0.591	●	●	●	0.618	0.370	0.206	0.063
LXMU160508PER-MM	0.0315	0.591	●	●	●	0.618	0.370	0.207	0.047
LXMU190608PER-MM	0.0315	0.709	●	●	●	0.748	0.492	0.269	0.047

● : Line up

STANDARD CUTTING CONDITIONS

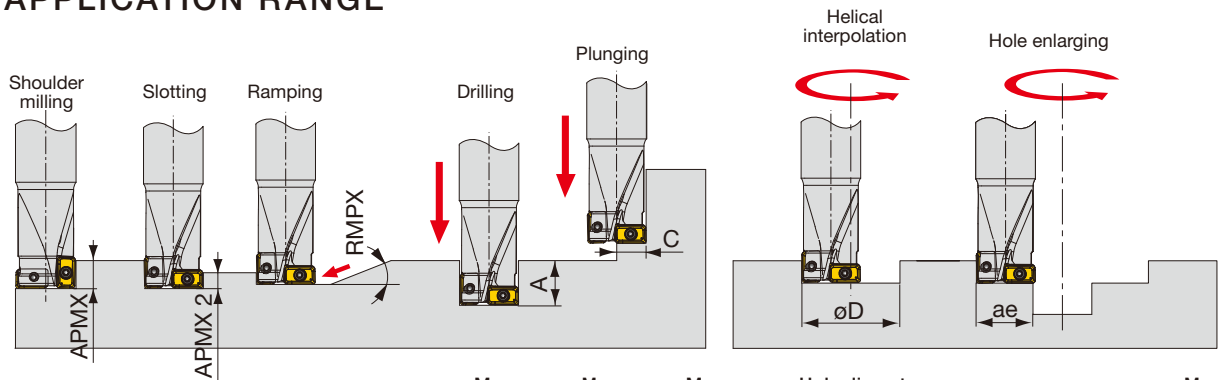
ISO	Workpiece materials		Hardness	Grades	Cutting speed Vc (sfm)	Drilling (ZEFP = 1)*	Shouldering / Helical interpolation*	
						Feed per revolution f (ipr)	Feed per tooth fz (ipt)	
							08	10 / 12
P	Low carbon steel 1015, etc.		- 200 HB	AH3225	328 - 984	0.001 - 0.003	0.002 - 0.010	0.002 - 0.012
	Carbon steel and alloy steel 1055, etc.		- 300 HB	AH3225	328 - 820	0.001 - 0.003	0.002 - 0.010	0.002 - 0.012
	Prehardened steel NAK80, PX5, etc.		30 - 40 HRC	AH3225	328 - 656	0.001 - 0.002	0.002 - 0.008	0.002 - 0.010
M	Stainless steel 304SS, etc.		-	AH3225	262 - 591	0.001 - 0.003	0.002 - 0.008	0.002 - 0.009
K	Gray cast iron Class 25, Class 30, etc.		150 - 250 HB	AH8015	328 - 984	0.001 - 0.004	0.002 - 0.010	0.002 - 0.012
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250 HB	AH8015	328 - 820	0.001 - 0.003	0.002 - 0.008	0.002 - 0.010
S	Titanium alloys Ti-6Al-4V, etc.		-	AH3225	66 - 197	0.001 - 0.002	0.002 - 0.006	0.002 - 0.006
	Superalloys Inconel718, etc.		-	AH8015	66 - 131	0.001 - 0.002	0.002 - 0.006	0.002 - 0.006
H	Hardened steel	H-13, etc.	40 - 50 HRC	AH8015	164 - 492	0.001 - 0.002	0.002 - 0.006	0.002 - 0.006
		D2, etc.	50 - 60 HRC	AH8015	131 - 230	0.001 - 0.002	0.002 - 0.006	0.002 - 0.006

*In the following cases, feed as if the cutter has a single effective cutting edge (ZEFP = 1):

- Hole making
- Helical interpolating for holes with a hole diameter (ϕD) $\leq 1.25 \times$ the tool diameter (DC)
- The axial D.O.C. exceeds APMX2 (See next page for APMX2)



