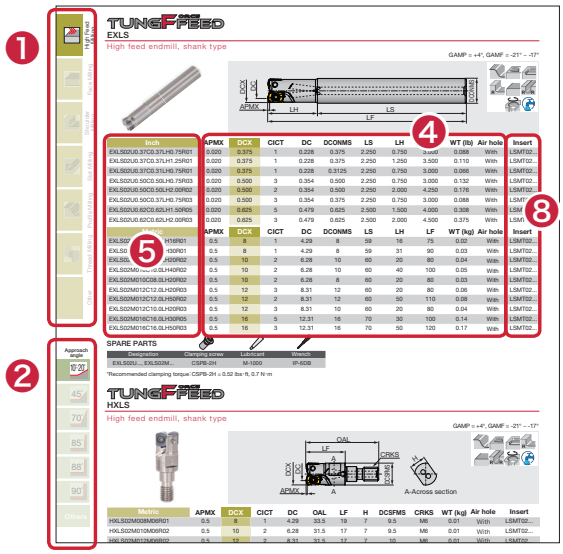
Milling Cutter

Milling Cutter - Content structure

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



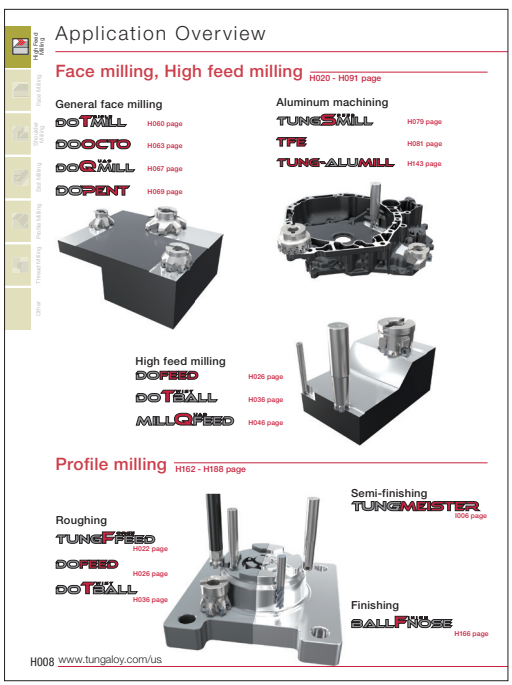
How to use the page

Method ①

Select the application (❶) and the approach angle (❷) at the left end of each page and choose a designation you need (❺) in the dimension table (❹). Applicable inserts are shown in (❽).

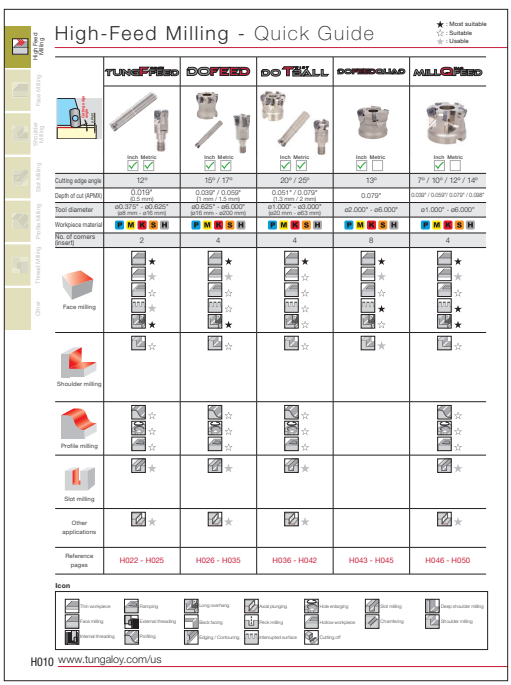
Method ②

Select the tool series name on H008 – H009 and check the details on the product page.



Method ③

Select the tool series or the tool specification on H010 - H019 and see the details on each page.



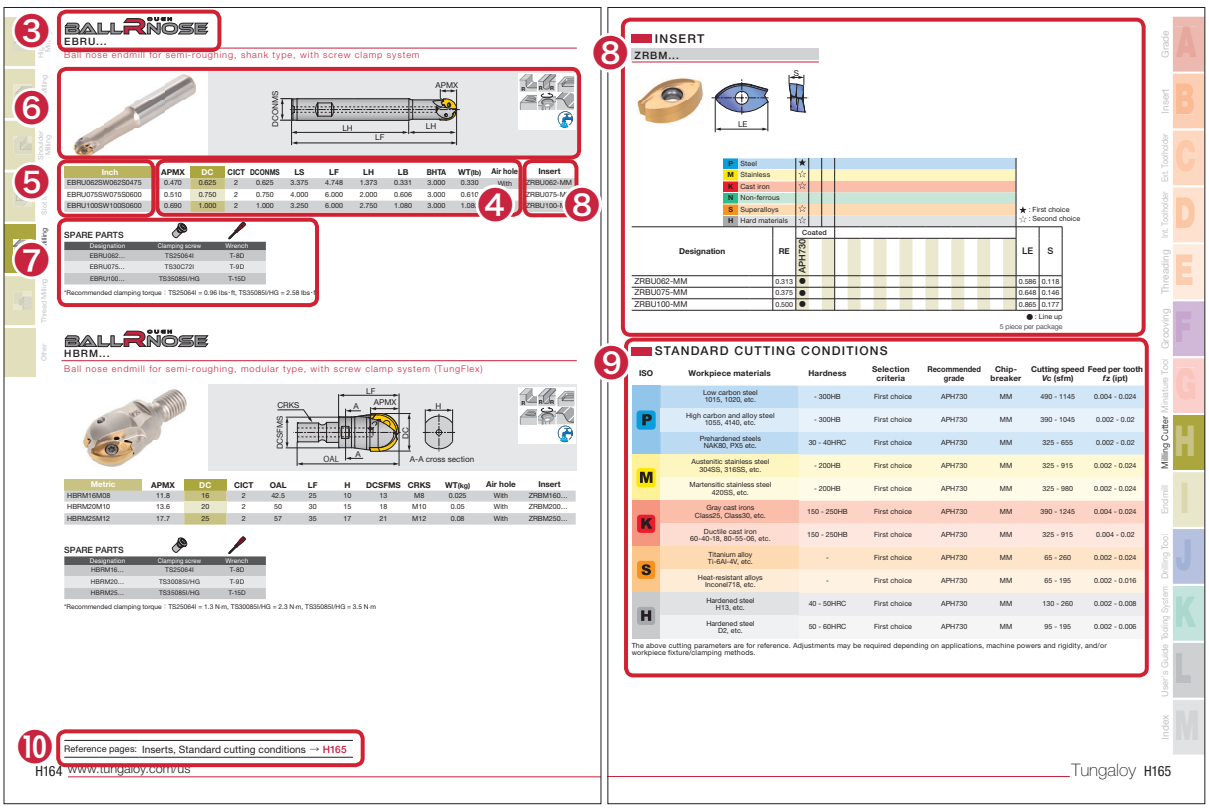
Icon

Approach angle

10°-20°	10° ~ 20°
45°	45°
70°	70°
85°	85°
88°	88°
90°	90°

Application

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



BALLNOSE EBRU...

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
EBRU062SW062SD475	0.470	0.625	2	0.625	3.375	4.748	1.373	0.331	3.000	0.330	With	ZRBU062-MM
EBRU075SW075SD600	0.510	0.750	2	0.750	4.000	6.000	2.000	0.606	3.000	0.610	With	ZRBU075-M
EBRU100SW100SD800	0.690	1.000	2	1.000	3.250	6.000	2.750	1.080	3.000	1.08	With	ZRBU100-M

SPARE PARTS

Designation	Clamping screw	Wrench
EBRU062...	TS25064I	T-8D
EBRU075...	TS30C72I	T-9D
EBRU100...	TS35085I/HG	T-15D

*Recommended clamping torque : TS25064I = 0.96 lbs·ft, TS35085I/HG = 2.58 lbs·ft

BALLNOSE HBRM...

Ball nose endmill for semi-roughing, modular type, with screw clamp system (TungFlex)

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
HBRM16...	TS25064I	T-8D
HBRM20...	TS30085I/HG	T-9D
HBRM25...	TS35085I/HG	T-15D

*Recommended clamping torque : TS25064I = 1.3 N·m, TS30085I/HG = 2.3 N·m, TS35085I/HG = 3.5 N·m

Reference pages: Inserts, Standard cutting conditions → H165

H164 www.tungaloy.com/us

INSERT

ZRBM...

Designation	RE	APH730	Coated							LE	S
ZRBU062-MM	0.313	●								0.586	0.118
ZRBU075-MM	0.375	●								0.648	0.146
ZRBU100-MM	0.500	●								0.865	0.177

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

★ : First choice
☆ : Second choice

● : Line up

5 piece per package

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 steel 1015, 1020, etc.	- 300HB	First choice	APH730	MM	490 - 1145	0.004 - 0.024
	High carbon and alloy steel 1055, 4140, etc.	- 300HB	First choice	APH730	MM	390 - 1045	0.002 - 0.02
	Prehardened steels NAK80, PX5 etc.	30 - 40HRC	First choice	APH730	MM	325 - 655	0.002 - 0.02
M	Austenitic stainless steel 304SS, 316SS, etc.	- 200HB	First choice	APH730	MM	325 - 915	0.002 - 0.024
	Martensitic stainless steel 420SS, etc.	- 200HB	First choice	APH730	MM	325 - 980	0.002 - 0.024
K	Gray cast irons Class25, Class30, etc.	150 - 250HB	First choice	APH730	MM	390 - 1245	0.004 - 0.024
	Ductile cast iron 60-40-18, 80-55-06, etc.	150 - 250HB	First choice	APH730	MM	325 - 915	0.004 - 0.02
S	Titanium alloy Ti-6Al-4V, etc.	-	First choice	APH730	MM	65 - 260	0.002 - 0.024
	Heat-resistant alloys Inconel718, etc.	-	First choice	APH730	MM	65 - 195	0.002 - 0.016
H	Hardened steel H13, etc.	40 - 50HRC	First choice	APH730	MM	130 - 260	0.002 - 0.008
	Hardened steel D2, etc.	50 - 60HRC	First choice	APH730	MM	95 - 195	0.002 - 0.006

The above cutting parameters are for reference. Adjustments may be required depending on applications, machine powers and rigidity, and/or workpiece fixture/clamping methods.

Tungaloy H165

❶ : Application
❷ : Approach angle
❸ : Tool series name
❹ : Dimension table
❺ : Mill designation
❻ : Dimension drawing (conforming to ISO13399)
❼ : Spare parts
❽ : Insert
❾ : Standard cutting conditions
❿ : Reference page

Machining accuracy

- F Finishing
- M Medium cutting
- R Roughing
- 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.

Designation system for Cutter

Symbol	Type
T	Bore type
E	Endmill type
L	Longedge type
H	Modular

① Type

Symbol	Type
TN	TN**
SN	SN**
LN	LN**
LS	LS**

③ First alphabet of insert

Symbol	Type
B	Bore type
C	Cylindrical shank
M	Modular
W	Weldon shank
S	TungMeister

⑦ Type of connection

Symbol	Size	Symbol	Size
B: Bore type Hole diameter		C: Cylindrical W: Weldon shank Shank diameter	
0.75	0.75 in	0.75	0.75 in
1.25	1.25 in	1.25	1.25 in
20.0	20 mm	10.0	10 mm
47.6	47.6 mm	25.0	25 mm
M: Modular Thread size		V: TungMeister Connection size	
06	M6	05	S05
10	M10	08	S08

⑧ Attachment size

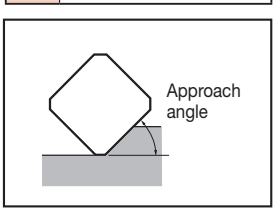
⑩ No. of inserts

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
T	A	SN	13	U	3.00	B	1.00	R	08

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
E	P	TN	12	U	1.25	C	1.25	R	03	N

② Approach of cutter

Symbol	Type
A	40° ~ 45°
E	70°
H	88°
P	90°
X	High feed
F	Special
T	Thread mill



④ Cutting edge length

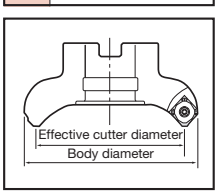
Symbol	Size (ℓ)
S	ℓ
T	ℓ
R	ℓ
H	ℓ
A	ℓ

⑤ Unit

Symbol	Type
M	ISO
J	JIS
U	Inch

⑥ Effective cutter diameter

Symbol	Size
M / J: Unit in mm	
080	80 mm
200	200 mm
U: Unit in inch	
2.00	2 in

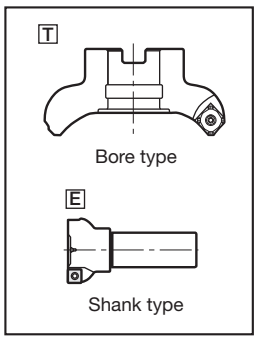


⑨ Hand of cutter

Symbol	Hand
R	Right hand
L	Left hand
N	Neutral

⑪ Additional feature

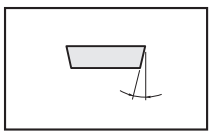
Symbol	Type
L	Long shank
N	No coolant hole



Symbol	Type
T	Bore type
E	Shank type

① Type

H	Hybrid TAC Mill Series



Symbol	Relief angle
C	7°
P	11°
D	15°
E	20°
F	25°
N	0°
Others	Special

③ Relief angle

Symbol	Hand
R	Right
L	Left

⑤ Direction of cut

Symbol	Unit
M	mm
U	in

⑦ Unit

Symbol	Type
T~: General type	
–	JIS
E	ISO
A	ANSI
E~: Shank type	
–	Cylindrical
W	Weldon
C	Combination

⑨ Attachment specification

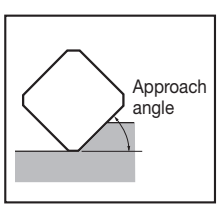
⑩ Number of inserts

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
T	P	A	10	R	200	U	0075	A	04

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
E	P	A	15	R	150	U	0125	W	02	L

② Angle, Category

Symbol	Cutting edge angle
P	90° ~ 80°
E	80° ~ 70°
D	60° ~ 50°
A	50° ~ 40°
L	With long cutting edge
Others	Special

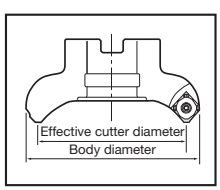


④ Cutting edge length

Symbol	Size (ℓ)
S	ℓ
T	ℓ
R	ℓ
H	ℓ
A	ℓ

⑥ Effective cutter diameter

Symbol	Size
M: Unit in mm	
080	80 mm
200	200 mm
I: Unit in inch	
200	2 in



⑧ Attachment size

Symbol	Size
M: Unit in mm Hole diameter	
20.0	20 mm
25.4	25.4 mm
31.7	31.75 mm
47.6	47.625 mm
I: Unit in inch Hole diameter	
0075	0.75 in
0125	1.25 in
0200	2 in
E~: Shank type Shank diameter	
10.0	10 mm
12.0	12 mm
16.0	16 mm
25.0	25 mm
32.0	32 mm

⑪ Additional feature

Symbol	Type
W	Wedge clamp
L	Long shank
LE	Long edge
CS	Carbide shank
N	No coolant hole

Designation system for Insert

Symbol	Hole	Shape of hole	Chipbreaker	Shape
N	Without	–	Without	
R			Single-sided	
F			Double-sided	
W	With	Partly cylindrical hole, single-side 40° ~ 60° Counter sink	Without	
T			Single-sided	
Q		Partly cylindrical hole, double-side 40° ~ 60° Counter sink	Without	
U			Double-sided	
B		Partly cylindrical hole, single-side 70° ~ 90° Counter sink	Without	
H			Single-sided	
C		Partly cylindrical hole, double-side 70° ~ 90° Counter sink	Without	
J			Double-sided	
X	-	-	-	

4 Groove and hole

Shape	Cutting edge length (ℓ)
S	
T	
R	
H	
A	

5 Cutting edge length

Symbol	Thickness (mm)
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

Thickness

6 Thickness

(Example)

Metric

1	2	3	4	5
P	N	C	U	09

(Example)

Inch

1	2	3	4	5
S	D	K	N	4

1 Shape

Symbol	Shape	Nose angle (degree)	Figure
H	Hexagonal	120°	
S	Square	90°	
T	Triangular	60°	
C	Rhombic	80°	
E		75°	
G		70°	
L	Rectangular	90°	
A	Parallelogram	85°	
R	Round		
W	Wiper	80°	
W	Special	-	
O	Octagonal	135°	
P	Pentagonal	108°	
X	Special	Others	
Y	Special		
Z	Special		

2 Relief angle

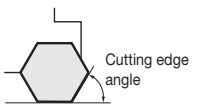
Symbol	Relief angle
C	7°
D	15°
E	20°
F	25°
G	30°
M	Others
N	0°
P	11°
Q	Other applications
O	Other applications
X	Other applications
S	Other applications
W	2-step relief

3 Accuracy (mm)

Symbol (class)	Corner height (m)	Thickness (s)	I. C. dia. (ød)
A	± 0.005	± 0.025	± 0.025
C	± 0.013	± 0.025	± 0.025
E	± 0.025	± 0.025	± 0.025
G	± 0.025	± 0.13	± 0.025
H	± 0.013	± 0.025	± 0.013
K	± 0.013	± 0.025	± 0.05 ~ ± 0.13
M	± 0.08 ~ ± 0.18	± 0.13	± 0.05 ~ ± 0.13
N	± 0.08 ~ ± 0.18	± 0.025	± 0.05 ~ ± 0.13

Standard I. C. dia.	I. C. dia. (ød) tolerance		Corner height (mm) tolerance	
	J, K, L, M, N	U	M, N	U
6.35	± 0.05	± 0.08	± 0.08	± 0.13
9.525				
12.7	± 0.08	± 0.13	± 0.13	± 0.2
15.875	± 0.1	± 0.18	± 0.15	± 0.27
19.05				
25.4	± 0.13	± 0.25	± 0.18	± 0.38

Symbol	Cutting edge angle
A	45°
D	60°
E	75°
F	85°
G	70°
H	87°
P	90°
U	Special, small entering angle
Z	Special, universal



7 Cutting edge angle

Symbol	Relief angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
Z	Special

8 Wiper relief angle

Symbol	Cutting edge	Shape
F	Sharp	
E	Round	
T	Chamfer	
S	Combination	
P	Combination	

9 Major cutting edge

Symbol	Hand of insert
R	Right
L	Left
N	Without

10 Hand of insert

Symbol	Description
HM	General-purpose high feed milling chipbreaker
MM	General-purpose milling chipbreaker
MW	Milling insert with wiper edge
B	Milling insert for burr removal
D	Insert with diamond sintered body
W	Wiper insert (multiple corners)
WS	Wiper insert (single corner)
WD	Wiper insert (with diamond sintered body)
BD	Wiper for burr removal (diamond sintered body)
MJ	General-purpose milling chipbreaker
MH	Milling chipbreaker with reinforced cutting edge
ML	Milling chipbreaker for low cutting force
MS	Milling chipbreaker for stainless steel
HJ	High feed milling chipbreaker
AJ	Milling chipbreaker for non-ferrous metal
NMJ	General-purpose milling chipbreaker with serration
NAJ	Milling chipbreaker with serration for non-ferrous metal

11 Supplementary symbol

6	7	8	9	10		11
05	G	N	E	R	-	MJ
2	Z		T	N		16

4 Groove and hole

Symbol	Shape of hole	Hole
A	Without	With
F	Double side	Without
G	Double side	With
M	Single side	With
N	Without	With
U	Without	Without
W	Without	With

5 Inscribed circle (I. C.)

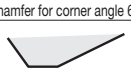
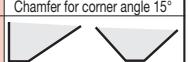
	Symbol	I. C. dia. (mm)
Inch	3	9.525
	4	12.7
	5	15.875
	6	19.05

6 Thickness

	Symbol	Thickness (mm)
Inch	2	3.18
	3	4.76
	4	6.35
	6	9.52

7 Corner radius

Symbol	Corner radius (mm)
1	0.4 (0.397)
2	0.8 (0.794)
3	1.2 (1.191)
4	1.6 (1.588)
5	2.0 (1.984)
6	2.4 (2.381)

Symbol	Description
F	Special design (e.g. for MS cutter)
H	Chamfer for corner angle 60°
S	 Chamfer for corner angle 15°
Z	 Flat chamfer

*For wiper inserts, the designation uses "W" as the shape symbol of inch items. For metric items, the shape symbol is the same as that of regular inserts, and a supplementary symbol, such as W, WS, and WD, is at the end of each designation.

Application Overview

Face milling, High feed milling

H020 - H091 page

General face milling

DOTRIPLEMILL H060 page

DOOCTO H063 page

DOQUADMILL H067 page

DOPENT H069 page

Aluminum machining

TUNGSPEEDMILL H079 page

TFE H081 page

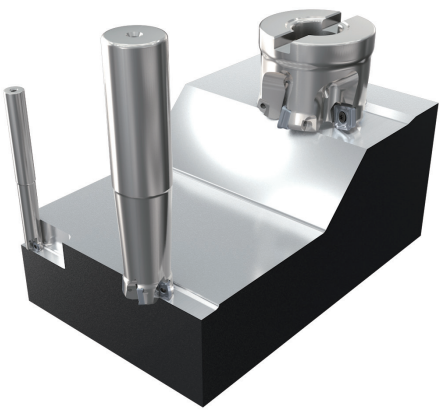
TUNG-ALUMILL H143 page

High feed milling

DOFEED H026 page

DOTWISTBALL H036 page

MILLQUADFEED H046 page



Profile milling

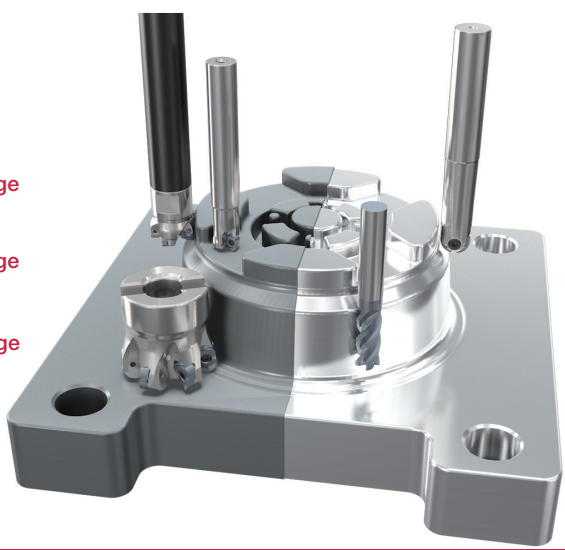
H162 - H188 page

Roughing

TUNGFORCEFEED H022 page

DOFEED H026 page

DOTWISTBALL H036 page



Semi-finishing

TUNGMEISTER I019 page

Finishing

BALLFINISHNOSE H166 page

Shoulder milling

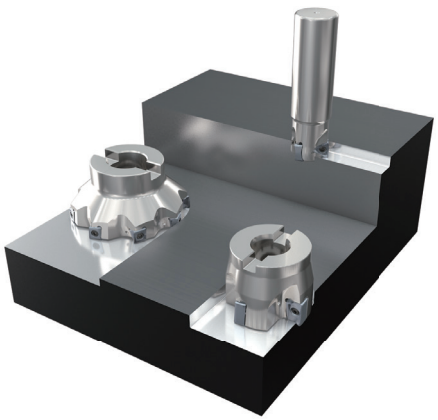
H092 - H149 page

Shoulder milling (double side)

DOFORCETRI H094 page

DOREC H136 page

TECMILL H140 page

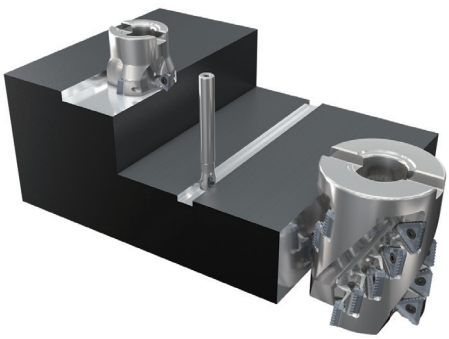


Shoulder milling (single side)

TUNG-TRI H097 page

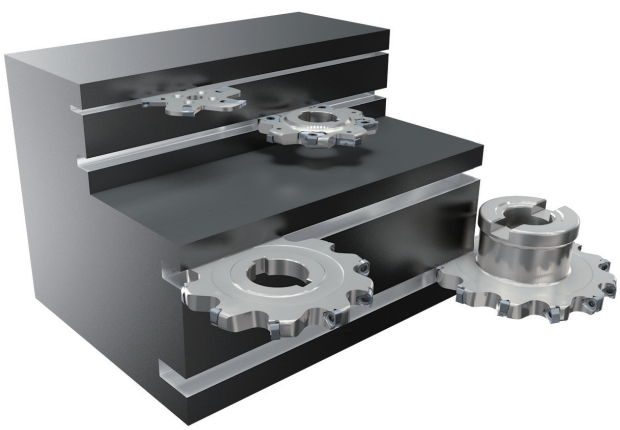
TUNGTRISHRED H108 page

TUNGFORCEREC H111 page



Other applications

H150 - H161 page



Slot milling

TUNGMINISLIT H151 page

TUNGTHINSLIT H155 page

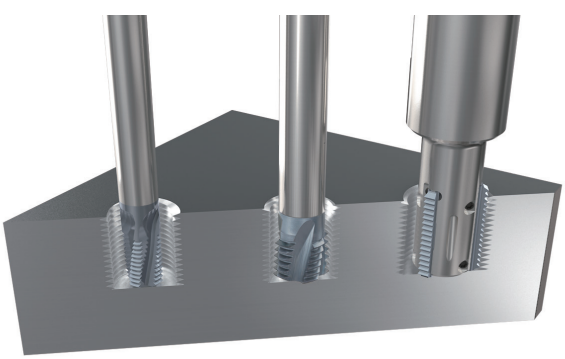
TUNGUNIVERSALSLOT H157 page

TECTANGENTIALSLOT H159 page

Thread milling

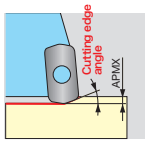
H190, H204, H210 page

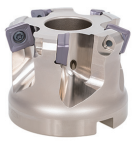
TUNGMEISTER I006 page



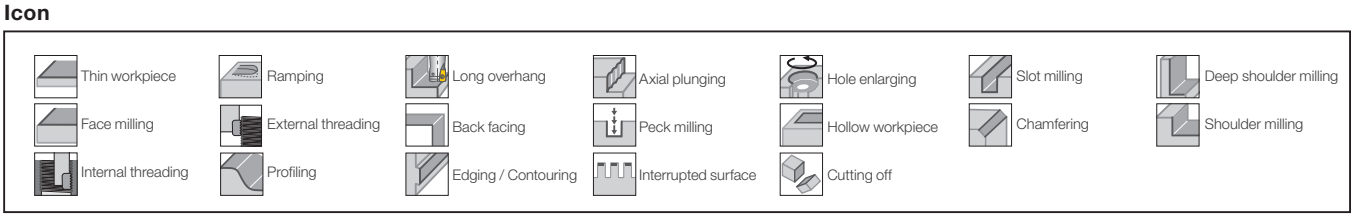
High-Feed Milling - Quick Guide

★ : Most suitable
☆ : Suitable
★ : Usable

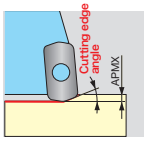
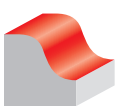


	TUNGFORCEFEED	DOFEED	DOTWISTBALL	DOFEEDQUAD	MILLQUADFEED
	Inch ✓ Metric ✓	Inch ✓ Metric ✓	Inch ✓ Metric ✓	Inch ✓ Metric	 Inch ✓ Metric
Cutting edge angle	12°	15° / 17°	20° / 25°	13°	7° / 10° / 12° / 14°
Depth of cut (APMX)	0.019" (0.5 mm)	0.039" / 0.059" (1 mm / 1.5 mm)	0.051" / 0.079" (1.3 mm / 2 mm)	0.079"	0.039" / 0.059"/ 0.079" / 0.098"
Tool diameter	ø0.375" - ø0.625" (ø8 mm - ø16 mm)	ø0.625" - ø6.000" (ø16 mm - ø200 mm)	ø1.000" - ø3.000" (ø20 mm - ø63 mm)	ø2.000" - ø6.000"	ø1.000" - ø6.000"
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	8	4
Face milling	★ ★ ☆ ★ ★	★ ★ ☆ ☆ ★	★ ☆ ☆ ☆ ☆	★ ★ ☆ ★ ☆	★ ★ ☆ ★ ★
Shoulder milling	☆	☆	☆	★	☆
Profile milling	☆ ☆ ☆	☆ ☆ ☆	☆ ☆ ☆		☆ ☆ ☆
Slot milling	★	★	★		★
Other applications	★	★	★		★
Reference pages	H022 - H025	H026 - H035	H036 - H042	H043 - H045	H046 - H050

Icon

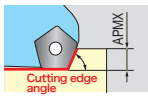


★ : Most suitable
☆ : Suitable
★ : Usable

	MILLFEED TXP				
	Inch ✓ Metric ☐				
Cutting edge angle	10° / 15° / 20°				
Depth of cut (APMX)	0.060" / 0.118"				
Tool diameter	ø0.750" - ø6.000"				
Workpiece material	P M K H				
No. of corners (insert)	3				
Face milling	★ ★ ☆ ★ ★				
Shoulder milling	☆				
 Profile milling	☆ ☆ ☆				
Slot milling	★				
Other applications	★				
Reference pages	H051 - H056				

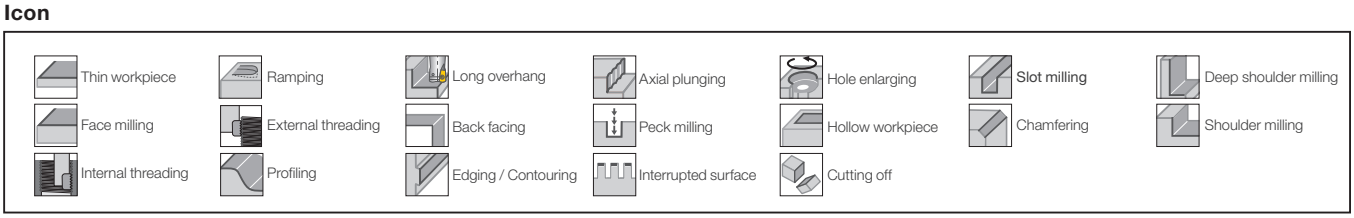
Face Milling - Quick Guide

★ : Most suitable
☆ : Suitable
★ : Usable

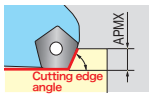


	DOTMILL TRIPLE	DOOCTO	DOPENT	DOQMILL QUAD	TUNGMILL
	Inch ✓ Metric ☐	Inch ✓ Metric ☐	Inch ✓ Metric ☐	Inch ✓ Metric ☐	Inch ✓ Metric ✓
Cutting edge angle	45°	44° / 45° / 15°	70°	88°	30°~45°
Depth of cut (APMX)	0.236" / 0.134"	0.187" / 0.295" / 0.138" / 0.059"	0.252"	0.375"	0.157" / 0.197" / 0.079"
Tool diameter	ø2.000" - ø6.000"	ø2.500" - ø8.000"	ø1.250" - ø6.000"	ø2.000" - ø4.000"	ø2.000" - ø6.000"
Workpiece material	P M K S H	P M K S H	P M K N S	P M K S H	P M K S N
No. of corners (insert)	8 / 16	8 / 16	10	8	4
Face milling	★ ☆ ★ ★	★ ★ ★ ★	★ ★ ☆ ☆	★ ★ ☆ ☆	★ ★ ★ ★
Shoulder milling				★	
Profile milling	★				
Slot milling				★	
Other applications	☆	☆			☆
Reference pages	H060 - H062	H063 - H066	H069 - H071	H067 - H068	H074 - H078

Icon



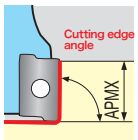
★ : Most suitable
☆ : Suitable
★ : Usable



	TFE	TUNGSMILL	DPD EDPD
	Inch ✓ Metric ✓	Inch ✓ Metric ☐	Inch ☐ Metric ✓
Cutting edge angle	85°	90°	90°
Depth of cut (APMX)	0.315" / 0.138" / 0.059"	0.177"	8 mm
Tool diameter	ø2.000" - ø4.000"	ø2.500" - ø6.000"	ø63 mm - ø160 mm
Workpiece material	P M K N	N	N
No. of corners (insert)	4 / 1 / 2	1	1
Face milling	★ ★ ★ ☆	★ ★ ★ ☆	★ ☆ ★ ☆
Shoulder milling		★	★
Profile milling			
Slot milling			
Other applications			
Reference pages	H081 - H084	H079 - H080	H085 - H086

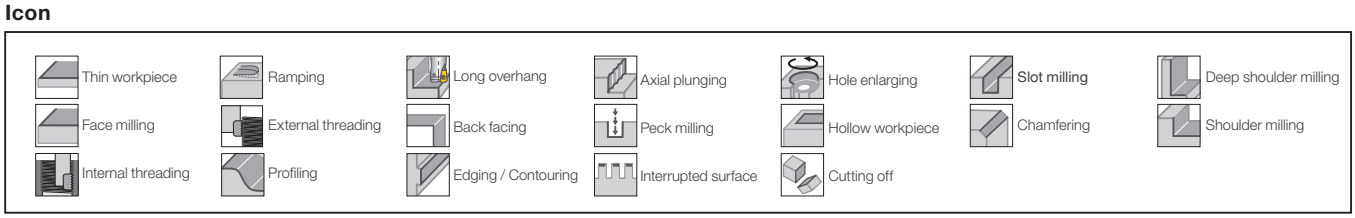
Shoulder milling - Quick Guide

★ : Most suitable
☆ : Suitable
★ : Usable

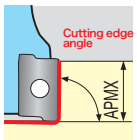


	TUNGFREC ONCE	TUNGREC		TUNG-TRI	
			Roughing		Roughing
	Inch ✓ Metric ✓	Inch ✓ Metric ✓	Inch ✓ Metric ☐	Inch ✓ Metric ✓	Inch ✓ Metric ☐
Cutting edge angle	90°	90°	90°	90°	90°
Depth of cut (APMX)	0.236" (6 mm)	0.276" / 0.417" / 0.657" (7 mm / 10.6 mm / 16.7 mm)	1.197" - 1.921"	0.236" / 0.394" / 0.590" (6 mm / 10 mm / 15 mm)	1.102" - 3.268"
Tool diameter	ø0.315" - ø1.000" (ø8 mm - ø40 mm)	ø0.500" - ø6.000" (ø12 mm - ø160 mm)	ø1.000" - ø2.000"	ø0.500" - ø6.000" (ø12 mm - ø160 mm)	ø2.000" - ø4.000"
Workpiece material	P M K N S H	P M K N S	P M K N S	P M K N S	P M K N S
No. of corners (insert)	2	2	2	3	3
Face milling	★ ☆ ★ ☆ ☆	☆ ☆ ★ ★ ★	★ ★ ★ ★ ★	★ ☆ ★ ☆ ☆	★ ★ ★ ☆ ☆
Shoulder milling	★ ★ ★	★ ☆ ★	★ ☆ ★	★ ★ ☆	★ ★ ★
Profile milling	★ ☆ ☆	★ ☆ ★	★ ★ ★	★ ★ ☆	★ ★ ★
Slot milling	★	☆		★	
Other applications	★	★		★	
Reference pages	H111 - H115	H116 - H128		H097 - H107	

Icon



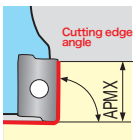
★ : Most suitable
☆ : Suitable
★ : Usable



	TUNG-TRI SHRED		TUNGQUAD		TUNG-ALUMILL
		Roughing		Roughing	
	Inch ✓ Metric ☐	Inch ✓ Metric ☐	Inch ✓ Metric ✓	Inch ✓ Metric ☐	Inch ✓ Metric ☐
Cutting edge angle	90°	90°	90°	90°	90°
Depth of cut (APMX)	0.630"	2.402" - 2.992"	0.157" (4 mm)	0.799" - 0.953"	0.512" - 0.630"
Tool diameter	ø2.000" - ø4.000"	ø2.500" - ø3.000"	ø0.500" - ø2.000" (ø12 mm - ø40 mm)	ø0.750" - ø1.000"	ø1.000" - ø5.000"
Workpiece material	P M K S	P M K S	P M K N S	P M K N S	N
No. of corners (insert)	3	3	4	4	2
Face milling	☆ ★ ★ ☆ ★	★ ★ ★ ☆ ★	☆ ☆ ★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ☆
Shoulder milling	★ ★ ☆	☆ ★ ☆	★ ★ ☆	★ ☆ ★	★ ★ ★
Profile milling					★ ★ ★
Slot milling	★	★	★		★
Other applications			★		☆
Reference pages	H108 - H110	H108	H129 - H131		H143 - H145

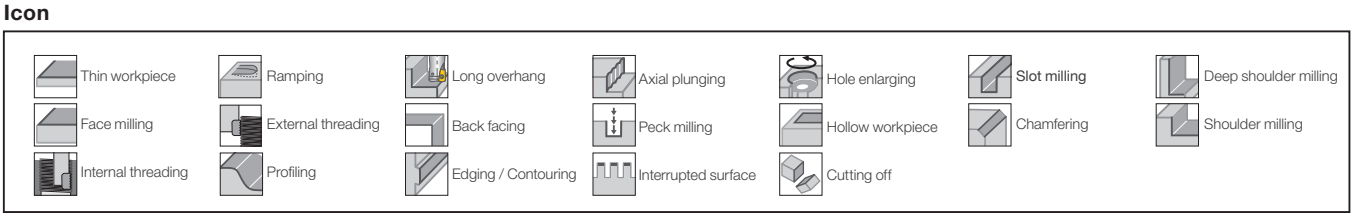
Shoulder milling - Quick Guide

★ : Most suitable
☆ : Suitable
★ : Usable



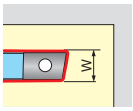
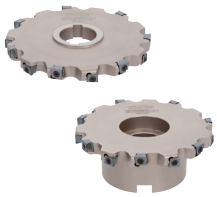
	TUNGMILL	DOFTRI	DOREC	TECMILL	
	Inch ✓ Metric ✓	Inch ✓ Metric ☐	Inch ✓ Metric ☐	Inch ✓ Metric ☐	Roughing Inch ✓ Metric ☐
Cutting edge angle	90°	90°	90°	90°	90°
Depth of cut (APMX)	0.394" (10 mm)	0.433"	0.354" / 0.630"	0.381" / 0.594"	2.303" / 2.634"
Tool diameter	ø2.000" - ø6.000" (ø32 mm - ø200 mm)	ø0.750" - ø6.000"	ø1.000" - ø6.000"	ø1.250" - ø5.000"	ø2.000" - ø2.500"
Workpiece material	P M K N 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)	4	6	4	4	4
Face milling	☆ ☆ ★ ★ ★	★ ☆ ★ ★ ☆	★ ★ ★ ★ ★	☆ ★ ★ ★ ★	★ ★ ★ ★ ★
Shoulder milling	★ ★ ★	★ ★ ☆	★ ★ ☆	★ ★ ★	★ ☆ ☆
Profile milling			★ ★ ★		
Slot milling	★	☆	★		
Other applications	★	★	☆	☆	
Reference pages	H132- H135	H094 - H096	H136 - H139	H140 - H142	

Icon



Slot milling - Quick Guide

★ : Most suitable
☆ : Suitable
★ : Usable

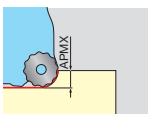
	TUNGMSLIT	TUNGTSLIT	TUNGUSLOT	TECTSLOT	TUNGMEISTER
	Inch ✓ Metric ✓	Inch ✓ Metric ✓	Inch ✓ Metric	 Inch ✓ Metric	Inch ✓ Metric ✓
Depth of cut (W)	1.6 mm - 4.1 mm	0.250" - 0.313" (4 mm - 8 mm)	0.375" - 0.625"	0.630" - 0.984"	0.030" - 0.394"
Tool diameter	ø63 - ø125	ø3.000" - ø8.000" (ø80 mm - ø200 mm)	ø3.000" - ø6.000"	ø3.937" - ø9.843"	ø0.500" - ø1.000" (ø15.7 mm - ø27.7 mm)
Workpiece material	P M K	P M K S	P M K S	P M K S	P M K N S
No. of corners (insert)	1	6	6	4	1
Face milling	★ ★ ★ ★ ★	★ ★ ★ ★ ★	☆ ★ ★ ★ ☆	☆ ★ ★ ★ ☆	★ ★ ★ ★ ★
Shoulder milling	★ ★	★ ★	☆ ☆ ★	☆ ☆ ★	★ ★
Profile milling					
Slot milling	★	★	★	★	★
Other applications	★	★			
Reference pages	H151 - H154	H155 - H156	H157 - H158	H159 - H160	H204 - H205

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

Profile milling - Quick Guide

★ : Most suitable
☆ : Suitable
★ : Usable

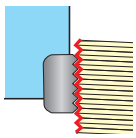
	DOTWISTBALL	ROUNDSPLIT	BALLROUGHNOSE	BALLFINISHNOSE	DOMINIMILL
	Inch ✓ Metric ✓	Inch ✓ Metric ☐	Inch ✓ Metric ✓	Inch ✓ Metric ✓	Inch ☐ Metric ✓
Depth of cut (APMX)	0.157" / 0.236" (4 mm / 5 mm / 6 mm)	0.236" / 0.315"	0.470" / 0.510" / 0.690" (11.8 mm / 13.6 mm / 17.7 mm)	0.157" / 0.630" (4 mm - 16 mm)	1 mm
Tool diameter	ø1.000" - ø3.000" (ø20 mm - ø63 mm)	ø1.250" - ø5.000"	ø0.625" - ø1.000" (ø16 mm - ø25 mm)	ø0.375" - ø1.250" (ø8 mm - ø32 mm)	ø16 - ø25
Workpiece material	P M K S H	P M K N S	P M K S H	P M K N S H	P H
No. of corners (insert)	4	4 / 8	2	1	6
Face milling	☆ ☆ ☆	☆ ☆ ★	★ ☆ ☆	★ ★ ☆	★ ★ ☆
Shoulder milling	★	☆	☆	☆	☆
Profile milling	★ ★ ☆	★ ☆ ☆	★ ☆ ☆	★ ☆ ☆	★ ☆ ★
Slot milling	☆	☆	★	★	★
Other applications	★	★	★	★	☆
Reference pages	H036 - H042	H177 - H181	H164 - H165	H166 - H170	H171

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

Thread milling - Quick Guide

★ : Most suitable
☆ : Suitable
★ : Usable

	SOLIDTHREAD	TUNGMEISTER	THREADMILLING		
			ETTL, ETLN	Thread milling cutter	
	Inch ☐ Metric ☑	Inch ☐ Metric ☑	Inch ☐ Metric ☑	Inch ☐ Metric ☑	
Pitch	0.25 - 3.5	0.5 - 4.5	1 - 3	1.5 - 6	
Tool diameter	ø0.7 - ø20	ø10 - ø21.7	ø17 - ø30	ø23 - ø80	
Workpiece material	P M K S	P M K S	P M K S	P M K	
No. of corners (insert)	-	-	1 / 2	2	
Thread milling	★ ★	★ ★	★ ★	★ ★	
Reference pages	H191 - H209	H204 - H205	H210 - H213	H214 - H215	

Icon

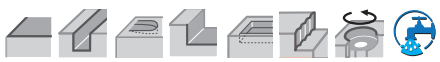
Thin workpiece	Ramping	Long overhang	Axial plunging	Hole enlarging	Slot milling	Deep shoulder milling
Face milling	External threading	Back facing	Peck milling	Hollow workpiece	Chamfering	Shoulder milling
Internal threading	Profiling	Edging / Contouring	Interrupted surface	Cutting off		

DOFEED

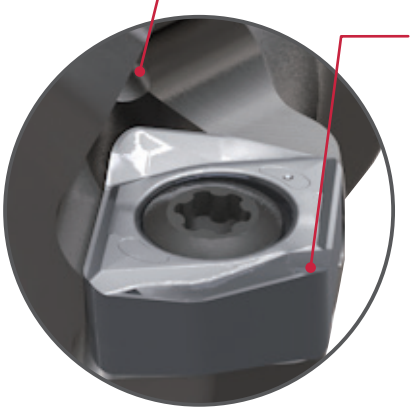
Innovative high-feed cutters!

DoFeed offers outstanding productivity thanks to its close-pitch insert orientation and light cutting geometry. The rich lineup is suitable for a wide variety of applications.

Outstanding productivity



Excellent chip evacuation prevents chip packing

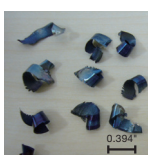


Optimized coolant jet delivery effectively removes chips and prevents it from re-cutting

Large inclination forms ideal chips and controls the chips flow

DOFEED

Good
Curl consistently at ideal length



Competitor Poor
Crushed or unstable

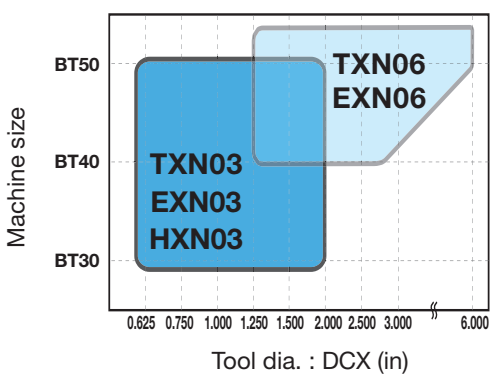
P Steel

Cutter	: TXN06R200U0075A05
Insert	: LNMU06X5ZER-MJ
Grade	: AH725
Workpiece material	: Carbon steels (1055)
Cutting speed	: *Vc* = 590 sfm
Feed per tooth	: *fz* = 0.070 ipt
Depth of cut	: *ap* = 0.039"
Coolant	: Dry
Machine	: Vertical M/C, BT50

Rich lineup of cutter bodies from ø0.625" to ø6.000"

Insert	Bore type	Shank type	Modular type
LN*U03 Max. ap = 0.039"	**TXN03** (DCX = 1.500" - 2.000")	**EXN03** (DCX = 0.630" - 1.250")	**HXN03** (DCX = 0.630" - 1.260")
LN*U06 Max. ap = 0.059"	**TXN06** (DCX = 2.000" - 6.000")	**EXN06** (DCX = 1.250" - 1.500")	

Applicable area

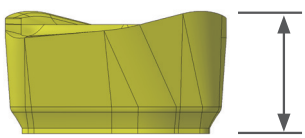


Reference pages: H026 - H035

TUNGFORCE FEED

Small-diameter high feed milling cutter with impressive machining efficiency and reliability

Built to perform at higher machining conditions



Thick insert corner
Max 10 % thicker
than competitors'

Strong insert corner for high feed operations

- Thick insert corner is designed to withstand fracturing force

Robust and easy-to-handle insert screws

- M2 screws reduce screw neck shears under high cutting forces. A larger screw enhances insert's fixation and easy handling.

TUNGFORCE FEED
(M2)

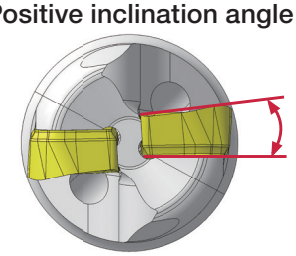
Competitor
(M1.8)

Proper chip formation assures a reliable machining process

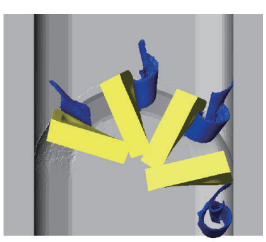
Positive inclination angle of the insert promotes smooth chip evacuation

- The positive cutting edge position contributes to a controlled chip formation and easy chip evacuation when machining next to shoulder and slotting operation.

Positive inclination angle



TUNGFORCE FEED



Competitor

Proper chip control eliminates recuts and premature insert failure

Chip formation

Ideal curled chips

Crushed chips

P
Steel

Cutter	: EXLS02U0.50C0.50LH2.00R02
Insert	: LSMT0202ZER-HM AH3225
Workpiece material	: 1055
Cutting speed	: *Vc* = 656 sfm
Application	: Slotting
Depth of cut	: *ap* = 0.020" × 20 passes
Coolant	: Dry
Machine	: Vertical M/C, CAT40

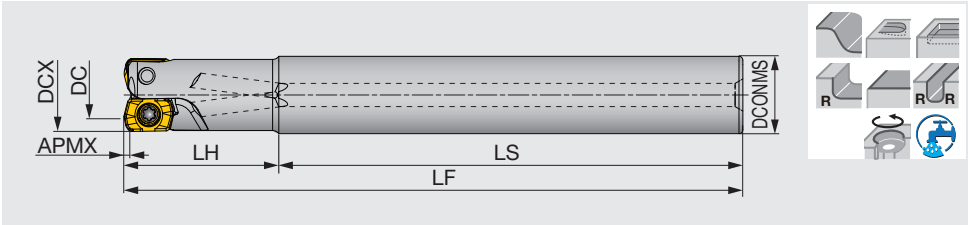
Reference pages: H022 - H025

TUNGFORCE FEED

EXLS

High feed endmill, shank type

GAMP = +4°, GAMF = -21° ~ -17°



Inch	APMX	DCX	CICT	DC	DCONMS	LS	LH	LF	WT (lb)	Air hole	Insert
EXLS02U0.37C0.37LH0.75R01	0.020	0.375	1	0.228	0.375	2.250	0.750	3.000	0.088	With	LSMT02...
EXLS02U0.37C0.37LH1.25R01	0.020	0.375	1	0.228	0.375	2.250	1.250	3.500	0.110	With	LSMT02...
EXLS02U0.37C0.31LH0.75R01	0.020	0.375	1	0.228	0.3125	2.250	0.750	3.000	0.066	With	LSMT02...
EXLS02U0.50C0.50LH0.75R03	0.020	0.500	3	0.354	0.500	2.250	0.750	3.000	0.132	With	LSMT02...
EXLS02U0.50C0.50LH2.00R02	0.020	0.500	2	0.354	0.500	2.250	2.000	4.250	0.176	With	LSMT02...
EXLS02U0.50C0.37LH0.75R03	0.020	0.500	3	0.354	0.375	2.250	0.750	3.000	0.088	With	LSMT02...
EXLS02U0.62C0.62LH1.50R05	0.020	0.625	5	0.479	0.625	2.500	1.500	4.000	0.308	With	LSMT02...
EXLS02U0.62C0.62LH2.00R03	0.020	0.625	3	0.479	0.625	2.500	2.000	4.500	0.375	With	LSMT02...

Metric	APMX	DCX	CICT	DC	DCONMS	LS	LH	LF	WT (kg)	Air hole	Insert
EXLS02M008C08.0LH16R01	0.5	8	1	4.29	8	59	16	75	0.02	With	LSMT02...
EXLS02M008C08.0LH30R01	0.5	8	1	4.29	8	59	31	90	0.03	With	LSMT02...
EXLS02M010C10.0LH20R02	0.5	10	2	6.28	10	60	20	80	0.04	With	LSMT02...
EXLS02M010C10.0LH40R02	0.5	10	2	6.28	10	60	40	100	0.05	With	LSMT02...
EXLS02M010C08.0LH20R02	0.5	10	2	6.28	8	60	20	80	0.03	With	LSMT02...
EXLS02M012C12.0LH20R03	0.5	12	3	8.31	12	60	20	80	0.06	With	LSMT02...
EXLS02M012C12.0LH50R02	0.5	12	2	8.31	12	60	50	110	0.08	With	LSMT02...
EXLS02M012C10.0LH20R03	0.5	12	3	8.31	10	60	20	80	0.04	With	LSMT02...
EXLS02M016C16.0LH30R05	0.5	16	5	12.31	16	70	30	100	0.14	With	LSMT02...
EXLS02M016C16.0LH50R03	0.5	16	3	12.31	16	70	50	120	0.17	With	LSMT02...

SPARE PARTS

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

*Recommended clamping torque：CSPB-2H = 0.52 lbs·ft, 0.7 N·m

Approach angle

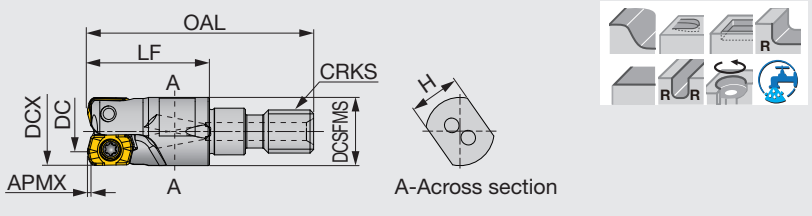
10°-20° | 45° | 70° | 85° | 88° | 90° | Others

TUNGFORCE FEED

HXLS

High feed endmill, shank type

GAMP = +4°, GAMF = -21° ~ -17°



Metric	APMX	DCX	CICT	DC	OAL	LF	H	DCSFMS	CRKS	WT (kg)	Air hole	Insert
HXLS02M008M06R01	0.5	8	1	4.29	33.5	19	7	9.5	M6	0.01	With	LSMT02...
HXLS02M010M06R02	0.5	10	2	6.28	31.5	17	7	9.5	M6	0.01	With	LSMT02...
HXLS02M012M06R02	0.5	12	2	8.31	31.5	17	7	10	M6	0.01	With	LSMT02...
HXLS02M012M06R03	0.5	12	3	8.31	31.5	17	7	10	M6	0.01	With	LSMT02...
HXLS02M016M08R03	0.5	16	3	12.31	40	23	10	13	M8	0.03	With	LSMT02...
HXLS02M016M08R05	0.5	16	5	12.31	40	23	10	13	M8	0.03	With	LSMT02...