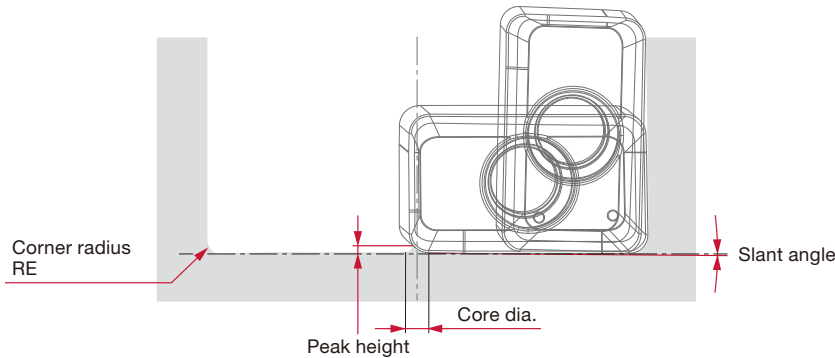
APPLICATION RANGE



		Max. depth of cut		Max. drilling depth*	Max. cutting width in plunging	Max. ramping angle	Hole diameters (w/ flat bottom) machinable		Hole diameters machinable		Max. cutting width engagement
Inch	DC	APMX	APMX 2	A	C	RMPX	øDmin	øDmax	øDmin	øDmax	ae
EVLX08U0.62...	0.625	0.276	0.157	0.469	0.313	3°	16.930	30.470	0.625	31.330	0.546
EVLX10U0.787...	0.780	0.354	0.157	0.590	0.394	3°	22.000	37.950	0.787	39.150	0.708
EVLX12U1.00...	1.000	0.433	0.236	0.750	0.500	3°	27.450	48.650	1.000	49.750	0.921

*Use pecking or dwelling method when drilling holes deeper than 0.197".

HOLE BOTTOM PROFILE AFTER DRILLING

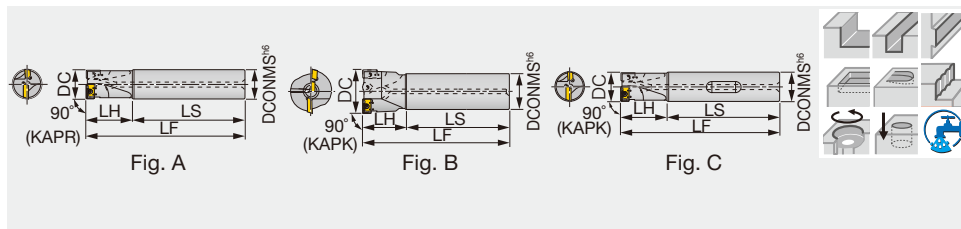


Unit: mm										Unit: in					
DC	D16	D17	D20		D21		D25		D26	0.625"	0.787"		1.000"		
Insert	LXMU08...		LXMU10...				LXMU12...			LXMU08...	LXMU10...		LXMU12...		
RE	0.4		0.4	0.8	0.4	0.8	0.4	0.8	0.4	0.8	0.016"	0.016"	0.031"	0.016"	0.031"
Peak height	0.43	0.86	0.1	0.24	0.86	0.86	0.45	0.45	0.86	0.86	0.0134"	0.004"	0.009"	0.034"	0.034"
Core dia.	0.9	1.9	0.21	1.02	1.22	2.02	0.7	1.37	1.59	2.36	0.0307"	0.008"	0.04"	0.041"	0.07"
Slant angle	Conical shape with $\approx 0.3^\circ$ slant angle														

EVX

Multi purpose endmill, shank type, with center cutting edge

Standard type GAMP = +2° ~ +5°, GAMF = -10° ~ -3.5°
Long type GAMP = +5°, GAMF = -4° ~ -2°



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	Coolant hole	Fig.	Insert
EVX08062RSU	0.276	0.625	2	0.625	1.906	1.250	3.156	Without	C	XXMU08...
EVX08062RLHU	0.276	0.625	2	0.625	5.375	1.625	7.000	With	A	XXMU08...
EVX10020RSU	0.276	0.787	2	0.750	2.031	1.250	3.281	Without	C	XXMU10...
EVX10020RLHU	0.276	0.787	2	0.750	5.500	2.000	7.500	With	A	XXMU10...
EVX12100RSU	0.276	1.000	2	1.000	2.281	1.625	3.906	Without	C	XXMU12...
EVX12100RLHU	0.354	1.000	2	1.000	6.000	2.750	8.750	With	A	XXMU12...
EVX16125RSU	0.276	1.250	2	1.250	2.281	2.000	4.281	Without	C	XXMU16...
EVX16125RLHU	0.354	1.250	2	1.250	6.750	3.250	10.000	With	A	XXMU16...

Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	Coolant hole	Fig.	Insert
EVX08016RSA	7	16	2	16	90	30	120	With	A	XXMU08...
EVX08016RS	7	16	2	16	90	30	120	Without	A	XXMU08...
EVX08016RLA	7	16	2	16	135	40	175	With	A	XXMU08...
EVX08016RL	7	16	2	16	135	40	175	Without	A	XXMU08...
EVX10020RSA	9	20	2	20	90	30	120	With	A	XXMU10...
EVX10020RS	9	20	2	20	90	30	120	Without	A	XXMU10...
EVX10020RLA	9	20	2	20	135	50	185	With	A	XXMU10...
EVX10020RL	9	20	2	20	135	50	185	Without	A	XXMU10...
EVX12025RSA	11.5	25	2	25	100	40	140	With	A	XXMU12...
EVX12025RS	11.5	25	2	25	100	40	140	Without	A	XXMU12...
EVX12025RLA	11.5	25	2	25	150	70	220	With	A	XXMU12...
EVX12025RL	11.5	25	2	25	150	70	220	Without	A	XXMU12...
EVX16032RSA	15	32	2	32	110	50	160	With	A	XXMU16...
EVX16032RS	15	32	2	32	110	50	160	Without	A	XXMU16...
EVX16032RLA	15	32	2	32	175	80	255	With	A	XXMU16...
EVX16032RL	15	32	2	32	175	80	255	Without	A	XXMU16...
EVX12040RSA	11.5	40	2	42	120	60	180	With	B	XXMU12, WCMT05...
EVX12040RS	11.5	40	2	42	120	60	180	Without	B	XXMU12, WCMT05...
EVX12040RLA	11.5	40	2	42	210	100	310	With	B	XXMU12, WCMT05...
EVX12040RL	11.5	40	2	42	210	100	310	Without	B	XXMU12, WCMT05...
EVX16050RSA	15	50	2	42	160	50	210	With	B	XXMU16, WCMT06...
EVX16050RS	15	50	2	42	160	50	210	Without	B	XXMU16, WCMT06...
EVX16050RLA	15	50	2	42	310	50	360	With	B	XXMU16, WCMT06...
EVX16050RL	15	50	2	42	310	50	360	Without	B	XXMU16, WCMT06...
EVX16063RSA	15	63	2	42	190	50	240	With	B	XXMU16, WCMT06...
EVX16063RS	15	63	2	42	190	50	240	Without	B	XXMU16, WCMT06...
EVX16063RLA	15	63	2	42	310	50	360	With	B	XXMU16, WCMT06...
EVX16063RL	15	63	2	42	310	50	360	Without	B	XXMU16, WCMT06...

SPARE PARTS

Designation	Clamping screw 1	Clamping screw 2	Lubricant	Wrench 1	Wrench 2
EVX08...	-	CSPB-2.2	M-1000	IP-7D	-
EVX10...	-	CSPB-2.5	M-1000	IP-8D	-
EVX12...	-	CSPD-3	M-1000	IP-10D	-
EVX16125R**U, EVX16032R...	CSPB-3.5	-	M-1000	IP-15D	-
EVX16050, 63R...	CSPB-3.5	CSTB-3.5D	M-1000	IP-15D	T-9D

Recommended clamping torque: CSPB-2.2 = 0.74 lbs-ft, 1 N-m, CSPB-2.5 = 0.96 lbs-ft, 1.3 N-m, CSPB-3.5 = 2.58 lbs-ft, 3.5 N-m, CSPD-3 = 1.84 lbs-ft, 2.5 N-m, CSTB-3.5D = 1.7 lbs-ft, 2.3 N-m

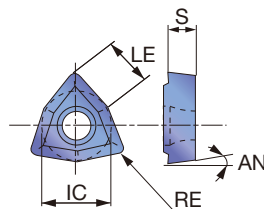
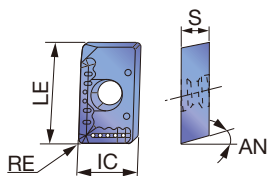
Reference pages: Inserts, Standard cutting conditions → **H260**



INSERT

XXMU-MJ

WCMT-D4



P	Steel	★	★	
M	Stainless	★		★
K	Cast iron		★	
N	Non-ferrous			
S	Superalloys			
H	Hard materials	★		

★ : First choice
☆ : Second choice

Designation	RE	Coated			LE	IC	S	AN
		AH3135	AH120	AH140				
XXMU08T204PR-MJ	0.016	●	●	●	0.323	0.220	0.109	10°
XXMU10H308PR-MJ	0.031	●	●	●	0.417	0.268	0.138	11°
XXMU12X408PR-MJ	0.031	●	●	●	0.520	0.311	0.165	11°
XXMU16X508PR-MJ	0.031	●	●	●	0.661	0.437	0.197	11°
WCMT050308-D4	0.031		●	●	0.213	0.313	0.125	7°
WCMT06T308-D4	0.031		●	●	0.256	0.375	0.156	7°