SPARE PARTS

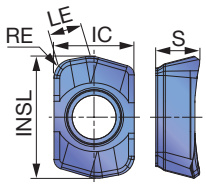
Designation	Clamping screw	Lubricant	Wrench
HXLS02M...	CSPB-2H	M-1000	IP-6DB

*Recommended clamping torque ：CSPB-2H = 0.7 N·m

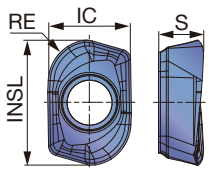
Reference pages: Inserts → H023, Standard cutting conditions → H024 - H025, TungFlex → H167

INSERT

LSMT-HM (High feed)



LSMT-MM (Radius)



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

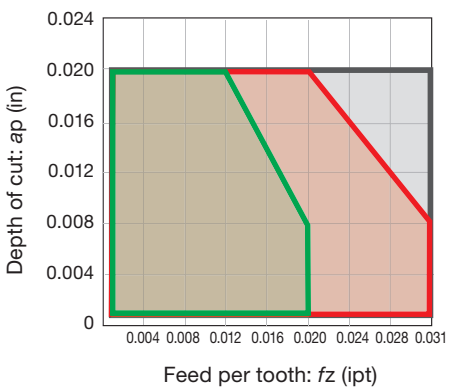
★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated AH3225	Coated AH8015	LE	INSL	IC	S
LSMT0202ZER-HM	0.039	0.020	●	●	0.067	0.252	0.165	0.091
LSMT0202R2-MM	0.079	0.079	●	●	-	0.252	0.169	0.091

● : Line up

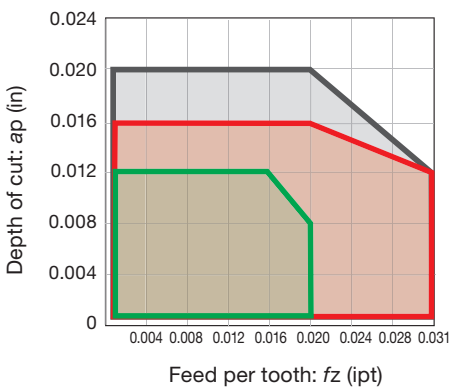
APPLICATION

LSMT02-HM



- For standard shanks in ≤ 3xD
- For long-neck shanks in ≥ 4xD
- For modular head shanks in ≥ 7xD

LSMT02-MM



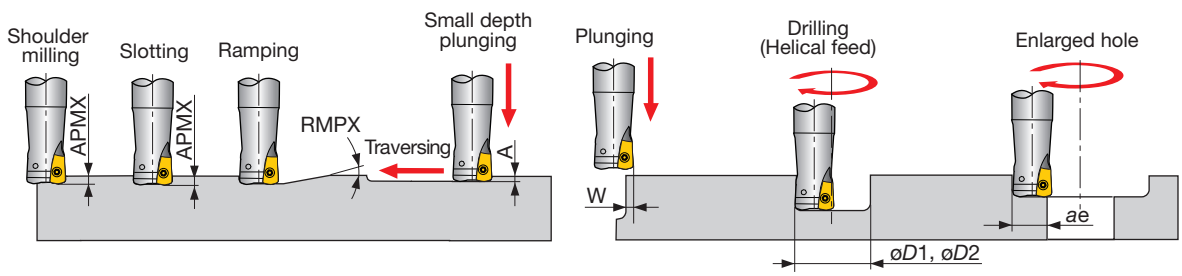
- For standard shanks in ≤ 3xD
- For long-neck shanks in ≥ 4xD
- For modular head shanks in ≥ 7xD

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

STANDARD CUTTING CONDITIONS

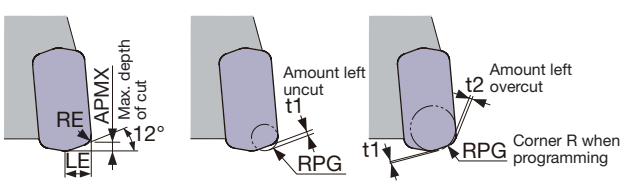
ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Carbon steels 1045, 1055, etc.		- 300HB	First choice	AH3225	330 - 990	0.008 - 0.031
			- 300HB	Wear resistance	AH8015	330 - 990	0.008 - 0.031
	Alloy steels 4140, SCr415, etc.		- 300HB	First choice	AH3225	330 - 990	0.008 - 0.031
			- 300HB	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	Fracture resistance	AH3225	330 - 660	0.008 - 0.020
M	Stainless steels 304, 316, etc.		- 200HB	First choice	AH3225	330 - 660	0.008 - 0.020
K	Gray cast irons No.250B, etc.		150 - 250HB	First choice	AH8015	330 - 990	0.008 - 0.031
			150 - 250HB	Fracture 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	Fracture resistance	AH3225	260 - 660	0.008 - 0.031
S	Titanium alloy Ti-6Al-4V, etc.		- 40HRC	First choice	AH3225	100 - 200	0.004 - 0.012
			- 40HRC	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	Fracture resistance	AH3225	70 - 170	0.004 - 0.012
H	Hardened steel	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

APPLICATION RANGE



Inch	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Max. cutting width in plunging W	Min. machining øD1	Max. machining øD2	Max. cutting width in enlarged hole ae
EXLS02U0.37...	0.375	0.020	3.6°	0.007	0.078	0.513	0.730	0.292
EXLS02U0.50...	0.500	0.020	1.8°	0.007	0.078	0.763	0.980	0.417
EXLS02U0.62...	0.625	0.020	1.3°	0.007	0.078	1.013	1.230	0.542

Tool geometry on programming



LSMT02...-HM

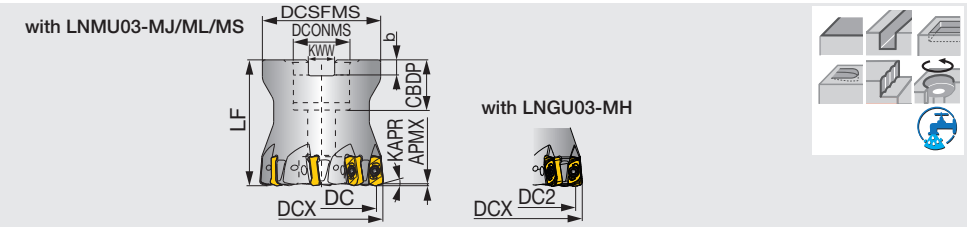
Corner R when programming: RPG	Amount left uncut t1 (in)	Amount left overcut t2 (in)
0.039 *Recommend	0.006	0
0.059	0.003	0.006
0.079	0	0.013

Tool dia.: DC (in), Number of revolutions: *n* (rpm), Feed speed: *Vf* (ipm), Max. depth of cut: *ap* = 0.020", Number of teeth: CICT									
ø0.315", CICT = 1		ø0.394", CICT = 2		ø0.472"			ø0.630"		
n	*Vf*	*n*	*Vf*	*n*	*Vf*		*n*	*Vf*	
					CICT = 2	CICT = 3		CICT = 3	CICT = 5
7960	160	6370	255	5310	215	320	3980	240	400
Vc = 656 sfm, *fz* = 0.020 ipt									
7960	160	6370	255	5310	215	320	3980	240	400
Vc = 656 sfm, *fz* = 0.020 ipt									
5970	95	4780	153	3980	125	190	2990	145	240
Vc = 492 sfm, *fz* = 0.016 ipt									
4780	75	3820	122	3190	100	155	2390	115	190
Vc = 394 sfm, *fz* = 0.016 ipt									
7960	160	6370	255	5310	210	320	3980	240	400
Vc = 656 sfm, *fz* = 0.020 ipt									
5970	120	4780	190	3980	160	240	2990	180	300
Vc = 492 sfm, *fz* = 0.020 ipt									
1590	13	1270	20	1060	17	25	800	19	32
Vc = 131 sfm, *fz* = 0.008 ipt									
1190	10	1000	16	800	13	20	600	15	25
Vc = 98 sfm, *fz* = 0.008 ipt									
4780	57	3820	92	3190	76	115	2390	86	190
Vc = 394 sfm, *fz* = 0.012 ipt									
2390	19	1910	30	1590	25	35	1190	30	50
Vc = 197 sfm, *fz* = 0.008 ipt									

DOFEED
TXN03

High feed mill, for 4-corner double sided inserts

GAMP = +6°,GAMF = +12° ~ 13°



Inch	APMX	DCX	CICT	DC	DC2	DCSFMS	DCONMS	CBDP	LF	b	KWW	KAPR	WT(lb)	Air hole	Insert
TXN03R150U0050A05	0.039	1.500	5	1.248	1.247	1.460	0.500	0.750	1.575	0.160	0.252	17°	0.530	With	LN*U03...
TXN03R150U0050A06	0.039	1.500	6	1.248	1.247	1.380	0.500	0.600	1.575	0.160	0.252	17°	0.510	With	LN*U03...
TXN03R200U0075A05	0.039	2.000	5	1.718	1.757	1.693	0.750	0.750	1.969	0.197	0.315	17°	1.100	With	LN*U03...
TXN03R200U0075A08	0.039	2.000	8	1.718	1.757	1.693	0.750	0.750	1.969	0.197	0.315	17°	1.100	With	LN*U03...
TXN03R200U0075A10	0.039	2.000	10	1.718	1.757	1.693	0.750	0.750	1.969	0.197	0.315	17°	1.100	With	LN*U03...

SPARE PARTS

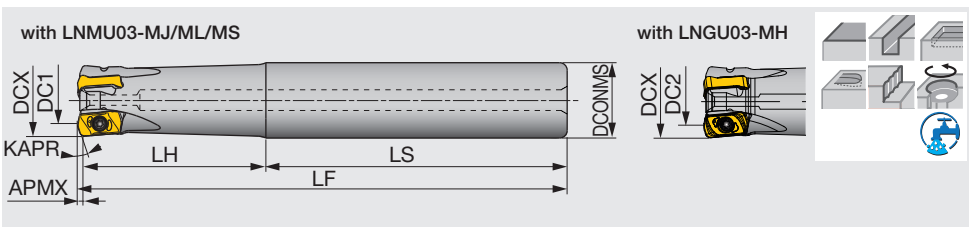
Designation	Clamping screw	Lubricant	Shell locking bolt (Optional parts)	Wrench
TXN03R150U...	CSPB-2.5	M-1000	(SR UNF 1/4X3/4 B18.3)	IP-8D
TXN03R200U...	CSPB-2.5	M-1000	(C0.375X1.125H)	IP-8D

*Recommended clamping torque : CSPB-2.5 = 0.96 lbs·ft

DOFEED
EXN03

High feed endmill, shank type, with center through coolant hole, for 4-corner double sided inserts

GAMP = +6°, GAMF = +5° ~ +11°



Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

Inch	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	WT(lb)	Air hole	Insert
EXN03R062U0062-02	0.039	0.625	2	0.372	0.381	0.625	4.000	1.250	2.750	15°	0.310	With	LN*U03...
EXN03R062U0062-02L	0.039	0.625	2	0.372	0.381	0.625	6.000	2.000	4.000	15°	0.460	With	LN*U03...
EXN03R068U0062-02	0.039	0.688	2	0.434	0.436	0.625	4.000	1.250	2.750	17°	0.310	With	LN*U03...
EXN03R068U0062-02L	0.039	0.688	2	0.434	0.436	0.625	6.000	1.000	5.000	17°	0.490	With	LN*U03...
EXN03R075U0075-02	0.039	0.750	2	0.495	0.498	0.750	5.000	2.000	3.000	17°	0.550	With	LN*U03...
EXN03R075U0075-03	0.039	0.750	3	0.495	0.498	0.750	5.000	2.000	3.000	17°	0.550	With	LN*U03...
EXN03R075U0075-03L	0.039	0.750	3	0.495	0.498	0.750	6.500	3.500	3.000	17°	0.710	With	LN*U03...
EXN03R087U0075-02	0.039	0.875	2	0.621	0.623	0.750	5.000	2.000	3.000	17°	0.570	With	LN*U03...
EXN03R087U0075-03	0.039	0.875	3	0.621	0.623	0.750	5.000	2.000	3.000	17°	0.570	With	LN*U03...
EXN03R087U0075-03L	0.039	0.875	3	0.621	0.623	0.750	6.500	1.250	5.250	17°	0.750	With	LN*U03...
EXN03R100U0100-04	0.039	1.000	4	0.746	0.748	1.000	5.500	2.500	3.000	17°	1.080	With	LN*U03...
EXN03R100U0100-04L	0.039	1.000	4	0.746	0.748	1.000	7.000	4.000	3.000	17°	1.340	With	LN*U03...
EXN03R100U0100-05	0.039	1.000	5	0.746	0.748	1.000	5.500	2.500	3.000	17°	1.080	With	LN*U03...
EXN03R112U0100-04	0.039	1.125	4	0.871	0.872	1.000	5.500	2.500	3.000	17°	1.120	With	LN*U03...
EXN03R112U0100-04L	0.039	1.125	4	0.871	0.872	1.000	7.000	1.500	5.500	17°	1.460	With	LN*U03...
EXN03R112U0100-05	0.039	1.125	5	0.871	0.872	1.000	5.500	2.500	3.000	17°	1.120	With	LN*U03...
EXN03R125U0125-05	0.039	1.250	5	0.997	0.997	1.250	6.000	3.000	3.000	17°	1.870	With	LN*U03...
EXN03R125U0125-05L	0.039	1.250	5	0.997	0.997	1.250	8.000	5.000	3.000	17°	2.430	With	LN*U03...
EXN03R125U0125-06	0.039	1.250	6	0.997	0.997	1.250	6.000	3.000	3.000	17°	1.850	With	LN*U03...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EXN03...	CSPB-2.5	M-1000	IP-8D

*Recommended clamping torque : CSPB-2.5 = 0.96 lbs·ft

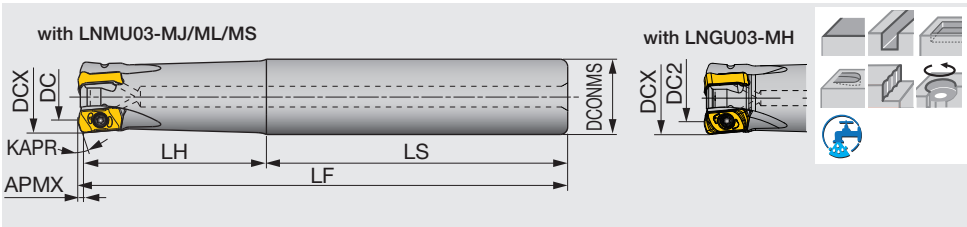
Reference pages: Inserts → H029, Standard cutting conditions → H030 - H031

DOFEED

EXN03-C

High feed endmill, shank type, with coolant directly to the tool tips, for 4-corner double sided inserts

GAMP = +6°,GAMF = +5° ~ +11°



Inch	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	WT(lb)	Air hole	Insert
EXN03R075U0075-03-C	0.039	0.750	3	0.494	0.498	0.750	5.000	2.000	3.000	17°	0.660	With	LN*U03...
EXN03R087U0075-03-C	0.039	0.875	3	0.634	0.623	0.750	5.000	2.000	3.000	17°	0.660	With	LN*U03...
EXN03R100U0100-05-C	0.039	1.000	5	0.756	0.748	1.000	5.500	2.500	3.000	17°	1.100	With	LN*U03...
EXN03R125U0125-06-C	0.039	1.250	6	1.008	0.997	1.250	6.000	3.000	3.000	17°	1.760	With	LN*U03...

Metric	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	WT(kg)	Air hole	Insert
EXN03R016M16.0-02-C	1	16	2	9.6	9.8	16	100	30	70	15°	0.2	With	LN*U03...
EXN03R016M16.0-02L-C	1	16	2	9.6	9.8	16	150	50	100	15°	0.2	With	LN*U03...
EXN03R020M20.0-03-C	1	20	3	13.5	13.6	20	130	50	80	17°	0.3	With	LN*U03...
EXN03R020M20.0-03L-C	1	20	3	13.5	13.6	20	160	80	80	17°	0.3	With	LN*U03...
EXN03R020M20.0-04-C	1	20	4	13.5	13.6	20	130	50	80	17°	0.3	With	LN*U03...
EXN03R025M25.0-04-C	1	25	4	18.5	18.6	25	140	60	80	17°	0.5	With	LN*U03...
EXN03R025M25.0-04L-C	1	25	4	18.5	18.6	25	180	100	80	17°	0.6	With	LN*U03...
EXN03R025M25.0-05-C	1	25	5	18.5	18.6	25	130	60	80	17°	0.5	With	LN*U03...
EXN03R032M32.0-05-C	1	32	5	25.5	25.6	32	150	70	80	17°	0.8	With	LN*U03...
EXN03R032M32.0-05L-C	1	32	5	25.5	25.6	32	200	120	80	17°	1.1	With	LN*U03...
EXN03R032M32.0-06-C	1	32	6	25.5	25.6	32	150	70	80	17°	0.8	With	LN*U03...
EXN03R040M32.0-06-C	1	40	6	33.6	33.7	32	150	45	105	17°	1	With	LN*U03...
EXN03R040M32.0-06L-C	1	40	6	33.6	33.7	32	220	45	175	17°	1.4	With	LN*U03...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EXN03...	CSPB-2.5	M-1000	IP-8D

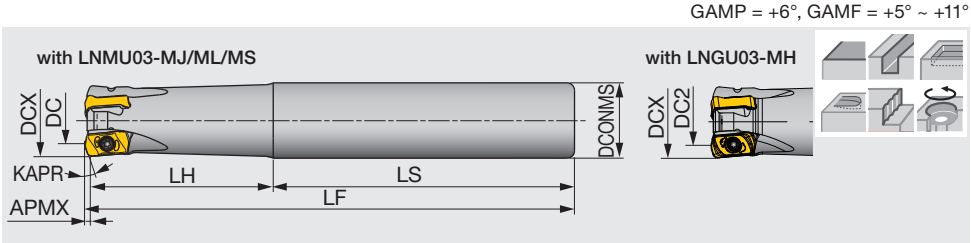
*Recommended clamping torque :CSPB-2.5 = 0.96 lbs·ft, 1.3 N·m

DOFEED

EXN03-N

High feed endmill (Eco), shank type, for double sided inserts

GAMP = +6°, GAMF = +5° ~ +11°



Metric	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	WT(kg)	Air hole	Insert
EXN03R016M16.0-02N	1	16	2	9.6	9.8	16	100	30	70	15°	0.2	Without	LN*U03...
EXN03R020M20.0-03N	1	20	3	13.5	13.6	20	130	50	80	17°	0.3	Without	LN*U03...
EXN03R025M25.0-04N	1	25	4	18.5	18.6	25	140	60	80	17°	0.5	Without	LN*U03...
EXN03R032M32.0-05N	1	32	5	25.5	25.6	32	150	70	80	17°	0.8	Without	LN*U03...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EXN03...	CSPB-2.5	M-1000	IP-8D

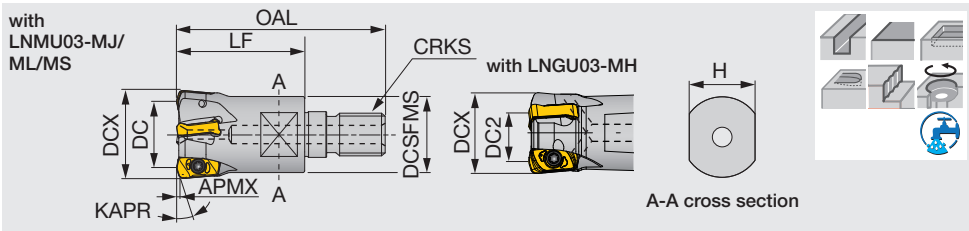
*Recommended clamping torque :CSPB-2.5 = 1.3 N·m

Reference pages: Inserts → H029, Standard cutting conditions → H030 - H031

DOFEED
HXN03

High feed endmill, modular type, with center through coolant hole (TungFlex)

GAMP= +6°,GAMF= +5° ~ +11°



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

See page **H167** for TungFlex modular shank.

SPARE PARTS

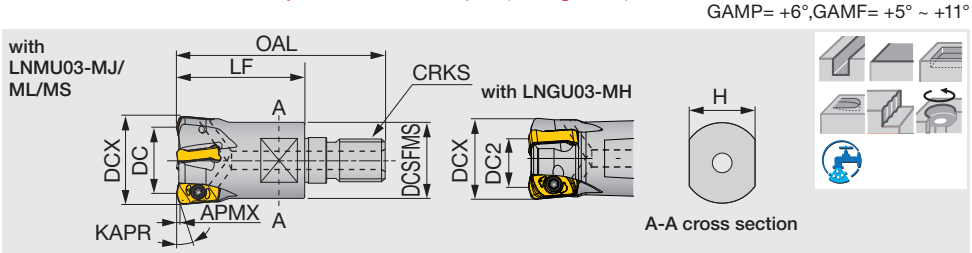
Designation	Clamping screw	Lubricant	Wrench
HXN03...	CSPB-2.5	M-1000	IP-8D

*Recommended clamping torque：CSPB-2.5 = 1.3 N·m

DOFEED
HXN03-C

High feed endmill, modular type, with coolant directly to the tool tips (TungFlex)

GAMP= +6°,GAMF= +5° ~ +11°



Metric	APMX	DCX	CICT	DC	DC2	OAL	LF	H	DCSFMS	KAPR	CRKS	WT(kg)	Air hole	Insert
HXN03R016MM08-02-C	1	16	2	9.6	9.8	42	25	10	12.8	15°	M8	0.03	With	LN*U03...
HXN03R020MM10-03-C	1	20	3	13.5	13.6	49	30	15	17.8	17°	M10	0.06	With	LN*U03...
HXN03R020MM10-04-C	1	20	4	13.5	13.6	49	30	15	17.8	17°	M10	0.06	With	LN*U03...
HXN03R025MM12-04-C	1	25	4	18.5	18.6	57	35	17	20.8	17°	M12	0.1	With	LN*U03...
HXN03R025MM12-05-C	1	25	5	18.5	18.6	57	35	17	20.8	17°	M12	0.1	With	LN*U03...
HXN03R032MM16-05-C	1	32	5	25.5	25.6	63	40	22	28.8	17°	M16	0.2	With	LN*U03...
HXN03R032MM16-06-C	1	32	6	25.5	25.6	63	40	22	28.8	17°	M16	0.2	With	LN*U03...
HXN03R040MM16-06-C	1	40	6	33.6	33.7	63	40	22	28.8	17°	M16	0.27	With	LN*U03...

See page **H167** for TungFlex modular shank.

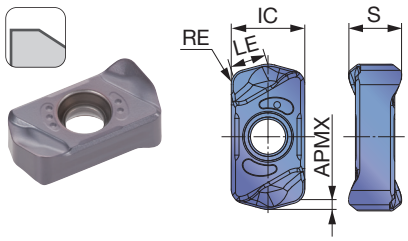
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
HXN03...	CSPB-2.5	M-1000	IP-8D

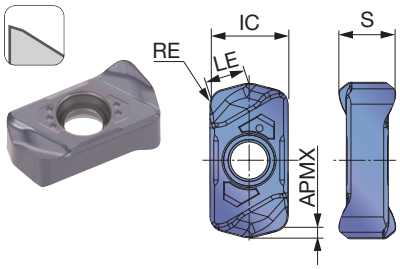
*Recommended clamping torque：CSPB-2.5 = 1.3 N·m

Reference pages: Inserts → **H029**, Standard cutting conditions → **H030 - H031**, TungFlex → **H167**

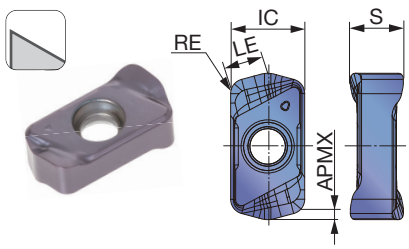
LNMU03-MJ (General purpose)



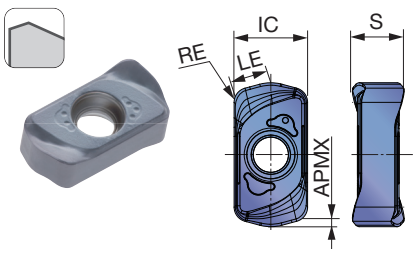
LNMU03-ML (Low cutting force)



LNMU03-MS (For stainless steel)



LNGU03-MH (Reinforced cutting edge)



		AH130	AH3225	AH3035	AH725	AH8015	AH8005
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
			AH130	AH3225	AH3035	AH725	AH8015	AH8005			
LNMU0303ZER-MJ	0.047	0.039	●	●	●	●	●		0.126	0.236	0.169
LNMU0303ZER-ML	0.047	0.039	●	●	●	●	●		0.126	0.236	0.169
LNMU0303ZER-MS	0.047	0.039	●	●					0.126	0.236	0.169
LNGU0303ZER-MH	0.047	0.039					●	●	0.126	0.236	0.169

● : Line up

STANDARD CUTTING CONDITIONS TXN03/EXN03/HXN03

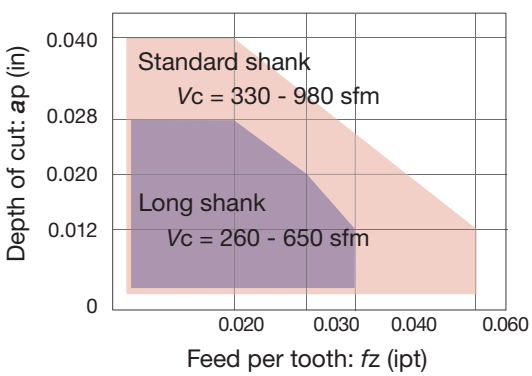
ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt) Tool dia.: DCX (in) ø0.625~ ø0.875	ø1.000~ ø2.000	Plunging	ø0.625", CICT = 2 n	Vf	ø0.688", CICT = 2 n	Vf	ø0.75 n	Vf CICT = 2	Vf CICT = 3
P	Carbon steels 1045, 1055, etc.	- 300HB	First choice	AH3225	MJ	330 - 980	0.020 - 0.047	0.020 - 0.059	0.004	4,030	250	3,660	227	3,360	208	312
										Vc = 660 sfm, fz = 0.031 ipt						
	Alloy steels 4140, 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
										Vc = 660 sfm, fz = 0.031 ipt						
	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
										Vc = 490 sfm, fz = 0.028 ipt						
		30 - 40HRC	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
										Vc = 490 sfm, fz = 0.028 ipt						
M	Stainless steels 304SS, 316SS, 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
										Vc = 390 sfm, fz = 0.02 ipt						
	Precipitation hardening stainless steels 17-4 PH, etc.	28HRC - (H1150)	First choice	AH130	MS	260 - 490	0.008 - 0.020	0.008 - 0.020	0.004	2,380	57	2,170	52	1,990	48	72
			Wear resistance	AH3225	MS					Vc = 390 sfm, fz = 0.012 ipt						
		40HRC - (H900)	First choice	AH3035	ML	260 - 390	0.004 - 0.012	0.004 - 0.012	0.004	**2,020**	**32**	**1,830**	**29**	**1,680**	**27**	**40**
			Fracture resistance	AH3035	MJ					Vc = 330 sfm, fz = 0.008 ipt						
K	Gray cast irons Class 25, 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
										Vc = 660 sfm, fz = 0.031 ipt						
	Ductile cast irons 65-45-12, 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
										Vc = 490 sfm, fz = 0.031 ipt						
S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice	AH130	ML	100 - 200	0.012 - 0.028	0.012 - 0.028	0.003	790	25	720	23	660	21	32
			Fracture resistance	AH130	MJ					Vc = 130 sfm, fz = 0.016 ipt						
	Heat-resistant alloy Inconel, Hastelloy, etc.	- 40HRC	First choice	AH8015	ML	70 - 160	0.004 - 0.012	0.004 - 0.012	0.002	610	10	560	9	510	8	12
			Fracture resistance	AH725	ML					Vc = 100 sfm, fz = 0.008 ipt						
H	Hot mold steel HB, etc.	40 - 55HRC	First choice	AH8015	MH	260 - 490	0.004 - 0.020	0.004 - 0.020	0.002	2,390	57	2,170	52	1,990	48	72
			Low resistance	AH8015	MJ		0.004 - 0.012	0.004 - 0.012		Vc = 390 sfm, fz = 0.012 ipt						
	Hot mold steel of D.T.C materials DAC**, DH**, DIEVER, etc.	40 - 55HRC	First choice	AH8015	MJ	160 - 330	0.004 - 0.012	0.004 - 0.012	0.002	1,590	25	1,440	23	1,320	21	32
			Fracture resistance	AH8015	MH		0.004 - 0.020	0.004 - 0.020		Vc = 260 sfm, fz = 0.008 ipt						
	Cold mold steel D2, 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
										Vc = 200 sfm, fz = 0.005 ipt						
		55 - 60HRC	Fracture resistance	AH8015	MH	160 - 230	0.001 - 0.004	0.002 - 0.008	0.001	1,220	5	1,110	4	1,020	4	6
										Vc = 200 sfm, fz = 0.002 ipt						

- 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.

Cautionary points in use

The use of a standard or long shank

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

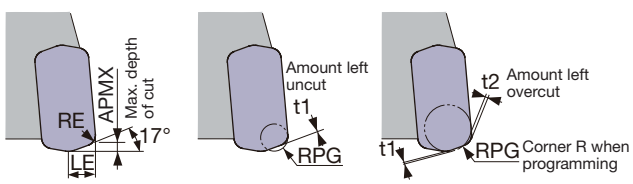


Tool dia.: DCX = ø0.625 - 1.250"
Workpiece: 1015 (200HB)

L/D ratio of overhang
Standard shank: L/D ≤ 3
Long shank: L/D = 4

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 = 0.060". If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t1) and overcut (t2).



LNMU03-MJ/ML

Max. depth of cut APMX (in)	Corner radius RE	LE (in)	Corner R when programming: RPG	Amount left uncut t1 (in)	Amount left overcut t2 (in)
0.039	0.047	0.118	0.039	0.018	-
0.039	0.047	0.118	0.060	0.014	-
0.039	0.047	0.118	0.079	0.008	0.004
0.039	0.047	0.118	0.098	0.003	0.011

LNGU03-MH

Max. depth of cut APMX (in)	Corner radius RE (in)	LE (in)	Corner R when programming: RPG	Amount left uncut t1 in)	Amount left overcut t2 (in)
0.039	0.047	0.118	0.039	0.018	-
0.039	0.047	0.118	0.060	0.014	-
0.039	0.047	0.118	0.079	0.008	0.004
0.039	0.047	0.118	0.098	0.003	0.011

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

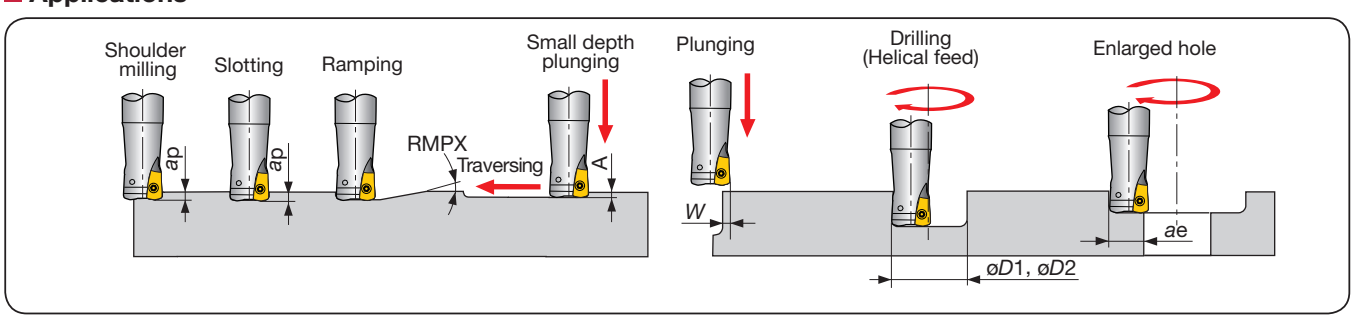
Tool dia.: DCX (in), Number of revolutions: *n* (rpm), Feed speed: *Vf* (ipm), Max. depth of cut: *ap* = 0.004"

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																		

- 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.

Applications



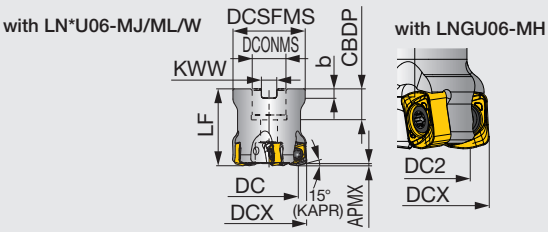
Inch	Tool dia. DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Max. cutting width in plunging *W*	Min.machinable hole dia. *øD1*	Max.machinable hole dia. *øD2*	Max. cutting width in enlarged hole *ae*
EXN03R062U0062...	ø0.625	0.039	1.7°	0.012	0.118	0.897	1.181	0.492
EXN03R068U0062...	ø0.688	0.039	1.7°	0.012	0.118	0.991	1.339	0.571
EXN03R075U0075...	ø0.750	0.039	1.2°	0.012	0.118	1.132	1.496	0.650
EXN03R087U0075...	ø0.875	0.039	1°	0.012	0.118	1.371	1.654	0.728
EXN03R100U0100...	ø1.000	0.039	0.9°	0.012	0.118	1.610	1.890	0.846
EXN03R112U0100...	ø1.125	0.039	0.8°	0.012	0.118	1.857	2.126	0.965
EXN03R125U0125...	ø1.250	0.039	0.7°	0.012	0.118	2.104	2.441	1.122
TXN03R150U0075...	ø1.500	0.039	0.5°	0.012	0.118	2.750	3.070	1.437
TXN03R200U0075...	ø2.000	0.039	0.4°	0.012	0.118	3.540	3.858	1.830

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

DOFEED
TXN06

High feed mill, for 4-corner double sided inserts

GAMP = +10°, GAMF = +2° ~ +6°



Inch	APMX	DCX	CICT	DC	DC2	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...

SPARE PARTS

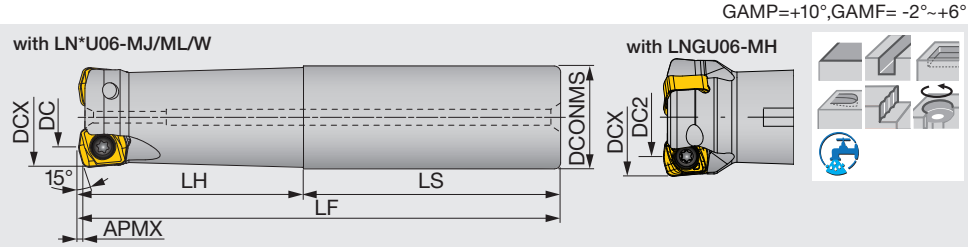
Designation	Clamping screw	Grip	Lubricant	Torx bit	Shell locking bolt (Optional parts)
TXN06R200U..., 250U...	CSPB-5	H-TB2W	M-1000	BLDIP20/S7	(C0.375X1.125H)
TXN06R300U...	CSPB-5	H-TB2W	M-1000	BLDIP20/S7	(C0.500X1.375H)
TXN06R400U..., 500U...	CSPB-5	H-TB2W	M-1000	BLDIP20/S7	(TMBA-0.750H)
TXN06R600U...	CSPB-5	H-TB2W	M-1000	BLDIP20/M7	-

*Recommended clamping torque：CSPB-5 = 3.69 lbs・ft

DOFEED
EXN06

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

GAMP=+10°,GAMF= -2°~+6°



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

SPARE PARTS

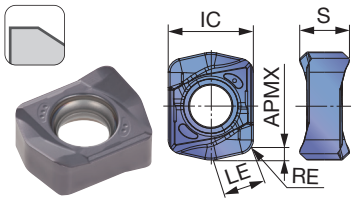
Designation	Clamping screw	Lubricant	Wrench
EXN06	CSPB-5	M-1000	IP-20D

*Recommended clamping torque：CSPB-5 = 3.69 lbs・ft

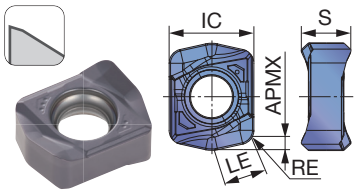
Reference pages: Inserts → H033, Standard cutting conditions → H034 - H035

INSERT

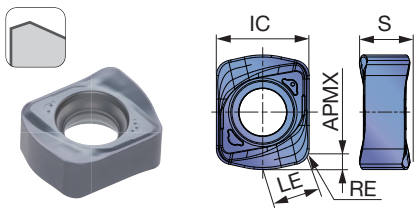
LNMU06-MJ



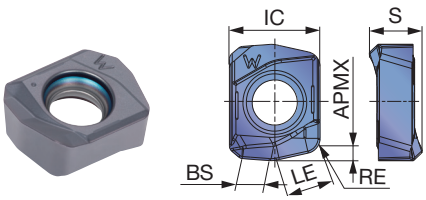
LNMU06-ML



LNGU06-MH



LNGU06-W (2 corners)



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
			AH130	AH3225	AH3035	AH725	AH120	AH8015	AH8005				
LNMU06X5ZER-MJ	0.079	0.059	●	●	●	●	●	●		0.236	0.472	0.276	-
LNMU06X5ZER-ML	0.079	0.059	●	●	●	●	●	●		0.236	0.472	0.276	-
LNGU06X5ZER-MH	0.079	0.059						●	●	0.236	0.472	0.276	-
LNGU06X5ZER-W	0.079	0.059				●				0.236	0.472	0.276	0.142

● : Line up

Reference pages: Standard cutting conditions → H034 - H035

STANDARD CUTTING CONDITIONS TXN06 / EXN06

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth: *fz* (ipt) Tool dia.: DCX (in) ø1.25" ~ ø6"	Plunging	ø1.25", CICT = 2 *n*	ø1.25", CICT = 2 *Vf*	ø1.5", CICT = 3 *n*	ø1.5", CICT = 3 *Vf*
P	Carbon steels 1045, 1055, etc.	- 300HB	First choice	AH3225	MJ	330 - 980	0.020 - 0.059	0.006	2,020	162	1,680	202
									Vc = 660 sfm, *fz* = 0.040 ipt			
	Alloy steels 4140, etc.	- 300HB	First choice	AH3225	MJ	330 - 660	0.020 - 0.059	0.006	2,020	162	1,680	202
									Vc = 660 sfm, *fz* = 0.040 ipt			
	Prehardened steels NAK80, PX5, etc.	30 - 40HRC	First choice	AH3225	MJ	330 - 660	0.020 - 0.047	0.006	1,500	93	1,250	116
									Vc = 490 sfm, *fz* = 0.031 ipt			
		30 - 40HRC	Wear resistance	AH8015	MJ	330 - 660	0.020 - 0.060	0.006	1,500	120	1,250	150
									Vc = 490 sfm, *fz* = 0.040 ipt			
M	Stainless steels 304SS, 316SS, etc.	- 200HB	First choice	AH130	ML	260 - 490	0.012 - 0.031	0.004	1,190	57	990	71
									Vc = 390 sfm, *fz* = 0.024 ipt			
	Precipitation hardening stainless steels 17-4 PH, etc.	28HRC - (H1150)	First choice	AH130	MS	260 - 490	0.008 - 0.020	0.004	1,190	29	990	36
			Wear resistance	AH3225	MS				*Vc* = 390 sfm, *fz* = 0.012 ipt			
		40HRC - (H900)	First choice	AH3035	ML	260 - 390	0.004 - 0.012	0.004	1,010	16	840	20
			Fracture resistance	AH3035	MJ				*Vc* = 330 sfm, *fz* = 0.008 ipt			
K	Gray cast irons Class 25, etc.	150 - 250HB	First choice	AH120	MJ	330 - 980	0.020 - 0.059	0.006	2,020	162	1,680	202
									Vc = 660 sfm, *fz* = 0.040 ipt			
		150 - 250HB	First choice	AH120	MJ	260 - 660	0.020 - 0.059	0.006	1,500	120	1,250	150
									Vc = 490 sfm, *fz* = 0.040 ipt			
S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice	AH130	ML	100 - 200	0.012 - 0.028	0.003	400	16	330	20
			Fracture resistance	AH130	MJ				*Vc* = 130 sfm, *fz* = 0.020 ipt			
	Heat-resistant alloy Inconel, Hastelloy, etc.	- 40HRC	First choice	AH8015	ML	70 - 160	0.004 - 0.012	0.002	310	5	250	6
			Fracture resistance	AH725	ML				*Vc* = 100 sfm, *fz* = 0.008 ipt			
H	Hot mold steel HB, etc.	40 - 55HRC	First choice	AH8015	MH	260 - 490	0.004 - 0.020	0.002	1,190	29	990	36
			Low resistance	AH8015	MJ		0.004 - 0.012		*Vc* = 390 sfm, *fz* = 0.012 ipt			
	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	660	16
			Fracture resistance	AH8015	MH		0.004 - 0.020		*Vc* = 260 sfm, *fz* = 0.008 ipt			
	Cold mold steel D2, etc.	55 - 60HRC	First choice	AH8005	MH	160 - 230	0.002 - 0.012	0.001	610	5	510	6
									Vc = 200 sfm, *fz* = 0.004 ipt			
		55 - 60HRC	Fracture resistance	AH8015	MH	160 - 230	0.002 - 0.012	0.001	610	2	510	3
									Vc = 200 sfm, *fz* = 0.002 ipt			

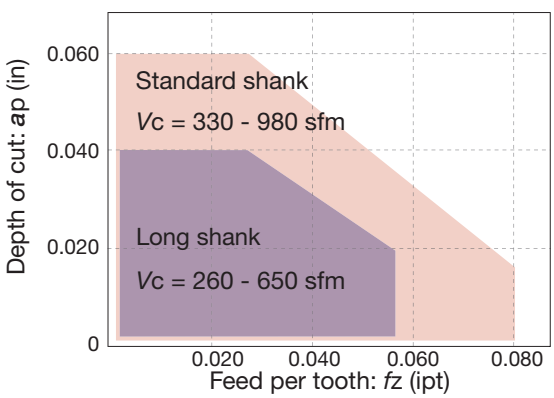
· The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: "The usage of standard and long shanks" shown in previous page.

· 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.

Cautionary points in use

The use of a standard or long shank

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

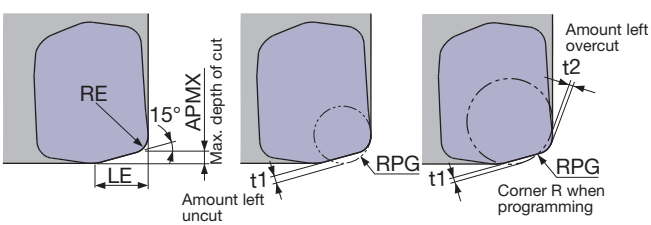


Tool dia.: DCX = ø1.250" - 1.500"
Workpiece: 1055 (200HB)

L/D ratio of overhang
Standard shank: L/D ≤ 3
Long shank: L/D = 4

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-MJ/ML

Max. depth of cut APMX (in)	Corner radius RE	LE (in)	Corner R when programming: RPG	Amount left uncut t1 (in)	Amount left overcut t2 (in)
0.059	0.079	0.236	0.079	0.039	-
			0.118	0.030	-
			0.157	0.021	0.010

LNGU06-MH

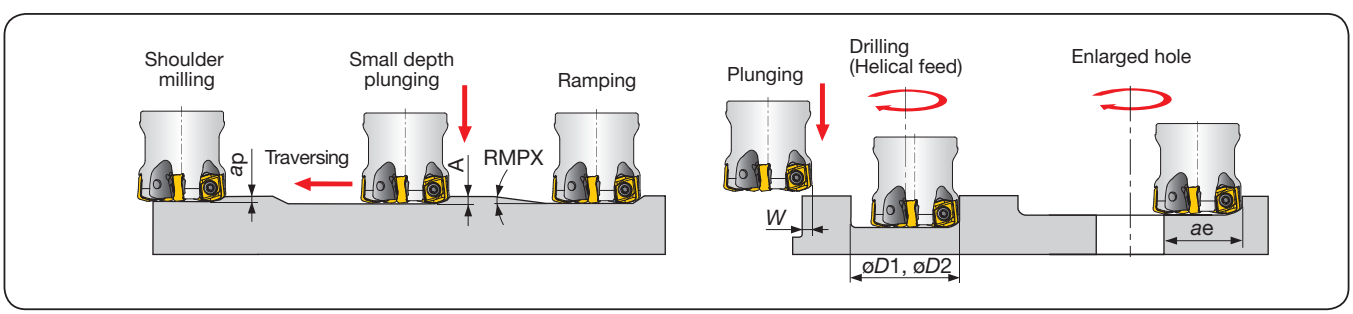
Max. depth of cut APMX (in)	Corner radius RE	LE (in)	Corner R when programming: RPG	Amount left uncut t1 (in)	Amount left overcut t2 (in)
0.059	0.079	0.236	0.079	0.035	-
			0.118	0.026	-
			0.157	0.016	0.010

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

Tool dia: DCX (in), Number of revolution: *n* (min-1), Feed speed: *Vf* (ipm), Max. depth of cut: *ap*=0.059", Number of teeth: CICT

ø2"			ø2.5"			ø3"			ø4"			ø5"			ø6"		
n	*Vf* CICT = 4	*Vf* CICT = 5	*n*	*Vf* CICT = 4	*Vf* CICT = 6	*n*	*Vf* CICT = 5	*Vf* CICT = 7	*n*	*Vf* CICT = 6	*Vf* CICT = 10	*n*	*Vf* CICT = 8	*Vf* CICT = 12	*n*	*Vf* CICT = 10	*Vf* CICT = 14
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
Vc = 660 sfm, *fz* = 0.040 ipt																	
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
Vc = 660 sfm, *fz* = 0.040 ipt																	
940	117	146	750	93	140	620	96	135	470	87	146	370	92	138	310	96	135
Vc = 490 sfm, *fz* = 0.031 ipt																	
940	150	188	750	120	180	620	124	174	470	113	188	370	118	178	310	124	174
Vc = 490 sfm, *fz* = 0.040 ipt																	
740	71	89	600	58	86	500	60	84	370	53	89	300	58	86	250	60	84
Vc = 390 sfm, *fz* = 0.024 ipt																	
740	36	44	600	29	43	500	30	42	370	27	44	300	29	43	250	30	42
Vc = 390 sfm, *fz* = 0.012 ipt																	
630	20	25	500	16	24	420	17	24	320	15	26	250	16	24	210	17	24
Vc = 330 sfm, *fz* = 0.008 ipt																	
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
Vc = 660 sfm, *fz* = 0.040 ipt																	
940	150	188	750	120	180	620	124	174	470	113	188	370	118	178	310	124	174
Vc = 490 sfm, *fz* = 0.040 ipt																	
250	20	25	200	16	24	170	17	24	120	14	24	100	16	24	80	16	22
Vc = 130 sfm, *fz* = 0.020 ipt																	
190	6	8	150	5	7	130	5	7	100	5	8	80	5	8	60	5	7
Vc = 100 sfm, *fz* = 0.008 ipt																	
740	36	44	600	29	43	500	30	42	370	27	44	300	29	43	250	30	42
Vc = 390 sfm, *fz* = 0.012 ipt																	
500	16	20	400	13	19	330	13	18	250	12	20	200	13	19	170	14	19
Vc = 260 sfm, *fz* = 0.008 ipt																	
380	6	8	310	5	7	250	5	7	190	5	8	150	5	7	130	5	7
Vc = 200 sfm, *fz* = 0.004 ipt																	
380	3	4	310	2	4	250	3	4	190	2	4	150	2	4	130	3	4
Vc = 200 sfm, *fz* = 0.002 ipt																	

Applications



Inch	Tool dia. DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Max. cutting width in plunging *W*	Min.machinable hole dia. ø*D*1	Max.machinable hole dia. ø*D*2	Max. cutting width in enlarged hole *ae*
EXN06R125U…	ø1.250	0.059	1.4°	0.016	0.236	1.830	2.300	0.970
EXN06R150U…	ø1.500	0.059	0.9°	0.016	0.236	2.330	2.800	1.220
TXN06R200U…	ø2.000	0.059	0.7°	0.016	0.236	3.330	3.800	1.720
TXN06R250U…	ø2.500	0.059	0.5°	0.016	0.236	4.330	4.800	2.220
TXN06R300U…	ø3.000	0.059	0.3°	0.016	0.236	5.330	5.800	2.720

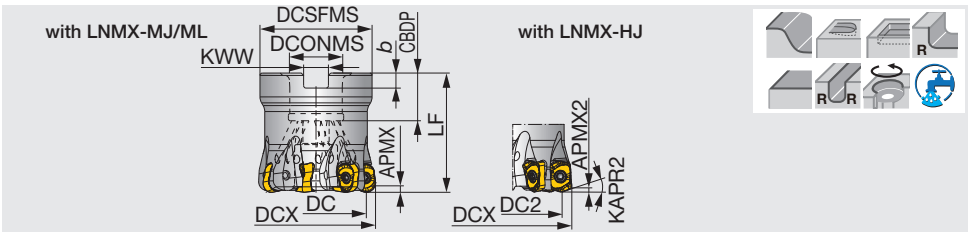
For DCX above 4.000", slot milling, ramping or contouring is not recommended as chips may be re-cut.

DO TWIST BALL

TXLN

Radius mill, for 4-corner double sided inserts

GAMP= +3°, GAMF= -13°



Inch	APMX	APMX2	DCX	CICT	DC	DC2	KAPR2	DCSFMS	LF	DCONMS	CBDP	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	LNMX04...
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	LNMX04...
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	LNMX06...
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	LNMX06...
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	LNMX06...

Metric	APMX	APMX2	DCX	CICT	DC	DC2	KAPR2	DCSFMS	LF	DCONMS	CBDP	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	LNMX04...
TXLN04M042B16.0R06	4	1.3	42	6	34.2	33.6	20°	35	40	16	18	8.4	5.6	0.21	With	LNMX04...
TXLN04M050B22.0R07	4	1.3	50	7	42.2	41.6	20°	47	50	22	20	10.4	6.3	0.45	With	LNMX04...
TXLN04M052B22.0R07	4	1.3	52	7	44.2	43.6	20°	47	50	22	20	10.4	6.3	0.47	With	LNMX04...
TXLN04M063B22.0R07	4	1.3	63	7	55.2	54.6	20°	59	50	22	20	10.4	6.3	0.76	With	LNMX04...
TXLN05M040B16.0R05	5	-	40	5	29.8	-	-	35	40	16	18	8.4	5.6	0.26	With	LNMX05...
TXLN05M050B22.0R06	5	-	50	6	39.8	-	-	47	50	22	20	10.4	6.3	0.50	With	LNMX05...
TXLN06M050B22.0R05	6	2	50	5	37.6	37.3	25°	47	50	22	20	10.4	6.3	0.50	With	LNMX06...
TXLN06M052B22.0R05	6	2	52	5	39.6	39.3	25°	49	50	22	20	10.4	6.3	0.55	With	LNMX06...
TXLN06M063B22.0R06	6	2	63	6	50.6	50.3	25°	59	50	22	20	10.4	6.3	0.82	With	LNMX06...

SPARE PARTS

Designation	Clamping screw	Torx bit	Grip	Shell locking bolt (Optional parts)
TXLN04U1.50B0.50R06	CSPD-3	BLD IP10/S7	SW6-SD	(SR UNF 1/4X3/4 B18.3)
TXLN04U2.00B0.75R07	CSPD-3	BLD IP10/S7	SW6-SD	(C0.375X1.125H)
TXLN06U2.00B..., TXLN06U2.50B...	CSPB-5	BLDIP20/S7	H-TB2W	(C0.375X1.125H)
TXLN06U3.00B1.00R07	CSPB-5	BLDIP20/S7	H-TB2W	(C0.500X1.375H)
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
TXLN06M052B22.0R05	CSPB-5	BLDIP20/S7	H-TB2W	CM10X30H
TXLN06M063B22.0R06	CSPB-5	BLDIP20/S7	H-TB2W	CM10X30H

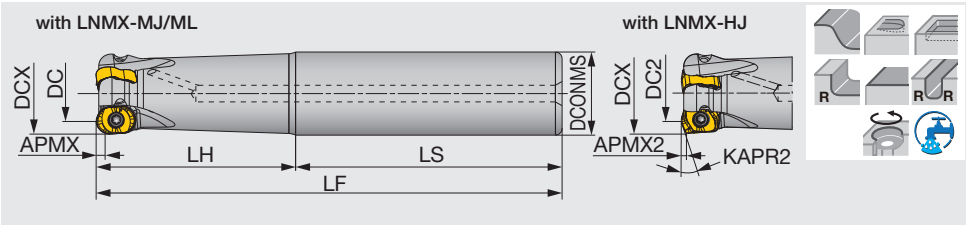
*Recommended clamping torque: CSPD-3 = 1.84 lbs·ft, 2.5 N·m, CSPB-4S = 2.58 lbs·ft, 3.5 N·m, CSPB-5 = 3.69 lbs·ft, 5 N·m

Reference pages: Inserts → H038, Standard cutting conditions → H039 - H041

EXLN

Radius endmill, shank type, for 4-corner double sided inserts

GAMP= +3°, GAMF= -12° ~ -14°



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	1.000	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	1.800	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	1.800	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	1.900	With	LNMX04...
EXLN06U1.50C1.25R03	0.236	0.079	1.500	3	1.012	1.000	25°	1.250	4.000	2.000	6.000	2.060	With	LNMX05..

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...
EXLN04M025C25.0R03	4	1.3	25	3	17.2	16.6	20°	25	80	60	140	0.46	With	LNMX04...
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...
EXLN05M025C25.0R02	5	-	25	2	15	-	-	25	90	60	150	0.54	With	LNMX05..
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	0.90	With	LNMX06..
EXLN06M040C32.0R04	6	2	40	4	27.6	27.3	25°	32	100	50	150	0.95	With	LNMX06..

SPARE PARTS

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

*Recommended clamping torque：CSPD-3 = 1.84 lbs·ft, 2.5 N·m, CSPB-5 = 3.69 lbs·ft, 5 N·m

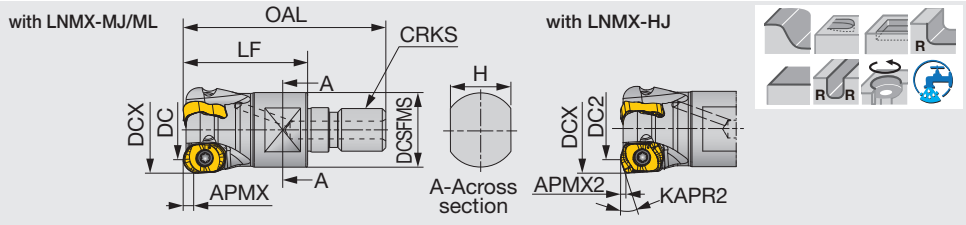
Reference pages: Inserts → H038, Standard cutting conditions → H039 - H041

DOTWIST BALL

HXLN04-M

Radius endmill, modular type, for 4-corner double sided inserts (TungFlex)

GAMP= +3°, GAMF= -12° ~ -14°



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...
HXLN04M032M16R04	4	1.3	32	4	24.2	23.6	20°	63	40	22	29	M16	0.20	With	LNMX04...
HXLN05M025M12R02	5	-	25	2	15	-	-	57	35	17	21	M12	0.10	With	LNMX05...
HXLN05M032M16R04	5	-	32	4	21.9	-	-	63	40	22	28.8	M16	0.20	With	LNMX05...
HXLN06M032M16R02	6	2	32	2	19.6	19.3	25°	63	40	22	28.8	M16	0.24	With	LNMX06...

See page **H167** for TungFlex modular shank.

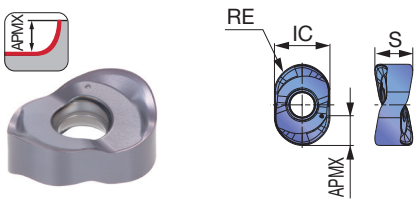
SPARE PARTS

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

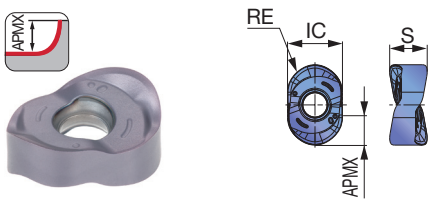
*Recommended clamping torque：CSPD-3 = 2.5 N·m, CSPB-4S = 3.5 N·m, CSPB-5 = 5 N·m

INSERT

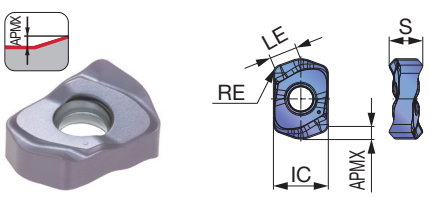
LNMX-MJ



LNMX-ML



LNMX-HJ



Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

		Coated	
		AH120	AH3135
P	Steel	☆	★
M	Stainless		★
K	Cast iron	★	
N	Non-ferrous		
S	Superalloys	★	☆
H	Hard materials	★	★

★ : First choice
☆ : Second choice

Designation	RE	APMX	AH120	AH3135	LE	IC	S
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	●	●	0.169	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

STANDARD CUTTING CONDITIONS

For 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.		- 200 HB	First choice	AH3135	MJ	325 - 980	0.008 - 0.024
			- 200 HB	Low cutting force	AH3135	ML	325 - 980	0.008 - 0.024
	Carbon steel, Alloy steel 1055, 4140, etc.		- 300 HB	First choice	AH3135	MJ	325 - 820	0.008 - 0.024
			- 300 HB	Low cutting force	AH3135	ML	325 - 820	0.008 - 0.024
	Prehardened steel NAK80, PX5, etc.		30 - 40 HRC	First choice	AH3135	MJ	325 - 655	0.006 - 0.016
			30 - 40 HRC	Low cutting force	AH3135	ML	325 - 655	0.006 - 0.016
M	Austenitic Stainless steel 304SS, 316SS, etc.		- 200 HB	First choice	AH3135	MJ	325 - 655	0.008 - 0.024
			- 200 HB	Low cutting force	AH3135	ML	325 - 655	0.008 - 0.024
	Martensitic Stainless steel 420SS etc.		- 200 HB	First choice	AH3135	ML	325 - 980	0.008 - 0.024
			- 200 HB	Fracture resistance	AH3135	MJ	325 - 980	0.008 - 0.024
K	Gray cast iron Class 25, Class 30, etc.		150 - 250 HB	First choice	AH120	MJ	325 - 980	0.008 - 0.024
			150 - 250 HB	Low cutting force	AH120	ML	325 - 980	0.008 - 0.024
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250 HB	First choice	AH120	MJ	260 - 820	0.008 - 0.024
			150 - 250 HB	Low cutting force	AH120	ML	260 - 820	0.008 - 0.024
S	Titanium alloy Ti-6Al-4V, etc.		-	First choice	AH3135	ML	95 - 195	0.006 - 0.024
			-	Fracture resistance	AH3135	MJ	95 - 195	0.006 - 0.024
	Superalloys Inconel718, etc.		-	First choice	AH120	ML	65 - 160	0.002 - 0.012
			-	Fracture resistance	AH120	MJ	65 - 160	0.002 - 0.012
H	Hardened steel	H13, etc.	40 - 50 HRC	First choice	AH3135	MJ	160 - 490	0.004 - 0.012
			40 - 50 HRC	Wear resistance	AH120	MJ	160 - 490	0.004 - 0.012
		D2, etc.	50 - 60 HRC	First choice	AH120	MJ	160 - 225	0.002 - 0.006

Reference pages: TungFlex → H167

STANDARD CUTTING CONDITIONS

LNMX04-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	AH3135	HJ	325 - 980	0.020 - 0.051
				Wear resistance	AH120			
	Carbon steel, Alloy steel 1055, 4140, etc.		- 300HB	First choice	AH3135	HJ	325 - 820	0.020 - 0.051
				Wear resistance	AH120			
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	AH3135	HJ	325 - 655	0.016 - 0.039
				Wear resistance	AH120			
M	Austenitic Stainless steel 304SS, 316SS, etc.		- 200HB	First choice	AH3135	HJ	325 - 655	0.012 - 0.035
	Martensitic Stainless steel 420SS, etc.		- 200HB	First choice	AH3135	HJ	325 - 980	0.012 - 0.035
K	Gray cast iron Class 25, Class 30, etc.		150 - 250HB	First choice	AH120	HJ	325 - 980	0.020 - 0.051
				Fracture resistance	AH3135			
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250HB	First choice	AH120	HJ	260 - 820	0.020 - 0.051
				Fracture resistance	AH3135			
S	Titanium alloy Ti-6Al-4V, etc.		150 - 250HB	First choice	AH3135	HJ	95 - 195	0.012 - 0.028
	Superalloys Inconel718, etc.		150 - 250HB	First choice	AH120	HJ	65 - 160	0.004 - 0.012
H	Hardened steel	H13, etc.	40 - 50HRC	First choice	AH3135	HJ	160 - 490	0.004 - 0.020
				Wear resistance	AH120			
		D2, etc.	50 - 60HRC	First choice	AH120	HJ	160 - 225	0.002 - 0.008

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	AH3135	HJ	325- 980	0.012 - 0.044
				Wear resistance	AH120			
	Carbon steel, Alloy steel 1055, 4140, etc.		- 300HB	First choice	AH3135	HJ	325 - 820	0.012 - 0.044
				Wear resistance	AH120			
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	AH3135	HJ	325 - 655	0.008 - 0.028
				Wear resistance	AH120			
M	Austenitic Stainless steel 304SS, 316SS, etc.		- 200HB	First choice	AH3135	HJ	325 - 655	0.008 - 0.028
	Martensitic Stainless steel 420SS, etc.		- 200HB	First choice	AH3135	HJ	325 - 980	0.008 - 0.028
K	Gray cast iron Class 25, Class 30, etc.		150 - 250HB	First choice	AH120	HJ	325 - 980	0.012 - 0.044
				Fracture resistance	AH3135			
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250HB	First choice	AH120	HJ	260 - 820	0.012 - 0.044
				Fracture resistance	AH3135			
S	Titanium alloy Ti-6Al-4V, etc.		150 - 250HB	First choice	AH3135	HJ	95 - 195	0.006 - 0.024
	Superalloys Inconel718, etc.		150 - 250HB	First choice	AH120	HJ	65 - 160	0.002 - 0.012
H	Hardened steel	H13, etc.	40 - 50HRC	First choice	AH3135	HJ	160 - 490	0.004 - 0.012
				Wear resistance	AH120			
		D2, etc.	50 - 60HRC	First choice	AH120	HJ	160 - 225	0.002 - 0.006

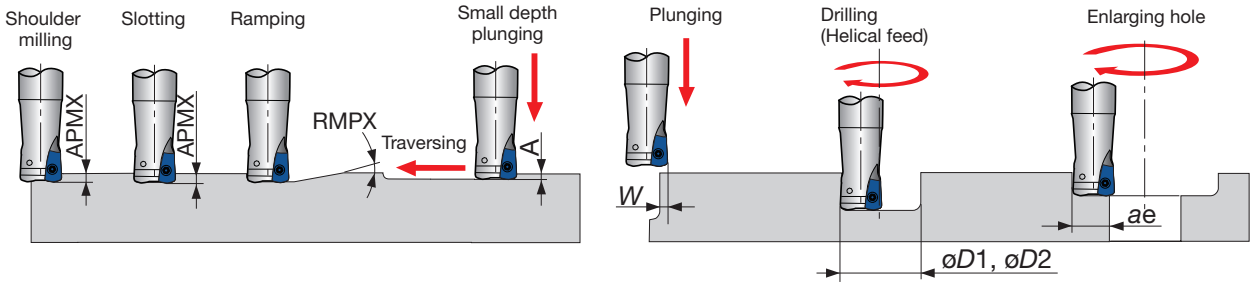
Tool dia: ø*Dc* (in), Number of revolution: *n* (rpm), Feed speed: *Vf* (ipm), Max. depth of cut: *ap* = 0.051", Number of teeth: z

ø0.787", CICT = 2		ø0.984", CICT = 3		ø1.260"			ø1.575", CICT = 6		ø1.654", CICT = 6		ø1.969", CICT = 7		ø2.047", CICT = 7		ø2.480", CICT = 7	
					Vf											
n	*Vf*	*n*	*Vf*	*n*	Coarse pitch (CICT = 4)	Close pitch (CICT = 5)	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*
3,180	225	2,550	271	1,990	282	353	1,590	338	1,520	323	1,270	315	1,220	303	1,010	250
Vc = 656 sfm, *fz* = 0.036 ipt																
2,860	203	2,290	243	1,790	254	317	1,430	304	1,360	289	1,150	285	1,100	273	910	226
Vc = 590 sfm, *fz* = 0.036 ipt																
2,390	132	1,910	158	1,490	164	206	1,190	197	1,140	189	950	183	920	178	760	146
Vc = 492 sfm, *fz* = 0.028 ipt																
2,390	113	1,910	135	1,490	141	176	1,190	169	1,140	161	950	157	920	152	760	126
Vc = 492 sfm, *fz* = 0.024 ipt																
3,180	150	2,550	181	1,990	188	235	1,590	225	1,520	215	1,270	210	1,220	202	1,010	167
Vc = 656 sfm, *fz* = 0.024 ipt																
3,180	225	2,550	271	1,990	282	353	1,590	338	1,520	323	1,270	315	1,220	303	1,010	250
Vc = 656 sfm, *fz* = 0.036 ipt																
2,550	181	2,040	217	1,590	225	282	1,270	270	1,210	257	1,020	253	980	243	810	201
Vc = 525 sfm, *fz* = 0.036 ipt																
720	28	570	34	450	35	44	360	43	340	40	290	40	280	39	230	32
Vc = 148 sfm, *fz* = 0.02 ipt																
480	7	380	9	300	9	12	240	11	230	11	190	11	180	10	150	8
Vc = 98 sfm, *fz* = 0.008 ipt																
1,590	37	1,270	45	990	47	59	800	57	760	54	640	53	610	50	510	42
Vc = 328 sfm, *fz* = 0.012 ipt																
950	9	760	11	600	12	15	480	14	450	13	380	13	370	13	300	10
Vc = 197 sfm, *fz* = 0.005 ipt																

Tool dia: DCX (in), Number of revolution: *n* (rpm), Feed speed: *Vf* (ipm), Max. depth of cut: *ap* = 0.079", Number of teeth: z

ø1.260, z = 2		ø1.575, z = 4		ø1.969, z = 5		ø2.047, z = 5		ø2.480, z = 6	
n	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*
2,010	110	1,670	140	1,250	180	1,000	170	840	160
Vc = 656 sfm, *fz* = 0.028 ipt									
1,800	100	1,500	130	1,130	160	900	150	750	150
Vc = 590 sfm, *fz* = 0.028 ipt									
1,500	50	1,250	70	940	80	750	80	630	80
Vc = 492 sfm, *fz* = 0.018 ipt									
1,500	50	1,250	70	940	80	750	80	630	80
Vc = 492 sfm, *fz* = 0.018 ipt									
2,010	70	1,670	90	1,250	110	1,000	110	840	110
Vc = 656 sfm, *fz* = 0.018 ipt									
2,010	110	1,670	140	1,250	180	1,000	170	840	160
Vc = 656 sfm, *fz* = 0.028 ipt									
1,600	90	1,340	110	1,000	140	800	130	670	130
Vc = 525 sfm, *fz* = 0.028 ipt									
450	14	380	17	280	21	230	21	190	20
Vc = 148 sfm, *fz* = 0.015 ipt									
300	4	250	5	190	7	150	6	130	6
Vc = 98 sfm, *fz* = 0.007 ipt									
1,000	16	840	20	630	25	500	24	420	24
Vc = 328 sfm, *fz* = 0.008 ipt									
600	5	500	6	380	8	300	7	250	7
Vc = 197 sfm, *fz* = 0.004 ipt									

MACHINING APPLICATIONS



MJ, ML

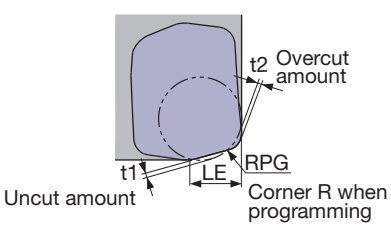
Inch	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging A	Max. cutting width in plunging W	Min. machining dia. øD1	Max. machining dia. øD2	Max. cutting width in enlarging ae
EXLN04U1.00C1.00R03	1.000	0.157	3°	0.031	0.157	1.535	1.929	0.803
EXLN04U1.25C1.25R04	1.250	0.157	1.9°	0.031	0.157	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
HXLN04M020M10R02	0.787	0.157	4.7°	0.031	0.157	1.102	1.496	0.591
HXLN04M025M12R03	0.984	0.157	3°	0.031	0.157	1.496	1.890	0.787
HXLN04M032M16R04	1.260	0.157	2°	0.031	0.157	2.047	2.441	1.063
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

HJ

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
HXLN04M020M10R02	0.787	0.051	4.9°	0.030	0.161	1.063	1.496	0.610
HXLN04M025M12R03	0.984	0.051	3°	0.030	0.161	1.457	1.890	0.807
HXLN04M032M16R04	1.260	0.051	2°	0.030	0.161	2.008	2.441	1.083
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

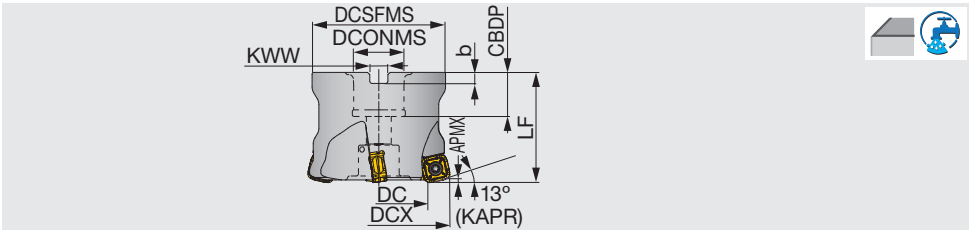
The following table shows the amount left uncut (t1) and overcut (t2).



	Max. depth of cut APMX (in)	LE (in)	Programmed corner R (in)	Amount left uncut t1 (in)	Amount left overcut t2 (in)
LNMX04-HJ	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

High feed face mill

GAMP = +7°, GAMF = -8° ~ -4.5°



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	SQMU1206ZSR-MJ
TXQ12R200U0075A04	0.079	2.000	4	1.362	1.850	1.969	0.750	0.750	0.315	0.197	1.120	With	SQMU1206ZSR-MJ
TXQ12R250U0075A04	0.079	2.500	4	1.862	2.323	1.969	0.750	0.750	0.315	0.197	1.760	With	SQMU1206ZSR-MJ
TXQ12R300U0100A05	0.079	3.000	5	2.362	2.835	2.480	1.000	1.024	0.374	0.236	3.770	With	SQMU1206ZSR-MJ
TXQ12R400U0150A06	0.079	4.000	6	3.362	3.780	2.480	1.500	1.457	0.626	0.394	5.710	With	SQMU1206ZSR-MJ
TXQ12R500U0150A07	0.079	5.000	7	4.362	3.780	2.480	1.500	1.457	0.626	0.394	7.010	With	SQMU1206ZSR-MJ
TXQ12R600U0200AZ08	0.079	6.000	8	5.37	3.937	2.480	2.000	1.496	0.748	0.433	9.700	With	SQMU1206ZSR-MJ

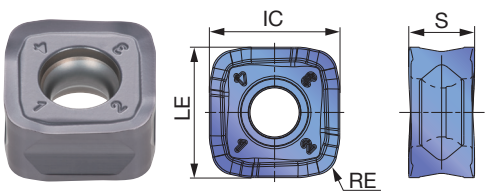
SPARE PARTS

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：CSPB-4 = 2.58 lbs･ft

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 AH120	AH130	AH725	T3130	LE	S	IC
SQMU1206ZSR-MJ	0.079	0.079	●	●	●	●	0.461	0.236	0.461

● : Line up

Reference pages: Standard cutting conditions → H044 - H045

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.	-	-	AH120	100 - 300	0.020 - 0.080
	Ductile cast irons 60-40-18, 65-45-12, etc.	-	-	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: *n* (rpm), Feed speed: *V*f (ipm), Max. depth of cut: APMX = 0.079"

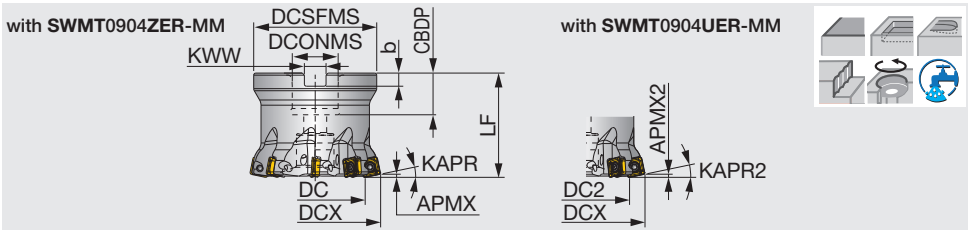
ø2.000"		ø2.500"		ø3.000"		ø4.000"		ø5.000"	
n	***V*f**	***n***	***V*f**	***n***	***V*f**	***n***	***V*f**	***n***	***V*f**
1,260	227	1,010	242	790	237	630	227	500	210
Vc = 660 sfm, *fz* = 0.060 ipt									
950	114	750	120	590	118	470	113	380	106
Vc = 500 sfm, *fz* = 0.040 ipt									
950	86	750	90	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									

MILLQFEED UAD

TXSW09

High feed mill, 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
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°	0.180	With	SWMT09...
TXSW09U2.00B0.75R07	0.059	0.039	2.000	7	1.405	1.366	1.772	0.750	0.750	1.969	0.315	0.197	12°	7°	0.380	With	SWMT09...

SPARE PARTS

Designation	Clamping screw	Torx bit	Grip	Shell locking bolt (optional parts)	Lubricant
TXSW09U1.50B0.50R05	CSPD-3	BLDIP10/S7	H-TB2W	(SR UNF 1/4X3/4 B18.3)	M-1000
TXSW09U2.00B0.75R07	CSPD-3	BLDIP10/S7	H-TB2W	(C0.375X1.125H)	M-1000

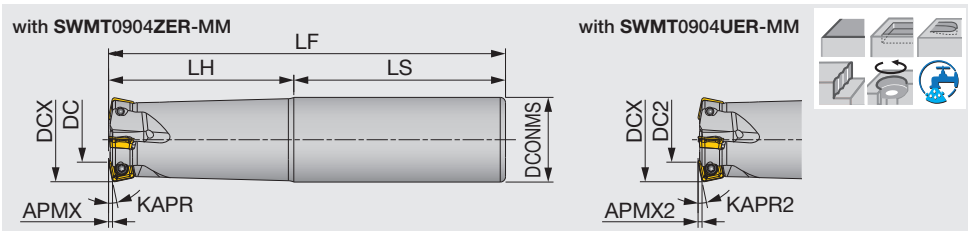
*Recommended clamping torque：CSPD-3 = 1.84 lbs·ft

MILLQFEED UAD

EXSW09

High feed mill, for 4-corner single sided inserts

GAMP = +3.9°, GAMF = -3.5°



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°	0.460	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°	0.580	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°	0.810	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°	1.070	With	SWMT09...

SPARE PARTS

Designation	Clamping screw	Wrench	Lubricant
EXSW09...	CSPD-3	IP-10D	M-1000

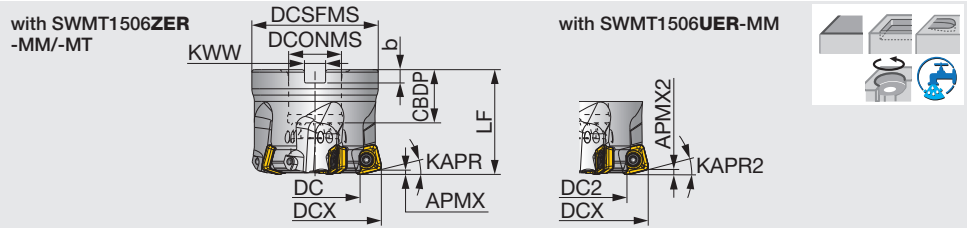
*Recommended clamping torque：CSPD-3 = 1.84 lbs·ft

Reference pages: Inserts → H047, Standard cutting conditions → H048 - H049

TXSW15

High feed mill, for 4-corner single sided inserts

GAMP = +5°, GAMF = 0°



Inch	APMX	APMX2	DCX	CICT	DC	DC2	DCSFMS	LF	DCONMS	CBDP	KWW	b	KAPR	KAPR2	WT(lb)	Air hole	Insert
TXSW15U2.00B0.75R03	0.098	0.079	2.000	3	0.929	0.905	1.850	1.969	0.750	0.750	0.315	0.197	14°	10°	0.950	With	SWMT15...
TXSW15U2.50B0.75R04	0.098	0.079	2.500	4	1.480	1.405	2.323	1.969	0.750	0.750	0.315	0.197	14°	10°	1.520	With	SWMT15...
TXSW15U3.00B1.00R05	0.098	0.079	3.000	5	1.980	1.905	2.835	2.480	1.000	1.024	0.374	0.236	14°	10°	2.710	With	SWMT15...
TXSW15U4.00B1.50R06	0.098	0.079	4.000	6	2.980	2.905	3.819	2.480	1.500	1.063	0.626	0.394	14°	10°	4.870	With	SWMT15...
TXSW15U5.00B1.50R07	0.098	0.079	5.000	7	3.980	3.905	3.819	2.480	1.500	1.614	0.626	0.394	14°	10°	6.370	With	SWMT15...
TXSW15U6.00B2.00R08	0.098	0.079	6.000	8	4.980	4.905	4.331	2.480	2.000	1.496	0.748	0.433	14°	10°	8.290	With	SWMT15...

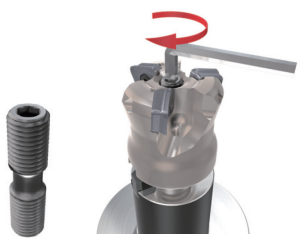
SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1 (Optional parts)	Shell locking bolt 2	Torx bit
TXSW15U2.00B0.75R03	TS50115I	H-TB2W	M-1000	-	SR 5/16-32UNEF_3/8-2	BT20S
TXSW15U2.50B0.75R04	TS50115I	H-TB2W	M-1000	(C0.375X1.125H)	-	BT20S
TXSW15U3.00B1.00R05	TS50115I	H-TB2W	M-1000	(C0.500x1.375H)	-	BT20S
TXSW15U4.00B1.50R06	TS50115I	H-TB2W	M-1000	(TMBA-0.750H)	-	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：TS50115I = 3.69 lbs･ft

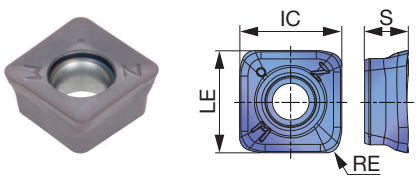
When installing TXSW15U2.00B0.75R03 on the arbor

- Always use the dedicated shell locking bolt (part code: SRPS118-0273) included in the package.
- Thoroughly read the installation manual included in the package before installation.

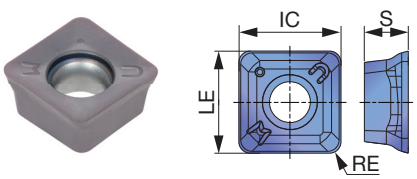


INSERT

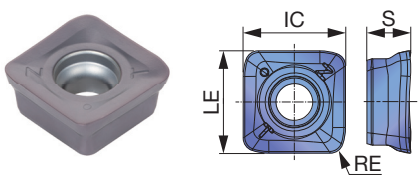
SWMT09/15ZER-MM



SWMT09/15UER-MM



SWMT15ZER-MT



		Coated	
		AH120	AH3135
P	Steel	☆	★
M	Stainless		★
K	Cast iron	★	
N	Non-ferrous		
S	Superalloys	★	☆
H	Hard materials	★	★

★ : First choice
☆ : Second choice

Designation	RE	APMX	AH120	AH3135	LE	IC	S
SWMT0904ZER-MM	0.039	0.059		●	0.339	0.339	0.157
SWMT0904UER-MM	0.039	0.039		●	0.356	0.356	0.157
SWMT1506ZER-MM	0.079	0.098	●	●	0.630	0.630	0.268
SWMT1506UER-MM	0.079	0.079		●	0.641	0.641	0.268
SWMT1506ZER-MT	0.079	0.098	●	●	0.627	0.627	0.268

● : Line up

Reference pages: Standard cutting conditions → H048 - H049

STANDARD CUTTING CONDITIONS

09 type

ISO	Workpiece material		Hardness	Priority	Insert type	Chip-breaker	Grade	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Carbon steel 1045, 1055, etc.		- 300HB	First choice	ZER	MM	AH3135	330 - 990	0.020 - 0.060
				for wear resistance	UER	MM	AH3135	330 - 990	0.020 - 0.060
	Alloy steel 4140, etc.		- 300HB	First choice	ZER	MM	AH3135	330 - 660	0.020 - 0.060
				for wear resistance	UER	MM	AH3135	330 - 660	0.020 - 0.060
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	ZER	MM	AH3135	330 - 660	0.020 - 0.047
				for wear resistance	UER	MM	AH3135	330 - 660	0.020 - 0.047
M	Austenitic stainless steel 304, etc.		- 200HB	First choice	UER	MM	AH3135	330 - 490	0.020 - 0.047
				Low cutting load	ZER	MM	AH3135	330 - 490	0.020 - 0.047
	Precipitation hardening stainless steel 174, etc.		28HRC - (H1150)	First choice	UER	MM	AH3135	260 - 490	0.012 - 0.047
				Low cutting load	ZER	MM	AH3135	260 - 490	0.012 - 0.047
			40HRC - (H900)	First choice	UER	MM	AH3135	260 - 400	0.012 - 0.031
				Low cutting load	ZER	MM	AH3135	260 - 400	0.012 - 0.031
K	Gray cast iron No.250B, No.300B, etc.		150 - 250HB	First choice	ZER	MM	AH3135	330 - 990	0.020 - 0.080
	Ductile cast iron 80-55-06, etc.		150 - 250HB	First choice	ZER	MM	AH3135	260 - 660	0.020 - 0.080
S	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	UER	MM	AH3135	100 - 200	0.012 - 0.028
				Low cutting load	ZER	MM	AH3135	100 - 200	0.012 - 0.028
	Heat-resistant alloys Inconel, Hastelloy, etc.		- 40HRC	First choice	UER	MM	AH3135	70 - 170	0.004 - 0.012
				for wear resistance	ZER	MM	AH3135	70 - 170	0.004 - 0.012
H	Hardened steel	H13, etc.	40 - 50HRC	First choice	ZER	MM	AH3135	260 - 430	0.004 - 0.012

15 type

ISO	Workpiece material		Hardness	Priority	Insert type	Chip-breaker	Grade	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Carbon steel 1045, 1055, etc.		- 300HB	First choice	ZER	MM	AH3135	330 - 990	0.020 - 0.060
				for wear resistance	ZER	MM	AH120	330 - 990	0.020 - 0.060
				for impact resistance	ZER	MT	AH3135	330 - 990	0.020 - 0.080
	Alloy steel 4140, etc.		- 300HB	First choice	ZER	MM	AH3135	330 - 660	0.020 - 0.060
				for wear resistance	ZER	MM	AH120	330 - 660	0.020 - 0.060
				for impact resistance	ZER	MT	AH3135	330 - 660	0.020 - 0.080
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	ZER	MM	AH3135	330 - 660	0.020 - 0.047
				for wear resistance	ZER	MM	AH120	330 - 660	0.020 - 0.047
				for impact resistance	ZER	MT	AH3135	330 - 660	0.020 - 0.060
M	Austenitic stainless steel 304, etc.		- 200HB	First choice	UER	MM	AH3135	330 - 490	0.020 - 0.047
				Low cutting load	ZER	MM	AH3135	330 - 490	0.020 - 0.047
	Precipitation hardening stainless steel 174, etc.		28HRC - (H1150)	First choice	UER	MM	AH3135	260 - 490	0.012 - 0.047
				Low cutting load	ZER	MM	AH3135	260 - 490	0.012 - 0.047
			40HRC - (H900)	First choice	UER	MM	AH3135	260 - 400	0.012 - 0.031
				Low cutting load	ZER	MM	AH3135	260 - 400	0.012 - 0.031
K	Gray cast iron No.250B, No.300B, etc.		150 - 250HB	First choice	ZER	MT	AH120	330 - 990	0.020 - 0.080
				for impact resistance	ZER	MT	AH3135	330 - 990	0.020 - 0.080
				Low cutting load	ZER	MM	AH120	330 - 990	0.020 - 0.060
	Ductile cast iron 80-55-06, etc.		150 - 250HB	First choice	ZER	MT	AH120	260 - 660	0.020 - 0.080
				for impact resistance	ZER	MT	AH3135	260 - 660	0.020 - 0.080
				Low cutting load	ZER	MM	AH120	260 - 660	0.020 - 0.060
S	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	UER	MM	AH3135	100 - 200	0.012 - 0.028
				Low cutting load	ZER	MM	AH3135	100 - 200	0.012 - 0.028
				for impact resistance	ZER	MT	AH3135	100 - 200	0.012 - 0.028
	Heat-resistant alloys Inconel, Hastelloy, etc.		- 40HRC	First choice	UER	MM	AH3135	70 - 170	0.004 - 0.012
				for wear resistance	ZER	MM	AH120	70 - 170	0.004 - 0.012
H	Hardened steel	H13, etc.	40 - 50HRC	First choice	ZER	MT	AH3135	260 - 430	0.004 - 0.012
				for wear resistance	ZER	MT	AH120	260 - 430	0.004 - 0.012
		D2, etc.	50 - 60HRC	First choice	ZER	MT	AH120	160 - 230	0.002 - 0.008

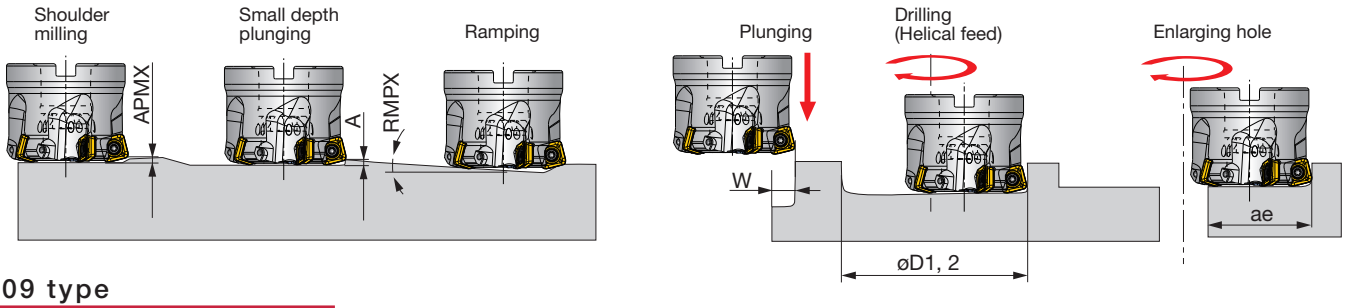
Tool dia.: DC (in), Number of revolutions: *n* (rpm), Feed speed: *Vf* (ipm), Number of inserts: CICT

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

Tool dia.: DC (in), Number of revolutions: *n* (rpm), Feed speed: *Vf* (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	***Vf***	***n***	***Vf***	***n***	***Vf***	***n***	***Vf***	***n***	***Vf***	***n***	***Vf***
1,270	150	1,010	159	800	157	640	151	510	141	400	126
					Vc = 660 sfm, *fz* = 0.040 ipt						
1,270	180	1,010	191	800	189	640	181	510	169	400	151
					Vc = 660 sfm, *fz* = 0.047 ipt						
960	113	760	120	600	118	480	113	380	105	300	94
					Vc = 490 sfm, *fz* = 0.040 ipt						
960	136	760	144	600	142	480	136	380	126	300	113
					Vc = 490 sfm, *fz* = 0.047 ipt						
960	91	760	96	600	94	480	91	380	84	300	76
					Vc = 490 sfm, *fz* = 0.031 ipt						
960	113	760	120	600	118	480	113	380	105	300	94
					Vc = 490 sfm, *fz* = 0.040 ipt						
760	72	610	77	480	76	380	72	310	69	240	61
					Vc = 400 sfm, *fz* = 0.031 ipt						
760	72	610	77	480	76	380	72	310	69	240	61
					Vc = 400 sfm, *fz* = 0.031 ipt						
640	45	510	48	400	47	320	45	250	41	200	38
					Vc = 330 sfm, *fz* = 0.024 ipt						
1,270	180	1,010	191	800	189	640	181	510	169	400	151
					Vc = 660 sfm, *fz* = 0.047 ipt						
1,270	150	1,010	159	800	157	640	151	510	141	400	126
					Vc = 660 sfm, *fz* = 0.040 ipt						
960	136	760	144	600	142	480	136	380	126	300	113
					Vc = 490 sfm, *fz* = 0.047 ipt						
960	113	760	120	600	118	480	113	380	105	300	94
					Vc = 490 sfm, *fz* = 0.040 ipt						
250	15	200	16	160	16	130	15	100	14	80	13
					Vc = 150 sfmn, *fz* = 0.020 ipt						
200	5	150	5	120	5	100	5	80	4	60	4
					Vc = 120 sfm, *fz* = 0.008 ipt						
640	15	510	16	400	16	320	15	250	14	200	13
					Vc = 100 sfm, *fz* = 0.200 ipt						
380	6	300	6	240	6	190	6	150	5	120	5
					Vc = 60 sfm, *fz* = 0.120 ipt						

APPLICATION RANGE



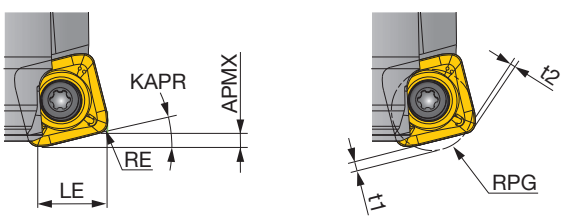
09 type

Inch	Tool dia. DCX	Max. depth of cut APMX SWMT 09**ZER	Max. depth of cut APMX SWMT 09**UER	Max. plunging depth A	Max. ramping angle RMPX SWMT 09**ZER	Max. ramping angle RMPX SWMT 09**UER	Max. cutting width in plunging W SWMT 09**ZER	Max. cutting width in plunging W SWMT 09**UER	Min. machining dia. øD1 SWMT 09**ZER	Min. machining dia. øD1 SWMT 09**UER	Max. machining dia. øD2 SWMT 09**ZER	Max. machining dia. øD2 SWMT 09**UER	Max. cutting width in enlarging ae SWMT 09**ZER	Max. cutting width in enlarging ae SWMT 09**UER
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
TXSW09U1.50…	1.500	0.059	0.039	0.012	1.9°	2.2°	0.275	0.295	2.370	2.331	2.881	2.881	1.165	1.145
TXSW09U2.00…	2.000	0.059	0.039	0.012	1.2°	1.4°	0.275	0.295	3.370	3.331	3.881	3.881	1.663	1.643

15 type

Inch	Tool dia. DCX	Max. depth of cut APMX SWMT 15**ZER	Max. depth of cut APMX SWMT 15**UER	Max. plunging depth A	Max. ramping angle RMPX	Max. cutting width in plunging W SWMT 15**ZER	Max. cutting width in plunging W SWMT 15**UER	Min. machining dia. øD1	Max. machining dia. øD2	Max. cutting width in enlarging ae SWMT 15**ZER	Max. cutting width in enlarging ae SWMT 15**UER
TXSW15M050B...	2.000	0.098	0.079	0.028	4.6°	0.591	0.630	2.787	3.772	1.433	1.393
TXSW15M063B...	2.500	0.098	0.079	0.028	2.9°	0.591	0.630	3.819	4.803	1.949	1.909
TXSW15J, M080B...	3.000	0.098	0.079	0.028	2.1°	0.591	0.630	4.819	5.803	2.449	2.409
TXSW15J, M100B...	4.000	0.098	0.079	0.028	1.4°	0.591	0.630	6.819	7.803	3.449	3.409
TXSW15J, M125B...	5.000	0.098	0.079	0.028	1°	0.591	0.630	8.819	9.803	4.449	4.409
TXSW15J, M160B...	6.000	0.098	0.079	0.028	0.8°	0.591	0.630	10.819	11.803	5.449	5.409

TOOL GEOMETRY FOR PROGRAMMING



09 type

APMX (in) SWMT 09**ZER	APMX (in) SWMT 09**UER	Actual corner radius RE (in)	LE (in) SWMT 09**ZER	LE (in) SWMT 09**UER	KAPR SWMT 09**ZER	KAPR SWMT 09**UER	Programmed corner radius RPG	Uncut amount: t1 (in) SWMT 09**ZER	Uncut amount: t1 (in) SWMT 09**UER	Overcut amount: t2 (in) SWMT 09**ZER	Overcut amount: t2 (in) 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

15 type

APMX (in) SWMT 15**ZER	APMX (in) SWMT 15**UER	Actual corner radius RE (in)	LE (in) SWMT 15**ZER	LE (in) SWMT 15**UER	KAPR SWMT 15**ZER	KAPR SWMT 15**UER	Programmed corner radius RPG	Uncut amount: t1 (in) SWMT 15**ZER	Uncut amount: t1 (in) SWMT 15**UER	Overcut amount: t2 (in) SWMT 15**ZER	Overcut amount: t2 (in) 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

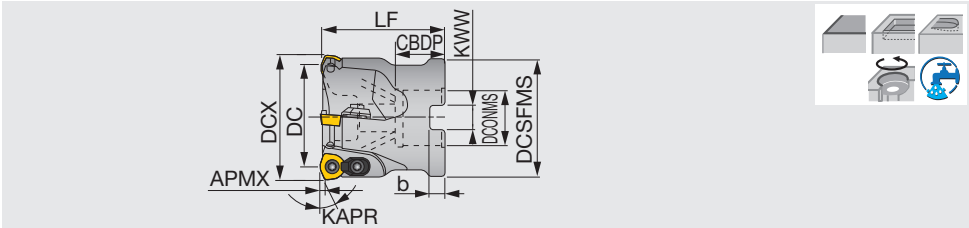
When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set in SWMT**ZER insert: RPG = 0.177", SWMT**UER insert: RPG = 0.157". If a larger radius is used, overcutting may occur.
The above table shows the uncut (t1) and overcut (t2) amounts for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

MILLFEED

TXP05/06/08/09

High feed mill

GAMP = +5°, GAMF = -4° ~ -6°



Inch	APMX	DCX	CICT	DC	DCSFMS	LF	DCONMS	CBDP	KWW	b	KAPR	WT(lb)	Air hole	Insert
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...

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 = 3.69 lbs·ft

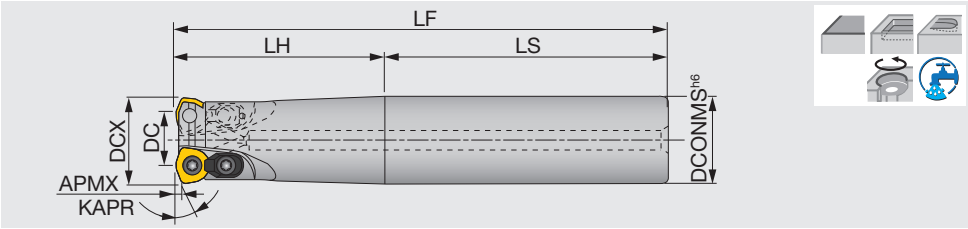
Reference pages: Inserts → H053, Standard cutting conditions → H054 - H055

MILLFEED

EXP05/06/08/09

High feed endmill, shank type

GAMP = +5°, GAMF = -6°



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	12000	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

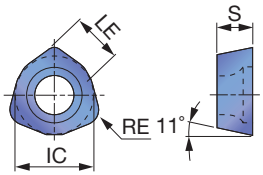
SPARE PARTS

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	-
EXP09...	CSY-20	CSPB-5	M-1000	-	IP-20T

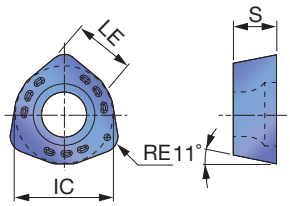
*Recommended clamping torque：CSPB-3.5S/CSPB-4S = 2.58 lbs･ft, CSTB-5 = 3.69 lbs･ft

Reference pages: Inserts → H053, Standard cutting conditions → H054 - H055

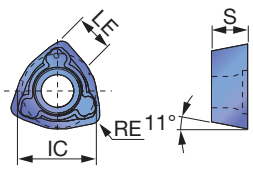
WPMW05/06



WPMT08/09



WPMT05/06/08/09-ML



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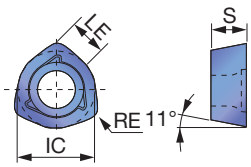
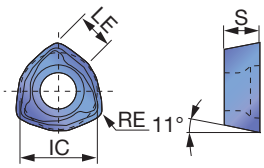


WPMT05/06/08/09-DML



		AH120	AH130	AH140	AH730	T3130	AH3135
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 → H054 - H055

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* = 0.039DCX"	*Vc* = 500 sfm, *fz* = 0.039 ipt *ap* = 0.039", *ae* = 0.039DCX"				
					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* = 0.039 DCX"	*Vc* = 425 sfm, *fz* = 0.039 ipt *ap* = 0.039", *ae* = 0.039 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* = 0.039 DCX"	*Vc* = 330 sfm, *fz* = 0.020 ipt *ap* = 0.039", *ae* = 0.039 DCX"				
					When plunging in small depth: *fz* = 0.004 ipt					
M	Stainless steels S30400, etc.	AH130 (AH3135)	330 ~ 650	0.020 ~ 0.078	*Vc* = 425 sfm, *fz* = 0.031 ipt *ap* = 0.039", *ae* = 0.039 DCX"	*Vc* = 425 sfm, *fz* = 0.039 ipt *ap* = 0.039", *ae* = 0.039 DCX"				
					When plunging in small depth: *fz* = 0.008 ipt					
K	Cast irons 250, etc.	AH120	330 ~ 820	0.032 ~ 0.098	*Vc* = 500 sfm, *fz* = 0.039 ipt *ap* = 0.039", *ae* = 0.039 DCX"	*Vc* = 590 sfm, *fz* = 0.059 ipt *ap* = 0.039", *ae* = 0.039 DCX"				
					When plunging in small depth: *fz* = 0.008 ipt					
S	Titanium alloys Ti-6Al-4V, etc.	AH130	98 ~ 197	0.012 ~ 0.028	*Vc* = 164 sfm, *fz* = 0.020 ipt, *ap* = 0.028", *ae* = 0.020 DCX"					
					When plunging in small depth: *fz* = 0.004 ipt					
	Heat-resistant alloys Inconel 718, etc.	AH120	33 ~ 131	0.004 ~ 0.012	*Vc* = 98 sfm, *fz* = 0.008 ipt, *ap* = 0.028", *ae* = 0.020 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* = 0.039 DCX"					
					When plunging in small depth: *fz* = 0.004 ipt					

08 type

Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

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* = 0.039 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* = 0.039 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* = 0.039 DCX"					
					When plunging in small depth: *fz* = 0.004 ipt						
M	Stainless steels S30400, etc.	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* = 0.039 DCX"					
					When plunging in small depth: *fz* = 0.008 ipt						
K	Cast irons 250, etc.	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* = 0.039 DCX"					
					When plunging in small depth: *fz* = 0.008 ipt						
S	Titanium alloys Ti-6Al-4V, etc.	AH130	98 ~ 197	0.012 ~ 0.028	*Vc* = 164 sfm, *fz* = 0.020 ipt, *ap* = 0.028", *ae* = 0.020 DCX"						
					When plunging in small depth: *fz* = 0.004 ipt						
	Heat-resistant alloys Inconel 718, etc.	AH120	33 ~ 131	0.004 ~ 0.012	*Vc* = 98 sfm, *fz* = 0.008 ipt, *ap* = 0.028", *ae* = 0.020 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* = 0.039 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.

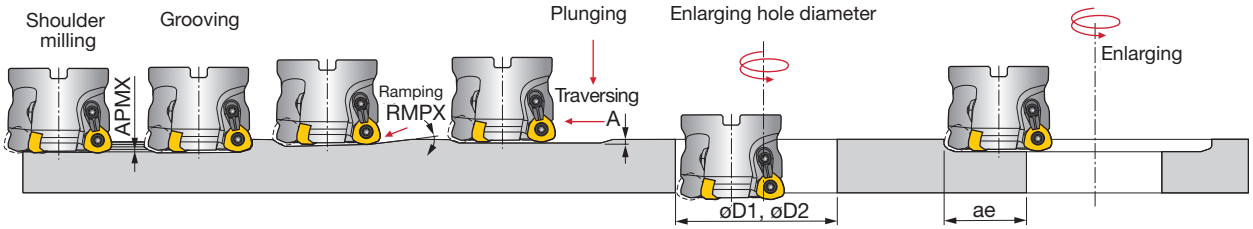
STANDARD CUTTING CONDITIONS

09 type

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* = 0.039 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* = 0.039 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* = 0.039 DCX"					
					When plunging in small depth: *fz* = 0.004 ipt					
M	Stainless steels S30400, etc.	AH130 (AH3135)	330 ~ 650	0.020 ~ 0.078	*Vc* = 500 sfm, *fz* = 0.059 ipt, *ap* = 0.079", *ae* = 0.039 DCX"					
					When plunging in small depth: *fz* = 0.008 ipt					
K	Cast irons 250, etc.	AH120	500 ~ 820	0.032 ~ 0.098	*Vc* = 650 sfm, *fz* = 0.078 ipt, *ap* = 0.079", *ae* = 0.039 DCX"					
					When plunging in small depth: *fz* = 0.008 ipt					
S	Titanium alloys Ti-6Al-4V, etc.	AH130	98 ~ 197	0.012 ~ 0.028	*Vc* = 164 sfm, *fz* = 0.020 ipt, *ap* = 0.059", *ae* = 0.020 DCX"					
					When plunging in small depth: *fz* = 0.039 ipt					
	Heat-resistant alloys Inconel 718, etc.	AH120	33 ~ 131	0.004 ~ 0.012	*Vc* = 98 sfm, *fz* = 0.008 ipt, *ap* = 0.039", *ae* = 0.020 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* = 0.039 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.

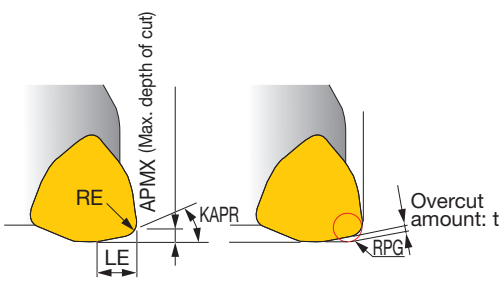
APPLICATION RANGE



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

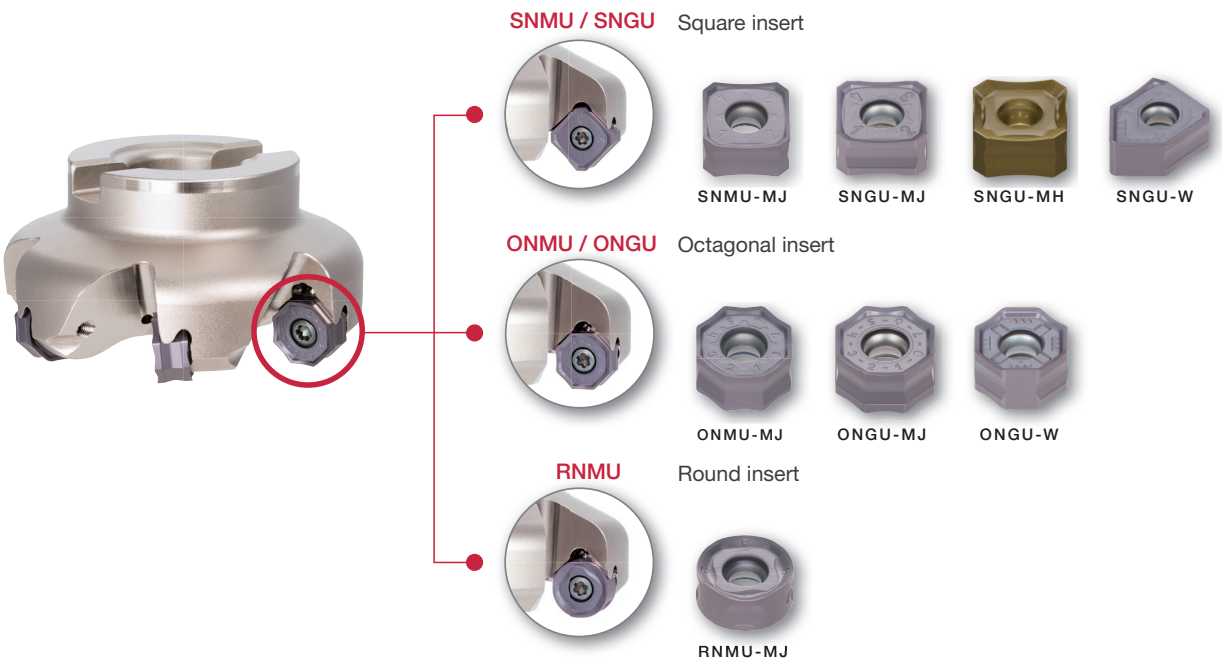
MEMO

TRIPLE DOTMILL

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



Approach angle

10°-20° | 45° | 70° | 85° | 88° | 90° | Others

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: H060 - H062

Super high density PCD cutter for efficient finishing of aluminum

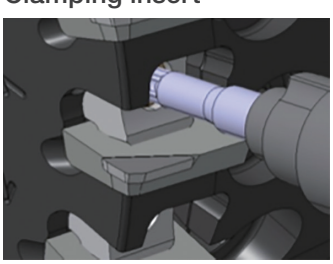
Super high density cutter

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

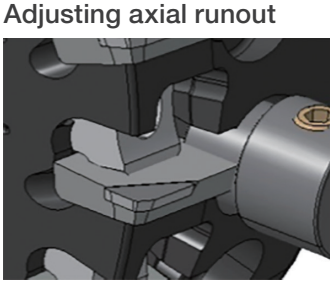
Super high density design
High speed cutting more than Vc = 9843 sfm is possible.

CamAdjust - super simple adjusting mechanism

Clamping insert



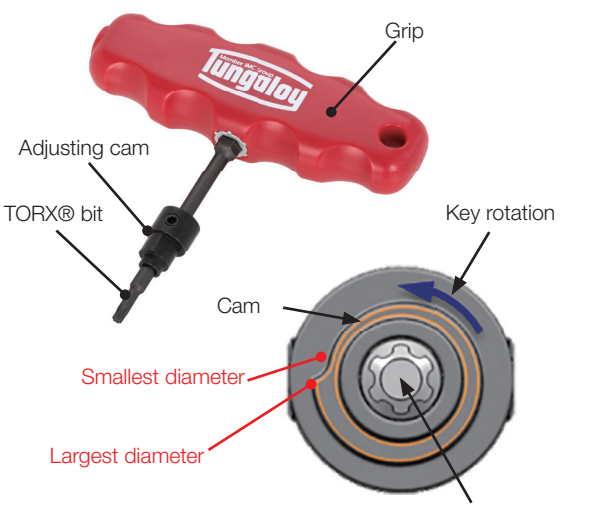
Adjusting axial runout



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.

Reference pages: H079 - H080

Special key wrench with adjusting cam



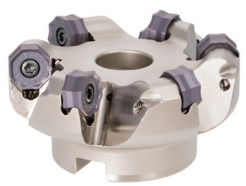
Insert's axial runout is adjusted with the eccentric cam profile.

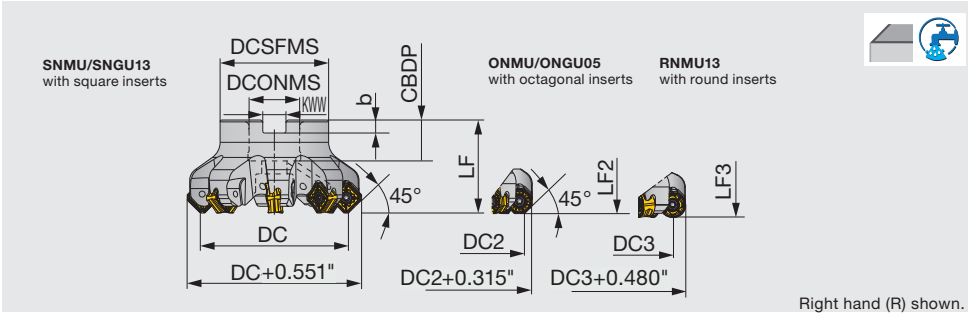
TRIPLE DOTMILL

TASN13

45° face mill, with screw clamp system, for double sided square, octagonal and round inserts

GAMP=+6.0°,GAMF=-6.8°~-6.3°





Right hand (R) shown.