●: Line up

STANDARD CUTTING CONDITIONS

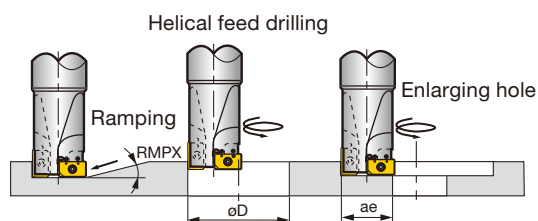
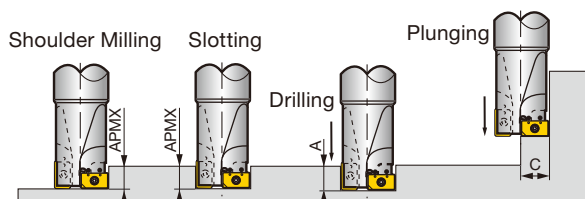
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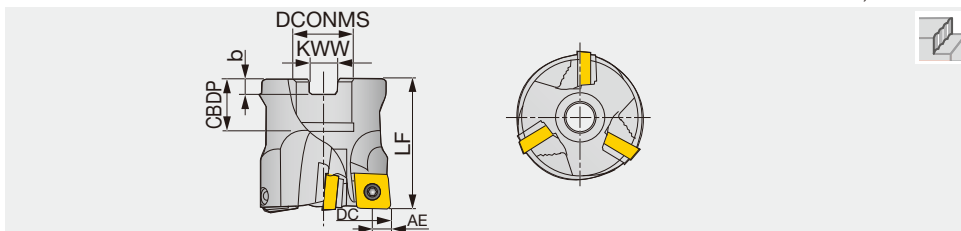


EVX

APPLICATION RANGE



Inch	Tool dia. DC	Max. depth of cut APMX	Max. drilling depth A	Max. cutting width in plunging C	Max. ramping angle RMPX	Min. machining hole dia. øDmin	Max. machining hole dia. øDmax	Max. cutting width in enlarging hole ae
EVX08062RSU/RLHU	0.625	0.276	0.315	0.315	3°	0.756	1.250	0.551
EVX10020RSU/RLHU	0.750	0.354	0.394	0.394	3°	0.945	1.500	0.709
EVX12100RSU/RLHU	1.000	0.453	0.492	0.492	3°	1.250	1.890	0.906
EVX16125RSU/RLHU	1.250	0.591	0.630	0.630	3°	1.510	2.440	1.250



Metric	DC	CICT	DCONMS	CBDP	LF	b	KWW	WT(kg)	Insert
TZP12050R	50	3	22	20	50	6	10	0.38	APMT120416PR-MJ
TZP12050R-E	50	3	22	20	50	6.3	10.4	0.38	APMT120416PR-MJ
TZP12063R	63	3	22	20	50	6	10	0.72	APMT120416PR-MJ
TZP12063R-E	63	3	22	20	50	6.3	10.4	0.72	APMT120416PR-MJ
TZP12080R	80	4	31.75	32	63	8	12.7	1.51	APMT120416PR-MJ

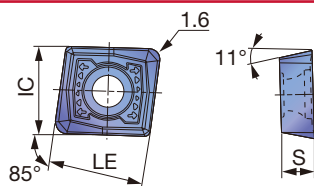
SPARE PARTS

Designation	Clamping screw	Lubricant	Shim screw	Shim	Wewnch1	Wewnch2
TZP12	CSTB-3.5T	M-1000	DTSS-3.5SS	ZSA1102	T-20D	P-3.5

Recommended clamping torque: 5 N·m

INSERT

APMT120416-MJ



P	Steel	☆	★	
M	Stainless			
K	Cast iron	★		
N	Non-ferrous			
S	Superalloys			
H	Hard materials			

★ : First choice
☆ : Second choice

Designation	RE	AE	Coated		IC	LE	S
			AH120	T3130			
APMT120416PR-MJ	0.063	0.394	●	●	0.500	0.531	0.187

● : Line up

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog



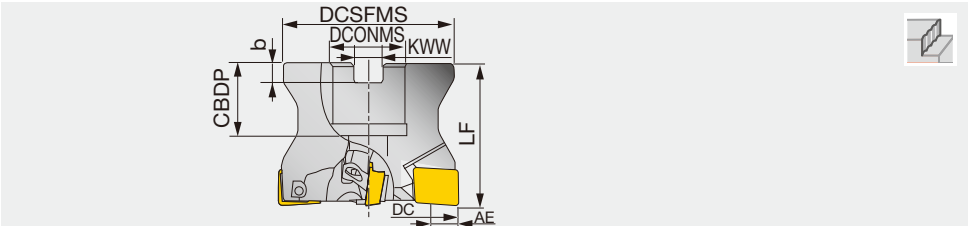
TZP12



TZP19

Plunge mill for roughing, with wedge clamp system

GAMP = +16°, GAMF = -2°



Metric	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Insert
TZP19080R	80	4	76	31.75	32	63	8	12.7	1.32	APMR190616PR-MJ
TZP19100R	100	5	96	31.75	32	63	8	12.7	2.41	APMR190616PR-MJ
TZP19125R	125	6	98	38.1	38	63	10	15.9	3.17	APMR190616PR-MJ