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	1.982	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	2.482	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	2.482	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	2.982	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	2.982	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	3.982	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	3.982	12	3.150	1.969	1.909	1.911	1.500	1.276	0.626	0.394	3.750	Without	B
TASN13U5.00B1.50R10	5.000	5.118	4.982	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	4.982	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	5.982	12	3.937	2.480	2.421	2.422	2.000	1.496	0.748	0.433	8.600	Without	B

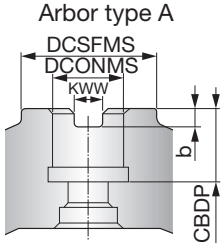
SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt (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-0.750H)	BLDIP15/S7
TASN13... (DC = 5.000")	CSPB-4	H-TB2W	M-1000	(TMBA-0.750H)	BLDIP15/M7
TASN13... (DC = 6.000")	CSPB-4	H-TB2W	M-1000	-	BLDIP15/M7

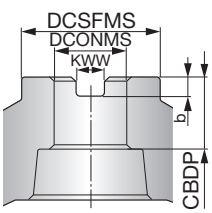
*Recommended clamping torque：CSPB-4 = 2.58 lbs·ft

Arbor type

Arbor type A

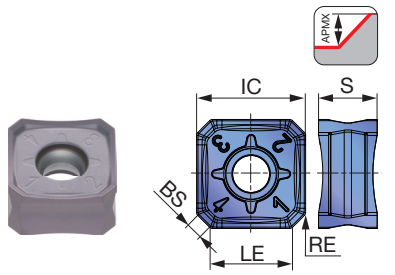


Arbor type B

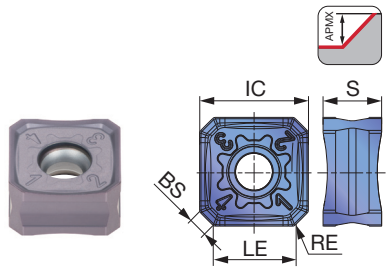


Reference pages: Inserts → H061, Standard cutting conditions → H062

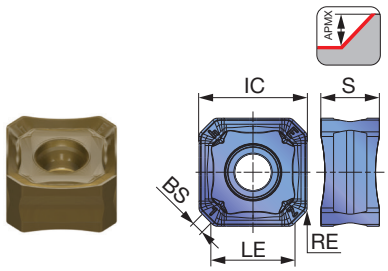
SNMU-MJ



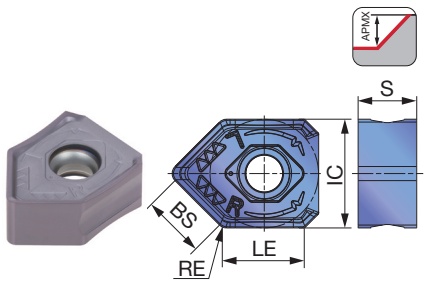
SNGU-MJ



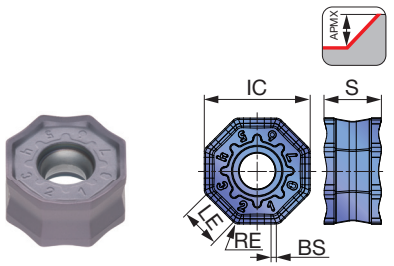
SNGU-MH



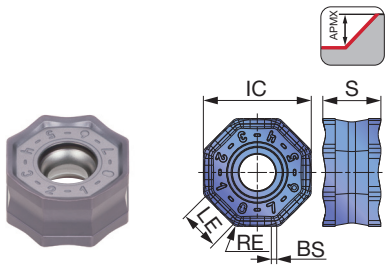
SNGU-W



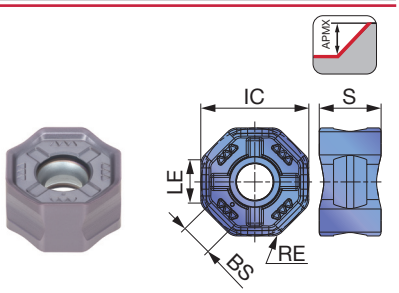
ONMU-MJ



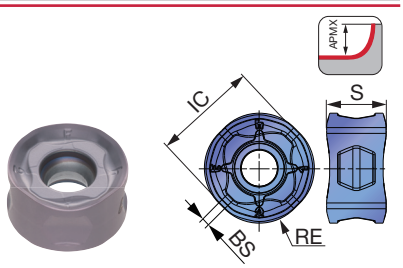
ONGU-MJ



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 AH120	AH3135	T3225	T1215	LE	IC	S	BS
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	0.280	0.039

●: Line up

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	AH3135	MJ	330 - 820	0.004 - 0.020
				Wear resistance	T3225	MJ	660 - 1150	0.004 - 0.016
	High carbon and alloy steel 1055, 4140, etc.		150 - 300HB	First choice	AH3135	MJ	330 - 820	0.004 - 0.016
				Wear resistance	T3225	MJ	590 - 980	0.004 - 0.016
	Prehardened steel NAK80, PX5, etc.		30 - 40HRC	First choice	AH3135	MJ	330 - 660	0.004 - 0.016
				Wear resistance	T3225	MJ	490 - 820	0.004 - 0.016
M	Stainless steel 304SS, 316SS, etc.		- 200HB	First choice	AH3135	MJ	330 - 660	0.004 - 0.014
				Wear resistance	T3225	MJ	330 - 820	0.004 - 0.012
	Stainless cast steel 1.4849, etc.		-	First choice	T3225	MH	200 - 390	0.004 - 0.012
				Low cutting force	AH3135	MJ	200 - 390	0.004 - 0.012
K	Gray cast iron Class 25, Class 30, etc.		150 - 250 HB	First choice	T1215	MJ	330 - 980	0.004 - 0.016
					AH120	MJ	330 - 820	0.004 - 0.020
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250 HB	First choice	T1215	MJ	330 - 980	0.004 - 0.016
					AH120	MJ	260 - 660	0.004 - 0.020
S	Titanium alloys Ti-6Al-4V, etc.		- 40HRC	First choice	AH3135	MJ	100 - 200	0.004 - 0.012
	Heat-resistant alloys Inconel718, etc.		- 40HRC	First choice	AH120	MJ	30 - 130	0.002 - 0.006
H	Hardened steel	H13, etc.	40 - 50 HRC	First choice	AH3135	MJ	260 - 430	0.004 - 0.008
		D2, etc.	50 - 60 HRC	First choice	AH120	MJ	160 - 230	0.001 - 0.004

RNMU

Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

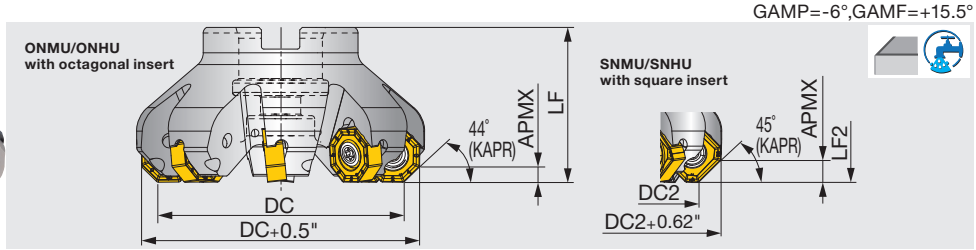
ISO	Workpiece materials		Hardness	Priority	Grades	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1015, 1020, etc.		200 - 300 HB	First choice	AH3135	MJ	330 - 820	*ap = 0.236": 0.004 - 0.012 *ap = 0.078": 0.016 - 0.031 *ap = 0.039": 0.031 - 0.059
				Wear resistance	T3225	MJ	660 - 1150	
	High carbon and alloy steel 1055, 4140, etc.		150 - 300 HB	First choice	AH3135	MJ	330 - 820	
				Wear resistance	T3225	MJ	590 - 980	
	Prehardened steel NAK80, PX5, etc.		30 - 40 HRC	First choice	AH3135	MJ	330 - 660	
				Wear resistance	T3225	MJ	490 - 820	
M	Stainless steel 304SS, 316SS, etc.		- 200 HB	First choice	AH3135	MJ	330 - 660	*ap = 0.236": 0.004 - 0.010 *ap = 0.078": 0.012 - 0.027 *ap = 0.039": 0.024 - 0.051
				Wear resistance	T3225	MJ	330 - 820	
	Stainless cast steel 1.4849, etc.		-	First choice	T3225	MJ	200 - 390	*ap = 0.078": 0.008 - 0.016 *ap = 0.039": 0.012 - 0.031
				Fracture resistance	AH3135	MJ	200 - 390	
K	Gray cast iron Class 25, Class 30, etc.		150 - 250 HB	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	330 - 820	
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250 HB	First choice	AH120	MJ	330 - 980	
					T1215	MJ	260 - 660	
S	Titanium alloys Ti-6Al-4V, etc.		- 40 HRC	First choice	AH3135	MJ	100 - 200	ap = 0.039": 0.006 - 0.031
	Heat-resistant alloys Inconel718, etc.		- 40 HRC	First choice	AH120	MJ	30 - 130	ap = 0.039": 0.002 - 0.012
H	Hardened steel	H13, etc.	40 - 50 HRC	First choice	AH3135	MJ	260 - 430	ap = 0.039": 0.004 - 0.010
		D2, etc.	50 - 60 HRC	First choice	AH120	MJ	160 - 230	ap = 0.020": 0.001 - 0.004

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

TAN07

45° face mill, with screw clamp system, for double sided square and octagonal inserts, or single sided octagonal inserts

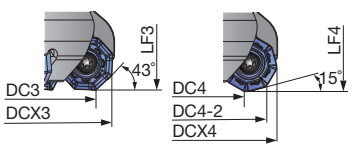
GAMP=-6°,GAMF=+15.5°



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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	C

Dimension when using positive type inserts (OWMT)

OWMT-ML **OWMT-HJ**

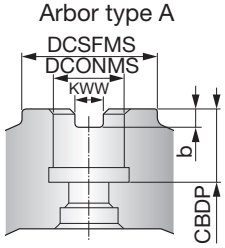


Inch	OWMT-ML			OWMT-HJ			
	DC3	DCX3	LF3	DC4	DC4-2	DCX4	LF4
TAN07R250U0075A...	2.520	2.213	1.789	3.000	2.665	3.028	1.805
TAN07R300U0100A...	3.020	2.713	2.039	3.500	3.165	3.528	2.055
TAN07R400U0150A...	4.020	3.713	2.039	4.500	4.165	4.528	2.055
TAN07R500U0150A...	5.020	4.713	2.539	5.500	5.165	5.528	2.555
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

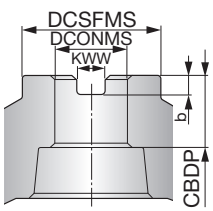
OWMT08 inserts can be only used with screw on type cutters.

Arbor type

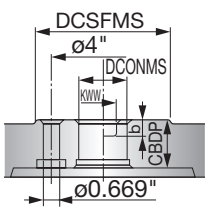
Arbor type A



Arbor type B



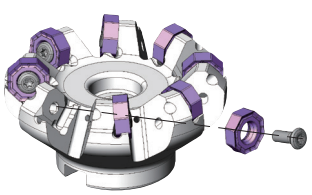
Arbor type C



SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Shell locking bolt (Optional parts)
TAN07R250...	SRM5X0.8IP20X+ACROLYTE	H-TB	BLDIP20/S7	(C0.375X1.125H)
TAN07R300...	SRM5X0.8IP20X+ACROLYTE	H-TB	BLDIP20/S7	(C0.500X1.375H)
TAN07R400, 500...	SRM5X0.8IP20X+ACROLYTE	H-TB	BLDIP20/S7	(TMBA-0.750H)
TAN07R600, 800...	SRM5X0.8IP20X+ACROLYTE	H-TB	BLDIP20/S7	-

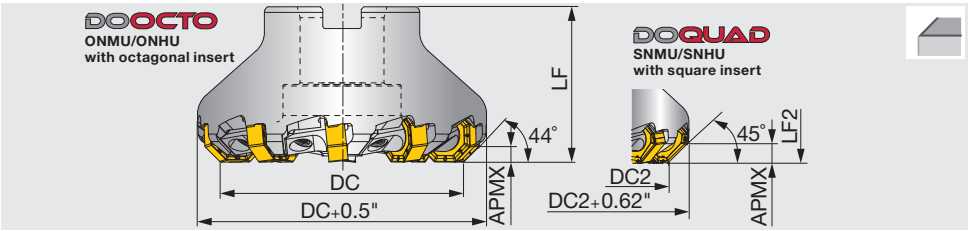
*Recommended clamping torque：SRM5X0.8IP20X+ACROLYTE = 5.53 lbs·ft



Reference pages: Inserts → H065, Standard cutting conditions → H066

DOOCTO
TAN07-W

High density 45˚ face mill, with wedge clamp system, for double sided square and octagonal inserts

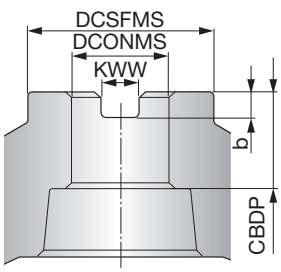


Inch	DC	DC2	CICT	DCSFMS	LF	LF2	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Insert	Arbor type
TAN07R250U0075A08W	2.500	2.394	8	1.750	1.750	1.805	0.750	0.750	0.313	0.188	1.60	Without	SN*U/ON*U/OWMT...	B
TAN07R300U0100A10W	3.000	2.894	10	2.000	2.000	2.055	1.000	0.750	0.375	0.219	2.00	Without	SN*U/ON*U/OWMT...	B
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/OWMT...	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/OWMT...	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/OWMT...	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/OWMT...	C

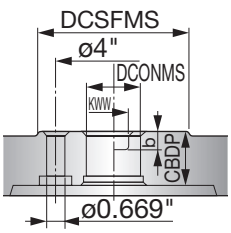
Note: OWMT insert cannot be used with a wedge clamp type cutter.

Arbor type

Arbor type B



Arbor type C

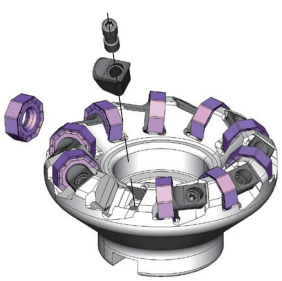


Approach angle

10°-20° | 45° | 70° | 85° | 88° | 90° | Others

SPARE PARTS

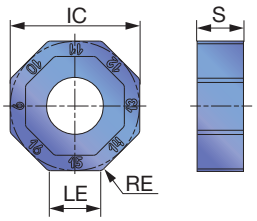
Designation	Grip	Torx bit	Wedge	Clamping screw	Shell locking bolt (Optional parts)
TAN07R250U**W	H-TBS	BLDIP15/S7	CL ARM-10-TUNG1	DS-6P	(C0.375X1.125H)
TAN07R300U**W	H-TBS	BLDIP15/S7	CL ARM-10-TUNG1	DS-6P	(C0.500X1.375H)
TAN07R400U**W, TAN07R500U**W	H-TBS	BLDIP15/S7	CL ARM-10-TUNG1	DS-6P	(TMBA-0.750H)
TAN07R600U**W, TAN07R800U**W	H-TBS	BLDIP15/S7	CL ARM-10-TUNG1	DS-6P	-



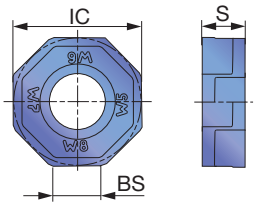
Reference pages: Inserts → H065, Standard cutting conditions → H066

INSERT

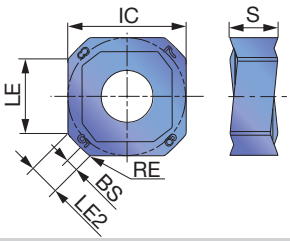
ONMU/ONHU0705-MJ / -ML



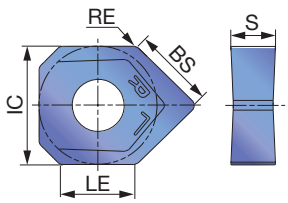
ONHU0705-W



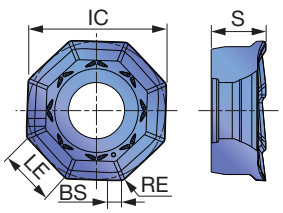
SNMU/SNHU1706 -MJ / -ML



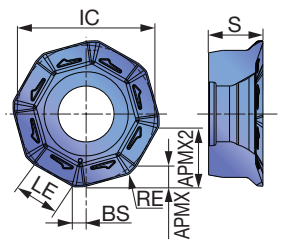
SNHU1706-W



OWMT0807-ML



OWMT0807-HJ



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

★ : First choice
☆ : Second choice

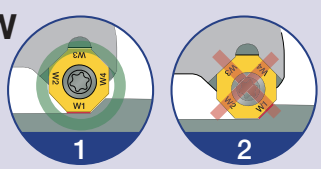
Designation	RE	APMX	Coated								LE	S	LE2	IC	BS	APMX2
			AH120	AH130	AH140	AH725	AH3135	T1115	T1215	T3225						
ONMU0705ANPN-MJ	0.031	0.187			●	●	●	●	●	●	0.283	0.244	-	0.681	-	-
ONHU0705ANPN-MJ	0.031	0.187			●	●					0.283	0.244	-	0.681	-	-
ONMU0705ANPN-ML	0.031	0.187	●				●				0.283	0.244	-	0.681	-	-
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	0.295
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

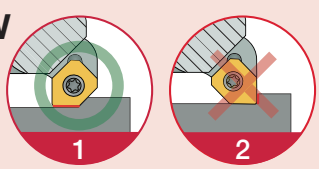
Attention for wiper inserts

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

STANDARD CUTTING CONDITIONS

Negative type

ISO	Workpiece material	Hardness	Priority	Recommendation Grade	Recommendation Chipbreaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
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

Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

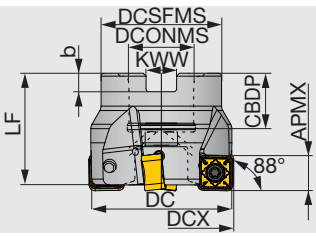
ISO	Workpiece material	Hardness	Priority	Grade	Cutting speed *Vc* (sfm)	Feed per tooth : *fz* (ipt) ML	Feed per tooth : *fz* (ipt) HJ*
P	Low carbon steel 1015, etc.	- 200 HB	First choice	AH3135	330 - 980	0.004 - 0.016	0.02 - 0.059
		- 200 HB	Fracture resistance	AH130	330 - 980	0.004 - 0.016	-
	High carbon 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".

THSN12

88° face mill, with screw clamp system, for double sided square inserts

GAMP = +3°, GAMF = -11°



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

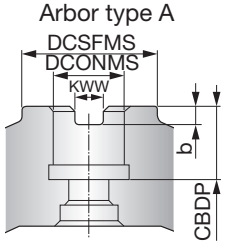
SPARE PARTS

Designation	Clamping screw	Torx bit	Grip	Shell locking bolt (Optional parts)
THSN12U2.00..., THSN12U2.50...	CSPB-4	BLDIP15/S7	H-TB2W	(C0.375X1.125H)
THSN12U3.00...	CSPB-4	BLDIP15/S7	H-TB2W	(C0.500X1.375H)
THSN12U4.00...	CSPB-4	BLDIP15/S7	H-TB2W	(TMBA-0.750H)

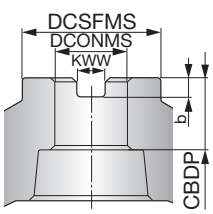
*Recommended clamping torque：CSPB-4 = 2.58 lbs･ft

Arbor type

Arbor type A

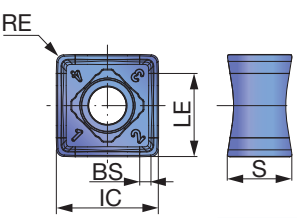


Arbor type B

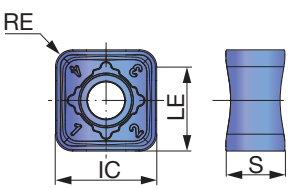


INSERT

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 AH120	AH3135	T1215	T3225	LE	S	IC	BS
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

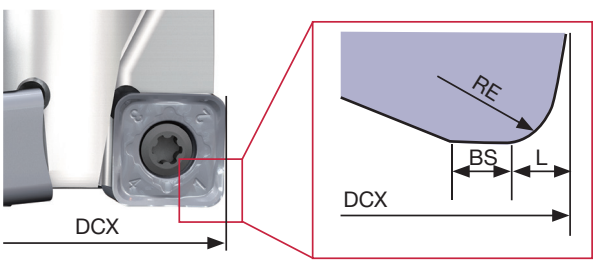
Reference pages: Standard cutting conditions → H068

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness HB	Selection criteria	Recommended grade	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steels 1015, etc.	- 200 HB	First choice	AH3135	MM	328 - 820	0.002 - 0.012
		- 200 HB	Wear resistance	T3225	MM	656 - 1148	0.002 - 0.010
	High carbon steels, alloyed steels 1055, 4140(H), etc.	- 300 HB	First choice	AH3135	MM	328 - 820	0.002 - 0.012
		- 300 HB	Wear resistance	T3225	MM	591 - 984	0.002 - 0.010
	Prehardened steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3135	MM	328 - 656	0.002 - 0.010
		30 - 40 HRC	Wear resistance	T3225	MM	492 - 820	0.002 - 0.008
M	Austenitic stainless steel 304,316, etc.	- 200 HB	First choice	AH3135	MM	328 - 656	0.002 - 0.010
		- 200 HB	Wear resistance	T3225	MM	328 - 820	0.002 - 0.008
	Stainless cast steel Hu etc.	-	First choice	T3225	MM	197 - 394	0.002 - 0.008
		-	Fracture resistance	AH3135	MM	197 - 394	0.002 - 0.008
K	Grey cast iron No.250, etc.	150 - 250 HB	First choice	T1215	MM	328 - 1148	0.002 - 0.012
		150 - 250 HB	Fracture resistance	AH120	MM	328 - 820	0.002 - 0.012
	Ductile cast iron 65-45-12, etc.	150 - 250 HB	First choice	T1215	MM	328 - 1148	0.002 - 0.010
		150 - 250 HB	Fracture resistance	AH120	MM	262 - 656	0.002 - 0.012
S	Titanium alloy Ti-6Al-4V, etc.	- 40 HRC	First choice	AH3135	MM	98 - 197	0.002 - 0.008
	Heat resistant alloy Inconel718, etc.	- 40 HRC	First choice	AH120	MM	33 - 131	0.002 - 0.006
H	Hardened steel H13, etc.	40 - 50 HRC	First choice	AH3135	MM	262 - 427	0.002 - 0.006
	Hardened steel D2, etc.	50 - 60 HRC	First choice	AH120	MM	164 - 230	0.001 - 0.003

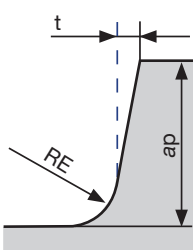
Tool offset

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 left over cut (t) when the cutter is considered as a shoulder milling cutter.

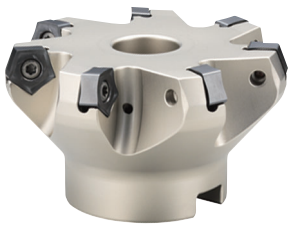


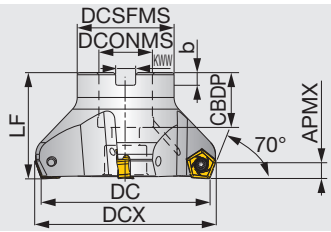
Inch	*ap* (in)									
	0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354	0.374
SNMU120608HNEN-MM	0.0004	0.0016	0.0020	0.0020	0.0028	0.0035	0.0055	0.0079	0.0106	0.0106
SNMU120612EN-MM	-	0	0	0.0004	0.0008	0.0020	0.0035	0.0059	0.0087	0.0098
SNMU120620EN-MM	-	0	0	0	0.0008	0.0020	0.0035	0.0059	0.0087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

TEN09R

70° face mill, with screw clamp system, for double sided pentagonal inserts

GAMP=-6°,GAMF=-10°~-2°





Right hand (R) shown.

Inch	APMX	DC	DCX	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Insert	Arbor type
TEN09R200U0075A03	0.252	2.000	2.240	3	1.693	1.575	0.750	0.750	0.315	0.197	0.300	With	PN*U0905...	A
TEN09R200U0075A04	0.252	2.000	2.240	4	1.693	1.575	0.750	0.750	0.315	0.197	0.300	With	PN*U0905...	A
TEN09R200U0075A06	0.252	2.000	2.240	6	1.693	1.575	0.750	0.750	0.315	0.197	0.300	With	PN*U0905...	A
TEN09R250U0075A04	0.252	2.500	2.740	4	1.693	1.575	0.750	0.750	0.315	0.197	0.500	With	PN*U0905...	A
TEN09R250U0075A06	0.252	2.500	2.740	6	1.693	1.575	0.750	0.750	0.315	0.197	0.500	With	PN*U0905...	A
TEN09R250U0075A08	0.252	2.500	2.740	8	1.693	1.575	0.750	0.750	0.315	0.197	0.500	With	PN*U0905...	A
TEN09R300U0100A04	0.252	3.000	3.240	4	1.969	1.969	1.000	1.024	0.374	0.236	0.900	With	PN*U0905...	A
TEN09R300U0100A07	0.252	3.000	3.240	7	1.969	1.969	1.000	1.024	0.374	0.236	0.900	With	PN*U0905...	A
TEN09R300U0100A10	0.252	3.000	3.240	10	1.969	1.969	1.000	1.024	0.374	0.236	0.900	With	PN*U0905...	A
TEN09R400U0150A05	0.252	4.000	4.240	5	3.150	1.969	1.500	1.378	0.626	0.394	1.300	With	PN*U0905...	B
TEN09R400U0150A08	0.252	4.000	4.240	8	3.150	1.969	1.500	1.378	0.626	0.394	1.300	With	PN*U0905...	B
TEN09R400U0150A12	0.252	4.000	4.240	12	3.150	1.969	1.500	1.378	0.626	0.394	1.400	With	PN*U0905...	B
TEN09R500U0150A06	0.252	5.000	5.240	6	3.150	2.480	1.500	1.457	0.626	0.394	2.600	With	PN*U0905...	B
TEN09R500U0150A10	0.252	5.000	5.240	10	3.150	2.480	1.500	1.457	0.626	0.394	2.700	With	PN*U0905...	B
TEN09R500U0150A16	0.252	5.000	5.240	16	3.150	2.480	1.500	1.457	0.626	0.394	2.900	With	PN*U0905...	B
TEN09R600U0200A07	0.252	6.000	6.240	7	3.937	2.480	2.000	1.496	0.748	0.433	4.400	Without	PN*U0905...	B
TEN09R600U0200A12	0.252	6.000	6.240	12	3.937	2.480	2.000	1.496	0.748	0.433	4.600	Without	PN*U0905...	B
TEN09R600U0200A20	0.252	6.000	6.240	20	3.937	2.480	2.000	1.496	0.748	0.433	4.900	Without	PN*U0905...	B

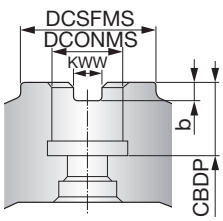
SPARE PARTS

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...	CSTR-4L100	H-TBS	M-1000	-	BT15M

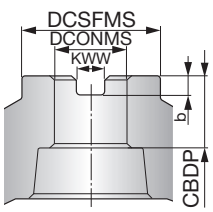
*Recommended clamping torque：CSTR-4L100 = 2.58 lbs･ft

Arbor type

Arbor type A



Arbor type B



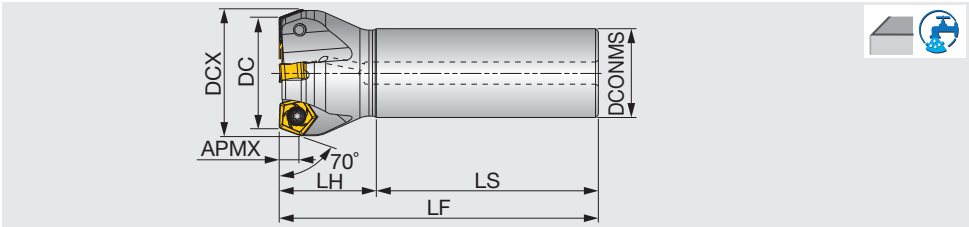
Reference pages: Inserts → H070, Standard cutting conditions → H071

DOPENT

EEN09

70° face endmill, shank type, with screw clamp system, for double sided pentagonal inserts

GAMP=-6°,GAMF=-2°~-10°

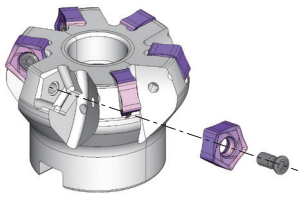


Inch	APMX	DC	DCX	CICT	DCONMS	LS	LH	LF	WT (lb)	Air hole	Insert
EEN09R125U0125W03	0.252	1.250	3	1.250	1.250	2.280	1.500	3.780	0.700	With	PN*U0905...
EEN09R150U0125W04	0.252	1.500	4	1.500	1.250	2.280	2.000	4.280	0.700	With	PN*U0905...

SPARE PARTS

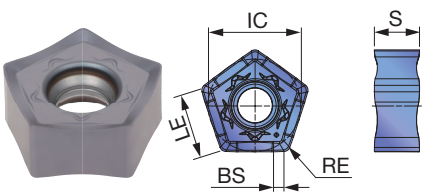
Designation	Clamping screw	Lubricant	Wrench
EEN09	CSTR-4L100	M-1000	T-15D

*Recommended clamping torque：CSTR-4L100 = 2.58 lbs･ft

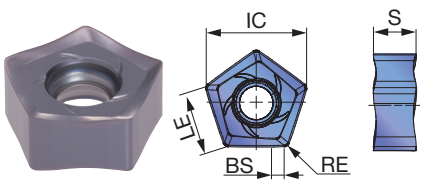


INSERT

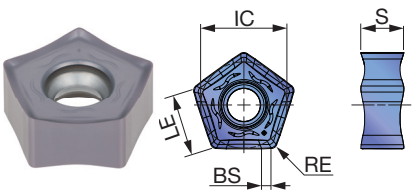
PN*U0905GNEN-MJ (Neutral)



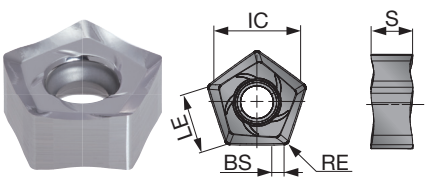
PNCU0905GNER-MJ (Right hand)



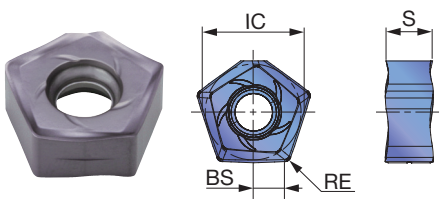
PNCU0905-ML (Neutral)



PNCU0905-AJ (Right hand)



PNCU0905-W (Right hand)



Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

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	LE	S	IC	BS
			AH120	AH140	AH725	AH3135	T1115	T1215	T3130	T3225	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

Reference pages: Standard cutting conditions → H071

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness HB	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	AH3135	MJ	330 - 820	0.004 - 0.024
		200 - 300 HB	Low cutting force	AH3135	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	AH3135	MJ	330 - 820	0.004 - 0.014
		150 - 300 HB	Low cutting force	AH3135	ML	330 - 820	0.004 - 0.012
		150 - 300 HB	Wear resistance	T3225	MJ	590 - 990	0.004 - 0.012
		150 - 300 HB	Surface quality	NS740	MJ	330 - 820	0.004 - 0.012
	Prehardened steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3135	MJ	330 - 660	0.004 - 0.012
		30 - 40 HRC	Low cutting force	AH3135	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	460 - 820	0.004 - 0.024
		150 - 250 HB	Fracture resistance	AH120	MJ	490 - 280	0.004 - 0.024
	Ductile cast iron 60-40-18, etc.	150 - 250 HB	First choice	T1215	MJ	330 - 660	0.004 - 0.024
		150 - 250 HB	Fracture resistance	AH120	MJ	390 - 720	0.004 - 0.024
N	Aluminum alloys Si < 13%	-	First choice	TH10	AJ	1640 - 4921	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 - 0.016
		- 40 HRC	Fracture resistance	AH3135	MJ	98 - 197	0.004 - 0.016
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	First choice	AH725	MJ	66 - 164	0.002 - 0.004

· Remove excessive chip 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 the operation with depth of cut which varies (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)

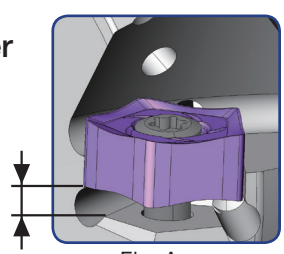


Fig. A

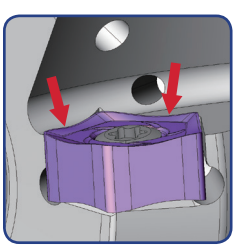


Fig. B

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.

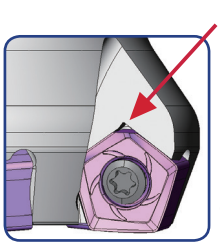


Fig. C

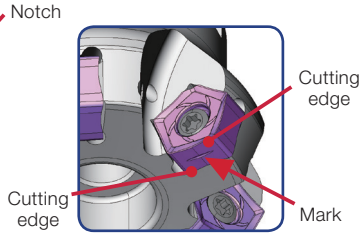


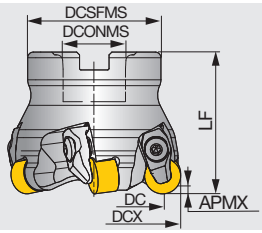
Fig. D

CERAMIC SMILL SPEED

TFMRN

Face milling cutter for high temperature alloy applications, Tool dia. ø2.000" - ø3.000"

GAMP = -7°, GAMF = +15°



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

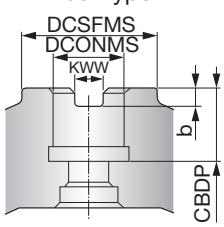
Metric	APMX	DC	DCX	CICT	DCONMS	LF	DCSFMS	WT(kg)	Insert	Arbor type
TFMRN563-22R-12FL	2	50.35	63	5	22	50	47	0.6	RNGN120700...	A
TFMRN580-27R-12FL	2	67.37	80	5	27	50	58	0.9	RNGN120700...	A

SPARE PARTS

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

Arbor type

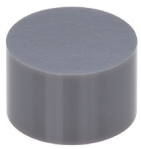
Arbor type A

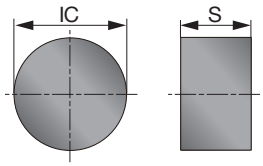


Reference pages: Inserts, Standard cutting conditions → H073

INSERT

RNGN-E/T1





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

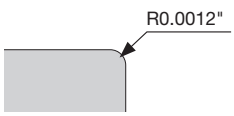
★ : First choice

Designation	APMX (in)	Edge prep.*	Ceramic TS200	Ceramic TS300	IC (in)	S (in)
RNGN120700-E	0.080	E	●		0.500	0.3125
RNGN120700-T1	0.080	T1	●		0.500	0.3125
RNGN120700-E	0.080	E		●	0.500	0.3125
RNGN120700-T1	0.080	T1		●	0.500	0.3125

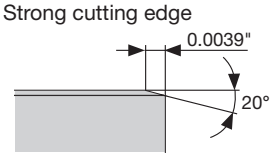
* Types of cutting edge preparations

●: Line up

E: Low cutting force



T1: Strong cutting edge



STANDARD CUTTING CONDITIONS

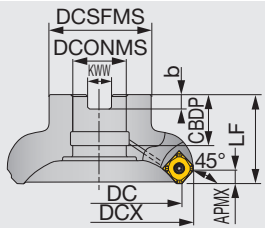
ISO	Workpiece materials	Grades	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)	Depth of cut *ap* (in)
S	Ni-based super alloys	TS200	1804 - 4265	0.002 - 0.008	0.004 - 0.079
		TS300	886 - 1804	0.002 - 0.008	0.004 - 0.079
	Co-based super alloys	TS200	1804 - 4921	0.002 - 0.008	0.004 - 0.079
		TS300	886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

TUNGMILL

TAW13

30° - 45° face mill, with screw clamp system, for SWMT/SWGT13 inserts

GAMP=+17°~+20°,GAMF=-16°~-11°



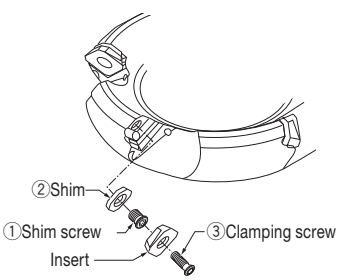
Right hand (R) shown.

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

*Recommended clamping torque：CSPB-3.5 = 2.58 lbs·ft

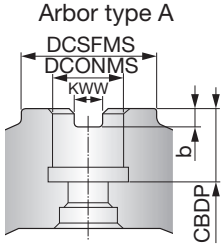
SPARE PARTS

Designation	③Clamping screw	Lubricant	①Shim screw	Shell locking bolt	②Shim	Wrench	Wrench 1
TAW13R200...	CSPB-3.5	M-1000	DTS5-3.5SS	0.375X1.125H	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

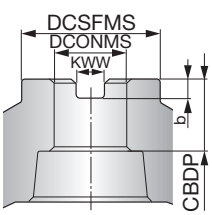


Arbor type

Arbor type A



Arbor type B

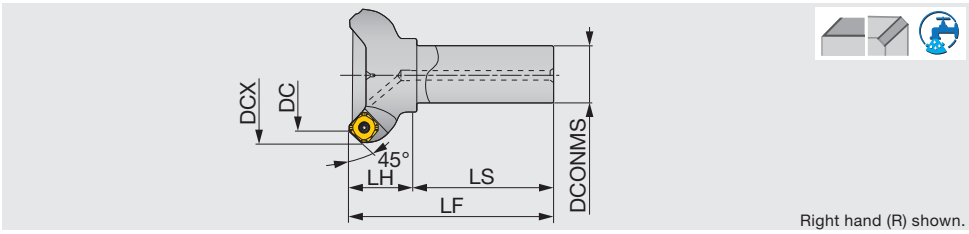


Reference pages: Inserts → H076, Standard cutting conditions → H077 - H078

EAW13

30° - 45° face endmill, shank type, with screw clamp system, for SWMT/SWGT13 inserts

GAMP=+17°~+20°,GAMF=-16°~-11°

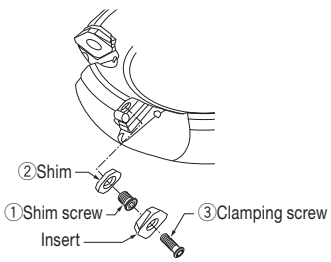


Metric	DC	DCX	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EAW13R025M25.0-02	25	39	2	25	80	35	115	0.4	With	SW*T13...
EAW13R032M32.0-02	32	46	2	32	80	35	115	0.7	With	SW*T13...
EAW13R040M32.0-03	40	54	3	32	80	35	115	0.8	With	SW*T13...
EAW13R050M32.0-03	50	63	3	32	80	40	120	1	With	SW*T13...
EAW13R050M32.0-04	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	③Clamping screw	Lubricant	①Shim screw	②Shim	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

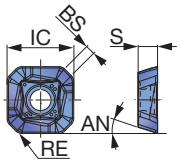
*Recommended clamping torque：CSPB-3.5 = 3.5 N·m



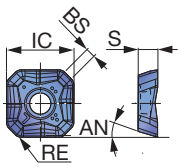
Reference pages: Inserts → H076, Standard cutting conditions → H077 - H078

INSERT

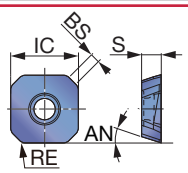
SWMT13T3-MJ



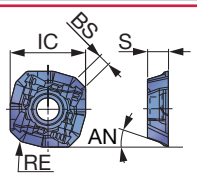
SWMT13T3-ML



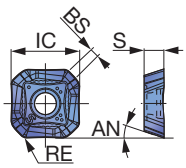
SWMW13T3 (Flat)



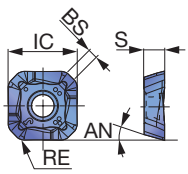
SWMT13T3-HJ



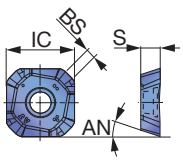
SWMT13T3-MS



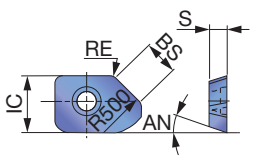
SWGT13T3-MJ



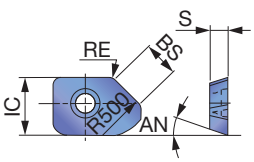
SWGT13T3-AJ



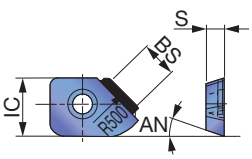
WWCW13T3AFER-WS



WWCW13T3AFFR-WS



WWCW13T3AFFR-WD



Approach angle: 10°-20° / 45° / 70° / 85° / 88° / 90° / Others

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

★ : First choice
☆ : Second choice

Designation	RE	APMX	AH120	AH130	AH140	AH3135	GH110	T1115	T1215	T3130	T3225	DS1100	NS740	KS05F	DX140	IC	S	AN	BS
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 : 1 piece per package

STANDARD CUTTING CONDITIONS

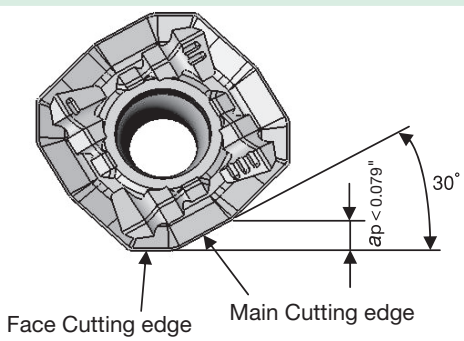
ISO	Workpiece materials	Priority	Grade	Cutting speed *vc* (sfm)	Roughing (Depth of cut: > 0.039") Feed per tooth: *fz* (ipt) MJ	ML	HJ	MS	Flat	AJ
P	Mild and low carbon steels 1010, 1015, etc. < 180 HB	First choice	AH3135	330 - 890	0.002 - 0.012	0.002 - 0.010	0.008 - 0.024	0.004 - 0.010	0.002 - 0.012	-
		Wear resistance	T3225	490 - 300	0.002 - 0.012	-	0.008 - 0.024	-	0.002 - 0.012	-
		Surface quality	NS740	330 - 980	0.002 - 0.009	-	-	-	0.002 - 0.009	-
	Carbon and alloy steels 1045, 4140, etc. < 300 HB	First choice	AH3135	330 - 760	0.002 - 0.010	0.002 - 0.008	0.008 - 0.020	-	0.002 - 0.010	-
		Wear resistance	T3225	490 - 910	0.002 - 0.010	-	0.008 - 0.020	-	0.002 - 0.010	-
		Surface quality	NS740	330 - 760	0.002 - 0.008	-	-	-	0.002 - 0.008	-
	Die steels H13, D2, etc. < 30 HRC	First choice	AH3135	330 - 590	0.002 - 0.008	0.002 - 0.008	0.008 - 0.016	-	0.002 - 0.008	-
		Wear resistance	T3225	330 - 590	0.002 - 0.008	-	0.008 - 0.016	-	0.002 - 0.008	-
M	Stainless steels S30400, S31600, etc. < 250 HB	First choice	AH3135	260 - 660	0.004 - 0.010	-	0.008 - 0.020	0.004 - 0.008	-	-
		Wear resistance	T3225	490 - 820	0.004 - 0.010	0.004 - 0.008	0.008 - 0.020	-	0.004 - 0.010	-
K	Gray cast irons No.250B, No.300B, etc.	First choice	T1215	590 - 980	0.002 - 0.010	-	0.008 - 0.024	-	0.002 - 0.010	-
		Fracture resistance	AH120	490 - 820	0.002 - 0.010	0.002 - 0.008	0.008 - 0.024	-	0.002 - 0.010	-
	Ductile cast irons 60-40-18, 80-55-06, etc.	First choice	T1215	390 - 660	0.002 - 0.010	-	0.008 - 0.024	-	0.002 - 0.010	-
		Fracture resistance	AH120	330 - 590	0.002 - 0.010	0.002 - 0.008	0.008 - 0.024	-	0.002 - 0.010	-
S	Titanium alloys Ti-6Al-4V, etc.	First choice	AH130	98 - 197	-	-	-	0.004 - 0.008	-	-
	Heat-resistant alloys Inconel 718, etc.	First choice	AH120	33 - 131	0.002 - 0.006	-	-	-	-	-
N	Aluminum alloys Si < 13 %	-	DS1100 KS05F	300 - 3281	-	-	-	-	-	0.002 - 0.008
	Aluminum alloys Si ≥ 13%	-	DS1100 KS05F	260 - 980	-	-	-	-	-	0.002 - 0.008
	Copper alloys	-	DS1100 KS05F	660 - 1640	-	-	-	-	-	0.002 - 0.008

Notes for use of HJ-type inserts

HJ-type inserts can be used for high feed machining.

When using the insert, care should be taken with the following:

- The maximum depth of cut is *ap* = 0.079". Select feeds within the above value.
- Do not use the HJ-type inserts with other types (such as MJ- and MS-types) in the same body.
- The outer shape of the HJ-type insert is different from those of other types (such as MJ- and MS-types), but the insert can be held in the same insert pocket.



Notes on use of wiper insert

- When requiring good surface finishes, use of a wiper insert (WWCW13T3AF_ R-W_) is recommended. In general, installing one wiper insert delivers superior surface finishes.
- When using the wiper insert, install the insert as shown in Fig. A. If the insert is installed as shown in Fig. B, breakage of the insert is inevitable and normal surface finish can not be obtained.
- The wiper insert must not be used together with HJ-type inserts
- The wiper insert has one wiping corner.
- The peripheral cutting edge of the wiper insert is retracted from the edge of the normal inserts. Therefore, the feed per tooth (ipt) of the normal insert following the wiper insert is double that of other inserts.
- When using the wiper insert, depth of cut (*ap*) less than 0.039" is recommended.

Fig. A

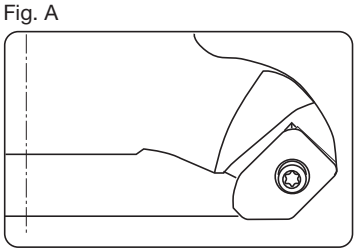
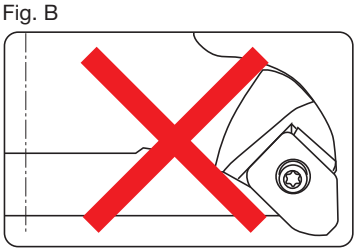


Fig. B



ISO	Workpiece materials	Priority	Grade	Cutting speed *vc* (sfm)	Light cutting to finishing (Depth of cut: ≤ 0.039") Feed per tooth: *fz* (ipt)					
					MJ	ML	HJ	MS	Flat	AJ
P	Mild and low carbon steels 1010, 1015, etc. < 180 HB	First choice	AH3135	330 - 890	0.002 - 0.010	0.002 - 0.008	0.008 - 0.024	0.004 - 0.008	0.002 - 0.010	-
		Wear resistance	T3225	490 - 980	0.002 - 0.010	-	0.008 - 0.024	-	0.002 - 0.010	-
		Surface quality	NS740	330 - 980	0.002 - 0.008	-	-	-	0.002 - 0.008	-
	Carbon and alloy steels 1045, 4140, etc. < 300 HB	First choice	AH3135	330 - 760	0.002 - 0.008	0.002 - 0.006	0.008 - 0.020	-	0.002 - 0.008	-
		Wear resistance	T3225	490 - 920	0.002 - 0.008	-	0.008 - 0.020	-	0.002 - 0.008	-
		Surface quality	NS740	330 - 760	0.002 - 0.007	-	-	-	0.002 - 0.007	-
	Die steels H13, D2, etc. < 30 HRC	First choice	AH3135	330 - 1590	0.002 - 0.007	0.002 - 0.005	0.008 - 0.016	-	0.002 - 0.007	-
		Wear resistance	T3225	330 - 590	0.002 - 0.007	-	0.008 - 0.016	-	0.002 - 0.007	-
M	Stainless steels S30400, S31600, etc. < 250 HB	First choice	AH3135	260 - 660	0.004 - 0.008	-	0.008 - 0.020	0.004 - 0.007	-	-
		Wear resistance	T3225	590 - 820	0.004 - 0.008	0.004 - 0.007	0.008 - 0.020	-	0.004 - 0.008	-
K	Gray cast irons No.250B, No.300B, etc.	First choice	T1215	590 - 980	0.004 - 0.008	-	0.008 - 0.024	-	0.004 - 0.008	-
		Fracture resistance	AH120	490 - 820	0.004 - 0.008	0.002 - 0.007	0.008 - 0.024	-	0.004 - 0.008	-
	Ductile cast irons 60-40-18, 80-55-06, etc.	First choice	T1215	390- 660	0.004 - 0.008	-	0.008 - 0.024	-	0.004 - 0.008	-
		Fracture resistance	AH120	330 - 590	0.004 - 0.008	0.002 - 0.007	0.008 - 0.024	-	0.004 - 0.008	-
S	Titanium alloys Ti-6Al-4V, etc.	-	AH130	98 - 197	-	-	-	0.004 - 0.008	-	-
	Heat-resistant alloys Inconel 718, etc.	-	AH120	33 - 131	0.002 - 0.006	-	-	-	-	-
N	Aluminum alloys Si < 13 %	-	DS1100 KS05F	990 - 3281	-	-	-	-	-	0.002 - 0.008
	Aluminum alloys Si ≥ 13%	-	DS1100 KS05F	260 - 980	-	-	-	-	-	0.002 - 0.008
	Copper alloys	-	DS1100 KS05F	660 - 1640	-	-	-	-	-	0.002 - 0.008

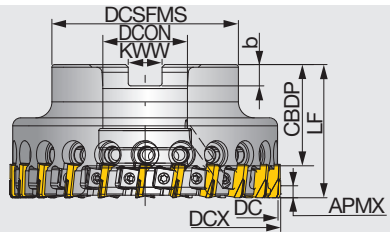
Notes:
- When cutting at a large depth of cut or a large cutting width, the cutting speed (*vc*) and feed (*fz*) should be set to the lower side of the values shown in the above table.
- Dry cutting (or air-blowing) is generally recommended. However, when chips tend to excessively adhere to the cutting edges when machining stainless steel, use a water soluble cutting fluid. In this case, use the AH130 grade at speeds lower than *vc* = 330 sfm.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
- TAW13 type TAC mills cannot be used for axial-feed cutting such as ramping, plunging and drilling.

TUNGSMILL SPEED

TPYD06

Face mill for aluminum machining, for PCD inserts

GAMP = +9°, GAMF = +4°



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

SPARE PARTS

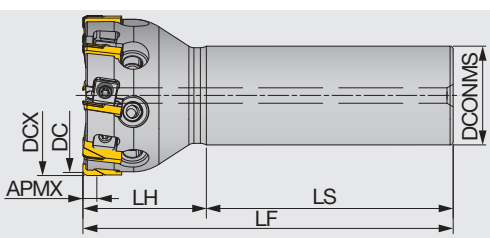
Designation	Insert locking wedge	Wedge fixing screw	Adjusting cam	Torx bit	Cam tightening screw	Wrench	Grip	Shell locking bolt	Shell locking bolt (Optional parts)
TPYD06U2.50B0.75R10	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	-	(C0.375X1.125H)
TPYD06U3.00B1.00R16	WF875N	DS-5T	AJC08	BLDT10/S7-A	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)
TPYD06M063B22.0R10	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	CM10X30H	-
TPYD06*080B2*.*R16	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	CM12X30H	-
TPYD06*100B32.0R22	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	CM16X40H	-
TPYD06*100B31.7R22	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	TMBA-M16H	-
TPYD06*125B**.*R26	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	TMBA-M20H	-
TPYD06*160B**.*R34	WF875N	DS-5T	AJC08	BLDT10/S7-A	SSHM4-4	P-2	H-TB2W	TMBA-M20H	-

TUNGSMILL SPEED

EPYD06

Face endmill for aluminum machining, shank type, for PCD inserts

GAMP = +9°, GAMF = +4°



Inch	APMX	DC	DCX	CICT	DCONMS	LF	LH	LS	WT (lb)	Air hole	RPMX	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	Insert
EPYD06M050C32.0R08	4.5	50	52	8	32	120	40	80	0.57	With	22,000	YDEN0603...

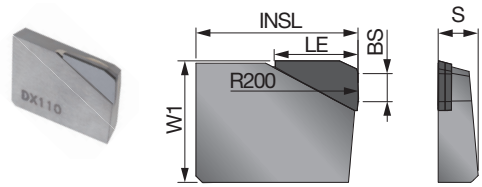
SPARE PARTS

Designation	Clamping screw	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

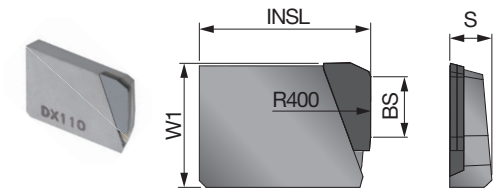
Reference pages: Inserts, Standard cutting conditions → H080

INSERT

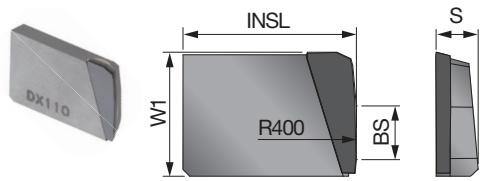
YDEN0603PD(F/S)R-D



YDEN0603PDFR-WD



YDEN0603PDFR-BD



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

★ : First choice
☆ : Second choice

Designation	APMX	Edge prep.	DX110	W1	INSL	S	BS	LE
YDEN0603PDFR-D	0.177	Without	●	0.375	0.500	0.122	0.087	0.256
YDEN0603PDSR-D	0.177	With	●	0.375	0.500	0.122	0.087	0.256
YDEN0603PDFR-WD	-	Without	●	0.364	0.504	0.122	0.177	-
YDEN0603PDFR-BD	-	With	●	0.364	0.508	0.122	0.157	-

Tungaloy provides refurbishing service for these inserts upon request.

● : Line up

1 piece per package

Approach angle
10°-20°
45°
70°
85°
88°
90°
Others

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Designation	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
N	Cast aluminum alloy / Die-cast Si < 13%	DX110	YDEN0603PDFR-D	1640 - 13123	0.002 - 0.008
	Cast aluminum alloy / Die-cast Si > 13%	DX110	YDEN0603PDFR-D	656 - 2625	0.002 - 0.008
	Aluminum alloy	DX110	YDEN0603PDFR-D	1640 - 13123	0.002 - 0.008
	Copper alloy	DX110	YDEN0603PDFR-D	656 - 1640	0.002 - 0.008

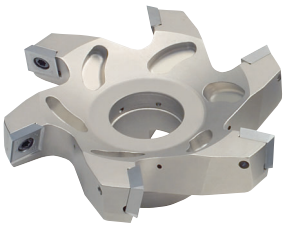
- The values in the above list are of standard recommendations and may require adjustments in consideration with cutting depths and/or workpiece/machine rigidity.
- Use wiper inserts (-WD) for better surface requirements and deburring inserts (-BD) to remove burrs.
- Always use wet cutting (emulsion coolant) for machining aluminum or copper alloys.

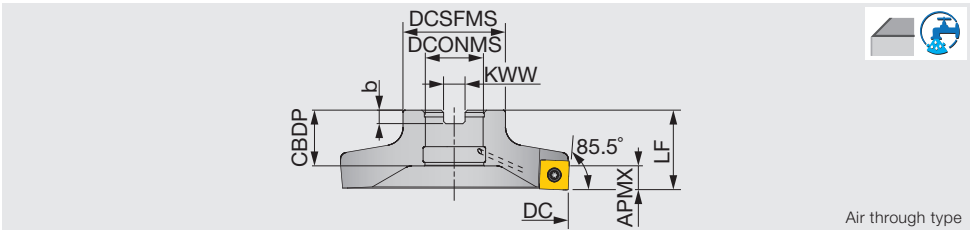
TFE

TFE12R

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

GAMP = +13°, GAMF = +7°





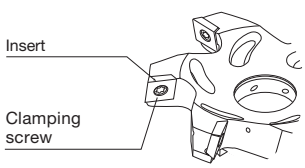
Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT (lb)	Air hole	Insert
TFE12300RU	0.315	3.000	4	1.970	1.380	1.000	0.964	0.375	0.236	0.880	With	SEG*12X4...
TFE12400RU	0.315	4.000	6	1.970	1.380	1.000	0.964	0.375	0.236	1.340	With	SEG*12X4...

Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	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	Wrench
TFE12300RU, TFE12400RU	CSPB-4S	M-1000	TMBA-0.500H	IP-15D
TFE12063R	CSPB-4S	M-1000	CM10X30H	IP-15D
TFE12080R, TFE12100R, TFE12125R	CSPB-4S	M-1000	TMBA-M12H TMBA-0.500H	IP-15D

*Recommended clamping torque：CSPB-4S = 2.58 lbs·ft, 3.5 N·m

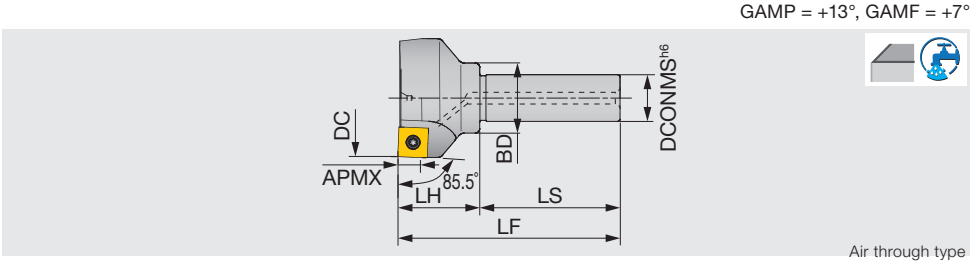


EFE

EFE12RU

86° face endmill for aluminum machining, shank type, with screw clamp system, for positive square inserts

GAMP = +13°, GAMF = +7°

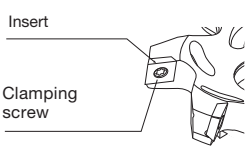


Inch	APMX	DC	CICT	DCONMS	BD	LS	LH	LF	WT (lb)	Air hole	Insert
EFE12200RU	0.315	2.000	3	0.750	1.180	2.362	1.375	3.406	0.77	With	SEG*12X4...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EFE12000RU	CSPB-4S	M-1000	IP-15D

*Recommended clamping torque：CSPB-4S = 2.58 lbs·ft



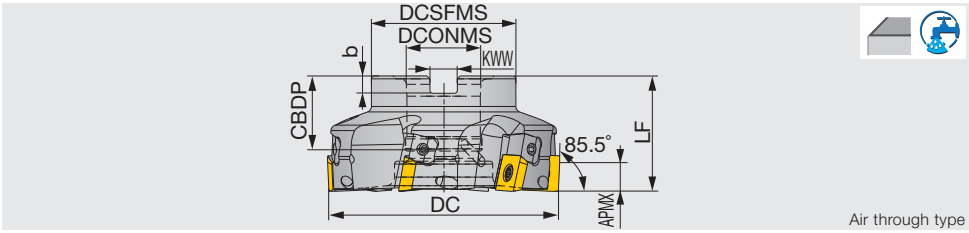
Reference pages: Inserts → H083, Standard cutting conditions → H084

TFE

TFE12R...-...A

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

GAMP = +13°, GAMF = +7°

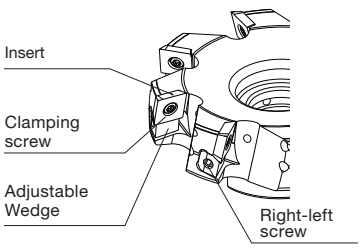


Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TFE12R080M25.4-06A	8	80	6	50	40	25.4	26	9.5	6	0.70	With	SEG*12X4...
TFE12R080M27.0E06A	8	80	6	55	40	27	22	12.4	7	0.69	With	SEG*12X4...
TFE12R100M25.4-08A	8	100	8	50	40	25.4	26	9.5	6	1.15	With	SEG*12X4...
TFE12R100M27.0E08A	8	100	8	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	Wrench 1
TFE12R**A	CSTB-4	FW-701R	M-1000	TMBA-M12H TMBA-0.500H	MCS520-2.5	P-2.5T	T-15LB

*Recommended clamping torque：CSTB-4 = 3.5 N·m



Insert setting procedure – adjustable-type TFE face milling cutter

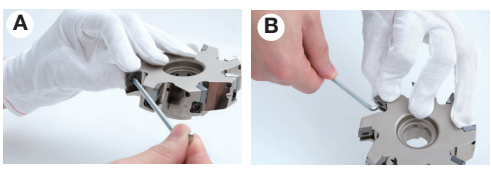
① Cleaning insert pockets

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.

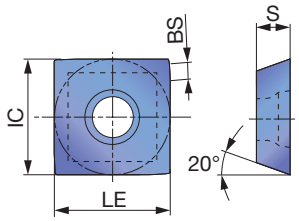
Note:
Do not re-tighten the insert screw after insert adjustment is completed. Additional tightening may weaken wedge clamping torque.

Cautions:

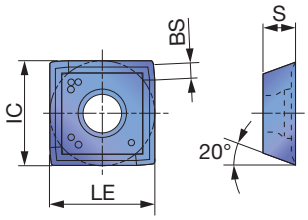
① Always clean all the insert pockets thoroughly of dust and chips. Any objects present in the pocket may shift the insert's position during machining and cause poor surface finishing quality.
② Always loosen the wedge screw before installing the insert as described in Step ②. If the wedge is left tightened 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.

Reference pages: Inserts → H083, Standard cutting conditions → H084

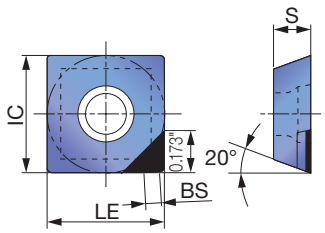
SEGW12X4ZEPR / ZEFR



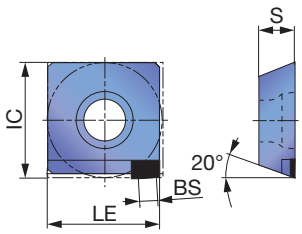
SEGT12X4-AJ



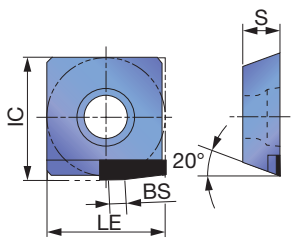
SEGW12X4ZEFR-D



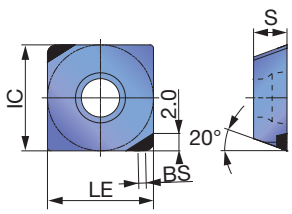
SEGW12X4ZEFR-WD



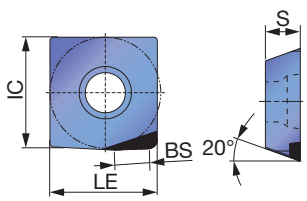
SEGW12X4ZEFR-BD



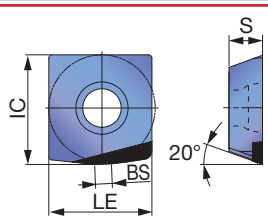
2QP-SECW12X412ZETR



1QP-SECW12X4ZETR-W



1QP-SECW12X4ZETR-B



		Coated			Cermet	Uncoated	PCD	CBN
P	Steel	★			★			
M	Stainless		★					
K	Cast iron	★						★
N	Non-ferrous			★		★	★	
S	Superalloys							
H	Hard materials							

★ : First choice

Designation	APMX	AH120	AH140	DS1100	NS740	KS05F	DX140	BX480	IC	LE	S	BS
SEGW12X4ZEFR	0.315					●			0.500	0.500	0.157	0.071
SEGW12X4ZEPR	0.315	●	●		●				0.500	0.500	0.157	0.055
SEGT12X4ZEFR-AJ	0.315			●		●			0.500	0.500	0.157	0.071
SEGW12X4ZEFR-D	0.138						●		0.500	0.500	0.157	0.071
SEGW12X4ZEFR-WD	-						●		0.504	0.488	0.157	0.079
SEGW12X4ZEFR-BD	-						●		0.516	0.488	0.157	0.071
2QP-SECW12X412ZETR	0.059							●	0.500	0.500	0.157	0.035
1QP-SECW12X4ZETR-W	-							●	0.508	0.484	0.157	0.157
1QP-SECW12X4ZETR-B	-							●	0.516	0.484	0.157	0.079

● : Line up

DX140: 2 pieces per package

BX480: 1 piece per package

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	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
		NS740	SEGW12X4ZEPR	330 - 590	0.001 - 0.006
M	Stainless steels < 250HB	AH140	SEGW12X4ZEPR	260 - 590	0.001 - 0.006
K	Grey and ductile cast irons	AH120	SEGW12X4ZEPR	330 - 650	0.001 - 0.006
	Grey cast iron	BX480	2QP-SECW12X412ZETR	2625 - 4921	0.002 - 0.012
	Ductile cast irons	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 (JIS 1000, 3000, 5000 and 6000 types) 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 (JIS 2000, 4000, and 7000 types) 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

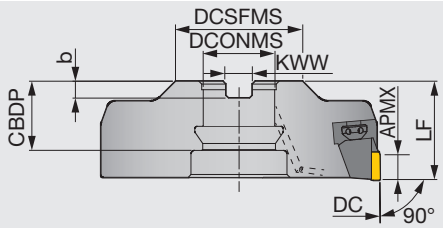
Notes:
- In milling aluminum and copper alloys:
  (1) For improved surface finish, use together with wiper insert SEGW12X4ZEFR-WD
  (2) For reducing burr occurrence, use together with deburring inserts SEGW12X4ZEFR-BD
- When milling aluminum and copper alloys, use of a water soluble cutting fluid is 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.

DPD

DPD09

Light weight mill for aluminum machining, for PCD inserts

GAMP = +8.5°, GAMF = +3° ~ +5°

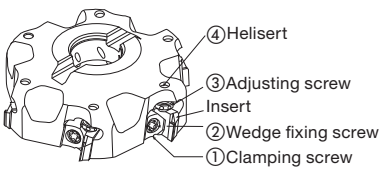


Metric	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
DPD09080R	7	80	4	50	41	25.4	23	9.5	6	0.8	With	YDEN0905...
DPD09080RB	7	80	6	50	41	25.4	28.5	9.5	6	0.82	With	YDEN0905...
DPD09100R	7	100	6	50	35	25.4	24.5	9.5	6	1.13	With	YDEN0905...
DPD09100RB	7	100	8	50	35	25.4	24.5	9.5	6	1.17	With	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	① Clamping screw	② Wedge fixing screw	③ Adjusting screw	④ Helisert	Shell locking bolt 1	Shell locking bolt 2	Wrench1	Wrench 2
DPD09080R*	FW-304R-T	FDS-8ST-18	AJM5	LM5-0.8X1DNS	-	CM12X30H	T-27T	T-7F
DPD09100R*	FW-304R-T	FDS-8ST-18	AJM5	LM5-0.8X1DNS	TMBA-0.500H	-	T-27T	T-7F
DPD09125R*	FW-304R-T	FDS-8ST-18	AJM5	LM5-0.8X1DNS	TMBA-0.500H	-	T-27T	T-7F
DPD09160R*	FW-304R-T	FDS-8ST-18	AJM5	LM5-0.8X1DNS	TMBA-M16H	-	T-27T	T-7F

*Recommended clamping torque：FDS-8ST-18 = 10 N·m

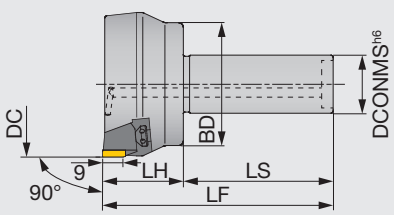


EDPD

EDPD09

Light weight endmill for aluminum machining, shank type, for PCD inserts

GAMP = +8.5°, GAMF = +3°

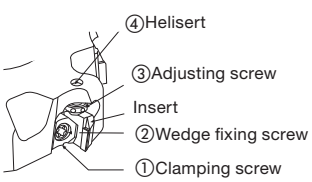


Metric	APMX	DC	CICT	DCONMS	BD	LS	LH	LF	WT(kg)	Air hole	Insert
EDPD09063R	7	63	3	25	37	60	40	100	0.75	With	YDEN0905...

SPARE PARTS

Designation	① Clamping screw	② Wedge fixing screw	③ Adjusting screw	④ Helisert	Wrench1	Wrench 2
EDPD09063R	FW-304R-T	FDS-8SST	AJM5	LM5-0.8X1DNS	T-27T	T-7F

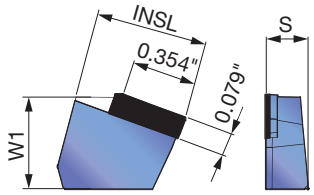
*Recommended clamping torque：FDS-8SST = 10 N·m



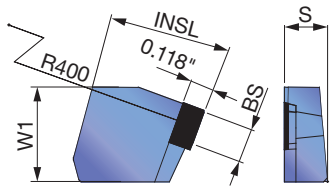
Reference pages: Inserts, Standard cutting conditions → H086

INSERT

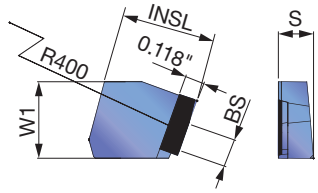
YDEN0905PDFR-D



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 DX140	W1	INSL	S	BS
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.

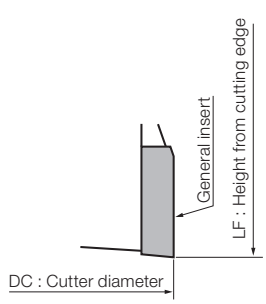
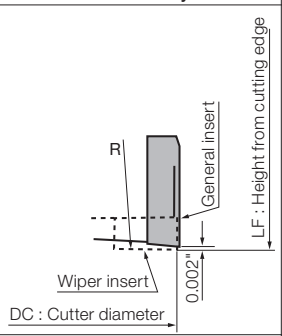
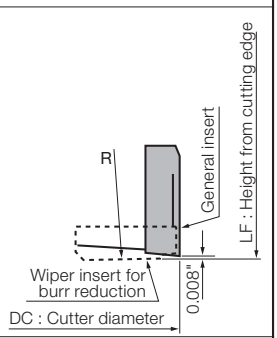
●: Line up
1 piece per package

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:
(1) When requiring improved surface finish, use the wiper insert together with regular inserts YDEN0905PDFR-WD.
(2) When requiring reduced burr occurrence, use the deburring inserts together with regular inserts YDEN0905PDFR-BD.
(3) When using the cutter at speeds over 1500m/min, use an arbor or tool-holder balanced to within G16.
(4) Wet cutting, using a water soluble cutting fluid, is recommended.
(5) 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.

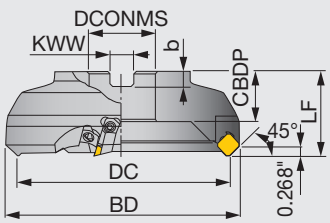
How to put each insert together

			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			△	○	◎

TMD4400RI-U

45° face mill, with wedge clamp system, for positive square inserts

GAMP = +15˚, GAMF = -3˚

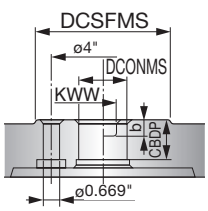


Right hand (R) shown.

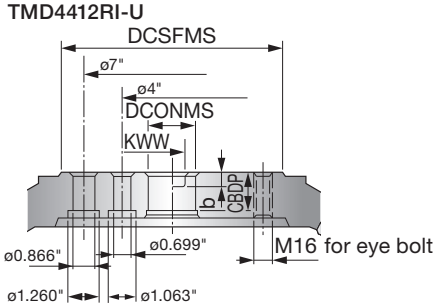
Inch	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT (lb)	Insert
TMD4403RI-U	0.157	3.150	4	3.780	1.970	1.000	1.020	0.375	0.236	3.100	SD*N42.../SD*R1203...
TMD4404RI-U	0.157	3.940	5	4.530	2.480	1.500	1.260	0.500	0.315	5.500	SD*N42.../SD*R1203...
TMD4405RI-U	0.157	4.920	6	5.470	2.480	1.500	1.500	0.625	0.394	7.900	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...

Arbor type

TMD4408/10RI-U



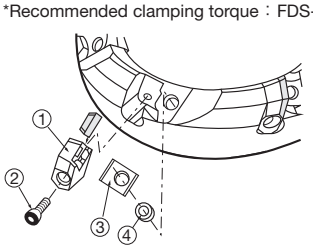
TMD4412RI-U



SPARE PARTS

Designation	① Locator	④ Wedge fixing screw	② Locator fixing screw	③ Wedge	Wrench	Shell locking bolt (Optional parts)
TMD4403RI-U	LD440R	FDS-8S	CM4X0.7X14	WP440R	TP-4	(TMBA-0.500H)
TMD4404...,TMD4405...	LD440R	FDS-8S	CM4X0.7X14	WP440R	TP-4	(TMBA-0.750H)
TMD4406..., TMD4408... TMD4410..., TMD4412...	LD440R	FDS-8S	CM4X0.7X14	WP440R	TP-4	-

*Recommended clamping torque：FDS-8S = 5.9 lbs･ft

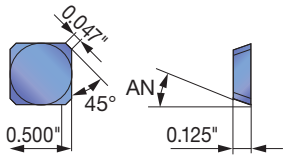


Reference pages: Inserts → H088, Standard cutting conditions → H089

INSERT

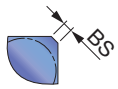
SDCN/SDEN/SDKN 42Z

Regular edge
SD*N42Z*N

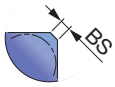


Details of edge

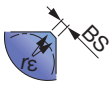
SDKN42ZTN16



SD*N42ZTN20

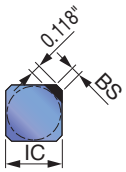


SDKN42ZTNCR
SDEN42ZTNCR



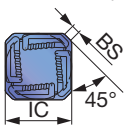
SDCN42ZFN-DIA

SDCN42ZFN-DIA

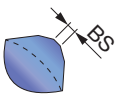


SDKR42Z-MJ

SDKR42ZSR-MJ
with 3-dimensional chipbreaker

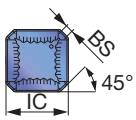


Details of edge



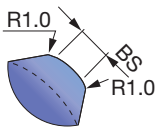
SDMR/SDKR 1203-MJ

SD*R1203AETN-MJ
with 3-dimensional chipbreaker

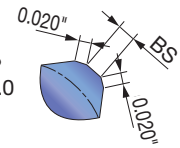


Details of edge

SDMR1203AETN-MJ

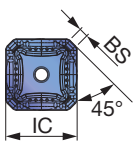


SDKR1203AETN-MJ

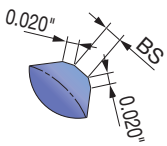


SDKR42Z-MS

SDKR42ZPN-MS

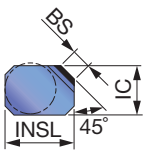


Details of edge



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
		AH3135	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

Approach angle
10°-20°
45°
70°
85°
88°
90°
Others

● : Line up

DX140: 1 piece per package

STANDARD CUTTING CONDITIONS

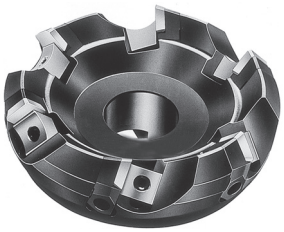
ISO	Workpiece material	Grade	Roughing (Depth of cut: APMX 0.059" ~ 0.157")		Finishing (Depth of cut: APMX 0.012 ~ 0.028")	
			Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Mild steels Unhardened steels < 180 HB	NS740	492 ~ 820	0.004 ~ 0.008	492 ~ 820	0.004 ~ 0.010
		T3225	492 ~ 1148	0.004 ~ 0.010	492 ~ 1148	0.004 ~ 0.011
		AH3135	492 ~ 984	0.004 ~ 0.007	591 ~ 984	0.004 ~ 0.012
	Carbon steels Alloy steels < 300 HB	NS740	328 ~ 591	0.004 ~ 0.007	492 ~ 656	0.004 ~ 0.009
		T3225	328 ~ 1050	0.004 ~ 0.009	492 ~ 1050	0.004 ~ 0.010
		AH3135	328 ~ 656	0.004 ~ 0.010	492 ~ 656	0.004 ~ 0.012
	Die steels < 30 HRC	AH3135	328 ~ 492	0.004 ~ 0.006	328 ~ 492	0.004 ~ 0.008
		T3225	328 ~ 820	0.004 ~ 0.006	328 ~ 820	0.004 ~ 0.008
M	Stainless steels < 250 HB	AH3135	262 ~ 591	0.006 ~ 0.010	328 ~ 656	0.006 ~ 0.011
		T3225	492 ~ 230	0.006 ~ 0.009	656 ~ 820	0.006 ~ 0.010
K	Cast irons Ductile cast irons	T1215	328 ~ 820	0.004 ~ 0.008	328 ~ 820	0.004 ~ 0.010
		AH120	328 ~ 656	0.004 ~ 0.010	328 ~ 656	0.004 ~ 0.012
S	Titanium alloys Ti-6Al-4V, etc.	AH130	98 ~ 197	0.004 ~ 0.008	98 ~ 197	0.004 ~ 0.008
	Superalloys Inconel718, etc.	AH120	33 ~ 131	0.002 ~ 0.006	33 ~ 131	0.002 ~ 0.004
N	Aluminum alloys Si < 13%	TH10	656 ~ 3280	0.002 ~ 0.008	1148 ~ 3280	0.004 ~ 0.012
		DX140	656 ~ 3280	0.002 ~ 0.007	1148 ~ 3280	0.004 ~ 0.008
	Copper alloy	TH10	656 ~ 1640	0.004 ~ 0.008	656 ~ 1640	0.004 ~ 0.010

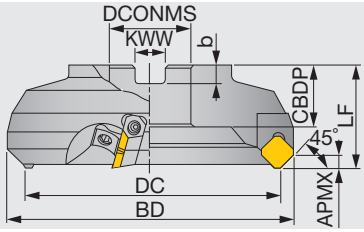
The above are the values for dry cutting of all materials except aluminum alloy.
Maximum depth of cut for DX140 SDCN42ZFN-DIA is 0.079".

TMD5400RI

45° face mill, with wedge clamp system, for positive square inserts

GAMP = +15°, GAMF = -3°



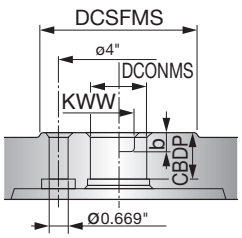


Right hand (R) shown.

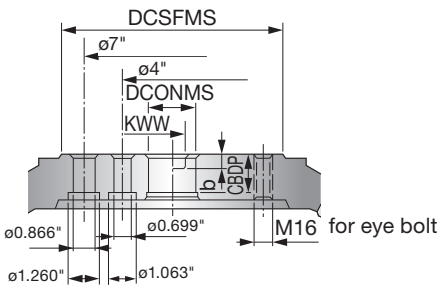
Inch	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT(lb)	Insert
TMD5404RI-U	0.236	3.940	4	4.650	2.480	1.500	1.260	0.625	0.394	5.510	SD*N53Z...
TMD5405RI-U	0.236	4.920	5	5.590	2.480	1.500	1.500	0.625	0.394	8.160	SD*N53Z...
TMD5406RI-U	0.236	6.300	5	6.930	2.480	2.000	1.500	0.750	0.433	12.790	SD*N53Z...
TMD5408RI-U	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...

Arbor type

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



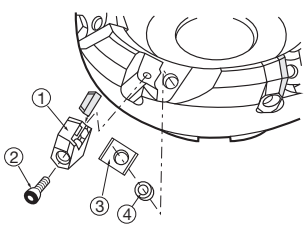
TMD5412RI-U



SPARE PARTS

Designation	① Locator	④ Wedge fixing screw	② Locator fixing screw	③ Wedge	Wrench	Shell locking bolt (Optional parts)
TMD5404..., TMD5405...	LD540R	FDS-8S	CM4X0.7X20	WF500R	TP-4	(TMBA-0.750H)
TMD5406..., TMD5408..., TMD5410..., TMD5412...	LD540R	FDS-8S	CM4X0.7X20	WF500R	TP-4	-

*Recommended clamping torque：FDS-8S = 5.9 lbs·ft

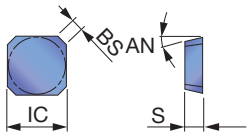


Reference pages: Inserts, Standard cutting conditions → H091

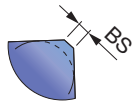
INSERT

SDCN/SDEN 53Z

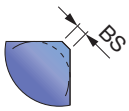
SD*N53Z*N



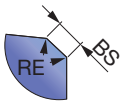
SDEN53ZTN20
Details of edge



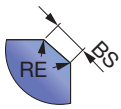
SDKN53ZTN16
Details of edge



SDEN53ZTNCR
Details of edge

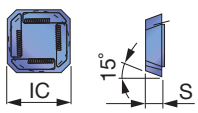


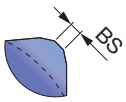
SDKN53ZTNCR
Details of edge



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		IC	S	AN	BS
		AH120	AH130	AH140	GH330	T3130	NS740	N308	UX30	TH10				
SDCN53ZTN	0.236						●	●			0.625	0.187	15°	0.047
SDEN53ZFN	0.236									●	0.625	0.187	15°	0.047
SDEN53ZTN	0.236				●		●		●		0.625	0.187	15°	0.047
SDEN53ZTNCR	0.236						●				0.625	0.187	15°	0.055
SDEN53ZTN20	0.236					●					0.625	0.187	15°	0.079
SDKN53ZFN	0.236									●	0.625	0.187	15°	0.047
SDKN53ZTN	0.236	●	●	●	●		●	●	●		0.625	0.187	15°	0.047
SDKN53ZTNCR	0.236						●				0.625	0.187	15°	0.063
SDKN53ZTN16	0.236					●					0.625	0.187	15°	0.063
SDKR53ZSR-MJ	0.236				●	●					0.625	0.187	15°	0.079

● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Roughing (Depth of cut: APMX 0.059" ~ 0.236") Cutting speed *Vc* (sfm)	Roughing Feed per tooth *fz* (ipt)	Finishing (Depth of cut: APMX 0.012" ~ 0.028") Cutting speed *Vc* (sfm)	Finishing Feed per tooth *fz* (ipt)
P	Mild steels Unhardened steels < 180 HB	NS740	492 ~ 820	0.004 ~ 0.010	492 ~ 820	0.004 ~ 0.012
		AH120	492 ~ 820	0.004 ~ 0.014	492 ~ 820	0.004 ~ 0.014
		T3130	492 ~ 984	0.004 ~ 0.014	591 ~ 984	0.004 ~ 0.014
		AH130	328 ~ 591	0.004 ~ 0.014	427 ~ 656	0.004 ~ 0.014
	Carbon steels Alloy steels < 300 HB	T3130	492 ~ 919	0.004 ~ 0.014	591 ~ 919	0.004 ~ 0.014
		NS740	328 ~ 591	0.004 ~ 0.010	492 ~ 656	0.004 ~ 0.012
		AH120	328 ~ 656	0.004 ~ 0.012	492 ~ 656	0.004 ~ 0.014
	Die steels < 30 HRC	T3130 · AH120	328 ~ 492	0.004 ~ 0.008	328 ~ 492	0.004 ~ 0.008
M	Stainless steels < 250 HB	AH130 · AH140	262 ~ 591	0.006 ~ 0.012	328 ~ 656	0.006 ~ 0.013
		GH330	492 ~ 755	0.006 ~ 0.012	656 ~ 820	0.006 ~ 0.012
K	Cast irons Ductile cast irons	AH120	328 ~ 656	0.004 ~ 0.012	328 ~ 656	0.004 ~ 0.012
N	Aluminum alloys Si < 13%	TH10	656 ~ 3281	0.002 ~ 0.012	1148 ~ 3281	0.004 ~ 0.012
	Copper alloy	TH10	656 ~ 1640	0.004 ~ 0.008	656 ~ 1640	0.004 ~ 0.010

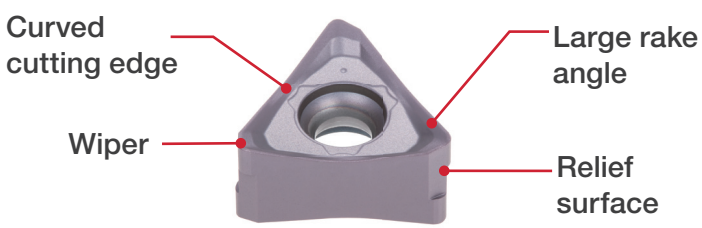
The above are the values for dry cutting of all materials except aluminum alloy.

DOFTRI FORCE

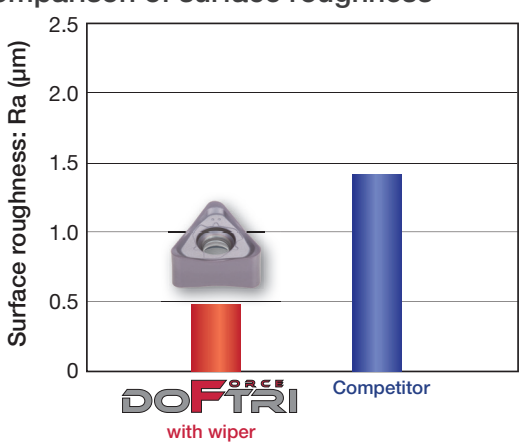
High precision shoulder mill series with economical double-sided triangular inserts

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

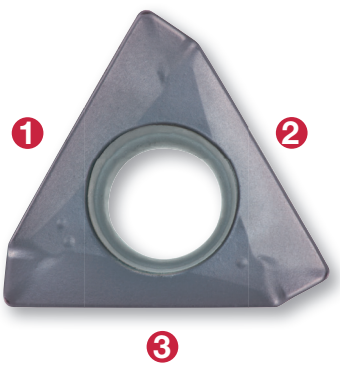


Reference pages: H094 - H096

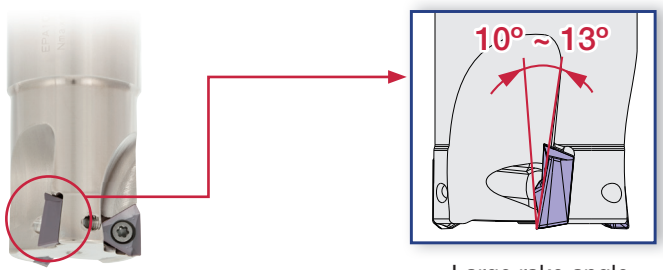
TUNG-TRI

Excellent cutting performance with improved profitability

Economical 3 cutting-edge inserts

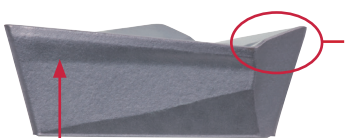


Drastically reduced cutting force



Large rake angle

Low cutting force for all depths of cut due to helical cutting edge with large rake angle.



Good surface finish due to positive inclination on wiper edge

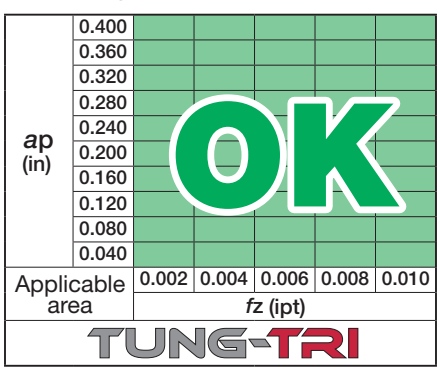
Uniquely designed flank face with built-in "margin" that prevents chattering and chipping.

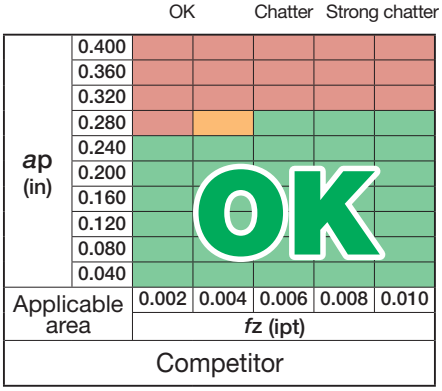
Applicable for a wide range of cutting conditions

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

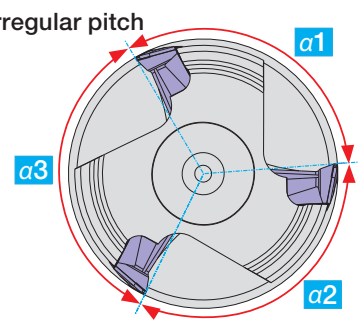
Cutting performance

○ OK　△ Chatter　× Strong chatter





Irregular pitch



$\alpha 1 \neq \alpha 2 \neq \alpha 3$

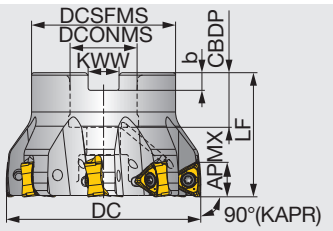
Cutter	: EPA10R125U0125W03N (DC = 1.250", CICT = 3)
Insert	: TOMT100404PDER-MJ
Grade	: AH3135
Workpiece	: 1055 (200 HB)
Cutting speed	: *Vc* = 500 sfm
Width of cut	: *ae* = 1.250"
Machine	: Vertical M/C, BT50

Reference pages: H097 - H107

DOFORCE TRI TPTN07

Square shoulder milling cutter with double-sided triangular inserts

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



Inch	APMX	DC	CICT	DCSFMS	LF(1)	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TPTN07U2.00B0.75R08	0.256	2.000	8	1.850	1.575	0.750	0.750	0.315	0.197	0.930	With	TNMU0703...

(1) The value is true with R0.8 insert. For R0.4, please refer to page H094

SPARE PARTS

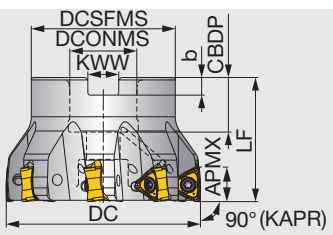
Designation	Clamping screw	Wrench	Lubricant	Shell locking bolt (Optional parts)
TPTN07U2.00B0.75R0	CSPB-2.5SH	IP-7D	M-1000	(C0.375X1.125H)

* Torque (lb·ft): CSPB-2.5SH = 0.81 lb·ft

DOFORCE TRI TPTN12

Square shoulder mill, with screw clamp system, for double sided triangular inserts

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



Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Shell locking bolt	Insert	Arbor type
TPTN12U2.00B0.75R05	0.433	2.000	5	1.850	1.575	0.750	0.750	0.315	0.197	0.89	With	C0.375X1.125H	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	C0.375X1.125H	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	C0.500X1.375H	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	TMBA-0.750H	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	TMBA-0.750H	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

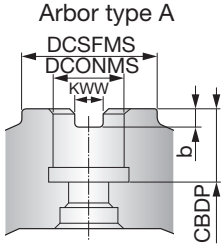
SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Lubricant	Shell locking bolt (Optional parts)
TPTN12U2.00R..., TPTN12U2.50R...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000	(C0.375X1.125H)
TPTN12U3.00R...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000	(C0.500X1.375H)
TPTN12U4.00R..., TPTN12U5.00R...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000	(TMBA-0.750H)
TPTN12U6.00R...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000	-

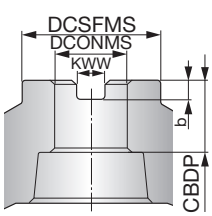
*Recommended clamping torque : CSPB-3.5 = 2.58 lbs·ft

Arbor type

Arbor type A



Arbor type B

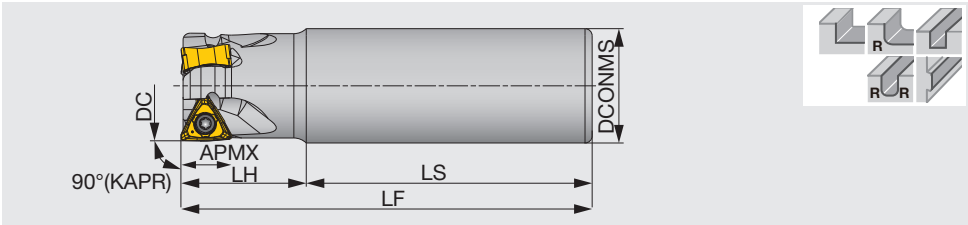


Reference pages: Inserts, Standard cutting conditions → H096

EPTN07

Square shoulder end mill with double-sided triangular inserts

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



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF(1)	WT(kg)	Air hole	Insert
EPTN07U0.75C0.75R02	0.256	0.750	2	0.750	2.500	1.000	3.500	0.370	With	TNMU0703..
EPTN07U0.75C0.75R02L	0.256	0.750	2	0.750	4.750	1.670	6.420	0.710	With	TNMU0703..
EPTN07U1.00C1.00R03	0.256	1.000	3	1.000	3.000	1.500	4.500	0.880	With	TNMU0703..
EPTN07U1.00C1.00R03L	0.256	1.000	3	1.000	5.700	3.000	8.700	1.720	With	TNMU0703..
EPTN07U1.00C1.00R04	0.256	1.000	4	1.000	3.000	1.500	4.500	0.880	With	TNMU0703..
EPTN07U1.25C1.25R04	0.256	1.250	4	1.250	3.000	1.500	4.500	1.390	With	TNMU0703..
EPTN07U1.25C1.25R05	0.256	1.250	5	1.250	3.000	1.500	4.500	1.390	With	TNMU0703..

(1) The value is true with R0.8 insert. For R0.4, please refer to page H094

SPARE PARTS

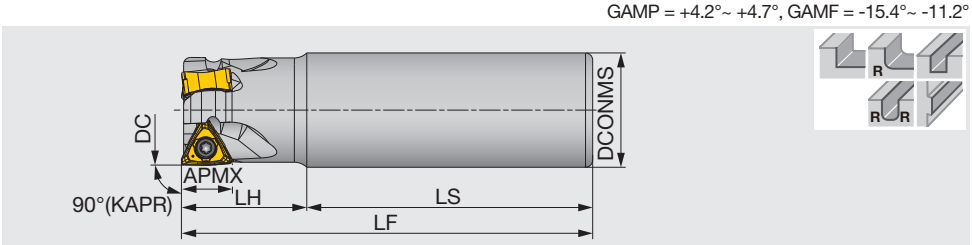
Designation	Clamping screw	Wrench
EPTN07...	CSPB-2.5SH	IP-7D

*Recommended clamping torque : CSPB-2.5SH = 0.81 lbs·ft

EPTN12

Square shoulder endmill, shank type, with screw clamp system, for double sided triangular inserts

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



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EPTN12U1.25C1.25R03N	0.433	1.250	3	1.250	3.000	1.500	4.500	1.560	Without	TN*U12...
EPTN12U1.50C1.25R04N	0.433	1.500	4	1.250	3.000	1.500	4.500	1.780	Without	TN*U12...

SPARE PARTS

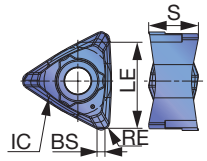
Designation	Clamping screw	Grip	Torx bit	Lubricant
EPTN12...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000

*Recommended clamping torque : CSPB-3.5 = 2.58 lbs·ft

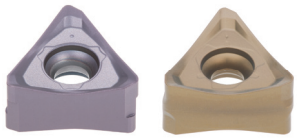
Reference pages: Inserts, Standard cutting conditions → H096

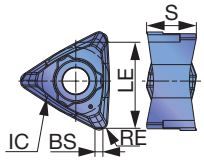
INSERT

TNMU07-MJ

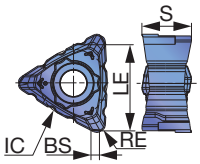


TNGU12-MJ/TNMU12-MJ

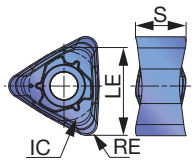




TNMU12-NMJ



TNMU12**R-MJ



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

★ :First choice
☆ :Second choice

Designation	RE	APMX	Coated AH120	AH3135	T1215	T3225	LE	IC	S	BS
TNMU070304PER-MJ	0.016	0.256	●	●			0.256	0.224	0.161	0.024
TNMU070308PER-MJ	0.032	0.256	●	●			0.256	0.224	0.161	0.024
TNGU120708PER-MJ	0.032	0.433	●	●	●		0.472	0.375	0.277	0.046
TNMU120708PER-MJ	0.032	0.433	●	●	●	●	0.472	0.375	0.280	0.046
TNMU120708PER-NMJ	0.032	0.433	●	●			0.472	0.375	0.280	0.046
TNMU1207R16PER-MJ	0.063	0.433	●	●			0.472	0.375	0.271	-

● : Line up

STANDARD CUTTING CONDITIONS

Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

ISO	Workpiece materials	Hardness	Priority	Grades	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1018, 1026, etc.	- 300 HB	First choice	AH3135	MJ	328 - 820	0.003 - 0.012
		- 300 HB	Wear resistance	T3225	MJ	328 - 984	0.003 - 0.012
		- 300 HB	Low cutting force	AH3135	NMJ	328 - 820	0.003 - 0.006
	Carbon steel and alloy steel 1055, 4140, etc.	- 300 HB	First choice	AH3135	MJ	328 - 755	0.003 - 0.012
		- 300 HB	Wear resistance	T3225	MJ	328 - 919	0.003 - 0.012
		- 300 HB	Low cutting force	AH3135	NMJ	328 - 919	0.003 - 0.006
	Prehardened steel H-13, P-20, etc.	30 - 40 HRC	First choice	AH3135	MJ	328 - 591	0.003 - 0.010
		30 - 40 HRC	Wear resistance	T3225	MJ	328 - 656	0.003 - 0.010
		30 - 40 HRC	Low cutting force	AH3135	NMJ	328 - 591	0.003 - 0.006
M	Stainless steel 304, 316, etc.	-	First choice	AH3135	MJ	295 - 656	0.003 - 0.010
		-	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
		150 - 250 HB	Wear resistance	T1215	MJ	459 - 984	0.003 - 0.012
		150 - 250 HB	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
		150 - 250 HB	Wear resistance	T1215	MJ	361 - 820	0.003 - 0.010
		150 - 250 HB	Low cutting force	AH120	NMJ	361 - 656	0.003 - 0.006
S	Titanium alloys Ti-6Al-4V, etc.	-	First choice	AH120	MJ	70 - 200	0.003 - 0.008
		-	Low cutting force	AH120	NMJ	70 - 200	0.003 - 0.006
	Heat-resistant alloys Inconel718, etc.	-	First choice	AH120	MJ	70 - 130	0.003 - 0.007
		-	Low cutting force	AH120	NMJ	70 - 130	0.003 - 0.006

When using NMJ chipbreaker, please set up the feed not to exceed the value below.

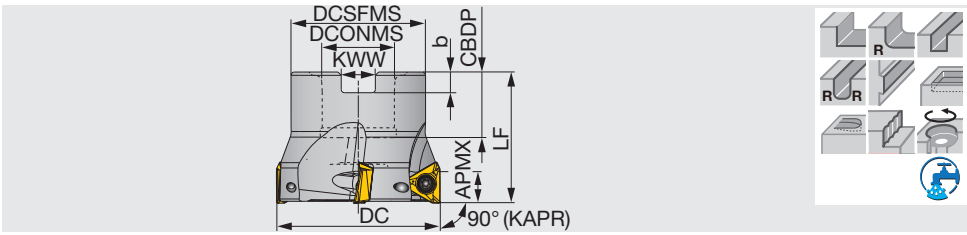
Designation	Chip thickness (in)
TNMU120708PER-NMJ	< 0.008

TUNG-TRI

TPA06

High precision square shoulder mill, with screw clamp system, for triangular inserts

GAMP = +8.5°~ +11.5°, GAMF = -5.5°~ -12.5°



Inch	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(lb)	Air hole	Insert
TPA06R200U0075A08	0.236	2.000	8	1.693	0.750	0.750	1.575	0.197	0.315	0.310	With	TOMT06...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench	Shell locking bolt (Optional parts)
TPA06R200U0075A08	CSTB-2.5	M-1000	T-8D	(C0.375X1.125H)

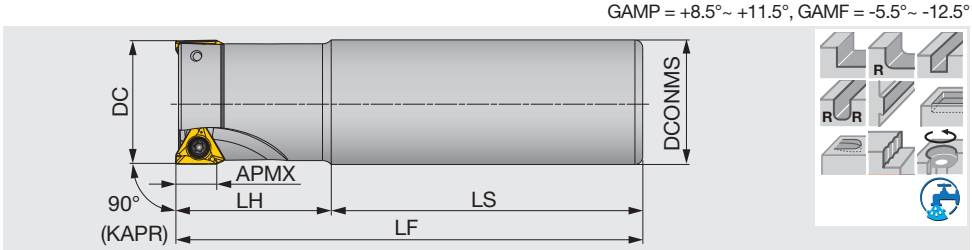
*Recommended clamping torque : CSTB-2.5 = 0.96 lb·ft

TUNG-TRI

EPA06

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

GAMP = +8.5°~ +11.5°, GAMF = -5.5°~ -12.5°



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EPA06R050U0050-01N	0.236	0.500	1	0.500	2.250	0.750	3.000	0.15	Without	TOMT06...
EPA06R063U0063-02N	0.236	0.625	2	0.625	2.563	0.937	3.500	0.29	Without	TOMT06...
EPA06R075U0075-03N	0.236	0.750	3	0.750	2.858	1.142	4.000	0.46	With	TOMT06...
EPA06R100U0100W04N	0.236	1.000	4	1.000	2.280	1.500	3.780	0.76	Without	TOMT06...

SPARE PARTS

Designation		Clamping screw	Lubricant	Wrench
EPA06...	ø*Dc* ≤ 0.625"	CSTB-2.5S	M-1000	T-8D
	ø*Dc* ≥ 0.750"	CSTB-2.5	M-1000	T-8D

*Recommended clamping torque : CSTB-2.5S/CSTB-2.5 = 0.96 lbs·ft

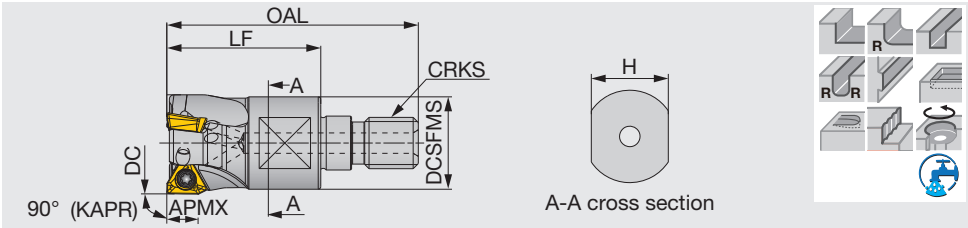
Reference pages: Inserts → H104, Standard cutting conditions → H106

TUNG-TRI

HPA06-M

High precision square shoulder endmill, modular type, for triangular inserts (TungFlex)

GAMP = +8.5°~ +11.5°, GAMF = -12.5°~ -5.5°



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	TOMT06...
HPA06R020MM10-03	6	20	3	49	30	15	18	M10	0.06	With	TOMT06...
HPA06R025MM12-04	6	25	4	57	35	17	21	M12	0.1	With	TOMT06...
HPA06R032MM16-05	6	32	5	63	40	22	29	M16	0.2	With	TOMT06...

See page **H167** for TungFlex modular shank.

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
HPA06R016MM08-02	CSTB-2.5S	M-1000	T-8D
HPA06R020 - 032MM...	CSTB-2.5	M-1000	T-8D

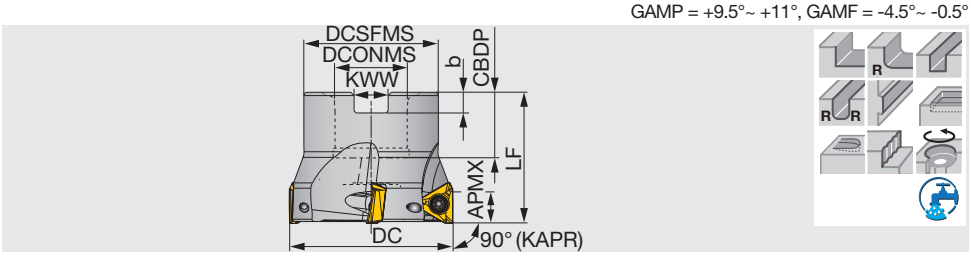
*Recommended clamping torque：CSTB-2.5S/CSTB-2.5 = 1.3 N·m

TUNG-TRI

TPA10

High precision square shoulder mill, with screw clamp system, for triangular inserts

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



Inch	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert	Arbor type
TPA10R200U0075A04	0.394	2.000	4	1.693	0.750	0.750	1.575	0.197	0.315	0.440	With	TO*T10...	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
TPA10R300U0100A07	0.394	3.000	7	2.283	1.000	1.024	1.969	0.236	0.374	1.120	With	TO*T10...	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

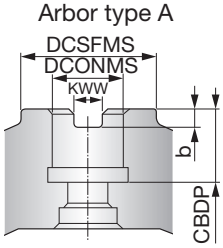
SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Lubricant	Shell locking bolt (Optional parts)
TPA10R200U... - 250U...	SR14-562/S	SW6-SD	BLDT10/S7	M-1000	(C0.375X1.125H)
TPA10R300U0100A07	SR14-562/S	SW6-SD	BLDT10/S7	M-1000	(C0.500X1.375H)
TPA10R400U0150A08	SR14-562/S	SW6-SD	BLDT10/S7	M-1000	(TMBA-0.750H)

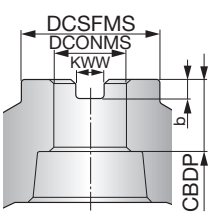
*Recommended clamping torque : SR14-562/S = 2.58 lbs·ft

Arbor type

Arbor type A



Arbor type B



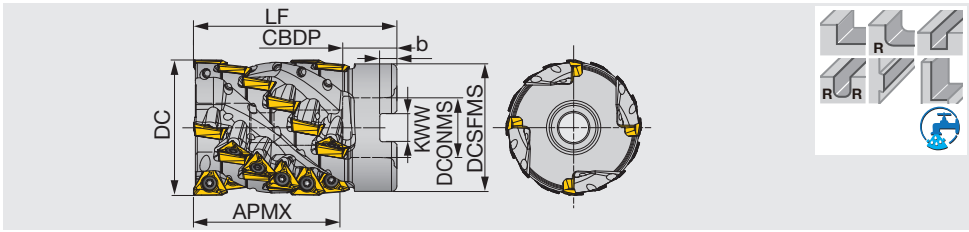
Reference pages: Inserts → **H104**, Standard cutting conditions → **H106**, TungFlex → **H167**

TUNG-TRI

TLA10

Square shoulder mill for roughing, with screw clamp system, for triangular inserts

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...

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	Wrench	Shell locking bolt
TLA10R200L213U0075A04	SR14-562	M-1000	T-10D	SD06-102
TLA10R250L213U0100A04	SR14-562	M-1000	T-10D	SD-08-C8

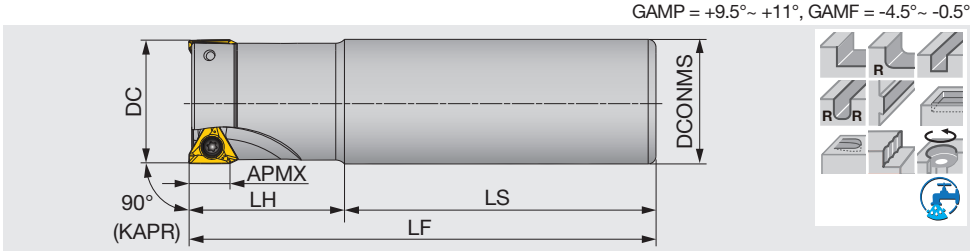
*Recommended clamping torque : SR14-562 = 1.84 lbs·ft

TUNG-TRI

EPA10

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

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



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EPA10R100U0075W02N	0.394	1.000	2	0.750	2.362	1.378	3.740	0.440	Without	TO*T10...
EPA10R100U0100W02N	0.394	1.000	2	1.000	2.362	1.378	3.740	0.710	Without	TO*T10...
EPA10R100U0100W02L	0.394	1.000	2	1.000	5.748	2.752	8.500	1.680	With	TO*T10...
EPA10R125U0125W02L	0.394	1.250	2	1.250	7.000	3.000	10.000	3.150	With	TO*T10...
EPA10R125U0125W03N	0.394	1.250	3	1.250	2.362	1.378	3.740	1.120	Without	TO*T10...
EPA10R125U0125W03ML	0.394	1.250	3	1.250	4.250	2.250	6.500	2.070	With	TO*T10...
EPA10R150U0125W02L	0.394	1.500	2	1.250	8.000	2.000	10.000	3.330	With	TO*T10...
EPA10R150U0125W03ML	0.394	1.500	3	1.250	4.250	2.250	6.500	2.430	With	TO*T10...
EPA10R150U0125W04N	0.394	1.500	4	1.250	3.157	1.969	5.126	1.680	Without	TO*T10...

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit
EPA10...	SR14-562/S	SW6-SD	M-1000	BLDT10/S7

*Recommended clamping torque : SR14-562 = 1.84 lbs·ft

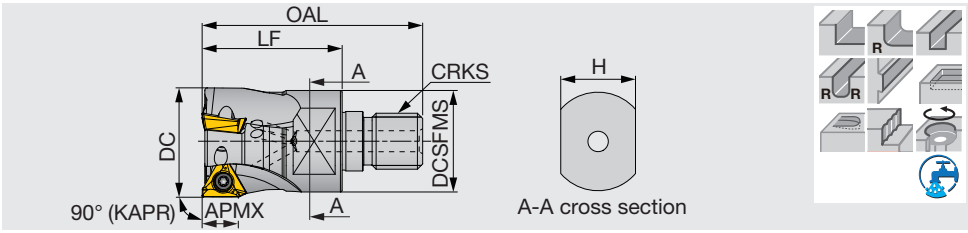
Reference pages: Inserts → H104, Standard cutting conditions → H106

TUNG-TRI

HPA10-M

High precision square shoulder endmill, modular type, for triangular inserts (TungFlex)

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



Metric	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
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...

See page **H167** for TungFlex modular shank.

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit
HPA10...	SR14-562/S	SW6-SD	M-1000	BLDT10/S7

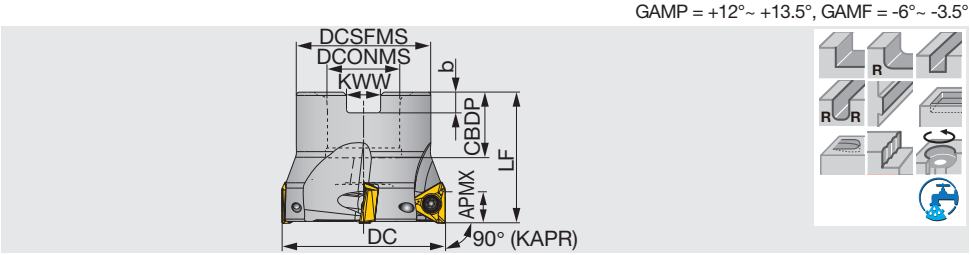
*Recommended clamping torque：SR14-562/S = 2.5 N·m

TUNG-TRI

TPA15

High precision square shoulder mill, with screw clamp system, for triangular inserts

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



Inch	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(lb)	Air hole	Insert	Arbor type
TPA15R200U0075A04	0.590	2.000	4	1.625	0.750	0.750	1.570	0.197	0.315	0.600	With	TO*T15...	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
TPA15R300U0100A06	0.590	3.000	6	2.250	1.000	1.024	1.750	0.236	0.374	1.900	With	TO*T15...	A
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

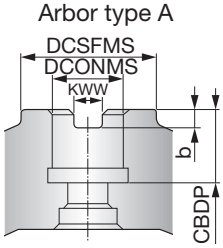
SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit	Shell locking bolt (Optional parts)
TPA15R200U..., TPA15R250U...	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	-

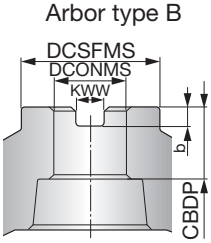
*Recommended clamping torque : TS45120I = 3.69 lbs·ft

Arbor type

Arbor type A



Arbor type B



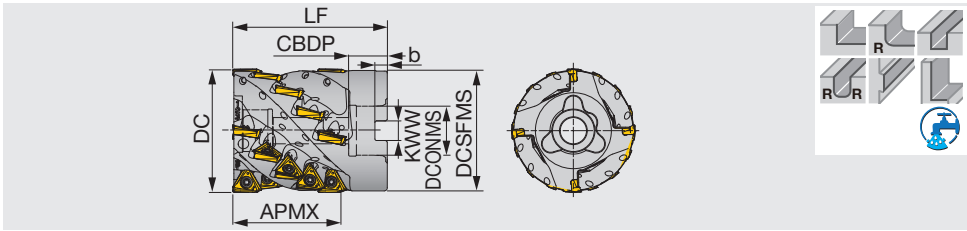
Reference pages: Inserts → **H104**, Standard cutting conditions → **H106**, TungFlex → **H167**

TUNG-TRI

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	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...

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	Torx bit	Lubricant	Shell locking bolt
TLA15R300L275U0125A04M	TS45120I	H-TB2W	BT20S	M-1000	SD-10-54
TLA15R400L326U0150A05M	TS45120I	H-TB2W	BT20S	M-1000	SD12-B9

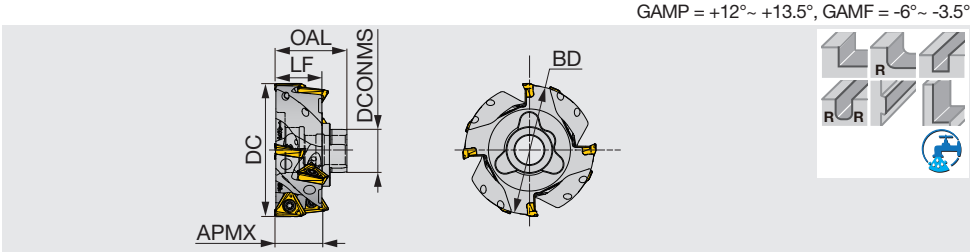
*Recommended clamping torque : TS45120I = 3.69 lbs·ft

TUNG-TRI

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…

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
TLA15...	TS45120I	H-TB2W	M-1000	BT20S

*Recommended clamping torque : TS45120I = 3.69 lbs·ft

CENTER BOLT
(Optional parts)

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

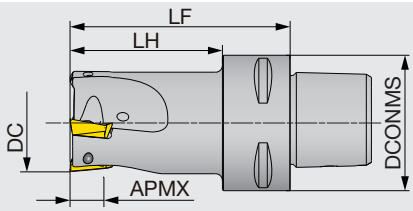
Reference pages: Inserts → H104, Standard cutting conditions → H106

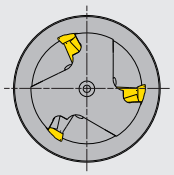
TUNG-TRI

C-EPA

TUNGCAP

Square shoulder milling





Metric	DC	APMX	DCONMS	CICT	LF	LH	Air hole	Insert
C4EPA10M032R03L065	32	10	40	3	65	45	With	TOMT1004...
C4EPA10M035R03L065	35	10	40	3	65	45	With	TOMT1004...
C6EPA15M040R03L080	40	15	63	3	80	58	With	TOMT1506...
C6EPA15M050R04L080	50	15	63	4	80	58	With	TOMT1506...

Applicable for 14 MPa coolant

SPARE PARTS

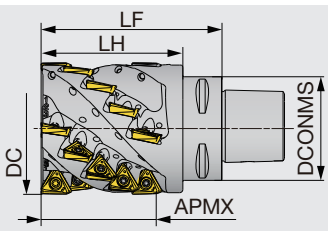
Designation	Clamping screw	Torx bit	Grip
C4EPA10M0**R03L065	SR14-562/S	BLDT10/S7	SW6-SD
C6EPA15M0**R0*L080	TS45120I	BT20S	H-TB2W

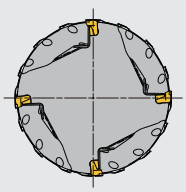
TUNG-TRI

C-TLA

TUNGCAP

Square shoulder milling (for large depth of cut)





Metric	DC	APMX	DCONMS	CICT	ZEFP	LF	LH	Air hole	Insert
C6TLA15M063R03L100	63	55	63	12	3	100	78	With	TOMT1506...
C6TLA15M080R04L110	80	70	63	20	4	110	86.2	With	TOMT1506...

Applicable for 14 MPa coolant

SPARE PARTS

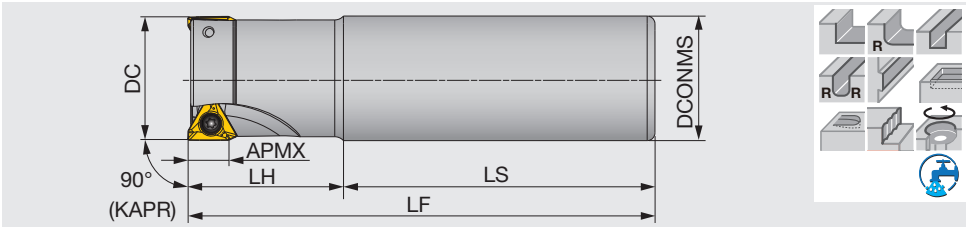
Designation	Clamping screw	Torx bit	Grip
C6TLA15M0**R0*L1**	TS45120I	BT20S	H-TB2W

Reference pages: C-EPA, C-TLA: Inserts → H104

EPA15

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

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



Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EPA15R150U0125W03N	0.590	1.500	3	1.250	2.250	2.250	4.500	1.480	With	TO*T15…
EPA15R150U0125W02L	0.590	1.500	2	1.250	2.250	4.250	6.500	2.070	With	TO*T15…
EPA15R200U0125W04N	0.590	2.000	4	1.250	2.250	2.250	4.500	1.740	Without	TO*T15…

SPARE PARTS

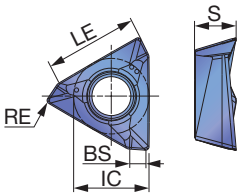
Designation	Clamping screw	Grip	Lubricant	Torx bit
EPA15...	TS45120I	H-TB2W	M-1000	BT20S

*Recommended clamping torque : TS45120I = 3.69 lbs·ft

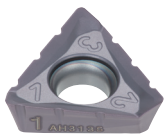
Reference pages: Inserts → H104, Standard cutting conditions → H106

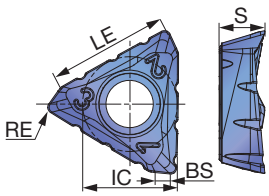
INSERT

TOMT-MJ

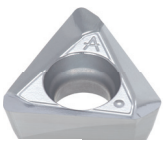


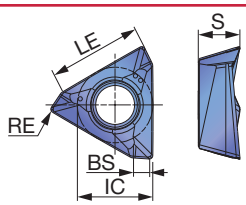
TOMT-NMJ





TOGT-AJ





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

★ : First choice
☆ : Second choice

Designation	RE	APMX	AH120	AH3135	T1215	T3225	KS05F	LE	IC	S	BS
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
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
TOMT150604PDER-MJ	0.016	0.590	●	●		●		0.618	0.500	0.236	0.087
TOMT150608PDER-MJ	0.031	0.590	●	●	●	●		0.618	0.500	0.236	0.075
TOMT150616PDER-MJ	0.063	0.590	●	●				0.618	0.500	0.236	0.043
TOMT150620PDER-MJ	0.079	0.590	●	●				0.618	0.500	0.236	0.028
TOMT150608PDER-NMJ	0.031	0.590	●	●		●		0.618	0.500	0.236	0.075
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
TOGT150604PDFR-AJ	0.016	0.590					●	0.618	0.493	0.220	0.087
TOGT150608PDFR-AJ	0.031	0.590					●	0.618	0.493	0.218	0.075

● : Line up

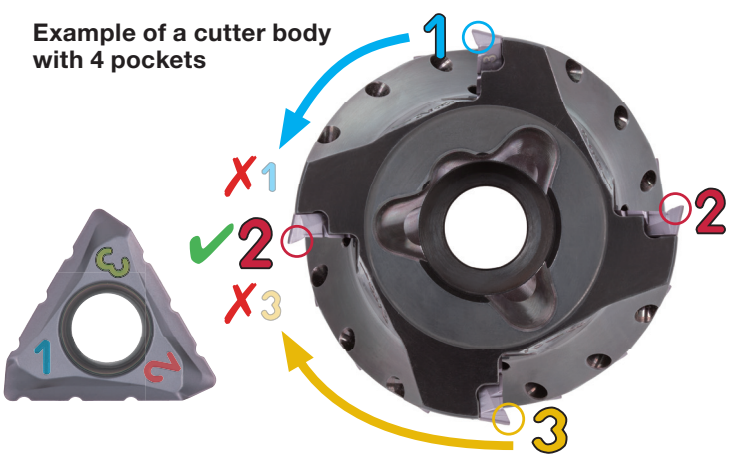
Caution for using NMJ chipbreaker

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.

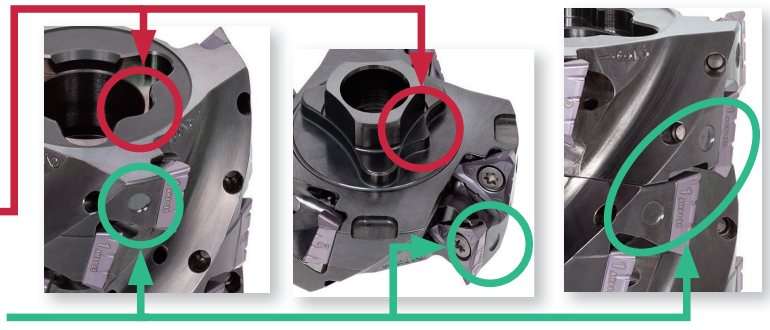
Item: TOMT150608PDER-NMJ

Example of a cutter body with 4 pockets



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 (Poka-yoke) to avoid setting error.



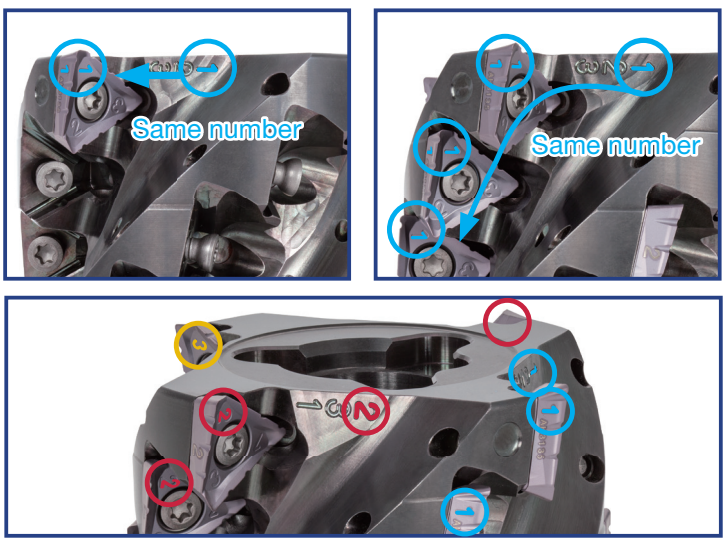
Directions for setting NMJ inserts on roughing type bodies

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.



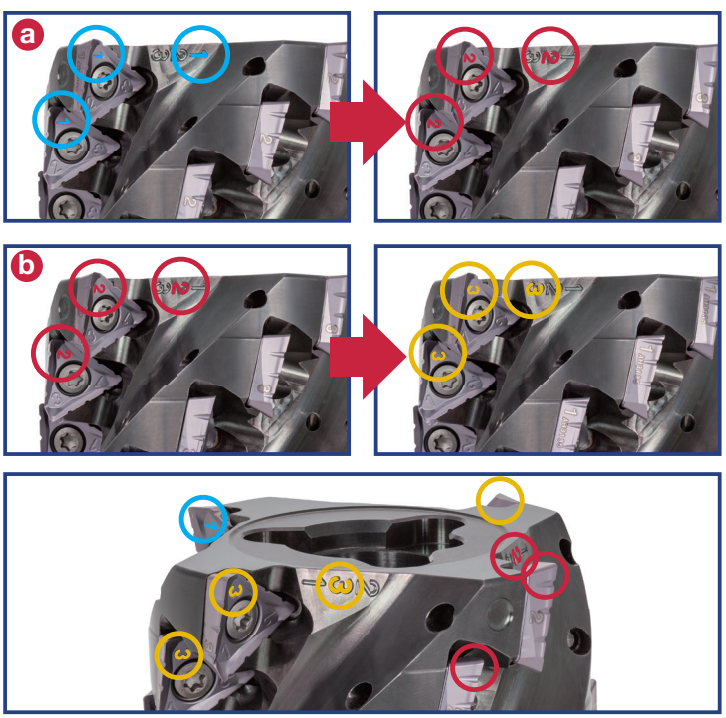
Directions for changing corners for inserts on roughing type bodies

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.



STANDARD CUTTING CONDITIONS

TPA/EPA/HPA

	Workpiece materials	Hardness HB	Grades	Cutting speed *Vc* (sfm)			Feed per tooth: *fz* (ipt)				
							MJ			NMJ	AJ
				T/E/HPA06	T/E/HPA10	T/E/EPA15	T/E/HPA06	T/E/HPA10	T/E/EPA15	T/E/EPA15	T/E/HPA10
P	Low carbon steel 1015, etc.	- 200	AH3135	330 - 2360	330 - 820	330 - 820	0.002 - 0.006	0.003 - 0.008	0.003 - 0.010	0.003 - 0.006	-
P	High carbon steel 1045, etc.	200 - 300	AH3135	330 - 560	330 - 660	330 - 755	0.002 - 0.005	0.003 - 0.006	0.003 - 0.008	0.003 - 0.006	-
P	Alloy steel 4140, etc.	150 - 300	AH3135	330 - 560	330 - 660	330 - 755	0.002 - 0.005	0.003 - 0.006	0.003 - 0.008	0.003 - 0.006	-
P	Tool steel H13, etc	30 - 40 HRC	AH3135	330 - 390	330 - 490	330 - 590	0.002 - 0.005	0.003 - 0.006	0.003 - 0.008	0.003 - 0.006	-
M	Stainless steel 304, etc.	-	AH3135	260 - 490	260 - 660	295 - 660	0.002 - 0.006	0.003 - 0.008	0.003 - 0.008	0.003 - 0.006	-
K	Grey cast iron No.250B, etc.	150 - 250	AH120	330 - 660	330 - 820	460 - 820	0.002 - 0.006	0.003 - 0.008	0.003 - 0.010	0.003 - 0.006	-
K			T1215	150 - 250	490 - 300	660 - 984	0.002 - 0.005	0.003 - 0.006	0.003 - 0.007	-	-
K	Ductile cast iron 65-45-12, etc.	150 - 250	AH120	260 - 490	260 - 660	360 - 660	0.002 - 0.006	0.003 - 0.008	0.003 - 0.010	0.003 - 0.006	-
K			T1215	330 - 660	430 - 820	490 - 820	0.002 - 0.005	0.003 - 0.006	0.003 - 0.007	-	-
N	Aluminum Si < 13%	-	KS05F	-	984 - 3280	-	-	-	-	-	0.003 - 0.009
N	Aluminum Si ≥ 13%	-	KS05F	-	330 - 660	-	-	-	-	-	0.003 - 0.009
S	Titanium alloys Ti-6Al-4V, etc.	-	AH120	66 - 164	66 - 200	66 - 200	0.002 - 0.004	0.003 - 0.006	0.003 - 0.007	0.003 - 0.006	-
S	Heat-resistant alloys Inconel 718, etc.	-	AH120	66 - 115	66 - 130	66 - 130	0.001 - 0.003	0.002 - 0.005	0.003 - 0.006	0.003 - 0.006	-

- 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.

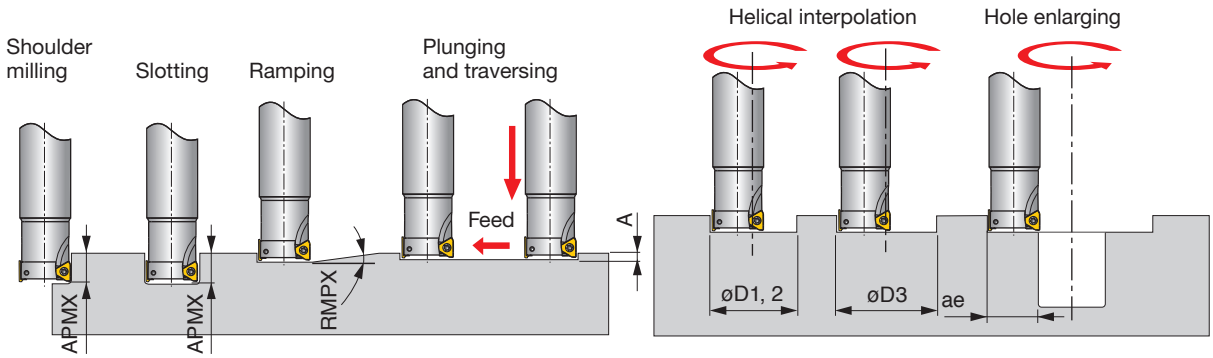
Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

TLA (Roughing type)

ISO	Workpiece materials	Hardness HB	Grades	Cutting speed *Vc* (sfm)		Feed per tooth: *fz* (ipt)			
						MJ		NMJ	AJ
				TLA10	TLA15	TLA10	TLA15	TLA15	TLA10
P	Low carbon steel 1015, etc.	- 200	AH3135	330 - 820	330 - 820	0.003 - 0.007	0.003 - 0.009	0.003 - 0.006	-
P	High carbon steel 1045, etc.	200 - 300	AH3135	330 - 660	330 - 270	0.003 - 0.006	0.003 - 0.007	0.003 - 0.006	-
P	Alloy steel 4140, etc.	30 - 40 HRC	AH3135	330 - 490	330 - 590	0.003 - 0.006	0.003 - 0.007	0.003 - 0.006	-
M	Stainless steel 304, etc.	-	AH3135	260 - 660	295 - 660	0.003 - 0.006	0.003 - 0.007	0.003 - 0.006	-
K	Grey cast iron No.250B, etc.	150 - 250	AH120	330 - 820	460 - 820	0.003 - 0.007	0.003 - 0.010	0.003 - 0.006	-
K			T1215	490 - 820	490 - 820	0.003 - 0.006	0.003 - 0.007	-	-
K	Ductile cast iron 65-45-12, etc.	150 - 250	AH120	260 - 660	360 - 660	0.003 - 0.007	0.003 - 0.010	0.003 - 0.006	-
K			T1215	490 - 820	490 - 820	0.003 - 0.006	0.003 - 0.007	-	-
N	Aluminum Si < 13%	-	KS05F	990 - 3280	-	-	-	-	0.003 - 0.009
N	Aluminum Si ≥ 13%	-	KS05F	330 - 660	-	-	-	-	0.003 - 0.009
S	Titanium alloys Ti-6Al-4V, etc.	-	AH120	66 - 217	66 - 217	0.003 - 0.006	0.003 - 0.007	0.003 - 0.006	-
S	Heat-resistant alloys Inconel 718, etc.	-	AH120	66 - 130	66 - 130	0.002 - 0.005	0.003 - 0.006	0.003 - 0.006	-

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

APPLICATION RANGE



Inch	DC	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Min. machining depth øD1	Max. machining diameter øD2	Max. machining diameter øD3 *	Max. cutting width in enlarging ae
EPA06R050U…	0.500	0.236	5°	0.024	0.748	0.984	0.882	0.480
EPA06R063U…	0.625	0.236	4°	0.024	0.984	1.234	1.132	0.605
EPA06R075U…	0.750	0.236	3°	0.024	1.240	1.484	1.382	0.730
EPA06R100U…	1.000	0.236	2°	0.024	1.752	1.984	1.882	0.980
TPA06R200U…	2.000	0.236	0.7°	0.024	3.740	3.984	3.882	1.980
EPA10R100U…	1.000	0.394	2°	0.024	1.689	1.984	1.882	0.980
EPA10R125U…	1.250	0.394	2°	0.024	2.189	2.484	2.382	1.230
EPA10R150U…	1.500	0.394	1.4°	0.024	2.689	2.984	2.882	1.480
TPA10R200U…	2.000	0.394	0.8°	0.024	3.689	3.984	3.882	1.980
TPA10R250U…	2.500	0.394	0.7°	0.024	4.689	4.984	4.882	2.480
TPA10R300U…	3.000	0.394	0.6°	0.024	5.689	5.984	5.882	2.980
TPA10R400U…	4.000	0.394	0.5°	0.024	7.689	7.984	7.882	3.980
EPA15R150U…	1.500	0.590	2.3°	0.031	2.547	2.969	2.823	1.461
E/TPA15R200U…	2.000	0.590	1.7°	0.031	3.547	3.969	3.823	1.961
TPA15R250U…	2.500	0.590	1.4°	0.031	4.547	4.969	4.823	2.461
TPA15R300U…	3.000	0.590	1°	0.031	5.547	5.969	5.823	2.961
TPA15R400U…	4.000	0.590	0.8°	0.031	7.547	7.969	7.823	3.961
TPA15R500U…	5.000	0.590	0.6°	0.031	9.547	9.969	9.823	4.961
TPA15R600U…	6.000	0.590	0.5°	0.031	11.547	11.969	11.823	5.961

* Flat bottom hole

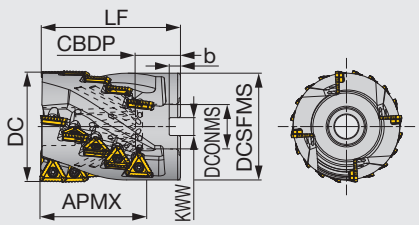
Corner RE for dimensions of øD1, øD2 and øD3: RE = 0.016" for E/TPA06, E/TPA10 and RE = 0.031" for E/TPA15.

TUNGTRI SHRED

LPTC16

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

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



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...

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

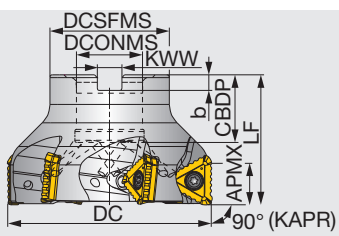
*Recommended clamping torque : TS 40B100I = 2.58 lbs·ft

TUNGTRI 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

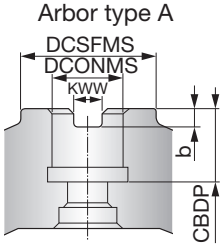
SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit	Shell locking bolt (Optional parts)
TPTC16U2.00B0.75R04	TS 40B100I	H-TB2W	M-1000	BT15S	TCS9.525-35-I
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)

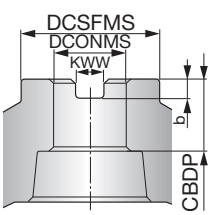
*Recommended clamping torque : TS 40B100I = 2.58 lbs·ft

Arbor type

Arbor type A



Arbor type B



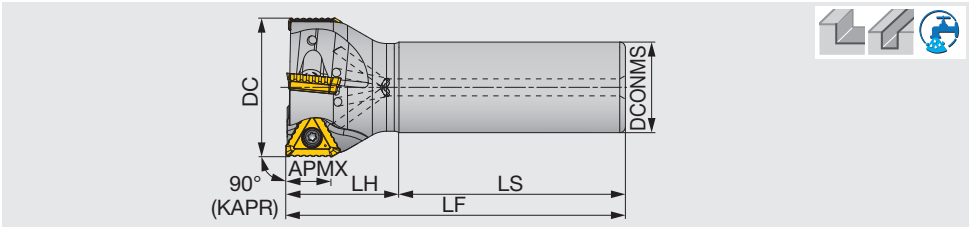
Reference pages: Inserts → H109, Standard cutting conditions → H110

TUNGTSHRED

EPTC16

Square shoulder endmill, shank type, with screw clamp system, for shred inserts

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



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

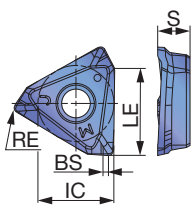
SPARE PARTS

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

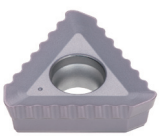
*Recommended clamping torque : TS 40B100I = 2.58 lb·ft

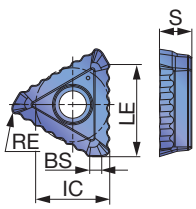
INSERT

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 AH120	AH3135	T1215	T3225	LE	IC	S	BS
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

Reference pages: Standard cutting conditions → H110

STANDARD CUTTING CONDITIONS

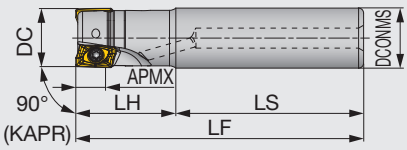
ISO	Workpiece materials	Hardness	Priority	Grade	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steels 1015, 1020, etc.	- 300 HB	First choice	AH3135	NMJ*	330 - 820	0.003 - 0.006
		- 300 HB	Wear resistance	T3225	NMJ*	330 - 990	0.003 - 0.006
		- 300 HB	For finishing	AH3135	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
		- 300 HB	Wear resistance	T3225	NMJ*	330 - 920	0.003 - 0.006
		- 300 HB	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
		30 - 40 HRC	Wear resistance	T3225	NMJ*	330 - 200	0.003 - 0.006
		30 - 40 HRC	For finishing	AH3135	MJ	330 - 590	0.003 - 0.008
M	Stainless steels 304, 316, etc.	-	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
		150 - 250 HB	Wear resistance	T1215	NMJ*	490 - 980	0.003 - 0.006
		150 - 250 HB	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
		150 - 250 HB	Wear resistance	T1215	NMJ*	490 - 980	0.003 - 0.006
		150 - 250 HB	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

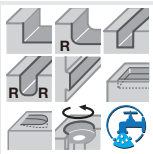
* When using the -NMJ chipbreaker, do not feed higher than 0.006 ipt.

EPAV06

Mini square shoulder endmill, shank type, with screw clamp system

GAMP = +6.0°~ +7.6°, GAMF = -37.1°~ -32.4°





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	0.090	With	AVGT06...
EPAV06U0.37C0.37R01	0.236	0.375	1	0.375	2.463	0.787	3.250	0.090	With	AVGT06...
EPAV06U0.37C0.37R01L	0.236	0.375	1	0.375	2.622	1.378	4.000	0.110	With	AVGT06...
EPAV06U0.50C0.50R02	0.236	0.500	2	0.500	2.463	0.787	3.250	0.150	With	AVGT06...
EPAV06U0.50C0.50R03	0.236	0.500	3	0.500	2.463	0.787	3.250	0.150	With	AVGT06...
EPAV06U0.50C0.50R02L	0.236	0.500	2	0.500	3.388	1.362	4.750	0.220	With	AVGT06...
EPAV06U0.62C0.62R03	0.236	0.625	3	0.625	2.713	0.787	3.500	0.260	With	AVGT06...
EPAV06U0.62C0.62R04	0.236	0.625	4	0.625	2.713	0.787	3.500	0.260	With	AVGT06...
EPAV06U0.62C0.62R03L	0.236	0.625	3	0.625	4.122	1.378	5.500	0.420	With	AVGT06...
EPAV06U0.75C0.62R04	0.236	0.750	4	0.625	2.815	1.185	4.000	0.330	With	AVGT06...
EPAV06U0.75C0.75R04	0.236	0.750	4	0.750	2.815	1.185	4.000	0.440	With	AVGT06...
EPAV06U0.75C0.75R05	0.236	0.750	5	0.750	2.815	1.185	4.000	0.440	With	AVGT06...
EPAV06U0.75C0.75R04L	0.236	0.750	4	0.750	6.500	1.375	7.875	0.900	With	AVGT06...
EPAV06U1.00C0.75R06	0.236	1.000	6	0.750	3.125	1.375	4.500	0.550	With	AVGT06...
EPAV06U1.00C1.00R05	0.236	1.000	5	1.000	3.125	1.375	4.500	0.930	With	AVGT06...
EPAV06U1.00C1.00R06	0.236	1.000	6	1.000	3.125	1.375	4.500	0.930	With	AVGT06...
EPAV06U1.00C1.00R04L	0.236	1.000	4	1.000	6.425	1.575	8.000	1.680	With	AVGT06...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EPAV06U...	CSPB-2H	M-1000	IP-6DB

*Recommended clamping torque : CSPB-2H = 0.52 lbs･ft

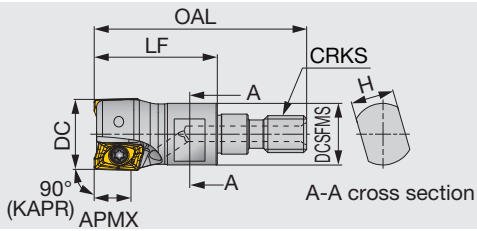
Reference pages: Inserts, Standard cutting conditions → H114

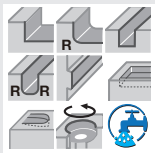
TUNGFORCE TUNGFREC

HPAV06-M

Mini square shoulder endmill, modular type (TungFlex)

GAMP = +6.0°~ +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	With	AVGT06...
HPAV06M012M06R02	6	12	2	34.5	20	7	10	M6	0.01	With	AVGT06...
HPAV06M012M06R03	6	12	3	34.5	20	7	10	M6	0.01	With	AVGT06...
HPAV06M016M08R03	6	16	3	42	25	10	13	M8	0.03	With	AVGT06...
HPAV06M016M08R04	6	16	4	42	25	10	13	M8	0.03	With	AVGT06...

See page **H167** for TungFlex modular shank.

SPARE PARTS

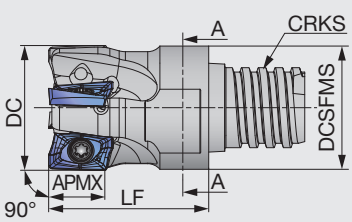
Designation	Clamping screw	Lubricant	Wrench
HPAV06M...	CSPB-2H	M-1000	IP-6DB

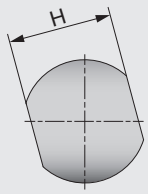
*Recommended clamping torque：CSPB-2H = 0.7 N·m

Reference pages: Inserts, Standard cutting conditions → **H114**, TungFlex → **H167**

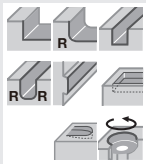
HPAV06-S

Mini square shoulder endmill, modular type (TungMeister)





A-A cross section



Metric	APMX	DC	CICT	LF	H	DCSFMS	CRKS	WT (kg)	Air hole	Insert
HPAV06M010S05R02	6 (0.236)	10 (0.394)	2	10 (0.394)	8	8 (0.315)	S05	0.01	Without	AVGT06...
HPAV06M010S06R02	6 (0.236)	10 (0.394)	2	16 (0.630)	8	9.8 (0.386)	S06	0.01	Without	AVGT06...
HPAV06M012S08R02	6 (0.236)	12 (0.472)	2	18 (0.709)	10	11.7 (0.461)	S08	0.02	Without	AVGT06...
HPAV06M012S08R03	6 (0.236)	12 (0.472)	3	18 (0.709)	10	11.7 (0.461)	S08	0.02	Without	AVGT06...
HPAV06M016S10R03	6 (0.236)	16 (0.630)	3	20 (0.787)	13	15.4 (0.606)	S10	0.03	Without	AVGT06...
HPAV06M016S10R04	6 (0.236)	16 (0.630)	4	20 (0.787)	13	15.4 (0.606)	S10	0.03	Without	AVGT06...

Unit: mm (inch)

- Applicable shank: VSSD, VTSD, VSC, VSTD, VER
  Please see page **I032 - I035** for the types and the selection of TungMeister shank.
  Please use VAD-M adapter to connect TungMeister with a metric thread shank.

Spanner*	Designation	Connection screw size
	KEYV-S05	S05
	KEYV-S06	S06
	KEYV-S08	S08
	KEYV-S10	S10

*sold separately

SPARE PARTS

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

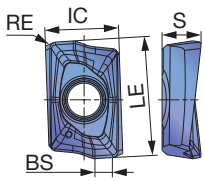
*Recommended clamping torque：CSPB-2H = 0.7 N·m

Reference pages: Inserts, Standard cutting conditions → H114, TungMeister shank → I032 - I035

INSERT

AVGT-MJ

AVGT-AJ



		AH120	AH130	AH3135	KS05F
P	Steel	★		★	
M	Stainless		☆	★	
K	Cast iron	★			
N	Non-ferrous				★
S	Superalloys	★	★	☆	
H	Hard materials	★			

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated			Uncoated	LE	IC	S	BS
			AH120	AH130	AH3135	KS05F				
AVGT060300PBER-MJ	-	0.236			●		0.315	0.197	0.106	0.063
AVGT060302PBER-MJ	0.008	0.236	●	●	●		0.315	0.197	0.106	0.059
AVGT060304PBER-MJ	0.016	0.236	●	●	●		0.315	0.197	0.106	0.051
AVGT060308PBER-MJ	0.031	0.236	●	●	●		0.315	0.197	0.102	0.035
AVGT060300PBFR-AJ	-	0.236				●	0.315	0.197	0.106	0.063
AVGT060302PBFR-AJ	0.008	0.236				●	0.315	0.197	0.106	0.059
AVGT060304PBFR-AJ	0.016	0.236				●	0.315	0.197	0.106	0.051
AVGT060308PBFR-AJ	0.031	0.236				●	0.315	0.197	0.102	0.035

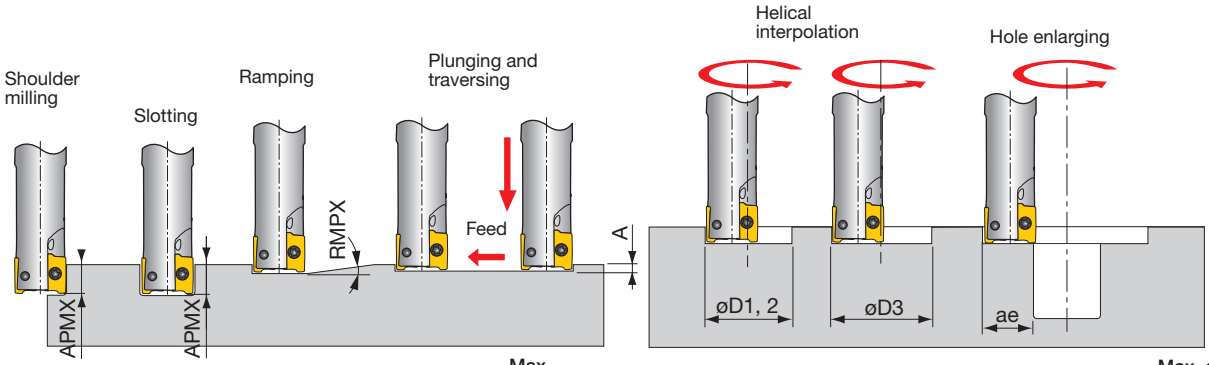
● : Line up

STANDARD CUTTING CONDITIONS

Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steels 1018, 1026, etc.		- 200 HB	First choice	AH3135	755 - 1410	0.003 - 0.005
P	Carbon steel and alloy steel 1055, 4140, etc.		- 300 HB	First choice	AH3135	490 - 1150	0.003 - 0.005
P	Prehardened steel H-13, P-20, etc.		30 - 40 HRC	First choice	AH3135	325 - 750	0.003 - 0.005
M	Stainless steel 304, 316, etc.		-	First choice	AH3135	490 - 720	0.003 - 0.004
K	Gray cast iron Class 25, Class 30, etc.		150 - 250 HB	First choice	AH120	655 - 1080	0.003 - 0.005
K	Ductile cast iron 60-40-12, 80-55-06, etc.		150 - 250 HB	First choice	AH120	490 - 785	0.003 - 0.005
N	Aluminum alloys Si < 13%		-	First choice	KS05F	2130 - 3280	0.003 - 0.005
N	Aluminum alloys Si ≥ 13%		-	First choice	KS05F	325 - 750	0.003 - 0.005
S	Titanium alloys Ti-6Al-4V, etc.		-	First choice	AH130	130 - 295	0.0016 - 0.004
S	Superalloys Inconel718, etc.		-	First choice	AH130	145 - 210	0.0016 - 0.004
H	Hardened steel	H13, etc.	40 - 50 HRC	First choice	AH120	145 - 225	0.002 - 0.004
H	Hardened steel	D2, etc.	50 - 60 HRC	First choice	AH120	130 - 210	0.0016 - 0.003

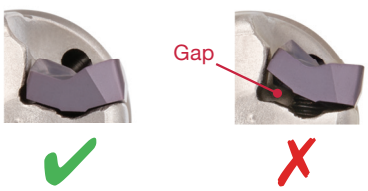
MACHINING APPLICATIONS



Inch	DC	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging A	Min. machining øD1	Max. machining øD2	Max. machining øD3*	Max. cutting width in enlarging 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°	0.012	1.026	1.220	1.181	0.610
EPAV06U0.75…	0.750	0 .236	1.5°	0.012	1.276	1.460	1.421	0.730
EPAV06U1.00…	1.000	0 .236	1°	0.012	1.775	1.960	1.921	0.980

*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.

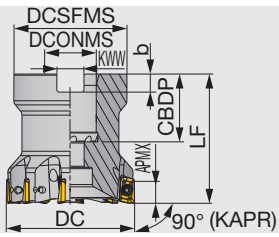


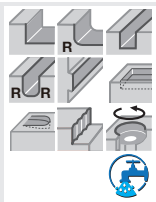
TUNGREC

TPO07

High precision square shoulder mill, with screw clamp system, for AOMT/AOGT07 inserts

GAMP = +7°, GAMF = +13°~ +18°





Inch	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert
TPO07R200U0075A12	2.000	12	1.693	1.575	0.750	0.789	0.315	0.197	0.660	With	AO*T0702...

SPARE PARTS

Designation	Clamping screw	Shell locking bolt (Optional parts)	Wrench
TPO07R200U0075A12	CSTB-2.5L046	(C0.375X1.125H)	T-7DB

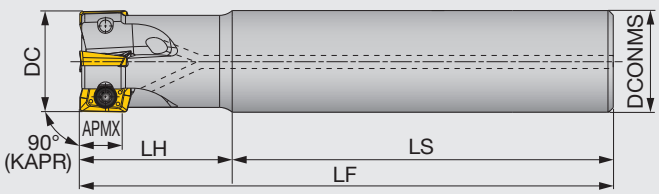
*Recommended clamping torque : CSTB-2.5L046 = 0.66 lb·ft

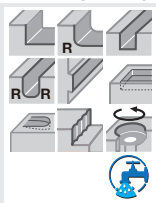
TUNGREC

EPO07

High precision square shoulder endmill, shank type, with screw clamp system, for AOMT/AOGT07 inserts

GAMP = +7°, GAMF = +13°~ +18°





Inch	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
EPO07R050U0050-02	0.500	2	0.500	2.250	0.750	3.000	0.140	With	AO*T0702...
EPO07R063U0063-04	0.625	4	0.625	2.563	0.937	3.500	0.250	With	AO*T0702...
EPO07R075U0075-05	0.750	5	0.750	2.875	1.125	4.000	0.410	With	AO*T0702...
EPO07R100U0075-03	1.000	3	0.750	2.000	1.500	3.500	0.400	With	AO*T0702...
EPO07R100U0100W07	1.000	7	1.000	2.281	1.500	3.781	0.680	With	AO*T0702...

*The DC above is the diameter when using MJ or AJ chipbreaker.
With HJ chipbreaker, the tool diameter is (DC above + 0.0024").
**The LF and LH above are the lengths when using MJ chipbreaker.
With AJ chipbreaker, the length is (LF, L + 0.004"). With HJ chipbreaker, the length is (LF, L + 0.02").

SPARE PARTS

Designation	Clamping screw	Wrench
EPO07R...	CSTB-2.5L046	T-7DB

*Recommended clamping torque : CSTB-2.5L046 = 0.66 lbs·ft

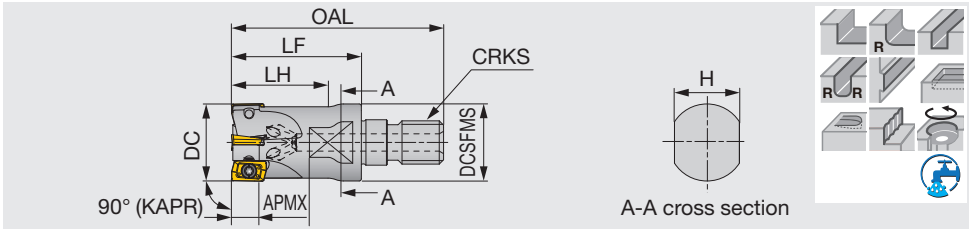
Reference pages: Inserts → H117, Standard cutting conditions → H118

TUNGREC

HPO07-M

High precision square shoulder endmill, modular type, for AOMT/AOGT07 inserts (TungFlex)

GAMP = +7°, GAMF = +13°~ +18°

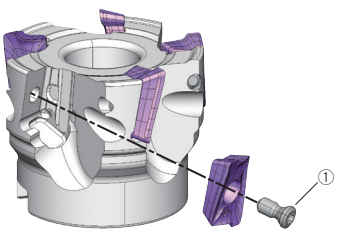


Metric	DC	CICT	OAL	LF	LH	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPO07R012MM06-02	12	2	39.5	25	-	7	9.8	M6	0.01	With	AO*T0702...
HPO07R012MM08-02	12	2	42	25	20	10	12.8	M8	0.02	With	AO*T0702...
HPO07R016MM08-04	16	4	42	25	-	10	12.8	M8	0.03	With	AO*T0702...
HPO07R016MM10-04	16	4	49	30	20	15	17.8	M10	0.05	With	AO*T0702...
HPO07R020MM10-05	20	5	49	30	-	15	17.8	M10	0.06	With	AO*T0702...
HPO07R025MM12-07	25	7	57	35	-	17	20.8	M12	0.1	With	AO*T0702...

SPARE PARTS

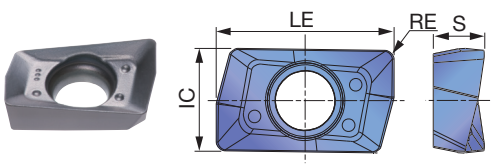
Designation	①Clamping screw	Lubricant	Wrench
HPO07R012MM0*-02	SR-10503833-S	M-1000	T-7DB
HPO07R016 - 025...	CSTB-2.5L046	M-1000	T-7DB

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

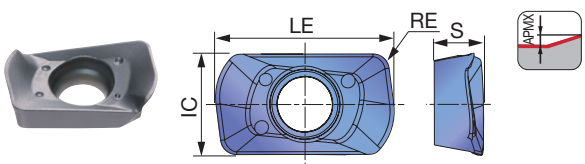


INSERT

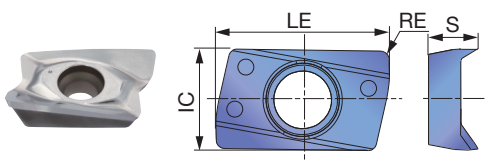
AOMT07-MJ



AOMT07-HJ (High feed insert geometry)



AOGT07-AJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	AH140	AH725	KS15F	LE	IC	S
AOMT070202PDPR-MJ	0.008	0.276	●	●		0.315	0.185	0.091
AOMT070204PDPR-MJ	0.016	0.276	●	●		0.315	0.185	0.091
AOMT070208PDPR-MJ	0.031	0.276	●	●		0.315	0.185	0.091
AOMT070216PDPR-MJ	0.063	0.276	●	●		0.315	0.185	0.091
AOMT070208PDPR-HJ	0.031	0.031	●	●		0.346	0.185	0.094
AOGT070204PDFR-AJ	0.016	0.252			●	0.319	0.185	0.091

● : Line up

Reference pages: Standard cutting conditions → H118, TungFlex → H167

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness HB	Grades	Cutting speed *Vc* (sfm)	Feed per tooth: *fz* (ipt) MJ	HJ	AJ
P	Low carbon steel 1018, 1020, 1026, etc.	< 200	AH725	300 - 660	0.002 - 0.004	0.015 - 0.035	-
	High carbon steel and alloy steel 1045, 4140, etc.	200 - 300	AH725	300 - 500	0.002 - 0.004	0.015 - 0.035	-
	Tool steel H13, etc.	150 - 300	AH725	260 - 400	0.002 - 0.004	0.015 - 0.035	-
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	-	AH140	300 - 500	0.002 - 0.004	0.015 - 0.035	-
K	Gray cast iron Class 25, Class 30, etc.	150 - 250	AH725	330 - 600	0.002 - 0.004	0.015 - 0.035	-
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 - 250	AH725	260 - 500	0.002 - 0.004	0.015 - 0.035	-
N	Aluminum alloys Si < 13%	-	KS15F	1000 - 3300	-	-	0.003 - 0.008
	Aluminum alloys Si ≥ 13%	-	KS15F	330 - 660	-	-	0.003 - 0.008
S	Titanium alloys Ti-6Al-4V, etc.	-	AH725	60 - 160	0.002 - 0.004	0.008 - 0.035	-
	Superalloys Inconel 718, etc.	-	AH725	60 - 115	0.002 - 0.003	0.008 - 0.024	-

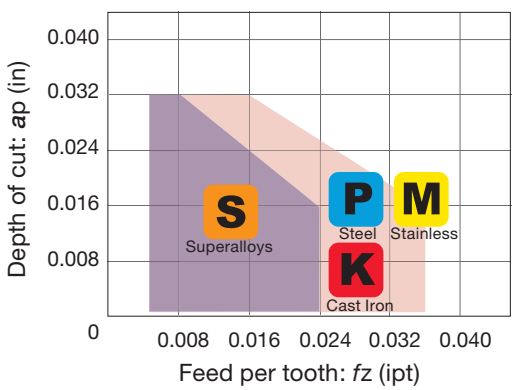
- To remove excessive chip accumulation use an air blast.
- To avoid built up edge on the cutting edges (Aluminum machining), use a water soluble coolant.
- When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
- Cutting conditions are limited by 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.

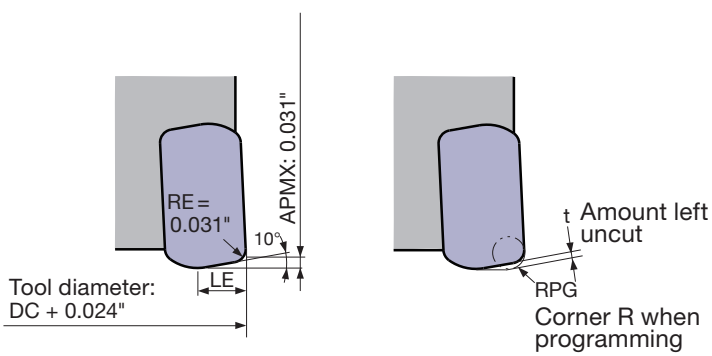
CAUTIONARY POINTS WHEN USING HJ INSERTS

HJ type inserts are designed for high feed machining.
Please note the following when using HJ inserts:

1. The shape of HJ insert differs from that of other inserts (MJ, AJ). However the same insert pocket can be used.
2. When using HJ inserts, all the inserts on the cutter body must be HJ type. Do not use other types of inserts (MJ and AJ types) with HJ inserts on the same cutter body.
3. When using CAD/CAM, please program it as a radius cutter. The table below shows the corner R when programming and the uncut area (t).
4. With HJ inserts, the tool diameter increases by 0.024" over the diameter DC shown in the table.

TungRec 07 type HJ inserts Standard conditions



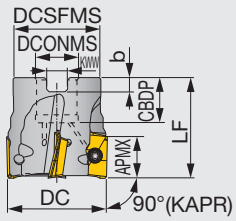


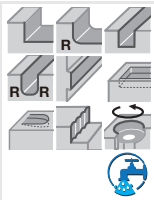
Max. depth of cut APMX (in)	Main cutting edge length LE (in)	Corner R when programming	Amount left uncut t (in)
0.031"	0.118"	R 0.020"	0.016"
		R 0.039"	0.012"

TUNGREC
TPS11

High precision square shoulder mills with ASMT/ASGT11 inserts

A.R. = +8.7°~ +18°, R.R. = –5.3°~ –19.4°





Inch	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	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...

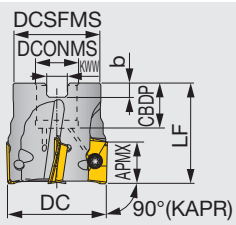
SPARE PARTS

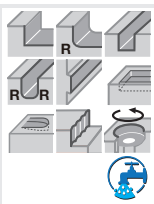
Designation	Clamping screw	Lubricant	Wrench	Shell locking bolts (Optional parts)
TPS11200RBU	CSPB-2.5	M-1000	IP-8D	(C0.375x1.125H)
TPS11300RBU	CSPB-2.5	M-1000	IP-8D	(C0.500x1.375H)
TPS11400RBU	CSPB-2.5	M-1000	IP-8D	(TMBA-0.750H)

TUNGREC
TPO11

Square shoulder mill, with screw clamp system, for double sided triangular inserts

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





Metric	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TPO11R040M16.0E06	10.6	40	6	35	16	18	40	5.6	8.4	0.21	With	AS*T11T3...
TPO11R050M22.0E07	10.6	50	7	45	22	20	40	6.3	10.4	0.35	With	AS*T11T3...
TPO11R063M22.0E08	10.6	63	8	47	22	20	45	6.3	10.4	0.59	With	AS*T11T3...
TPO11R080M25.4-10	10.6	80	10	58	25.4	26	50	6	9.5	1.07	With	AS*T11T3...
TPO11R100M31.75-11	10.6	100	11	70	31.75	32	63	8	12.7	1.95	With	AS*T11T3...
TPO11R080M27.0E10	10.6	80	10	58	27	22	50	7	12.4	1.05	With	AS*T11T3...
TPO11R100M32.0E11	10.6	100	11	70	32	25	63	8	14.4	2.01	With	AS*T11T3...

SPARE PARTS

Designation	Clamping screw	Lubricant	Shell locking bolt	Wrench
TPO11R040M16.0E06	CSPB-2.5	M-1000	CM8X30H	IP-8D
TPO11R050, 063...	CSPB-2.5	M-1000	CM10X30H	IP-8D
TPO11R080M25.4-10	CSPB-2.5	M-1000	CM12X30H	IP-8D
TPO11R100M31.75-11	CSPB-2.5	M-1000	CM16X40H	IP-8D
TPO11R080M27.0E10	CSPB-2.5	M-1000	CM12X30H	IP-8D
TPO11R100M32.0E11	CSPB-2.5	M-1000	CM16X40H	IP-8D

*Recommended clamping torque : CSPB-2.5 = 1.3 N·m

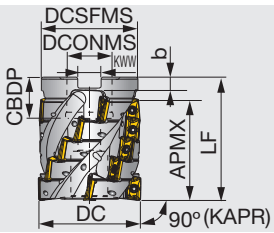
Reference pages: Inserts → H123, Standard cutting conditions → H124 - H125

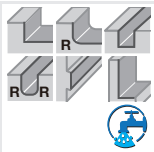
TUNGREC

TLS11

High efficiency square shoulder mill for roughing, for ASMT/ASGT11 inserts

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...

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
TLS11R200U0075A04	CSPB-2.5	M-1000	C0.375X1.125H	IP-8D

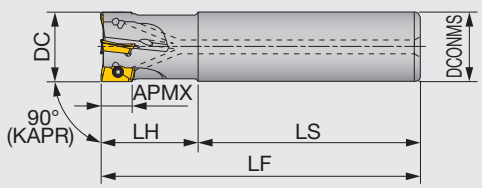
*Recommended clamping torque : CSPB-2.5 = 1.3 lb·ft

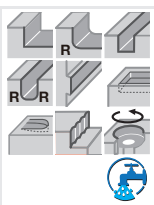
TUNGREC

EPS11

High precision square shoulder endmills with ASMT/ASGT11 inserts

A.R. = +8.7°~ +18°, R.R. = –5.3°~ –19.4°





Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

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...

SPARE PARTS

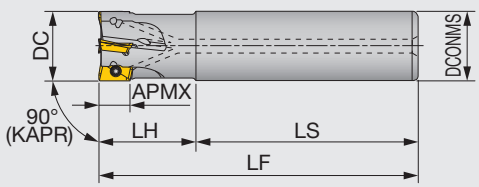
Designation	Clamping screw	Lubricant	Wrench
EPS11050RLU	CSPB-2.5	M-1000	IP-8D
EPS11050RSU	CSPB-2.5S	M-1000	IP-8D
EPS11062RLU	CSPB-2.5	M-1000	IP-8D
EPS11062RSU	CSPB-2.5S	M-1000	IP-8D
EPS11075RLU	CSPB-2.5	M-1000	IP-8D
EPS11075RSBU	CSPB-2.5S	M-1000	IP-8D
EPS11100RLU	CSPB-2.5	M-1000	IP-8D
EPS11100RSBU	CSPB-2.5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

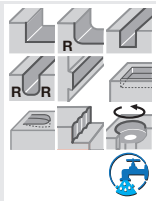
Reference pages: Inserts → H123, Standard cutting conditions → H124 - H125

EPO11

High precision square shoulder endmill, shank type, with screw clamp system, for ASMT/ASGT11 inserts

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





Metric	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EPO11R012 - 022...	CSPB-2.5S	M-1000	IP-8D
EPO11R025 - 050...	CSPB-2.5	M-1000	IP-8D

*Recommended clamping torque：CSPB-2.5/CSPB-2.5S = 1.3 N·m

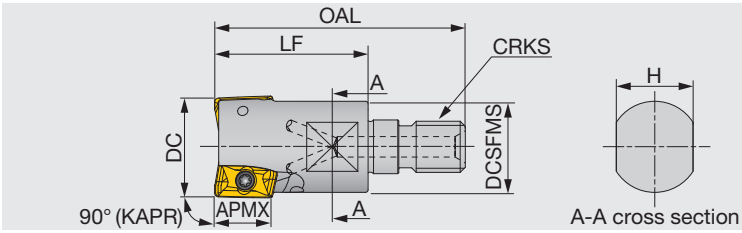
Reference pages: Inserts → H123, Standard cutting conditions → H124 - H125

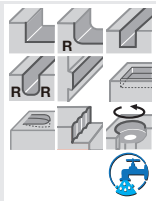
TUNGREC

HPO11-M

High precision square shoulder endmill, modular type, for ASMT/ASGT11 inserts (TungFlex)

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





Metric	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPO11R020MM10-02	10.6	20	2	49	30	15	17.8	M10	0.06	With	AS*T11T3...
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
HPO11R020MM10-02	CSPB-2.5S	M-1000	IP-8D
HPO11R025, 032...	CSPB-2.5	M-1000	IP-8D

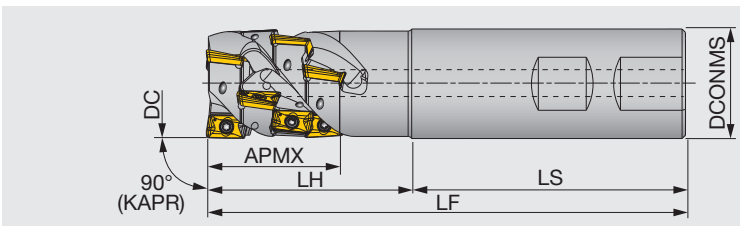
*Recommended clamping torque：CSPB-2.5/CSPB-2.5S = 1.3 N·m

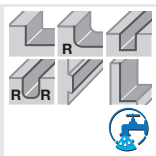
TUNGREC

ELS11

High efficiency roughing endmill, shank type, for ASMT/ASGT11 inserts

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...