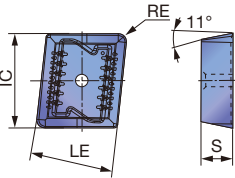
SPARE PARTS

Designation	Clamping screw	Adjusting screw	Shim	Wedge	Wewnch1	Wewnch 2
TZP19	CSTA-4	FDS-8ST	ZSA1502	WPP16R	T-15D	T-27T

Recommended clamping torque: 3.5 N·m

INSERT

APMR190616-MJ



P	Steel	☆	★	
M	Stainless			
K	Cast iron	★		
N	Non-ferrous			
S	Superalloys			
H	Hard materials			

★ : First choice
☆ : Second choice

Designation	RE	AE	Coated		IC	LE	S
			AH120	T3130			
APMR190616PR-MJ	0.063	0.669	●	●	0.750	0.625	0.250

●: Line up

STANDARD CUTTING CONDITIONS

Please scan below.

e-catalog

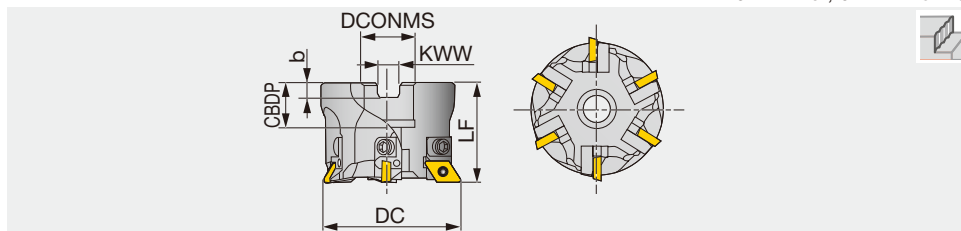


TZP19

TZF11

High precision plunge mill

GAMP = 0°, GAMF = -6° ~ 0°



Metric	CICT	DC	DCONMS	CBDF	LF	b	KWW	WT(kg)	Insert
TZF11050R	4	50	22	20	45	6	10	0.38	DPCW11T3ZFR
TZF11050R-E	4	50	22	20	45	6.3	10.4	0.38	DPCW11T3ZFR
TZF11063R	6	63	22	20	45	6	10	0.72	DPCW11T3ZFR
TZF11063R-E	6	63	22	20	45	6.3	10.4	0.72	DPCW11T3ZFR
TZF11080R	7	80	31.75	32	63	8	12.7	1.51	DPCW11T3ZFR

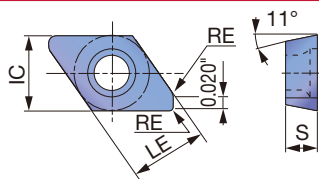
SPARE PARTS

Designation	Clamping screw	Cartridge	Lubricant	Cartridge fixing screw	Cartridge fixing screw	Shell locking bolt	Wewnch	Wewnch 1	Wewnch 2
TZF11050R*	CSTB-4S	SDUPR09CZ-11	M-1000	CM4X0.7X12	SSHM3-10	FSHM10-40	T-15D	P-1.5	P-3
TZF11063R*, TZF11080R	CSTB-4S	SDUPR09CZ-11	M-1000	CM4X0.7X12	SSHM3-10	-	T-15D	P-1.5	P-3

Recommended clamping torque: 3.5 N·m

INSERT

DPCW11T3 (High precision ground insert for plunging)



P	Steel	☆	★	
M	Stainless			
K	Cast iron	★	☆	
N	Non-ferrous			
S	Superalloys			
H	Hard materials	☆		

★ : First choice
☆ : Second choice

Designation	RE	Coated		Cermet		LE	IC	S
		AH120	AH740	NS740				
DPCW11T3ZFR	0.039	●	●	●		0.375	0.375	0.156

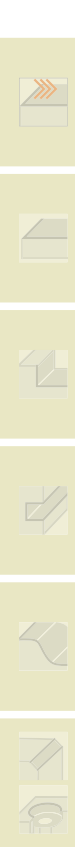
● : Line up

STANDARD CUTTING CONDITIONS

Please scan below.