SPARE PARTS

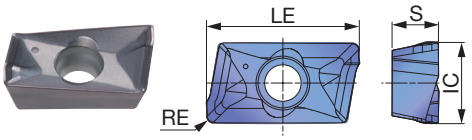
Designation	Clamping screw	Lubricant	Wrench
ELS11...	CSPB-2.5	M-1000	IP-8D

*Recommended clamping torque : CSPB-2.5 = 1.3 lbs·ft

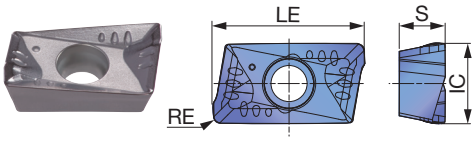
Reference pages: Inserts → H123, Standard cutting conditions → H124 - H125, Tung Flex → H167

INSERT

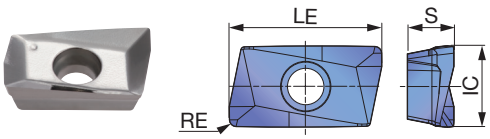
ASMT11-MJ



ASMT11-MS



ASGT11-AJ



		AH120	AH130	AH140	AH725	T1115	T1215	T3130	DS1100	NS740	KS05F
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	LE	IC	S
			AH120	AH130	AH140	AH725	T1115	T1215	T3130	DS1100	NS740	KS05F			
ASMT11T304PDPR-MJ	0.016	0.417	●	●		●	●		●		●		0.457	0.264	0.146
ASMT11T308PDPR-MJ	0.031	0.417	●	●	●	●	●	●	●		●		0.457	0.264	0.146
ASMT11T312PDPR-MJ	0.047	0.417	●			●			●		●		0.457	0.264	0.146
ASMT11T316PDPR-MJ	0.063	0.417	●			●			●		●		0.457	0.264	0.146
ASMT11T320PDPR-MJ	0.079	0.417	●										0.457	0.264	0.146
ASMT11T330PDPR-MJ	0.118	0.417	●	●									0.457	0.264	0.146
ASMT11T304PDPR-MS	0.016	0.417		●	●								0.457	0.264	0.146
ASGT11T304PDFR-AJ	0.016	0.417								●		●	0.457	0.264	0.146
ASGT11T308PDFR-AJ	0.031	0.417								●		●	0.457	0.264	0.146

● : Line up

STANDARD CUTTING CONDITIONS

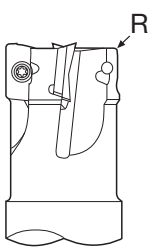
TPO11/EPO11/HPO11 type

ISO	Workpiece material	Brinell hardness HB	Priority	Grade	Cutting speed: *Vc* (sfm)	Feed per tooth: *fz* (ipt) MJ	MS	AJ
P	Low carbon steel 1018, 1020, 1026, etc.	~ 200	First choice	AH725	330 - 820	0.004 - 0.008	-	-
		~ 200	Wear resistance	T3130	330 - 820	0.004 - 0.008	-	-
		~ 200	Surface quality	NS740	330 - 820	0.002 - 0.006	-	-
	High carbon steel and alloy steel 1045, 4140, etc.	200 ~ 300	First choice	AH725	330 - 660	0.004 - 0.008	-	-
		200 ~ 300	Wear resistance	T3130	330 - 660	0.004 - 0.008	-	-
		200 ~ 300	Surface quality	NS740	330 - 660	0.002 - 0.005	-	-
	Tool steel H13, etc.	150 ~ 300	First choice	AH725	330 - 500	0.003 - 0.006	-	-
		150 ~ 300	Wear resistance	T3130	330 - 500	0.003 - 0.006	-	-
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	-	-	AH130	260 - 660	-	0.003 - 0.008	-
K	Gray cast iron Class 25, Class 30, etc.	150 ~ 250	First choice	AH120	330 - 820	0.005 - 0.01	-	-
		150 ~ 250	Wear resistance	T1215 T1115	330 - 820	0.005 - 0.01	-	-
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 ~ 250	First choice	AH120	260 - 660	0.005 - 0.01	-	-
		150 ~ 250	Wear resistance	T1215 T1115	260 - 660	0.005 - 0.01	-	-
N	Aluminum alloys Si < 13%	-	-	DS1100	1000 - 3300	-	-	0.002 - 0.008
	Aluminum alloys Si ≥ 13%	-	-	DS1100	330 - 660	-	-	0.002 - 0.008
	Copper alloys	-	-	KS05F	660 - 1650	-	-	0.002 - 0.008
S	Titanium alloys Ti-6Al-4V, etc.	-	-	AH130	60 - 200	-	0.003 - 0.006	-
	Superalloys Inconel 718, etc.	-	-	AH725	60 - 130	0.003 - 0.005	-	-

CAUTIONARY POINT IN MODIFYING CUTTER BODIES

When using inserts with corner radius RE ≥ 0.079" (2 mm), standard cutter bodies have to be modified "R". (Only for TPO11, EPO11, TLS11, ELS11, HPO11)

About roughing type TLS11, ELS11
From 2nd row onwards, please use insert with RE = 0.016" or 0.031"



Corner radius RE (in)	The dimension of modifying (in)
0.016 - 0.063	Unnecessary
0.079 - 0.118	0.080

STANDARD CUTTING CONDITIONS

Roughing type TLS11 / ELS11

ISO	Workpiece material	Brinell hardness HB	Priority	Grade	Cutting speed: *Vc* (sfm)	Feed per tooth: *fz* (ipt) MJ	MS	AJ
P	Low carbon steel 1018, 1020, 1026, etc.	~ 200	First choice	AH725	330 - 820	0.002 - 0.007	-	-
		~ 200	Wear resistance	T3130	330 - 820	0.002 - 0.007	-	-
	High carbon steel and alloy steel 1045, 4140, etc.	200 ~ 300	First choice	AH725	330 - 660	0.003 - 0.006	-	-
		200 ~ 300	Wear resistance	T3130	330 - 660	0.003 - 0.006	-	-
	Tool steel H13, etc.	150 ~ 300	First choice	AH725	330 - 500	0.003 - 0.006	-	-
		150 ~ 300	Wear resistance	T3130	330 - 500	0.003 - 0.006	-	-
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	-	-	AH130	330 - 500	-	0.003 - 0.006	-
K	Gray cast iron Class 25, Class 30, etc.	150 ~ 250	First choice	AH120	330 - 800	0.004 - 0.007	-	-
		150 ~ 250	Wear resistance	T1215 T1115	330 - 800	0.004 - 0.007	-	-
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 ~ 250	First choice	AH120	260 - 650	0.004 - 0.007	-	-
		150 ~ 250	Wear resistance	T1215 T1115	260 - 650	0.004 - 0.007	-	-
N	Aluminum alloys Si < 13%	-	-	DS1100	650 - 1650	-	-	0.002 - 0.007
	Aluminum alloys Si ≥ 13%	-	-	DS1100	330 - 650	-	-	0.002 - 0.007
S	Titanium alloys Ti-6Al-4V, etc.	-	-	AH130	60 - 200	0.003 - 0.006	-	-
	Superalloys Inconel718, etc.	-	-	AH725	60 - 130	0.003 - 0.005	-	-

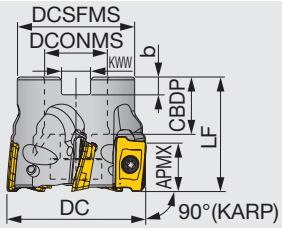
· To remove excessive chip accumulation use an air blast.
· To avoid built up edge on the cutting edges (Aluminum machining), use a water soluble coolant.
· When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by 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.

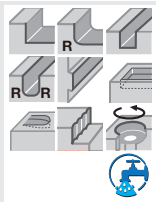
TUNGREC

TPO18

High precision square shoulder mill, with screw clamp system, for AOMT/AOGT18 inserts

GAMP = +14° ~ +17°, GAMF = +22° ~ +31°





Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
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

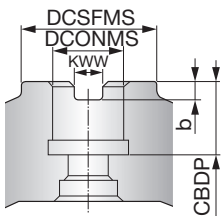
SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Shell locking bolt (Optional parts)
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	-

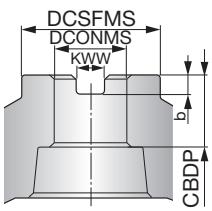
*Recommended clamping torque :
CSTB-4L093 = 2.58 lbs·ft, CSTB-4L120 = 2.58 lbs·ft

Arbor type

Arbor type A



Arbor type B

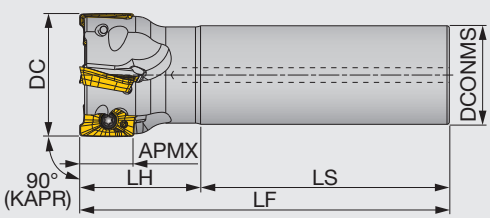


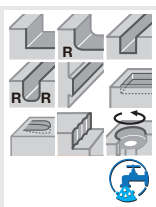
TUNGREC

EPO18

High precision square shoulder endmill, shank type, with screw clamp system, for AOMT/AOGT18 inserts

GAMP = +14° ~ +17°, GAMF = +22° ~ +31°





Inch	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(lb)	Air hole	Insert
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...

*The DC above is the diameter when using MJ chipbreaker. With AJ chipbreaker, the tool diameter is (DC above + 0.008").

SPARE PARTS

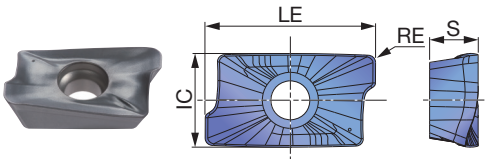
Designation	Clamping screw	Wrench
EPO18R100U...	CSTB-4L085	T-15DB
EPO18R125U..., -200U	CSTB-4L093	T-15DB

*Recommended clamping torque : CSTB-4L093 = 2.58 lbs·ft, CSTB-4L120 = 2.58 lbs·ft

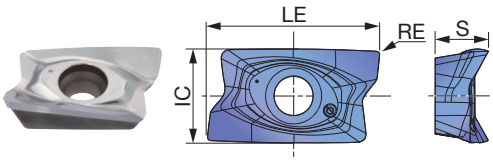
Reference pages: Inserts, Standard cutting conditions → H127

INSERT

AOMT18-MJ



AOGT18-AJ



		AH140	AH725	KS15F
P	Steel		★	
M	Stainless	★	☆	
K	Cast iron		★	
N	Non-ferrous			★
S	Superalloys		★	
H	Hard materials			

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated AH140	Coated AH725	Uncoated KS15F	LE	IC	S
AOMT180508PDPR-MJ	0.031	0.657	●	●		0.768	0.421	0.220
AOMT180516PDPR-MJ	0.063	0.657	●	●		0.768	0.421	0.220
AOMT180524PDPR-MJ	0.094	0.657	●	●		0.768	0.421	0.220
AOMT180532PDPR-MJ	0.126	0.657	●	●		0.768	0.421	0.220
AOGT180504PDFR-AJ	0.016	0.657			●	0.780	0.425	0.240
AOGT180508PDFR-AJ	0.031	0.657			●	0.780	0.425	0.240

● : Line up

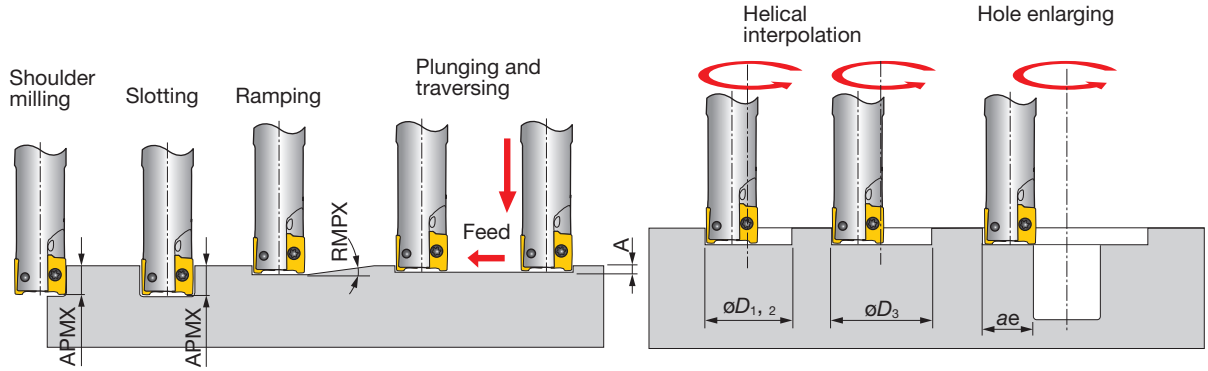
STANDARD CUTTING CONDITIONS

TPO18/EPO18 type

ISO	Workpiece material	Brinell hardness HB	Priority	Cutting speed: *Vc* (sfm)	Feed per tooth: *fz* (ipt) MJ	Feed per tooth: *fz* (ipt) AJ
P	Low carbon steel 1018, 1020, 1026, etc.	~ 200	AH725	330 - 820	0.003 - 0.010	-
	High carbon steel and alloy steel 1045, 4140, etc.	200 ~ 300	AH725	330 - 750	0.003 - 0.008	-
	Tool steel H13, etc.	150 ~ 300	AH725	330 - 600	0.003 - 0.008	-
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	-	AH140	330 - 660	0.003 - 0.008	-
K	Gray cast iron Class 25, Class 30, etc.	150 ~ 250	AH725	330 - 820	0.003 - 0.010	-
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 ~ 250	AH725	260 - 660	0.003 - 0.010	-
N	Aluminum alloys Si < 13%	-	KS15F	1000 - 3300	-	0.002 - 0.010
	Aluminum alloys Si ≥ 13%	-	KS15F	330 - 660	-	0.002 - 0.010
S	Titanium alloys Ti-6Al-4V, etc.	-	AH725	60 - 200	0.003 - 0.007	-
	Superalloys Inconel718, etc.	-	AH725	60 - 130	0.003 - 0.006	-

- To remove excessive chip accumulation use an air blast.
- To avoid built up edge on the cutting edges (Aluminum machining), use a water soluble coolant.
- When cutting an interrupted surface or a casted skin, the feed per tooth (fz) should be reduced to the lower recommended value shown in the above table.
- Cutting conditions are limited by 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.

APPLICATION RANGE



Inch	Tool dia. DC	Chipbreaker	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Min. machining øD1	Max. machining øD2	Max. machining øD3*	Max. cutting width in enlarging ae
EPO07R050U0050-02	0.500	MJ, AJ	0.276	7.5	0.020	0.750	0.862	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	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	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	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	0.882	0.480
EPS11062...	0.625	MJ, MS, AJ	0.417	5	0.020	0.790	1.332	1.332	0.610
EPS11075...	0.750	MJ, MS, AJ	0.417	3	0.020	1.100	1.382	1.382	0.730
EPS11100...	1.000	MJ, MS, AJ	0.417	2	0.020	1.500	1.882	1.882	0.980
EPS11125...	1.250	MJ, MS, AJ	0.417	1.5	0.020	2.050	2.382	2.382	1.230
EPO18R100U…	1.000	MJ, AJ	0.657	5.5	0.039	1.272	1.764	1.764	0.961
EPO18R125U…	1.250	MJ, AJ	0.657	3.5	0.039	1.772	2.264	2.264	1.211
EPO18R150U…	1.500	MJ, AJ	0.657	2.7	0.039	2.272	2.764	2.764	1.461
T/EPO18R200U…	2.000	MJ, AJ	0.657	1.9	0.039	3.272	3.764	3.764	1.961

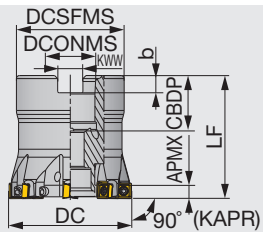
Inch	Tool dia. DC	Chipbreaker	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Min. machining øD1	Max. machining øD2	Max. machining øD3*	Max. cutting width in enlarging ae
TPO07R200U0075A12	2.000	MJ, AJ	0.276	0.9	0.020	3.000	3.960	3.862	1.980
	2.024	HJ	0.031	0.6	0.030	3.036	4.008	-	1.906
TPS11200RBU	2.000	MJ, MS, AJ	0.417	0.7	0.020	3.460	3.900	3.882	1.950
TPS11300RBU	3.000	MJ, MS, AJ	0.417	0.4	0.020	5.830	6.260	5.882	3.130
TPS11400RBU	4.000	MJ, MS, AJ	0.417	0.3	0.020	7.400	7.830	7.882	3.920
TPO18R250U0075A06	2.500	MJ, AJ	0.657	1.4	0.039	4.272	4.921	4.764	2.461
TPO18R300U0100A07	3.000	MJ, AJ	0.657	1.1	0.039	5.272	5.921	5.764	2.961
TPO18R400U0150A08	4.000	MJ, AJ	0.657	0.8	0.039	7.272	7.921	7.764	3.961
TPO18R500U0150A09	5.000	MJ, AJ	0.657	0.6	0.039	9.272	9.921	9.764	4.961
TPO18R600U0200A10	6.000	MJ, AJ	0.657	0.5	0.039	11.272	11.921	11.764	5.961

*Flat bottom hole
Corner RE for dimensions of $øD_1$, $øD_2$, and $øD_3$: RE = 0.016" for EPO07 / EPO11 and RE = 0.031" for EPO18.

TUNGQUAD
TPD05

High density square shoulder mill, with screw clamp system, for SDMT/SDHT05 inserts

GAMP = +5°, GAMF = -7° ~ +12°



Right hand (R) shown.

Inch	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	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...

SPARE PARTS

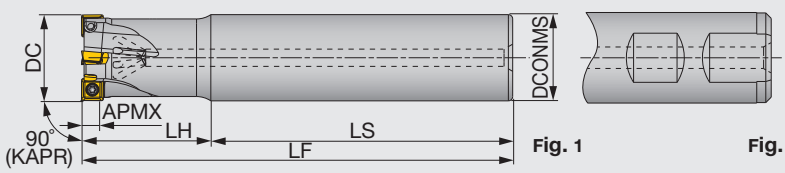
Designation	Clamping screw	Wrench	Shell locking bolt (Optional parts)
TPD05...	CSPB-2L043	IP-6DB	(C0.375X1.125H)

*Recommended clamping torque : CSPB-2L043 = 0.52 lbs·ft

TUNGQUAD
EPD05

High density square shoulder endmill, shank type, with screw clamp system, for SDMT/SDHT05 inserts

GAMP = +5°, GAMF = -7° ~ +12°



Right hand (R) shown.

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

SPARE PARTS

Designation	Clamping screw	Wrench
EPD05...	CSPB-2L043	IP-6DB

*Recommended clamping torque : CSPB-2L043 = 0.52 lbs·ft

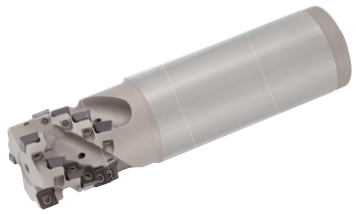
Reference pages: Inserts → H130, Standard cutting conditions → H131

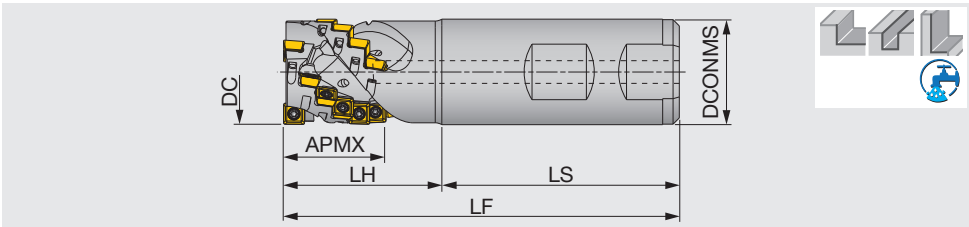
TUNGQUAD

ELD05

High density square shoulder endmill for roughing, shank type, with screw clamp system, for SDMT/SDHT05 inserts

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...

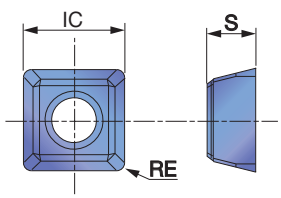
SPARE PARTS

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

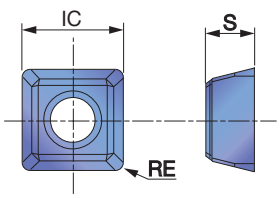
*Recommended clamping torque : CSPB-2L043 = 0.52 lbs･ft

INSERT

SDMT05-MJ



SDHT05-AJ



		AH140	AH725	TH10
P	Steel		★	
M	Stainless	★	☆	
K	Cast iron		★	
N	Non-ferrous			★
S	Superalloys		★	
H	Hard materials			

★ : First choice
☆ : Second choice

Designation	RE	APMX	AH140	AH725	TH10	S	IC
SDMT050204PN-MJ	0.016	0.157	●	●		0.094	0.200
SDHT050204FN-AJ	0.016	0.157			●	0.094	0.200

● : Line up

Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

Reference pages: Inserts → H130, Standard cutting conditions → H131

STANDARD CUTTING CONDITIONS

Bore, shank type TPD05/EPD05

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	750 - 1050	0.0015 - 0.004
	High carbon steel 1045, 1055, etc.	200 ~ 300	AH725	500 - 750	0.0015 - 0.004
	Alloyed steel 4140, 8620, etc.	150 ~ 300	AH725	500 - 750	0.0015 - 0.004
	Tool steel W1-8, etc.	~ 300	AH725	350 - 440	0.001 - 0.0035
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	-	AH140	330 - 650	0.001 - 0.0035
K	Gray cast iron Class 25, Class 30, etc.	150 ~ 250	AH725	500 - 820	0.002 - 0.005
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 ~ 250	AH725	330 - 590	0.002 - 0.005
N	Aluminum alloys Si < 13%	-	TH10	1150 - 1600	0.002 - 0.006
	Aluminum alloys Si ≥ 13%	-	TH10	330 - 650	0.002 - 0.006

* For deep and wide cutting, set the *Vc* and *fz* to the lower recommended limits and check the vibration and spindle load of the machine.

Roughing type ELD05

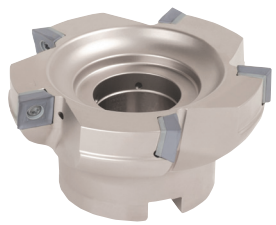
ISO	Workpiece material	Brinell hardness HB	Grade	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1018, 1020, 1026, etc.	~ 200	AH725	330 - 820	0.0015 - 0.004
	High carbon steel 1045, 1055, etc.	200 ~ 300	AH725	330 - 660	0.0015 - 0.004
	Alloyed steel 4140, 8620, etc.	150 ~ 300	AH725	330 - 660	0.0015 - 0.004
	Tool steel W1-8, etc.	~ 300	AH725	330 - 400	0.0012 - 0.0035
M	Stainless steel 304SS, 316SS, 17-4 PH, etc.	-	AH140	300 - 500	0.0012 - 0.0035
K	Gray cast iron Class 25, Class 30, etc.	150 ~ 250	AH725	330 - 820	0.002 - 0.005
	Ductile cast iron 60-40-18, 60-55-06, etc.	150 ~ 250	AH725	260 - 660	0.002 - 0.005
N	Aluminum alloys Si < 13%	-	TH10	660 - 1650	0.002 - 0.006
	Aluminum alloys Si ≥ 13%	-	TH10	330 - 650	0.002 - 0.006

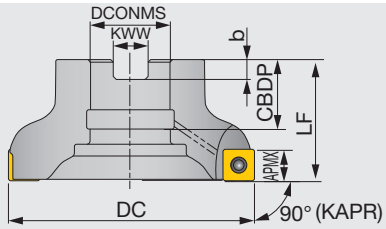
TUNGMILL

TPW13

Square shoulder mill, with screw clamp system, for SWMT/SWGT13 inserts

GAMP = +11.5°, GAMF = -13° ~ -10.5°





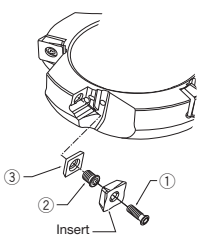
Right hand (R) shown.

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

SPARE PARTS

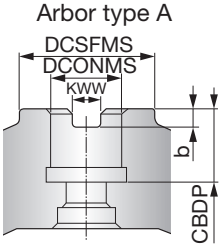
Designation	①Clamping screw	Lubricant	②Shim screw	Shell locking bolt	③Shim	Wrench for ①	Wrench for ②
TPW13R200...	CSPB-3.5	M-1000	DTS5-3.5SS	C0.375X1.125H	FSSP1102	IP-15D	P-3.5
TPW13R300...	CSPB-3.5	M-1000	DTS5-3.5SS	C0.500X1.375H	FSSP1102	IP-15D	P-3.5
TPW13R400..., 500...	CSPB-3.5	M-1000	DTS5-3.5SS	TMBA-0.750H	FSSP1102	IP-15D	P-3.5
TPW13R600...	CSPB-3.5	M-1000	DTS5-3.5SS	-	FSSP1102	IP-15D	P-3.5

*Recommended clamping torque : CSPB-3.5 = 2.58 lbs·ft

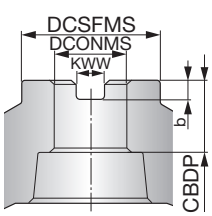


Arbor type

Arbor type A



Arbor type B

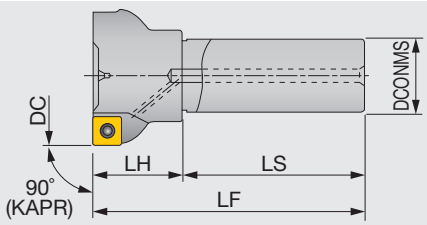


Reference pages: Inserts → H134, Standard cutting conditions → H135

EPW13

Square shoulder endmill, shank type, with screw clamp system, for SWMT/SWGT13 inserts

GAMP = +11.5°, GAMF = -13° ~ -10.5°



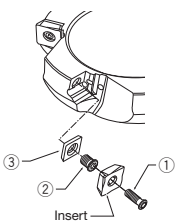
Right hand (R) shown.

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	①Clamping screw	Lubricant	②Shim screw	③Shim	Wrench for ①	Wrench for ②
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

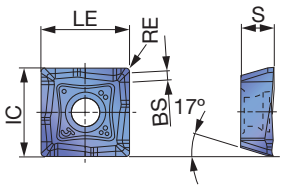
*Recommended clamping torque：CSPB-3.5 = 3.5 N·m



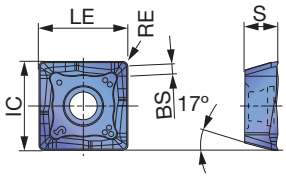
Reference pages: Inserts → H134, Standard cutting conditions → H135

INSERT

SWGT1304-MJ



SWMT1304-MJ



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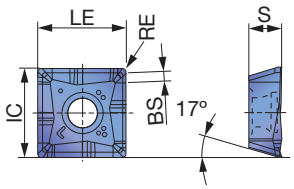
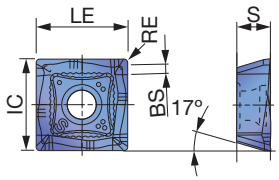
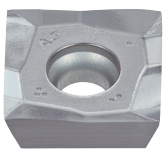
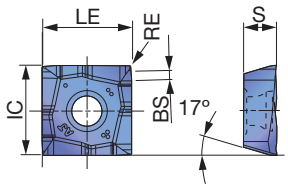


SWMT1304-MS



SWGT1304-AJ





		AH120	AH130	AH140	AH3135	T1115	T1215	T3130	T3225	DS1100	NS740	KS05F
P	Steel	☆			★			☆	☆		★	
M	Stainless		★	☆	★				☆			
K	Cast iron	★				☆	★					
N	Non-ferrous									★		★
S	Superalloys	★	☆									
H	Hard materials											

★ : First choice
☆ : Second choice

Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

Designation	RE	APMX	Coated									Cermet	Uncoated	LE	IC	S	BS
			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	-	0.394	●	●							●		●	0.535	0.535	0.197	0.063

● : Line up

STANDARD CUTTING CONDITIONS TPW / EPW13 type

ISO	Workpiece material	Grade	Cutting speed *Vc* (sfm)	Roughing (Depth of cut: APMX ≥ 0.040") Feed per tooth: *fz* (ip)				Light cutting to finishing (Depth of cut: APMX ≥ 0.040") Feed per tooth: *fz* (ip)			
				MJ	ML	MS	AJ	MJ	ML	MS	AJ
P	Mild steels Low carbon steels < 180HB	AH3135 (First choice)	330 - 890	0.002 - 0.010	0.002 - 0.008	-	-	0.002 - 0.008	0.002 - 0.007	-	-
		T3225 (Wear resistance)	500 - 980	0.002 - 0.010	-	-	-	0.002 - 0.008	-	-	-
		AH130 (Fracture resistance)	260 - 590	0.002 - 0.010	-	0.002 - 0.008	-	0.002 - 0.008	-	0.002 - 0.007	-
		NS740 (Surface finish)	330 - 980	0.002 - 0.006	-	-	-	0.002 - 0.005	-	-	-
	Carbon steels Alloy steels < 300HB	AH3135 (First choice)	330 - 760	0.002 - 0.008	0.002 - 0.006	-	-	0.002 - 0.007	0.002 - 0.005	-	-
		T3225 (Wear resistance)	490 - 920	0.002 - 0.008	-	-	-	0.002 - 0.007	-	-	-
		AH130 (Fracture resistance)	260 - 490	0.002 - 0.008	-	-	-	0.002 - 0.007	-	-	-
		NS740 (Surface finish)	330 - 760	0.002 - 0.006	-	-	-	0.002 - 0.005	-	-	-
	Die steels < 30HRC	AH3135 (First choice)	330 - 590	0.002 - 0.006	0.002 - 0.005	-	-	0.002 - 0.005	0.002 - 0.004	-	-
		T3225 (Wear resistance)	330 - 590	0.002 - 0.006	-	-	-	0.002 - 0.005	-	-	-
M	Stainless steels < 50HB	AH130 / AH3135 (First choice)	260 - 650	0.002 - 0.008	-	0.002 - 0.007	-	0.002 - 0.007	-	0.002 - 0.006	-
		AH120 (Wear resistance)	490 - 820	0.002 - 0.008	0.002 - 0.006	-	-	0.002 - 0.007	0.002 - 0.005	-	-
K	Gray cast irons Ductile cast irons	T1215 (First choice)	330 - 820	0.002 - 0.008	-	-	-	0.002 - 0.007	-	-	-
		AH120 (Fracture resistance)	330 - 820	0.002 - 0.008	0.002 - 0.006	-	-	0.002 - 0.007	0.002 - 0.005	-	-
N	Aluminum alloys Si < 13 %	DS1100 / KS05F (First choice)	980 - 3300	-	-	-	0.002 - 0.008	-	-	-	0.002 - 0.008
	Aluminum alloys Si ≥ 13 %	DS1100 / KS05F (First choice)	260 - 980	-	-	-	0.002 - 0.008	-	-	-	0.002 - 0.008
	Copper alloys	DS1100 / KS05F (First choice)	660 - 1650	-	-	-	0.002 - 0.008	-	-	-	0.002 - 0.008

- When machining at large depth of cut or large cutting width, *Vc* and *fz* should be reduced.
- As a rule, dry machining (including air blow) is recommended. But, for excessive chip welding, such as when machining stainless steels, use a water soluble cutting fluid. In this case, use AH140 and set the cutting speed to *Vc* ≤ 328 sfm.
- When machining mild steel, carbon steel or alloy steel in wet conditions the T3130 is recommended. In this case, *Vc* and *fz* should be reduced.
- TPW13 type can not be used for ramping, plunging and drilling.

Cautionary notes in use

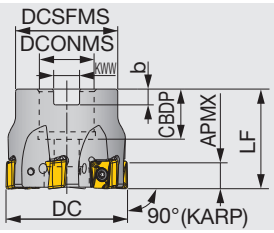
- In slotting or pocketing, when chips are likely to remain in the cutting zone, internal air supplying or air blow is recommended to prevent chip recutting.
- Use of inserts other than those specified, can result in poor cutting and cause damage to the cutter body. Therefore, specified inserts from the Tungaloy catalog 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.

DOREC

TPQ11,18

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

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

SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Shell locking bolt (Optional parts)
TPQ11R200..., TPQ11R250..., TPQ18R200..., TPQ18R250...	CSTB-3.5L115	SW6-SD	BLDT10/S7	(C0.375X1.125H)
TPQ11R300..., TPQ18R300...	CSTB-3.5L115	SW6-SD	BLDT10/S7	(C0.500X1.375H)
TPQ11R400..., TPQ18R400..., TPQ18R500...,	CSTB-3.5L115	SW6-SD	BLDT10/S7	(TMBA-0.750H)
TPQ18R600U0200A09	CSTB-3.5L115	SW6-SD	BLDT10/S7	-

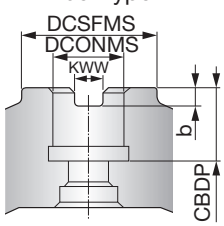
*Recommended clamping torque : CSTB-3.5L115 = 1.84 lbs·ft, SR14-591 = 3.69 lbs·ft

Approach angle

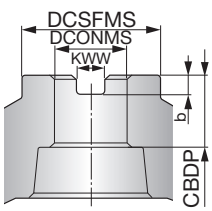
10°-20° 45° 70° 85° 88° 90° Others

Arbor type

Arbor type A



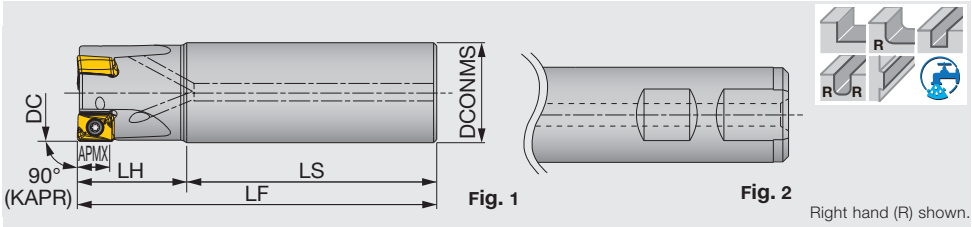
Arbor type B



Reference pages: Inserts → H137, Standard cutting conditions → H138

Square shoulder endmill, shank type, with screw clamp system, for LQMU inserts

GAMP = +4° ~ +5°, GAMF = +13° ~ +15°



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

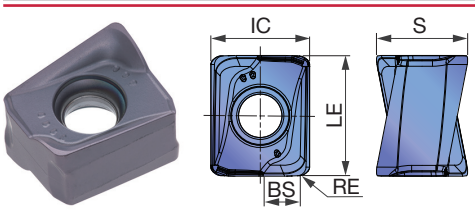
SPARE PARTS

Designation	Clamping screw	Grip 1	Grip 2	Torx bit	Wrench
EPQ11...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	T-10D

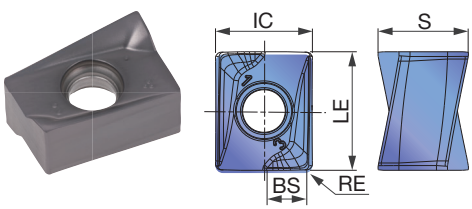
*Recommended clamping torque : CSTB-3.5L115 = 1.84 lbs·ft

INSERT

LQMU11-PXER-MJ (Suitable for ramping)



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 AH120	AH140	AH725	AH3135	LE	S	IC	BS
LQMU110704PNER-MJ	0.016	0.354	●	●	●		0.433	0.327	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	0.327	0.354	0.012
LQMU110720PNER-MJ	0.079	0.354	●				0.433	0.327	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	0.429	0.453	-

● : Line up

Reference pages: Standard cutting conditions → H138

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.		-	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.		-	AH120	95 - 195	0.0032 - 0.008*
	Superalloys Inconel 718, etc.		-	AH120	65 - 160	0.0024 - 0.004*
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	40 - 50HRC	AH120	145 - 225	0.004 - 0.006*
		SKD11, etc. X153CrMoV12, etc.	50 - 60HRC	AH120	130 - 210	0.0024 - 0.004*

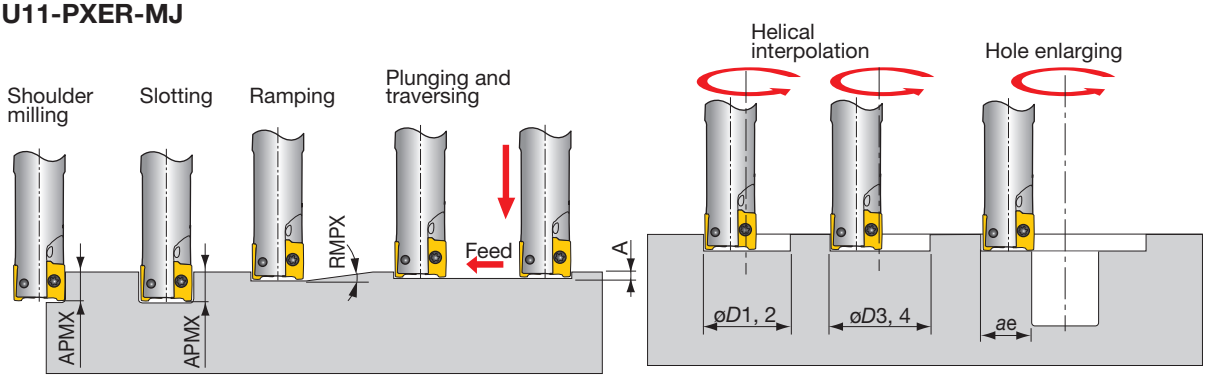
LQMU11/18-PNER-MJ

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

* When using LQMU11 inserts, see page **H139** 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



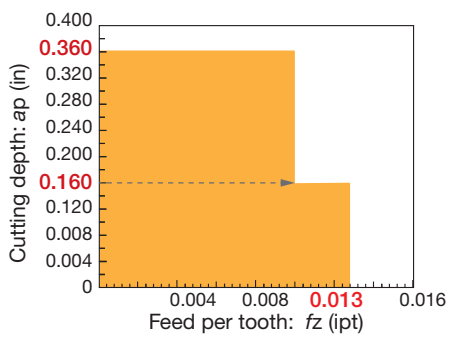
Inch	DC	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging A	Min. machining øD1	Max. machining øD2*	øD3	øD4*	RE	Max. cutting width in enlarging ae
EPQ11R100…	1.00	0.354	1.8°	0.023	1.41	1.87	1.96	1.94	0.031	0.96
EPQ11R125…	1.25	0.354	1.3°	0.023	1.91	2.37	2.46	2.44	0.031	1.21
TPQ11R150…	1.50	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

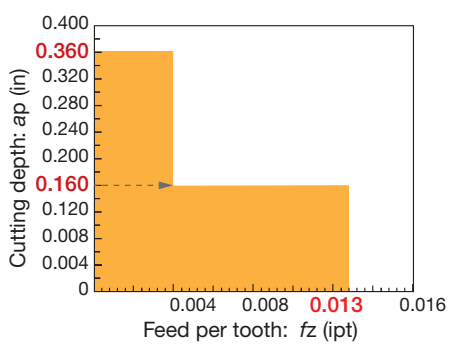
Maximum feed rate per tooth varies depending on the cutting depth and width.
Use proper feed rate as described below.
Use caution. Tool may damage if the parameters are not properly set.

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	: *Vc* = 660 sfm
Cutting width	: *ae* = 0.200"
Coolant	: Dry
Machine	: Vertical M/C, 22 HP

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



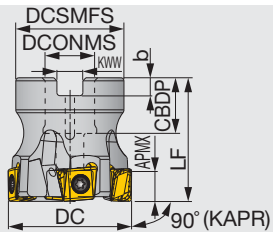
Cutter	: TPQ11R200U0075A06 (DC = 2.000", z = 6)
Insert	: LQMU110708PXER-MJ
Grade	: AH3125
Workpiece material	: 1055 (200HB)
Cutting Speed	: *Vc* = 660 sfm
Cutting width	: *ae* = 1.673"
Coolant	: Dry
Machine	: Vertical M/C, 22 HP

TECMILL

TPM11,16

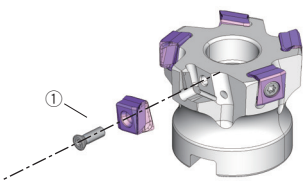
Square shoulder mill, with screw clamp system, for LMMU tangential clamp inserts

GAMP = +5° ~ +6°, GAMF = +9° ~ +13°



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
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
TPM16R300U0100A05	0.594	3.000	5	2.165	1.970	1.000	0.750	0.374	0.236	2.200	With	LMMU1107...	A
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



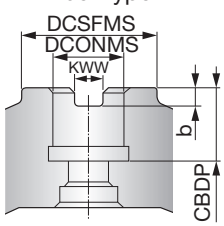
SPARE PARTS

Designation	①Clamping screw	Wrench	Torx bit	Shell locking bolt (Optional parts)
TPM11R200..., 250...	SM35-114-H0	T-15DF	-	(C0.375X1.125H)
TPM11R300...	SM35-114-H0	T-15DF	-	(C0.500X1.375H)
TPM11R400...	SM35-114-H0	T-15DF	-	(TMBA-0.750H)
TPM16R300...	CSTB-5L159	-	BT20S	(C0.500X1.375H)
TPM16R400..., 500...	CSTB-5L159	-	BT20S	(TMBA-0.750H)

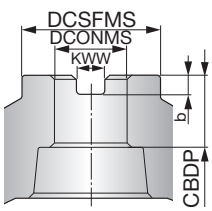
*Recommended clamping torque : CSTB-3.5L110 = 2.58 lbs·ft, CSTB-5L159 = 3.69 lbs·ft, SM35-114-H0 = 2.58 lbs·ft

Arbor type

Arbor type A



Arbor type B

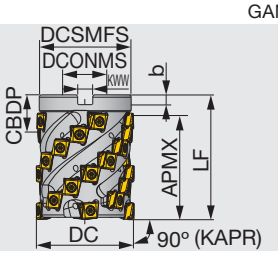


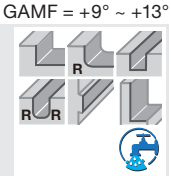
TECMILL

TLM11

Square shoulder mill for roughing, with screw clamp system, for LMMU tangential clamp inserts

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...

SPARE PARTS

Designation	Clamping screw	Wrench	Torx bit	Shell locking bolt
TLM11R200...	SM35-114-H0	T-15DF	BT15S	SD06-A2
TLM11R250...	SM35-114-H0	T-15DF	BT15S	SD08-52

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

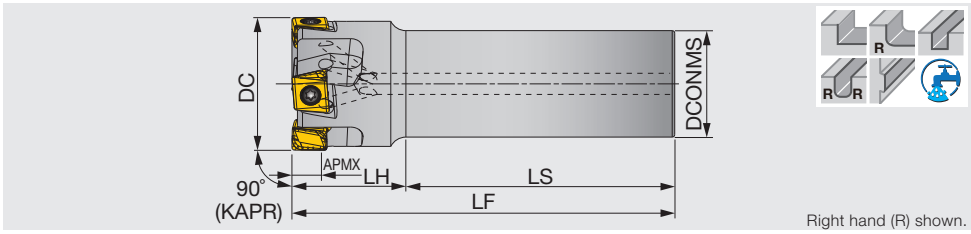
*Recommended clamping torque : SM35-114-H0 = 2.58 lbs·ft

Reference pages: Inserts → H141, Standard cutting conditions → H142

EPM11

Square shoulder endmill, shank type, with screw clamp system, for LMMU tangential clamp inserts

GAMP = +5° ~ +6°, GAMF = +9° ~ +13°



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

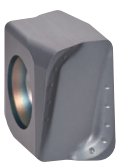
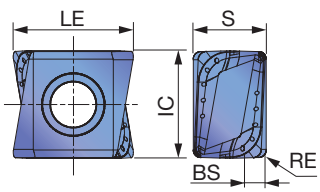
SPARE PARTS

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

*Recommended clamping torque : SM35-114-H0 = 2.58 lbs･ft

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 AH3135	AH725	AH120	AH140	T1215	T3225	LE	IC	S	BS
LMMU110708PNER-MJ	0.031	0.381	●	●	●	●	●	●	0.460	0.413	0.280	0.079
LMMU110716PNER-MJ	0.063	0.381	●	●	●	●	●	●	0.453	0.413	0.280	0.047
LMMU110724PNER-MJ	0.094	0.381		●	●	●			0.445	0.413	0.280	0.014
LMMU110732PNER-MJ	0.126	0.381		●	●	●			0.437	0.413	0.280	-
LMMU160908PNER-MJ	0.031	0.594	●	●	●	●	●	●	0.681	0.630	0.375	0.094
LMMU160916PNER-MJ	0.063	0.594	●	●	●	●			0.673	0.630	0.375	0.063
LMMU160924PNER-MJ	0.094	0.594		●	●	●			0.665	0.630	0.375	0.031
LMMU160932PNER-MJ	0.126	0.594		●	●	●			0.661	0.630	0.375	-

● : Line up

Reference pages: Standard cutting conditions → H142

STANDARD CUTTING CONDITIONS

Bore, shank type EPM / TPM

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	0.005 - 0.012
			- 200 HB	Wear resistance	T3225	492 - 1148	0.003 - 0.008
	Carbon steel and alloy steel 1055, 4140 etc.		- 300 HB	First choice	AH3135	328 - 755	0.004 - 0.010
			- 300 HB	Wear resistance	T3225	492 - 1148	0.003 - 0.008
	Prehardend steel NAK80, PX5, etc.		30 - 40 HRC	First choice	AH3135	328 - 755	0.004 - 0.010
			30 - 40 HRC	Wear resistance	T3225	394 - 1148	0.003 - 0.008
M	Stainless steel S30400, etc.		-	First choice	AH3135	295 - 591	0.004 - 0.010
K	Gray cast iron No.250B, etc.		150 - 250 HB	First choice	AH120	459 - 820	0.005 - 0.012
			150 - 250 HB	Wear resistance	T1215	394 - 1148	0.003 - 0.008
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250 HB	First choice	AH120	361 - 656	0.005 - 0.012
			150 - 250 HB	Wear resistance	T1215	394 - 1148	0.003 - 0.008
S	Titanium alloys Ti-6Al-4V, etc.		-	First choice	AH725	98 - 197	0.003 - 0.008
	Superalloys Inconel718, etc.		-	First choice	AH725	66 - 164	0.002 - 0.004
H	Hardened steel	H13, etc.	40 - 50 HRC	First choice	AH725	148 - 230	0.003 - 0.006
		D2, etc.	50 - 60 HRC	First choice	AH725	131 - 213	0.002 - 0.004

Roughing type TLM

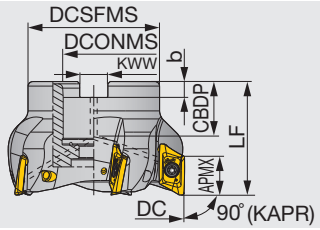
ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1015, etc.		- 200 HB	First choice	AH3135	328 - 820	0.004 - 0.010
			- 300 HB	Wear resistance	T3225	492 - 1148	0.004 - 0.008
	Carbon steel and alloy steel 1055, 4140 etc.		- 300 HB	First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

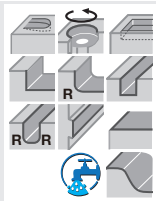
TUNG-ALUMILL

TPV16

90° shoulder mill for Aluminum machining, with screw clamp system, for XVCT16 inserts

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
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...

SPARE PARTS

Designation	Clamping screw	Grip	Torx bit	Shell locking bolt
TPV16R150U0075A03	TS40093I/HG	H-TBS	BT15S	TCS 9.525-35-I
TPV16R200U0075A04	TS40093I/HG	H-TBS	BT15S	SD06-46
TPV16R250..., 300...	TS40093I/HG	H-TBS	BT15S	SD08-47
TPV16R400..., 500...	TS40093I/HG	H-TBS	BT15S	SD12-82

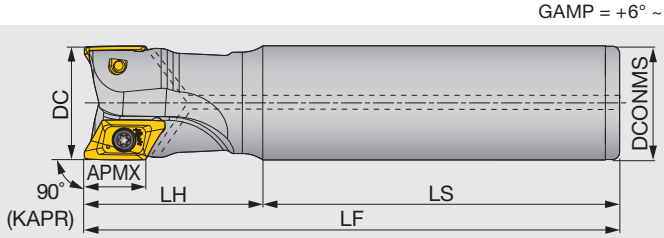
*Recommended clamping torque : TS40093I/HG = 3.32 lbs·ft

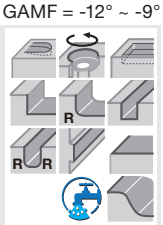
TUNG-ALUMILL

EPV16

90° shoulder endmill for Aluminum machining, shank type, with screw clamp system, for XVCT16 inserts

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...

SPARE PARTS

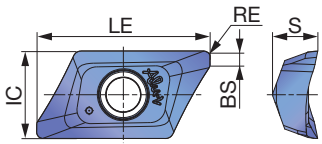
Designation	Clamping screw	Grip	Torx bit
EPV16R100...	TS40085I/HG	H-TBS	BT15S
EPV16R125,150...	TS40093I/HG	H-TBS	BT15S

*Recommended clamping torque : TS40085I/HG = 3.32 lbs·ft, TS40093I/HG = 3.3 lbs·ft

Reference pages: Inserts, Standard cutting conditions → H44

INSERT

XVCT16-AJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Uncoated TH10	LE	IC	S	BS
XVCT160504R-AJ	0.016	0.630	●	0.874	0.442	0.232	0.051
XVCT160508R-AJ	0.031	0.630	●	0.874	0.442	0.232	0.039
XVCT160512R-AJ	0.047	0.610	●	0.854	0.442	0.228	0.039
XVCT160516R-AJ	0.063	0.591	●	0.835	0.442	0.226	0.039
XVCT160520R-AJ	0.079	0.571	●	0.819	0.442	0.226	0.039
XVCT160524R-AJ	0.094	0.551	●	0.800	0.442	0.224	0.039
XVCT160525R-AJ	0.098	0.551	●	0.800	0.442	0.224	0.039
XVCT160530R-AJ	0.118	0.551	●	0.768	0.442	0.220	0.039
XVCT160532R-AJ	0.126	0.551	●	0.756	0.442	0.220	0.039
XVCT160540R-AJ	0.157	0.512	●	0.724	0.442	0.217	0.047
XVCT160550R-AJ	0.197	0.512	●	0.724	0.442	0.213	0.016

* When using inserts with corner radius RE ≥ 0.126",
standard cutter body has to be modified with "R". "R" = RE - 0.012".

● : Line up

Approach angle
10°-20°
45°
70°
85°
88°
90°
Others

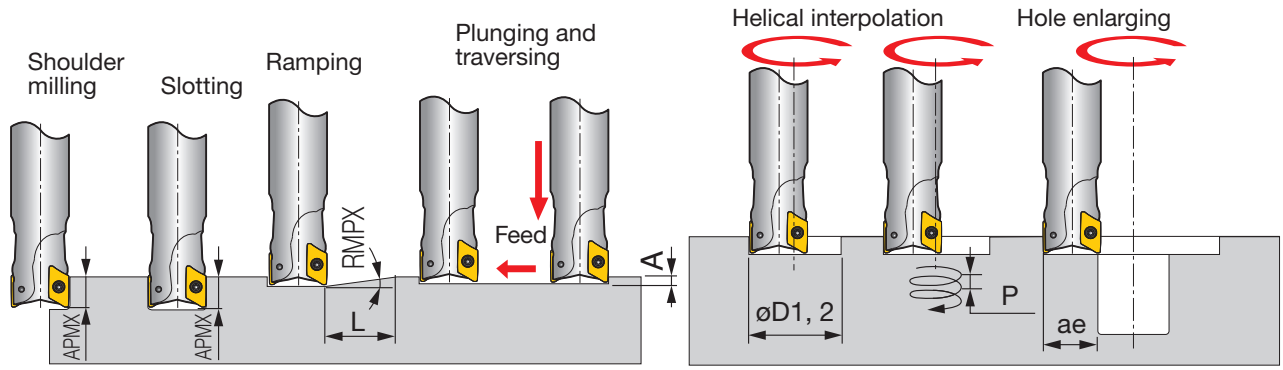
STANDARD CUTTING CONDITIONS

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
	Copper alloys	90	TH10	AJ	984 - 3281	0.004 - 0.006
		100	TH10	AJ	984 - 2625	0.004 - 0.006
	Duroplastics, fiber plastics	-	TH10	AJ	328 - 1640	0.004 - 0.006
	Hard rubber	-	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 lbf·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.

APPLICATION RANGE

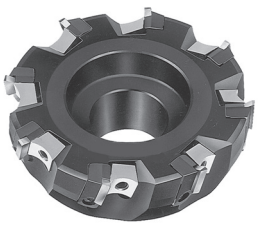


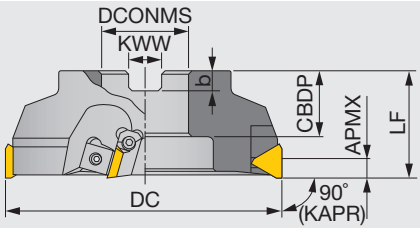
Inch	Tool DC	Corner radius RE	Max. depth of cut APMX	Straight ramp down: Max. ramping angle RMPX	Straight ramp down: Min. length L	Step down: Max. plunging depth A	Helical ramp down: Min. machining øD1	Helical ramp down: Min. pitch/rev P	Helical ramp down: Max. machining øD2	Helical ramp down: Max. pitch/rev P	Hole enlarging: Max. width 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

TSE4000RIAU

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

GAMP = +17°, GAMF = +5°





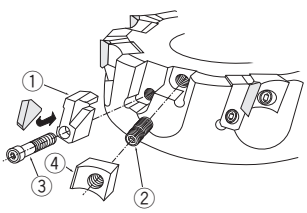
Right hand (R) shown.