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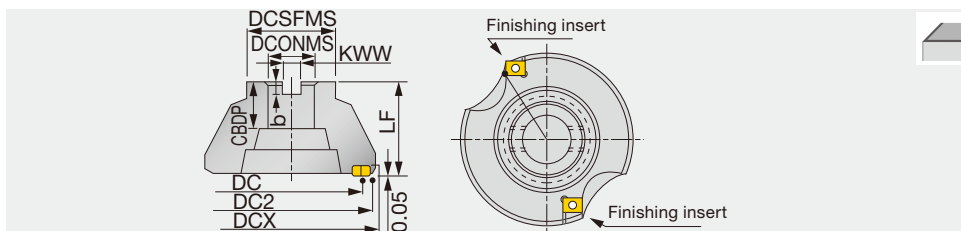




NMS09

High precision finishing face mill

GAMP = 10°, GAMF = -30°

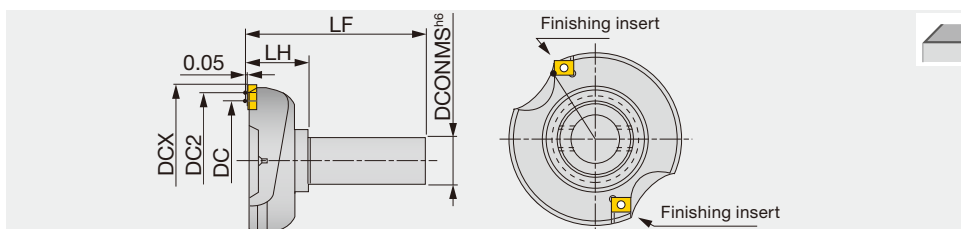


Metric	APMX	DC	CICT	DC2	DCX	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
NMS09080R	0.2	80	2	92	100.7	50	25.4	26	9.5	6	1.49	LNCQ0906...
NMS09100R	0.2	100	2	112	120.7	50	31.75	32	12.7	8	2.1	LNCQ0906...
NMS09125R	0.2	125	2	137	145.7	63	38.1	38	15.9	10	4.07	LNCQ0906...
NMS09160R	0.2	160	2	172	180.7	63	50.8	38	19	11	6.15	LNCQ0906...
NMS09200R	0.2	200	2	212	220.7	63	47.625	38	25.4	14	9.67	LNCQ0906...

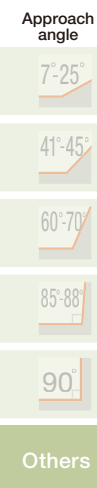
EMS09

High precision finishing endmill, shank type

GAMP = +10°, GAMF = -30°



Metric	APMX	DC	CICT	DC2	DCX	DCONMS	LH	LF	Insert
EMS09080R	0.2	80	2	92	100.7	32	40	120	LNCQ0906...



SPARE PARTS

Designation	Clamping screw	Wedge
NMS09..., EMS09080R	CSTB-4	T-15D

Recommended clamping torque: 3.5 N·m

INSERT

LNCQ0906N-100(50)L

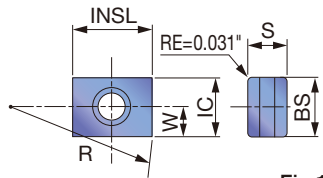


Fig.1

LNCQ0906-50S

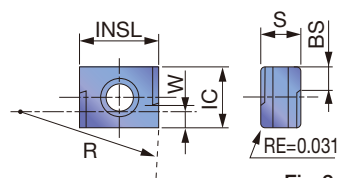


Fig.2

P	Steel	☆			★	
M	Stainless	★			★	
K	Cast iron	★	★			
N	Non-ferrous					
S	Superalloys					
H	Hard materials					

★ : First choice
☆ : Second choice

Designation	APMX	Coated		Cermet								IC	INSL	S	R	W	BS	Fig.
		AH120	GH110	NS740														
LNCQ0906N-100L	0.008	●	●	●								0.375	0.500	0.250	3.937	0.188	0.311	1
LNCQ0906N-50L	0.008	●	●	●								0.375	0.500	0.250	1.969	0.188	0.311	1
LNCQ0906R-50S	0.008	●	●	●								-	0.500	0.250	1.969	0.091	0.157	2

●: Line up

STANDARD CUTTING CONDITIONS

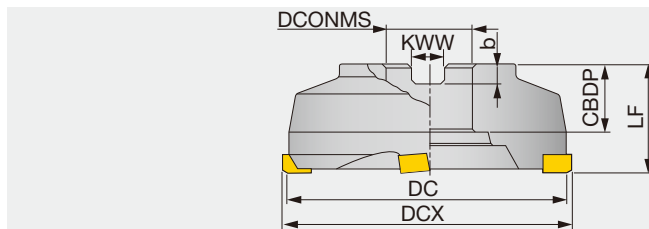
ISO	Workpiece material	Hardness (HB)	Grade	Cutting speed Vc (sfm)	LNCQ0906N-100(50)L		LNCQ0906R-50S	
					Depth of cut APMX (in)	Feed per tooth f (ipr)	Depth of cut APMX (in)	Feed per tooth f (ipr)
P	Mild steels	< 180	NS740	656 - 984	< 0.008	0.079 - 0.236	≤ 0.008	0.039 - 0.098
	Carbon steels	< 300	NS740	492 - 820				
	Alloy steels	< 300	NS740	394 - 656				
	Die steels	< 300	NS740	328 - 492				
M	Stainless steels	< 250	AH120 NS740	492 - 722	< 0.008	0.079 - 0.236	≤ 0.008	0.039 - 0.098
K	Cast irons	150 - 250	GH110 AH120	394 - 656	< 0.008	0.079 - 0.236	≤ 0.008	0.039 - 0.098



MS

High precision finishing face mill

GAMP = -5°, GAMF = -30°



Right hand (R) shown.

Metric	APMX	DC	CICT	DCX	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
MS04R/L	0.1	100	2	105	55	31.75	32	12.7	8	3	SN**56...
MS05R/L	0.1	125	2	130	60	38.1	38	15.9	10	4	SN**56...
MS06R/L	0.1	150	4	155	60	50.8	38	19	11	5	SN**56...
MS08R/L	0.1	200	4	205	60	47.625	38	25.4	14	8.5	SN**56...
MS10R/L	0.1	250	4	255	60	47.625	38	25.4	14	14	SN**56...
MS12R/L	0.1	300	4	305	60	47.625	38	25.4	14	23	SN**56...

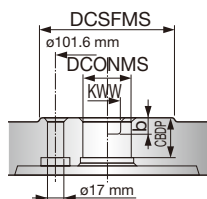
SPARE PARTS

Designation	Clamping screw	Locator	Pin	Locator fixing screw	Washer	Protector	Wrench
MS04R/L	CST-5	-	SP-8	-	-	PMS4R/L	T-25D
MS05R/L, MS06R/L	CST-5	-	SP-8	-	-	PMS5R/L	T-25D
MS08R/L - MS12R/L	CST-5	LMS56R/L	SP-8	CM6x25, CM6x16	VA6	PMS5R/L	T-25D

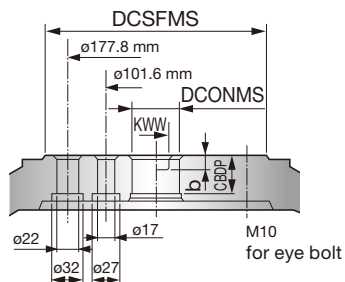
Recommended clamping torque: 3.5 N·m

Arbor type

MS08, 10R/L

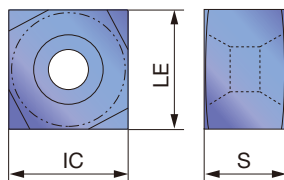


MS12R/L



INSERT

SNAA56FTR



Designation	APMX	Cermet	X407	LE	IC	S
SNAA56FTR	0.004	●		0.309	0.625	0.375

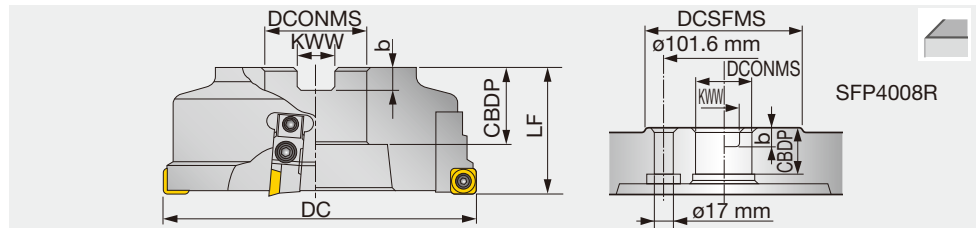
●: Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	Grade	Cutting speed V _c (sfm)	Feed per tooth f _z (ipt)	Depth of cut APMX (in)
P	Mild steels	< 180 HB	X407	853 - 984	≤ 0.236	≤ 0.004
	Carbon steels	< 300 HB	X407	394 - 591	≤ 0.236	≤ 0.004
	Alloy steels	< 300 HB	X407	394 - 591	≤ 0.236	≤ 0.004
	Die steels	< 30 HRC	X407	394 - 591	≤ 0.236	≤ 0.004
H	Carbon steel	40 - 50 HRC	X407	492 - 656	≤ 0.118	≤ 0.002

SFP4000R

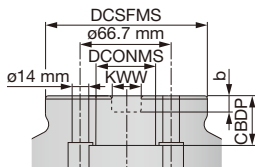
High precision finishing face mill, with adjustable structure



Metric	APMX	DC	CICT	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
SFP4004R	0.1	100	2	63	31.75	32	12.7	8	2.3	SPHA435FNW
SFP4005R	0.1	125	2	63	38.1	38	15.9	10	3.5	SPHA435FNW
SFP4006R	0.1	160	4	63	50.8	38	19	11	5.8	SPHA435FNW
SFP4008R	0.1	200	4	63	47.625	38	25.4	14	9	SPHA435FNW
SFP4004R-E	0.1	100	2	63	32	32	14.4	8	2.3	SPHA435FNW
SFP4005R-E	0.1	125	2	63	40	32	16.4	9	3.5	SPHA435FNW
SFP4006R-E	0.1	160	4	63	40	29	16.4	9	5.8	SPHA435FNW

Arbor type

SFP4006R-E



SPARE PARTS

Designation	Clamping screw	Locator	Adjusting screw	Locator fixing screw1	Locator fixing screw2	Wedge	Wrench	Washer1	Washer2	Wrench
SFP40...	CSTA-5S	LW400R	FDS-8S	CM5X0.8X16	CM5X0.8X18	FW-305	T-15D	5S	L5	P-4

Recommended clamping torque: 3.5 N·m

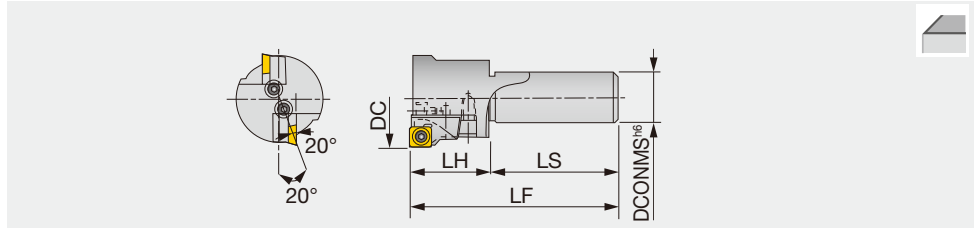
Reference pages: Inserts, Standard cutting conditions → **H268**



EFP4000R

High precision finishing endmill, shank type, with adjustable structure

GAMP = +5°, GAMF = -20°



Metric	APMX	DC	CICT	DCONMS	LS	LF	LH	Insert
EFP4050R	0.1	50	1	32	80	120	40	SPHA435FNW
EFP4063R	0.1	63	2	32	80	130	50	SPHA435FNW

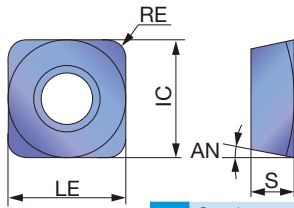
Note: EFP4050R does not have the adjustable structure.

SPARE PARTS

Designation	Clamping screw	Locator	Adjusting screw	Locator fixing screw1	Locator fixing screw2	Wedge	Wrench	Washer1	Washer2	Wrench
EFP4050R	CSTA-5S	LW402R	-	CM5X0.8X16	-	-	T-15D	-	-	-
EFP4063R	CSTA-5S	LW400R	FDS-8S	CM5X0.8X16	CM5X0.8X18	FW-305	T-15D	5S	L5	P-4

Recommended clamping torque: 3.5 N·m

INSERT SPHA435



P	Steel	★								
M	Stainless	★								
K	Cast iron		★							
N	Non-ferrous		★							
S	Superalloys									
H	Hard materials									

★ : First choice
☆ : Second choice

Designation	RE	APMX	Cermets		Uncoated							IC	LE	S	AN
			N308	TH10											
SPHA435FNW	0.079	0.004	●	●								0.500	0.500	0.187	11°

●: Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness (HB)	Grade	Cutting speed Vc (sfm)	Feed per revolution: f (ipr)		Depth of cut APMX (in)
					SFP	EFP	
P	Mild steels	< 180	N308	591 - 820	≤ 0.236	≤ 0.157	≤ 0.004
	Carbon steels	< 300	N308	492 - 656	≤ 0.236	≤ 0.157	≤ 0.004
	Alloy steels	< 300	N308	492 - 656	≤ 0.236	≤ 0.157	≤ 0.004
M	Stainless steels	< 250	N308	525 - 656	≤ 0.157	≤ 0.118	≤ 0.004
K	Cast irons	150 - 250	TH10	328 - 492	≤ 0.197	≤ 0.118	≤ 0.008
N	Non-ferrous metals	-	TH10	656 - 1640	≤ 0.236	≤ 0.157	≤ 0.004

Under the above conditions, attainable surface roughness is 3 to 4 μm RzJIS for steel and 6 to 12 μm RzJIS for cast iron.