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	①Locator	②Wedge	③Wedge fixing screw	④Locator fixing screw	Wrench	Shell locking bolt (optional parts)
TSE4003RIAU	LE403R	WF330N	FDS-8S	CM4X0.7X14	TP-4	(C0.500X1.375H)
TSE4004RIAU	LE403R	WF330N	FDS-8S	CM4X0.7X14	TP-4	(TMBA-0.750H)
TSE4005RIAU	LE405R	WF500R	FDS-8S	CM4X0.7X14	TP-4	(TMBA-0.750H)
TSE4006... - 4012...	LE405R	WF500R	FDS-8S	CM4X0.7X14	TP-4	-

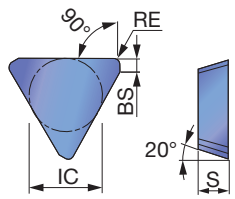
*Recommended clamping torque : FDS-8SS/FDS-8S = 5.9 lbs・ft



Reference pages: Inserts, Standard cutting conditions → H147

INSERT

TECN/TEEN 43Z



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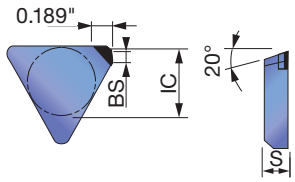
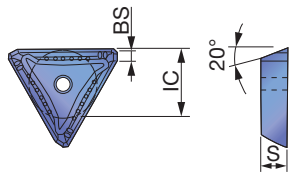


TEKR22-MS



		Coated										Cermet			Uncoated		PCD	
		AH120	AH130	AH140	AH330	GH330	T1115	T3130	AH3135	T1215	T3225	NS740	N308		UX30	TH10	DX140	
P	Steel	☆		☆	☆	☆		☆	★		☆	★	☆		☆			
M	Stainless	☆	★	☆					★		☆							
K	Cast iron	★					☆			★						☆		
N	Non-ferrous															★	★	
S	Superalloys	☆	☆															
H	Hard materials																	

★ : First choice
☆ : Second choice

Designation	RE	APMX	AH120	AH130	AH140	AH330	GH330	T1115	T3130	AH3135	T1215	T3225	NS740	N308		UX30	TH10	DX140		IC	S	BS
TECN43ZFR	C0.020	0.394															●			0.500	0.187	0.079
TECN43ZTR	0.039	0.394											●	●		●				0.500	0.187	0.052
TEEN43ZFR	C0.020	0.394															●			0.500	0.187	0.079
TEEN43ZTR	0.039	0.394	●	●	●	●	●	●	●	●	●	●	●	●		●				0.500	0.187	0.052
TECN43ZFR-DIA	-	0.138																●		0.500	0.187	0.079
TEKR2204PEPR-MS	-	0.394			●															0.500	0.187	0.071

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

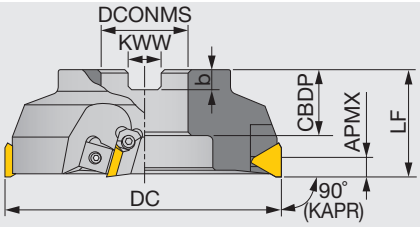
ISO	Workpiece material	Grades	Roughing (Depth of cut: > 0.059") Cutting speed *Vc* (sfm)	Roughing Feed per tooth *fz* (ipt)	Finishing (Depth of cut: 0.012 ~ 0.028") Cutting speed *Vc* (sfm)	Finishing Feed per tooth *fz* (ipt)
P	Mild steels Unhardened steels < 180 HB	AH3135	98 ~ 230	0.004 ~ 0.008	490 ~ 820	0.004 ~ 0.009
		T3225	98 ~ 984	0.004 ~ 0.009	180 ~ 984	0.004 ~ 0.010
		NS740	98 ~ 660	0.004 ~ 0.007	490 ~ 820	0.004 ~ 0.008
	Carbon steels Alloy steels < 300 HB	AH3135	330 ~ 660	0.004 ~ 0.007	98 ~ 755	0.004 ~ 0.008
		T3225	98 ~ 919	0.004 ~ 0.008	591 ~ 919	0.004 ~ 0.009
		NS740	330 ~ 490	0.004 ~ 0.006	490 ~ 660	0.004 ~ 0.007
	Die steels < 30 HRC	T3225	330 ~ 820	0.004 ~ 0.006	330 ~ 820	0.004 ~ 0.008
		AH3135	330 ~ 490	0.004 ~ 0.006	330 ~ 490	0.004~ 0.008
M	Stainless steels < 250 HB	AH3135	260 ~ 590	0.004 ~ 0.008	330 ~ 660	0.004 ~ 0.010
		T3225	490 ~ 660	0.004 ~ 0.007	660 ~ 820	0.004 ~ 0.010
K	Cast irons Ductile cast iron	T1215	330 ~ 820	0.004 ~ 0.008	330 ~ 820	0.004 ~ 0.010
		AH120	330 ~ 660	0.004 ~ 0.008	330 ~ 660	0.004 ~ 0.010
N	Aluminum alloys Si < 13%	TH10	660 ~ 3281	0.002 ~ 0.010	1150 ~ 3281	0.004 ~ 0.010
		DX140	660 ~ 3281	0.002 ~ 0.006	1150 ~ 3281	0.004 ~ 0.008
	Copper alloys	TH10	660 ~ 1640	0.004 ~ 0.006	660 ~ 1640	0.004 ~ 0.008
S	Titanium alloys Ti-6Al-4V, etc.	AH130	66 ~ 217	0.002 ~ 0.006	131 ~ 217	0.002 ~ 0.006
	Heat-resistant alloys Inconel 718, etc.	AH120	66 ~ 131	0.002 ~ 0.004	66 ~ 131	0.002 ~ 0.004

Dry cutting is recommended except for Aluminum alloys
Maximum depth of cut for DX140 TECN43ZFR-DIA is 0.138".

TSP4000RIA-U

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

GAMP = +5°, GAMF = 0°



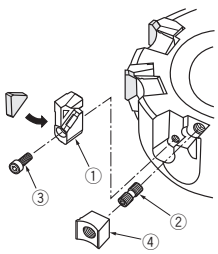
Right hand (R) shown.

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

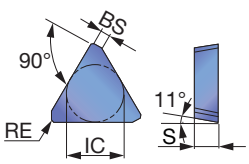
Designation	①Locator	②Wedge	③Wedge fixing screw	④Locator fixing screw	Wrench	Shell locking bolt (Optional parts)
TSP4003RIA-U	LP403R	WF330N	FDS-8S	CM4X0.7X14	TP-4	(C0.500X1.375H)
TSP4004RIA-U	LP403R	WF330N	FDS-8S	CM4X0.7X14	TP-4	(TMBA-0.750H)
TSP4005RIA-U	LP405R	WF500R	FDS-8S	CM4X0.7X14	TP-4	(TMBA-0.750H)
TSP4006... - 4012...	LP405R	WF500R	FDS-8S	CM4X0.7X14	TP-4	-

*Recommended clamping torque：FDS-8S = 5.9 lbs･ft



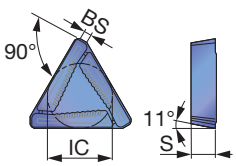
INSERT

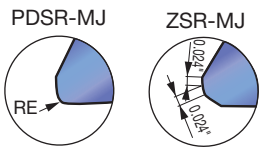
TPCN/TPEN/TPKN 43Z



Right hand (R) shown.

TPKR/TPMR-MJ





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							IC	LE	S	BS
			AH120	AH130	AH140	GH330	T1115	T3130		NS740	N308		UX30	TH10									
TPCN43ZFR	C0.020	0.394												●						0.500	-	0.187	0.079
TPCN43ZTR	C0.020	0.394								●	●		●							0.500	-	0.187	0.079
TPEN43ZTR	C0.020	0.394								●										0.500	-	0.187	0.079
TPEN43ZTRCR	0.039	0.394						●												0.500	-	0.187	0.079
TPKN43ZFR	C0.020	0.394												●						0.500	-	0.187	0.079
TPKN43ZFL	C0.020	0.394												●						0.500	-	0.187	0.079
TPKN43ZTR	C0.020	0.394	●	●	●	●	●	●		●	●		●							0.500	-	0.187	0.079
TPKR43ZSR-MJ	-	0.394				●		●												0.500	-	0.187	0.059
TPMR2204PDSR-MJ	0.031	0.394				●		●												0.500	-	0.187	0.047

● : Line up

Reference pages: Standard cutting conditions → H149

STANDARD CUTTING CONDITIONS

TSP4000RIA-U (When finishing insert is not in use)

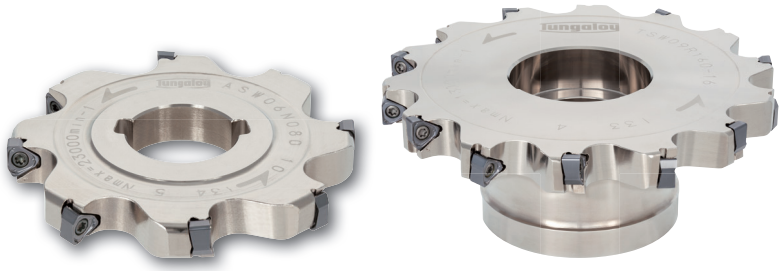
ISO	Workpiece material	Grades	Roughing (Depth of cut: > 0.059")		Finishing (Depth of cut: 0.012" ~ 0.028")	
			Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Mild steels Unhardened steels < 180 HB	AH120 · GH330	330 ~ 755	0.004 ~ 0.010	430 ~ 820	0.004 ~ 0.012
		T3130	430 ~ 990	0.004 ~ 0.011	590 ~ 990	0.004 ~ 0.012
		UX30	330 ~ 590	0.004 ~ 0.010	430 ~ 660	0.004 ~ 0.012
		NS740 · N308	430 ~ 660	0.004 ~ 0.008	490 ~ 820	0.004 ~ 0.010
	Carbon steels Alloy steels < 300 HB	AH120 · GH330	330 ~ 590	0.004 ~ 0.008	490 ~ 660	0.004~ 0.011
		T3130	430 ~ 590	0.004 ~ 0.010	590 ~ 919	0.004 ~ 0.011
		UX30	260 ~ 430	0.004 ~ 0.008	330 ~ 490	0.004~ 0.011
		NS740 · N308	330 ~ 490	0.004 ~ 0.007	490 ~ 660	0.004 ~ 0.009
	Die steels < 30 HRC	T3130 · AH120 · GH330	330 ~ 490	0.004 ~ 0.007	330 ~ 490	0.004 ~ 0.008
		UX30	260 ~ 430	0.004 ~ 0.007	260 ~ 430	0.004 ~ 0.008
M	Stainless steels < 250 HB	AH130 · AH140	490 ~ 660	0.006 ~ 0.009	660 ~ 755	0.15 ~ 0.010
		AH120	490 ~ 755	0.006 ~ 0.008	660 ~ 820	0.15 ~ 0.009
K	Cast irons Ductile cast iron	T1115	330 ~ 660	0.004 ~ 0.008	330 ~ 660	0.004 ~ 0.010
		TH10 · UX30	260 ~ 430	0.004 ~ 0.008	260 ~ 430	0.004 ~ 0.010
S	Titanium alloys	AH130	66 ~ 217	0.002~ 0.006	66 ~ 217	0.002 ~ 0.006
	Heat-resistant alloys	AH120	66 ~ 131	0.002 ~ 0.004	66 ~ 131	0.002 ~ 0.004

MJ INSERT TPM/KR

ISO	Workpiece material	Roughing (Depth of cut: > 0.059")	
		Feed per tooth *fz* (ipt)	
		TPKR43ZSR-MJ	TPMR2204PDSR-MJ
P	Mild steels·Unhardened steels < 180 HB	0.004 ~ 0.009	0.004 ~ 0.016
	Carbon steels · Alloy steels < 300 HB	0.004 ~ 0.008	0.004 ~ 0.014
	Die steels < 30 HRC	0.004 ~ 0.007	0.004 ~ 0.010

Please refer to the above table for cutting speeds and finishing conditions.

TUNGUSLOT UNIVERSAL

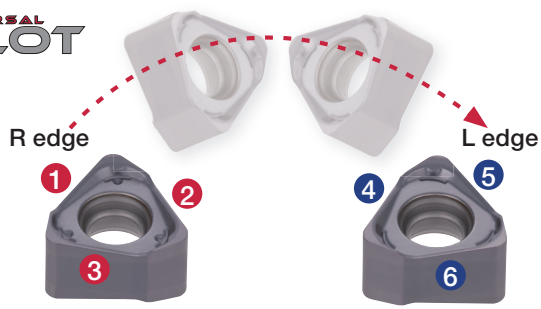


High economy with 6-corner wiper insert
Machining stability with the cutter design for optimum chip evacuation

High economy with 6-corner insert

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

TUNGUSLOT UNIVERSAL
6 corners
with wiper



ASW / TSW
CW = 0.394", 0.472", 0.551", 0.630"

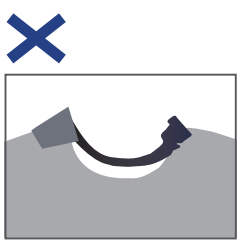
Excellent chip evacuation even in deep slot milling - optimum pocket design

TUNGUSLOT UNIVERSAL

OK

Optimum chipbreaker and big gullets create compact chip formation and smooth evacuation!

Competitor



Unformed chip and narrow gullet cause chip packing.

TUNGUSLOT UNIVERSAL ASW / TSW type

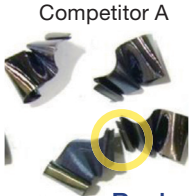
P **Steel** 1055 (200HB)
Edge width: CW = 0.394", Dry
Corner radius: RE = 0.031"

Cutter	Depth of slot: *ae* (in)		
	0.394"	0.787"	1.181"
TUNGUSLOT UNIVERSAL	○	○	○
Competitor A	○	○	×

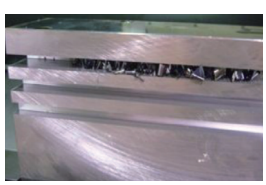
Chips at *ae* = 1.181" depth

TUNGUSLOT UNIVERSAL

Competitor A



Packed chips

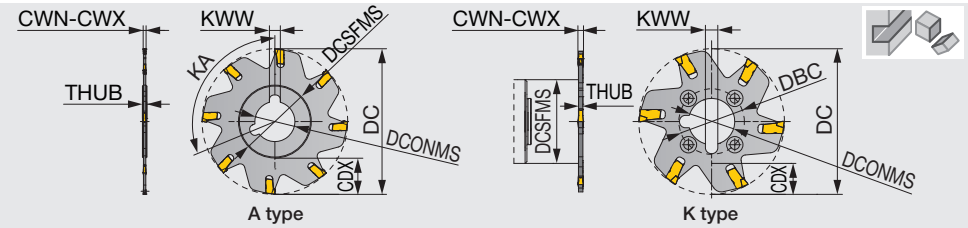


Chips are packed because of bad chip control and flow.

Reference pages: H157 - H158

S/ASG

Side cutter for thin slitting and cutting off



Metric	CWN	CWX	DC	CICT	Seat size	CDX	DCONMS	THUB	DCSFMS	DBC	KA	KWW	SS	SS	Drive flange	Key	Insert
SSG01R063-E1.6	1.5	1.79	63	6	1	14	10	2.4	32	22	-	3	SW25-32	SW1.00-32	-	K	SSM1*N/ SSS1*N
ASG01N076-1.6	1.5	1.79	76.2	8	1	14	25.4	2.4	39	-	112.5	6.35	-	-	-	A	SSM1*N/ SSS1*N
ASG01N080-E1.6	1.5	1.79	80	8	1	16	22	2.4	39	-	112.5	6	-	-	-	A	SSM1*N/ SSS1*N
ASG01N100-1.6	1.5	1.79	100	10	1	30	25.4	2.4	39	-	90	6.35	-	-	-	A	SSM1*N/ SSS1*N
ASG01N100-E1.6	1.5	1.79	100	10	1	30	22	2.4	39	-	90	6	-	-	-	A	SSM1*N/ SSS1*N
ASG01N125-1.6(4)	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)	1.5	1.79	125	12	1	30	27	2.4	64	-	75	7	-	-	-	A	SSM1*N/ SSS1*N
SSG02R063-E2	1.8	2.69	63	6	2	15	10	2.4	32	22	-	3	SW25-32	SW1.00-32	-	K	SSM2*N/ SSS2*N
ASG02N076-2	1.8	2.69	76.2	8	2	17	25.4	2.4	39	-	112.5	6.35	-	-	-	A	SSM2*N/ SSS2*N
ASG02N080-E2	1.8	2.69	80	8	2	20	22	2.4	39	-	112.5	6	-	-	-	A	SSM2*N/ SSS2*N
ASG02N100-2	1.8	2.69	100	10	2	30	25.4	2.4	39	-	90	6.35	-	-	-	A	SSM2*N/ SSS2*N
ASG02N100-E2	1.8	2.69	100	10	2	30	22	2.4	39	-	90	6	-	-	-	A	SSM2*N/ SSS2*N
ASG02N125-2(4)	1.8	2.69	125	12	2	32	31.75	2.4	60	-	75	7.92	-	-	-	A	SSM2*N/ SSS2*N
ASG02N125-E2(4)	1.8	2.69	125	12	2	32	27	2.4	60	-	75	7	-	-	-	A	SSM2*N/ SSS2*N
SSG03R063-E3	1.8	2.69	63	5	3	15	10	2.4	32	22	-	3	SW25-32	SW1.00-32	-	K	SSM3*N/ SSS3*N
SSG03R080-3	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	2.7	3.53	80	6	3	19(2)	22	2.4	40(1)	32	-	6	SW32-40	-	R22-46	K	SSM3*N/ SSS3*N
SSG03R100-3	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	2.7	3.53	100	6	3	29(3)	22	2.4	40(1)	32	-	6	SW32-40	-	R22-46	K	SSM3*N/ SSS3*N
SSG03R125-3(4)	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)	2.7	3.53	125	8	3	34	32	2.4	55	45	-	8	S32-55	-	R32-55	K	SSM3*N/ SSS3*N
SSG04R063-E4	3.54	4.52	63	5	4	15	10	3.2	32	22	-	3	SW25-32	SW1.00-32	-	K	SSM4*N/ SSS4*N
SSG04R080-4	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	3.54	4.52	80	6	4	19(2)	22	3.2	40(1)	32	-	6	SW32-40	-	R22-46	K	SSM4*N/ SSS4*N
SSG04R100-4	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	3.54	4.52	100	6	4	29(3)	22	3.2	40(1)	32	-	6	SW32-40	-	R22-46	K	SSM4*N/ SSS4*N
SSG04R125-4(4)	3.54	4.52	125	8	4	34	31.75	3.2	55	45	-	7.92	-	-	R1.25-55	K	SSM4*N/ SSS4*N
SSG04R125-E4(4)	3.54	4.52	125	8	4	34	32	3.2	55	45	-	8	S32-55	-	R32-55	K	SSM4*N/ SSS4*N

Tolerance of slot width*
±0.1

*Just for reference

(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, only one keyway.
Note: Since a single insert cuts the full groove width, use an insert with a width that is equal to the groove width in the application.
The CWN and the CWX are the min and max width of the groove respectively possible using the exact width of the insert. the cutter body is not adjustable.

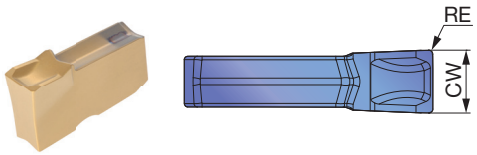
SPARE PARTS

Designation	Grip	Extractor
SSG01/02...	ESG0.5	-
ASG01/02...	ESG0.5	-
SSG03/04...	-	ESG1

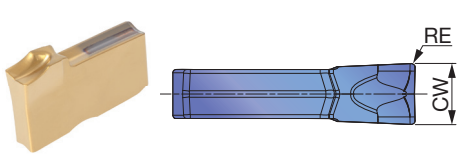
Reference pages: Inserts, Standard cutting conditions → H152

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 GH130	CW±0.04
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

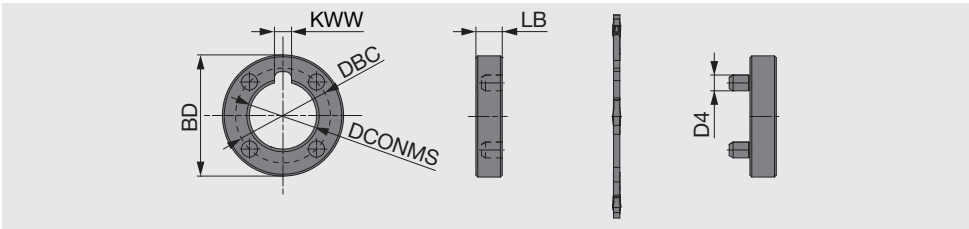
STANDARD CUTTING CONDITIONS

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
P	High carbon steel 1045, etc.	200 - 300	SSM...	330 - 560	0.0016 - 0.005
P	Alloy steels 4140, etc.	150 - 300	SSM...	300 - 530	0.0016 - 0.005
P	Tool steel D2, etc.	- 300	SSM...	230 - 390	0.0016 - 0.005
M	Stainless steel 304, etc.	-	SSS...	300 - 660	0.0016 - 0.005
K	Gray cast iron No250B, etc.	150 - 250	SSM...	330 - 660	0.0020 - 0.006
K	Ductile cast iron 65-45-12, etc.	150 - 250	SSM...	260 - 430	0.0020 - 0.006

TUNGMINI SLIT

R (drive flange set)

Drive flange set for side cutters



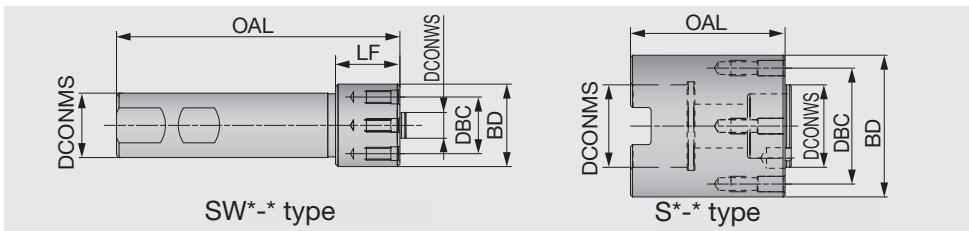
Inch	DCONMS	BD	D4	DBC	LB	KWW
R1.00-46	1.000	1.811	0.197	1.417	0.394	0.250
R1.25-55	1.250	2.165	0.236	1.772	0.394	0.236

Metric	DCONMS	BD	D4	DBC	LB	KWW
R1.00-46	25.4	46	5	36	10	6.35
R22-46	22	46	6	32	10	6

TUNGMINI SLIT

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
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	Wrench		
		Mono block type	Torx bit	Handle
SW25-32	SR76-961	SETT-15/5	-	-
SW32-40	SR76-963	SETT-15/5	-	-
SW32-25.4-46-J	SR76-963	SETT-15/5	-	-
SW1.00-32	SR76-961	SETT-15/5	-	-
SW1.25-46	SR76-963	SETT-15/5	-	-
S1.25-55	SR76-943	-	BT20M	H-TB
S32-55	SR76-943	-	BT20M	H-TB

*Recommended clamping torque：SR76-961, SR76-963 = 2.58 lbs·ft, 3.5 N·m, SR76-943 = 3.69 lbs·ft, 5 N·m

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

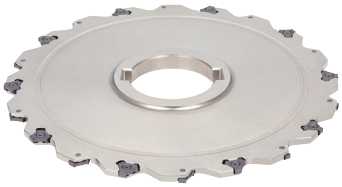
Shell adaptor

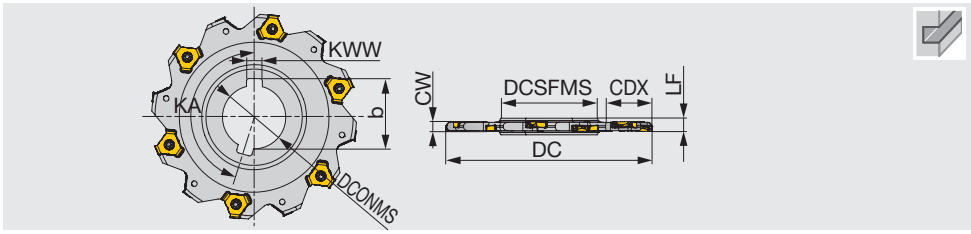
Shell mill / Endmill arbor

Tool dia.	ø2.480"	ø3.150"	ø3.937"	ø4.921"
Drive flange	-	✔	✔	✔
Shank / Shell adaptor	✔	✔	✔	✔

ASV 02/03/04/05

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**
ASV04N400-U025	0.250	4.000	5/10	1.890	1.250	0.394	1.386	0.312	0.957	162	TVKX04H3**
ASV04N500-U025	0.250	5.000	6/12	2.283	1.500	0.394	1.665	0.375	1.260	165	TVKX04H3**
ASV04N600-U025	0.250	6.000	8/16	2.283	1.500	0.394	1.665	0.375	1.760	168.75	TVKX04H3**
ASV04N800-U025	0.250	8.000	10/20	2.717	2.000	0.394	2.197	0.500	2.543	171	TVKX04H3**
ASV05N300-U031	0.313	3.000	4/8	1.614	1.000	0.472	1.102	0.250	0.595	157.5	TVKX0504**
ASV05N400-U031	0.313	4.000	5/10	1.890	1.250	0.472	1.386	0.312	0.957	162	TVKX0504**
ASV05N500-U031	0.313	5.000	6/12	2.283	1.500	0.472	1.665	0.375	1.260	165	TVKX0504**
ASV05N600-U031	0.313	6.000	8/16	2.283	1.500	0.472	1.665	0.375	1.760	168.75	TVKX0504**
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...
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...

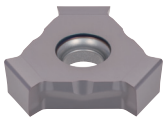
SPARE PARTS

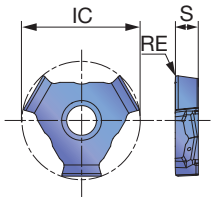
Designation	Clamping screw	Grip	Lubricant
ASV04N...	SR14-500/L5.1	BT15S	H-TBS
ASV05N...	SR14-500-L7.0	BT15S	H-TBS
ASV05N...	SR14-500-L7.0	H-TB2W	M-1000

*Recommended clamping torque：SR14-500/L5.1 = 3.32 lbs·ft, 3.5 N·m, SR14-500-L7.0 = 2.58 lbs·ft, 3.5 N·m

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 AH120	Coated AH130	Coated AH725	S	IC
TVKX020202TN-MJ	0.008	●		●	0.094	0.370
TVKX020204TN-MJ	0.016	●		●	0.094	0.370
TVKX03X302TN-MJ	0.008	●		●	0.126	0.370
TVKX03X304TN-MJ	0.016	●		●	0.126	0.370
TVKX04H304TN-MJ	0.016	●	●	●	0.138	0.665
TVKX04H308TN-MJ	0.031	●	●	●	0.138	0.665
TVKX050404TN-MJ	0.016	●	●	●	0.177	0.665
TVKX050408TN-MJ	0.031	●	●	●	0.177	0.665

● : Line up

STANDARD CUTTING CONDITIONS

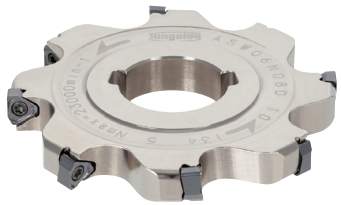
Approach angle: 10°-20°, 45°, 70°, 85°, 88°, 90°, Others

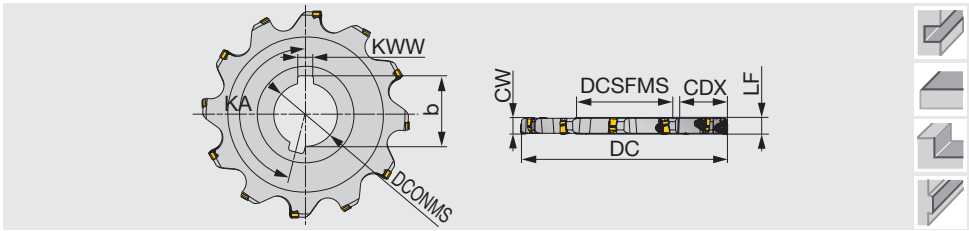
ISO	Workpiece material	Hardness (HB)	Priority	Grade	Cutting speed *Vc* (sfm)	Feed per edge line: *fz* (ipt) ASV *ae* / DC (in) 10%	ASV 20%	ASV *ae* / DC (in) 30%	ASV ≤ 50%
P	Low carbon steels 1015, etc.	- 200	First choice	AH725	300 - 590	0.0031 - 0.0098	0.0024 - 0.0075	0.0020 - 0.0063	0.0020 - 0.0059
		- 200	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	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
		200 - 300	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	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
		150 - 300	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	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063	0.0016 - 0.0055	0.0016 - 0.0051
		- 300	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.	-	-	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	-	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	-	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.	-	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.	-	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

TUNGUNIVERSALSLOT

ASW 06/07/09

Axial drive slot mill, for 6-corner double sided inserts





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**
ASW06N500-U037	0.375	5.000	6/12	2.283	1.500	0.375	1.665	0.375	1.319	165°	WNGU0603**
ASW06N600-U037	0.375	6.000	7/14	2.283	1.500	0.375	1.665	0.375	1.819	167.14°	WNGU0603**
ASW07N400-U050	0.500	4.000	5/10	1.890	1.250	0.500	1.386	0.312	1.016	162°	WNGU07T3**
ASW07N500-U050	0.500	5.000	6/12	2.283	1.500	0.500	1.665	0.375	1.319	165°	WNGU07T3**
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**

SPARE PARTS

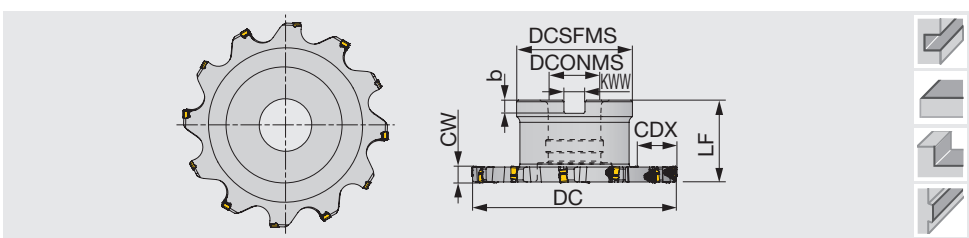
Designation	Clamping screw	Clamping screw 1	Grip	Grip 1	Torx bit	Wrench	Lubricant
ASW06N...	-	CSPB-2.5	-	-	-	IP-8D	M-1000
ASW07N400...	-	CSPD-3	-	SW6-SD	BLD IP10/S7	-	M-1000
ASW07N500...	-	CSPD-3	-	SW6-SD	BLD IP10/S7	-	M-1000
ASW07N600...	-	CSPD-3	-	-	-	IP-10D	M-1000
ASW09N400...	CSPB-3.5	-	H-TBS	-	BLD IP15/S7	-	M-1000
ASW09N600...	CSPB-3.5	-	-	-	-	IP-15D	M-1000

*Recommended clamping torque：CSPB-2.5 = 0.96 lbs·ft, CSPB-3.5 ＝ 2.58 lbs·ft, CSPD-3 = 1.84 lbs·ft

TUNGUNIVERSALSLOT

TSW 06/07/09

Radial drive slot mill, for 6-corner double sided inserts



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...
TSW06R500-U037	0.375	5.000	6/12	2.756	1.250	1.969	0.315	0.500	1.083	WNGU0603...
TSW06R600-U037	0.375	6.000	7/14	3.937	1.500	2.480	0.394	0.626	0.992	WNGU0603...
TSW07R400-U050	0.500	4.000	5/10	1.969	1.000	1.969	0.236	0.374	0.976	WNGU07T3...
TSW07R500-U050	0.500	5.000	6/12	2.756	1.250	1.969	0.315	0.500	1.083	WNGU07T3...
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...

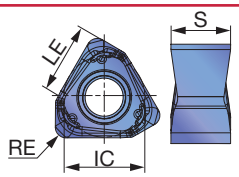
SPARE PARTS

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)
TSW06R500-U037	-	CSPD-3	-	M-1000	-	IP-8D	-
TSW06R600-U037	-	CSPD-3	-	M-1000	-	IP-8D	(TMBA-0.750H)
TSW07R400-U050	-	CSPD-3	SW6-SD	M-1000	BLD IP10/S7	-	(C0.500X1.375H)
TSW07R500-U050	-	CSPD-3	SW6-SD	M-1000	BLD IP10/S7	-	-
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

INSERT

WNGU-MJ



		AH120	AH130	AH725	AH3135
P	Steel	☆		★	★
M	Stainless		★	☆	★
K	Cast iron	★		☆	
N	Non-ferrous				
S	Superalloys	★	☆	★	
H	Hard materials				

★ : First choice
☆ : Second choice

Designation	RE	Coated AH120	AH130	AH725	AH3135	LE	IC	S
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

Approach angle
10°-20°
45°
70°
85°
88°
90°
Others

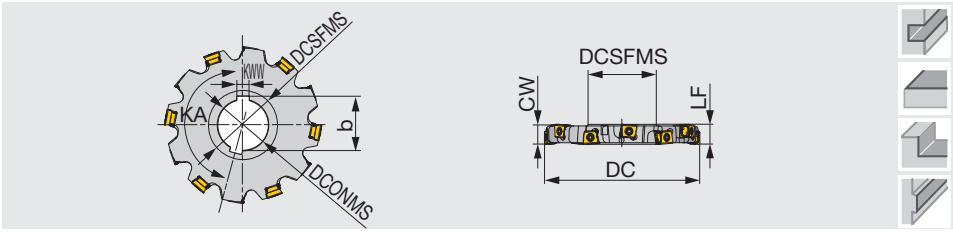
STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness (HB)	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	First choice	AH725	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
		- 200	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	First choice	AH725	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
		200 - 300	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	First choice	AH725	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
		150 - 300	Fracture resistance	AH130	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
	Tool steels D2, etc.	- 300	First choice	AH725	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
		- 300	Fracture resistance	AH130	300 - 590	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079
M	Stainless steel 304, etc.	-	-	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	-	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	-	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.	-	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.	-	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

TECTSLOT TANGENTIAL

ASN 10/12/15

Axial drive slot mill, for tangentially mounted inserts



Inch	CW	DC	ZEFP	CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	KA	Insert
ASN10R100M31.7-16-05	0.630	3.937	5	10	1.890	1.250	0.630	1.386	0.312	0.984	162°	LMEU1008**ZNEN-MJ
ASN10R125M38.1-16-06	0.630	4.921	6	12	2.283	1.500	0.630	1.665	0.375	1.280	165°	LMEU1008**ZNEN-MJ
ASN10R160M38.1-16-07	0.630	6.299	7	14	2.283	1.500	0.630	1.665	0.375	1.969	167.14°	LMEU1008**ZNEN-MJ
ASN12R100M31.7-19-05	0.748	3.937	5	10	1.890	1.250	0.748	1.386	0.312	0.984	162°	LMEU1208**ZNEN-MJ
ASN12R125M38.1-19-06	0.748	4.921	6	12	2.283	1.500	0.748	1.665	0.375	1.280	165°	LMEU1208**ZNEN-MJ
ASN12R160M38.1-19-07	0.748	6.299	7	14	2.283	1.500	0.748	1.665	0.375	1.969	167.14°	LMEU1208**ZNEN-MJ
ASN15R125M38.1-25-05	0.984	4.921	5	10	2.283	1.500	0.984	1.665	0.375	1.280	162°	LMEU1509**ZNEN-MJ
ASN15R160M38.1-25-06	0.984	6.299	6	12	2.283	1.500	0.984	1.665	0.375	1.969	165°	LMEU1206**ZNEN-MJ

SPARE PARTS

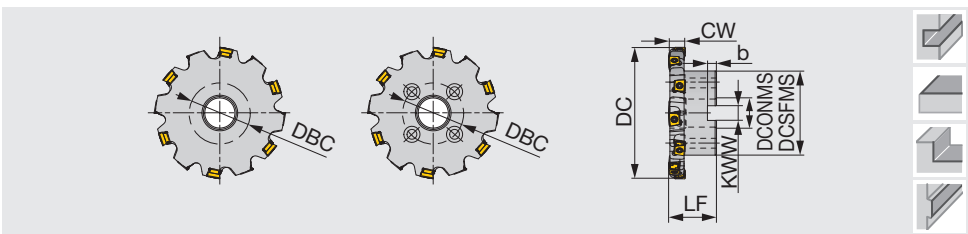
Designation	Clamping screw	Grip	Torx bit
ASN10/12R...	SM40-143-H0	H-TB	BT15S
ASN15R...	CSTB-5L159	H-TB	BT20S

*Recommended clamping torque：SM40-143-H0 = 0.96 lbs·ft, CSTB-5L159 = 3.69 lbs·ft

TECTSLOT TANGENTIAL

TSN

Radial drive slot mill, for tangentially mounted inserts



Inch	CW	DC	ZEFP	CICT	DCSFMS	DCONMS	LF	b	KWW	CDX	DBC	Insert
TSN10R100M25.4-16-05	0.630	3.937	5	10	1.969	1.000	1.969	0.236	0.374	0.945	-	LMEU1008**ZNEN-MJ
TSN10R125M31.7-16-06	0.630	4.921	6	12	2.756	1.250	1.969	0.315	0.500	1.043	-	LMEU1008**ZNEN-MJ
TSN10R160M38.1-16-07	0.630	6.299	7	14	3.937	1.500	2.480	0.394	0.626	1.142	-	LMEU1008**ZNEN-MJ
TSN10R200M47.6-16-08	0.630	7.874	8	16	5.315	1.875	2.480	0.551	1.000	1.240	4.000	LMEU1008**ZNEN-MJ
TSN12R100M25.4-19-05	0.748	3.937	5	10	1.969	1.000	1.969	0.236	0.374	0.945	-	LMEU1208**ZNEN-MJ
TSN12R125M31.7-19-06	0.748	4.921	6	12	2.756	1.250	1.969	0.315	0.500	1.043	-	LMEU1208**ZNEN-MJ
TSN12R160M38.1-19-07	0.748	6.299	7	14	3.937	1.500	2.480	0.394	0.626	1.142	-	LMEU1208**ZNEN-MJ
TSN12R200M47.6-19-08	0.748	7.874	8	16	5.315	1.875	2.480	0.551	1.000	1.240	4.000	LMEU1208**ZNEN-MJ
TSN12R250M47.6-19-09	0.748	9.843	9	18	5.512	1.875	2.480	0.551	1.000	2.126	4.000	LMEU1208**ZNEN-MJ
TSN15R125M31.7-25-05	0.984	4.921	5	10	2.756	1.250	1.969	0.315	0.500	1.043	-	LMEU1509**ZNEN-MJ
TSN15R160M38.1-25-06	0.984	6.299	6	12	3.937	1.500	2.480	0.394	0.626	1.142	-	LMEU1509**ZNEN-MJ
TSN15R200M50.8-25-07	0.984	7.874	7	14	5.315	2.000	2.480	0.551	1.000	1.240	4.000	LMEU1509**ZNEN-MJ
TSN15R250M63.5-25-08	0.984	9.843	8	16	5.512	2.500	2.480	0.551	1.000	2.126	4.000	LMEU1509**ZNEN-MJ

SPARE PARTS

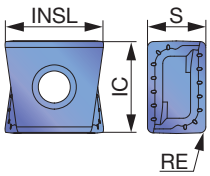
Designation	Clamping screw	Grip	Torx bit	Shell locking bolts (Optional parts)
TSN10R100M25.4-16-05	SM40-143-H0	H-TB	B_T15S	(C0.500X1.375H)
TSN10/12R125M..., TSN10/12R200M..., TSN12R125M..., TSN12R250M...	SM40-143-H0	H-TB	B_T15S	-
TSN10/12R160M...	SM40-143-H0	H-TB	B_T15S	(TMBA-0.750H)
TSN15R125M..., TSN15R200M..., TSN15R250M...	CSTB-5L159	H-TB	BT-20S	-
TSN15R160M38.1-25-06	CSTB-5L159	H-TB	BT-20S	(TMBA-0.750H)

*Recommended clamping torque：SM40-143-H0 = 0.96 lbs·ft, CSTB-5L159 = 3.69 lbs·ft

Reference pages: Inserts, Standard cutting conditions → H160

INSERT

LMEU-MJ



		AH120	AH140	AH725	AH3135
P	Steel	☆		☆	★
M	Stainless		☆	☆	★
K	Cast iron	★		☆	
N	Non-ferrous				
S	Superalloys	★		★	
H	Hard materials				

★ : First choice
☆ : Second choice

Designation	RE	Coated AH120	AH140	AH725	AH3135	INSL	IC	S
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 (HB)	Priority	Grade	Cutting speed *Vc* (sfm)	Feed per edge line: *fz* (ipt) TSN / ASN ae / DC (in) 10%	20%	30%	≤ 50%
P	Low carbon steels 1015, etc.	- 200	First choice	AH3135	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
		- 200	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	First choice	AH3135	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
		200 - 300	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	First choice	AH3135	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
		150 - 300	Fracture resistance	AH725	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
	Tool steels D2, etc.	- 300	First choice	AH3135	300 - 590	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
		- 300	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.	-	-	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	-	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	-	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.	-	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.	-	First choice	AH725	70 - 120	0.0047 - 0.0087	0.0035 - 0.0063	0.0028 - 0.0055	0.0028 - 0.0051

MEMO

PROFILEMILL SERIES

Lineups and Application Ranges

- All inserts are precision ground, making them suitable for various applications ranging from roughing to finishing
- Increased reliability thanks to the innovative insert clamping design

Finishing

Semi-Finishing

Roughing

Ball type

BALLFINISHNOSE

Tool diameter ø0.375" - ø1.250"
(R4 – R16)

BALLROUGHNOSE

Tool diameter ø0.625" - ø1.000"
(R8 - R12.5)

Radius type

BALLFINISHNOSE

Tool diameter ø0.375" - ø1.250"
(R0.5 – R1.5)

DOMINIMILL

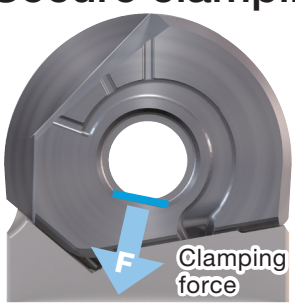
Tool diameter ø16 mm - 25 mm
(R0.5, R1.0)

Reference pages: BallFinishNose → H166 - H170, BallRoughNose → H164 - H165, DoMini-Mill → H171

BALL FINISH NOSE

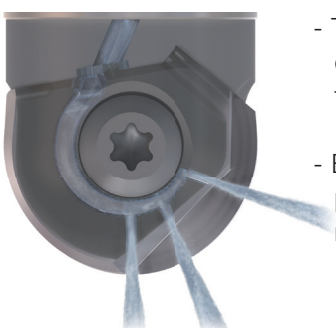
Indexable endmill for high precision finishing!

Secure clamping mechanism



- Clamping force gathers on the flat part of the insert hole as the screw is tightened.
- The force pushes the insert towards the cutter body, providing high repeatability and rigidity as well as minimum run-out.

Unique coolant delivery system

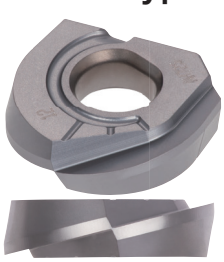


- The coolant channel on insert surface, delivers coolant to the cutting edge from three directions.
- Excellent chip evacuation and cooling effect provides good surface finish and long tool life in machining of hardened steel.

Two insert varieties

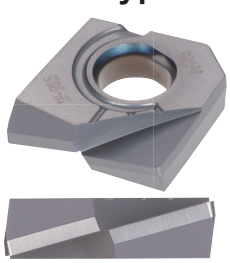
MJ chipbreaker

Ball nose type: ZFBM



- Suitable for finishing and three-dimensional milling of die & mold
- Applicable for a wide range of operations

Radius type: ZFRM

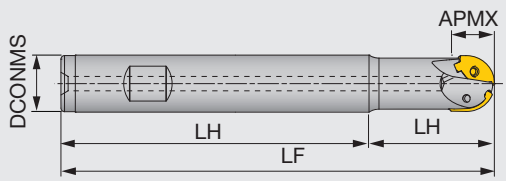


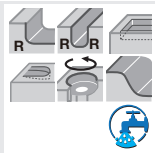
- Suitable for finishing of die & mold
- Designed for milling with high productivity

Reference pages: H166 - H170

BALLROUGH NOSE
EBRU...

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-MM
EBRU075SW075S0600	0.510	0.750	2	0.750	4.000	6.000	2.000	0.606	3.000	0.610	With	ZRBU075-MM
EBRU100SW100S0600	0.690	1.000	2	1.000	3.250	6.000	2.750	1.080	3.000	1.080	With	ZRBU100-MM

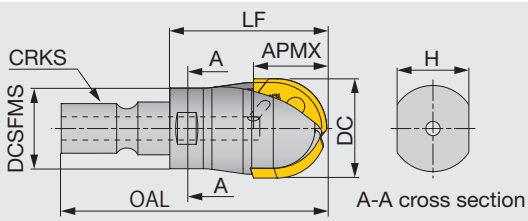
SPARE PARTS

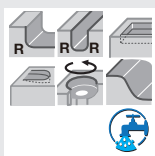
Designation	Clamping screw	Wrench
EBRU062...	TS25064I	T-8D
EBRU075...	TS30C72I	T-9D
EBRU100...	TS35085I/HG	T-15D

*Recommended clamping torque：TS25064I = 0.96 lbs･ft, TS35085I/HG = 2.58 lbs･ft

BALLROUGH NOSE
HBRM...

Ball nose endmill for semi-roughing, modular type, with screw clamp system (TungFlex)





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

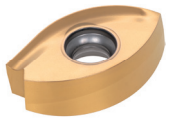
Designation	Clamping screw	Wrench
HBRM16...	TS25064I	T-8D
HBRM20...	TS30085I/HG	T-9D
HBRM25...	TS35085I/HG	T-15D

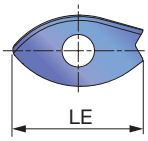
*Recommended clamping torque：TS25064I = 1.3 N·m, TS30085I/HG = 2.3 N·m, TS35085I/HG = 3.5 N·m

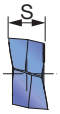
Reference pages: Inserts, Standard cutting conditions → H165

INSERT

ZRBU...







Inch

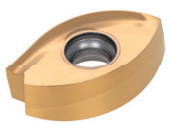
		APH730
P	Steel	★
M	Stainless	☆
K	Cast iron	☆
N	Non-ferrous	
S	Superalloys	☆
H	Hard materials	☆

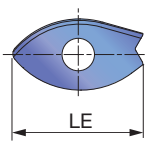
★ : First choice
☆ : Second choice

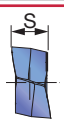
Designation	RE	Coated APH730	LE	S
ZRBU062-MM	0.313	●	0.586	0.118
ZRBU075-MM	0.375	●	0.648	0.146
ZRBU100-MM	0.500	●	0.865	0.177

● : Line up
5 piece per package

ZRBM...







Metric

		APH730
P	Steel	★
M	Stainless	☆
K	Cast iron	☆
N	Non-ferrous	
S	Superalloys	☆
H	Hard materials	☆

★ : First choice
☆ : Second choice

Designation	RE	Coated APH730	LE	S
ZRBM160-MM	8	●	12.4	3.7
ZRBM200-MM	10	●	14.9	4.8
ZRBM250-MM	12.5	●	18.9	5.9

●: Line up
5 piece per package

STANDARD CUTTING CONDITIONS

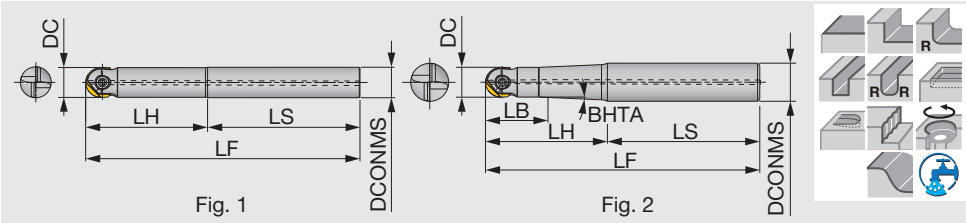
ISO	Workpiece materials	Hardness	Selection criteria	Recommended grade	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1015, 1020, etc.	- 300HB	First choice	APH730	MM	490 - 1145	0.004 - 0.024
	High carbon and alloy steel 1055, 4140, etc.	- 300HB	First choice	APH730	MM	390 - 1045	0.002 - 0.02
	Prehardened steels NAK80, PX5 etc.	30 - 40HRC	First choice	APH730	MM	325 - 655	0.002 - 0.02
M	Austenitic stainless steel 304SS, 316SS, etc.	- 200HB	First choice	APH730	MM	325 - 915	0.002 - 0.024
	Martensitic stainless steel 420SS, etc.	- 200HB	First choice	APH730	MM	325 - 980	0.002 - 0.024
K	Gray cast irons Class25, Class30, etc.	150 - 250HB	First choice	APH730	MM	390 - 1245	0.004 - 0.024
	Ductile cast iron 60-40-18, 80-55-06, etc.	150 - 250HB	First choice	APH730	MM	325 - 915	0.004 - 0.02
S	Titanium alloy Ti-6Al-4V, etc.	-	First choice	APH730	MM	65 - 260	0.002 - 0.024
	Heat-resistant alloys Inconel718, etc.	-	First choice	APH730	MM	65 - 195	0.002 - 0.016
H	Hardened steel H13, etc.	40 - 50HRC	First choice	APH730	MM	130 - 260	0.002 - 0.008
	Hardened steel D2, etc.	50 - 60HRC	First choice	APH730	MM	95 - 195	0.002 - 0.006

The above cutting parameters are for reference. Adjustments may be required depending on applications, machine powers and rigidity, and/or workpiece fixture/clamping methods.

BALL FINISH NOSE

EBFU

High precision finishing endmill, shank type, with screw clamp system



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

SPARE PARTS

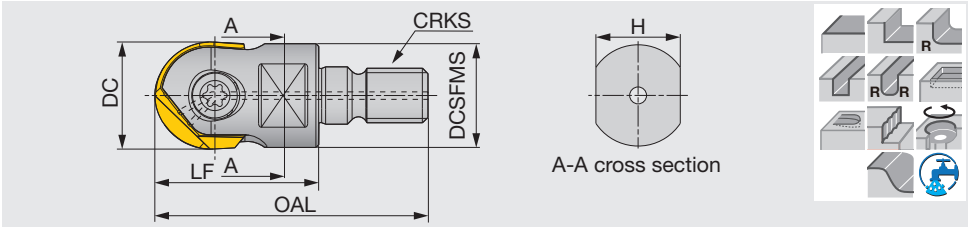
Designation	Clamping screw	Torx bit	Grip	Wrench
EBFU037...	TS30F100A	-	-	T10D
EBFU050...	TS40F120A	-	-	T15D
EBFU062...	TS50F160A	-	-	T-T20
EBFU075...	TS60F200A	BLDT25/M7	SW6-T	-
EBFU100...	TS70F250A	BLDT25/M7	SW6-T	-
EBFU125...	TS70F300A	-	-	T-T30

*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

Reference pages: Inserts → H168 - H169, Standard cutting conditions → H170

HBFM

High precision finishing endmill, modular type, with screw clamp system (TungFlex)



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...
HBFM12M08	12	40	23	10	13	M8	With	ZF*M120...
HBFM16M08	16	47	30	10	13	M8	With	ZF*M160...
HBFM20M10	20	49	30	15	19	M10	With	ZF*M200...
HBFM25M12	25	57	35	17	24	M12	With	ZFBM250...
HBFM30M16	30	66	43	22	29	M16	With	ZFBM300...
HBFM32M16	32	66	43	22	29.5	M16	With	ZFBM320...

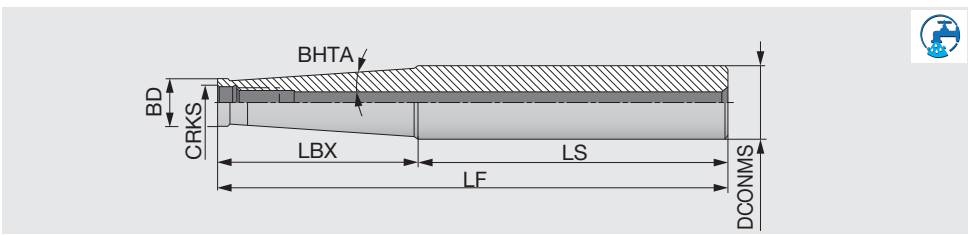
SPARE PARTS

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...	TS 80F300A	-	-	T-T30
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 = 7 N·m, TS 70F250A = 7 N·m, TS 80F300A = 10 N·m

TungFlex

TungFlex modular shank

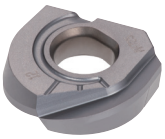


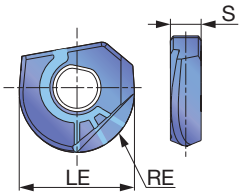
Metric	DCONMS	LF	LS	LBX	BD	CRKS	BHTA	Shank type
SM06-L60C10	10	60	40	20	9.7	M6	0°	Cylindrical
SM06-L105-C12	12	105	45	60	9.7	M6	1.2°	Cylindrical
SM06-L125-C16	16	125	65	60	9.7	M6	3.3°	Cylindrical
SM08-L73C16	16	73	48	25	13	M8	0°	Cylindrical
SM08-L128-C16	16	128	48	80	13	M8	0.9°	Cylindrical
SM08-L170-C20	20	170	103.2	66.8	13	M8	3.3°	Cylindrical
SM10-L80-C20	20	80	50	30	18	M10	0°	Cylindrical
SM10-L130-C20	20	130	50	80	18	M10	0.6°	Cylindrical
SM10-L200-C25	25	200	142.8	57.2	19	M10	3.3°	Cylindrical
SM12-L86-C25	25	86	56	30	21	M12	5.1°	Cylindrical
SM12-L200-C32	32	200	122	78	21	M12	4.4°	Cylindrical
SM16-L95-C32	32	95	60	35	29	M16	1.7°	Cylindrical
SM16-L230-C32	32	230	180	50	29	M16	1.8°	Cylindrical

Reference pages: Inserts → H168 - H169, Standard cutting conditions → H170

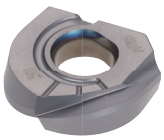
INSERT

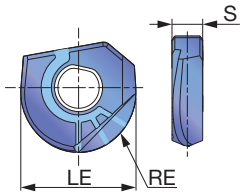
ZFBU-MJ / ZFBM-MJ





ZFBU-ML





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

★ : First choice
☆ : Second choice

Inch

Designation	RE	Coated AH725	LE	S
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

● : Line up

ZFBU037 / 050 / 062... : 5 piece per package
ZFBU075 / 100 / 125... : 1 piece per package

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

★ : First choice
☆ : Second choice

Metric

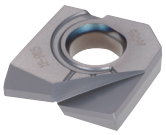
Designation	RE	Coated AH710	Coated AH725	LE	S
ZFBM080R00-MJ	4	●	●	8	2.4
ZFBM100R00-MJ	5	●	●	10	2.9
ZFBM120R00-MJ	6	●	●	12	3.4
ZFBM160R00-MJ	8	●	●	16	4.4
ZFBM200R00-MJ	10	●	●	20	5.4
ZFBM250R00-MJ	12.5	●	●	25	6.4
ZFBM300R00-MJ	15	●	●	30	7.4
ZFBM320R00-MJ	16	●	●	32	7.4

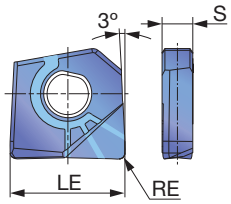
● : Line up

ZFBM080 / 100 / 120 / 160... : 5 piece per package
ZFBM200 / 250 / 300 / 320... : 1 piece per package

Reference pages: Standard cutting conditions → H170, TungFlex → H167

ZFRU-MJ / ZFRM-MJ (Corner radius type)





Inch

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

★ : First choice
☆ : Second choice

Designation	RE	Coated AH725	LE	S
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
ZFRU037 / 050 / 062... : 5 piece per package
ZFRU075 / 100 / 125... : 1 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 AH710	Coated AH725	LE	S
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

● : Line up
ZFRM120 / 160... : 5 piece per package
ZFRM200... : 1 piece per package

Reference pages: Standard cutting conditions → H170, TungFlex → H167

STANDARD CUTTING CONDITIONS

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	-	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	-	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

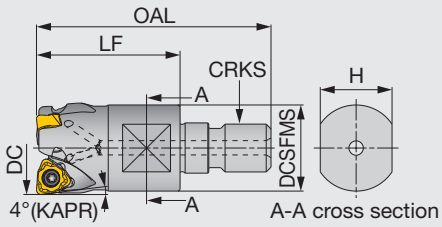
1. Clamp the insert on the shank.
2. Clamp the shank on a high-precision arbor.
3. Measure the run-out on tool presetter or by dial gauge.

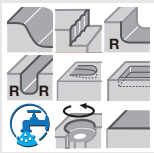
Notes:
1. Due to the helical cutting edge, it is important that the run-out is inspected with the insert clamped on the shank.
2. Do not use micrometer or caliper to inspect the insert diameter as inaccurate dimensions may be provided.

HFWX04-M

Small-radius finishing endmill, modular type (TungFlex)

GAMP = 0°, GAMF = -14°





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...

See page **H167** for TungFlex modular shank.

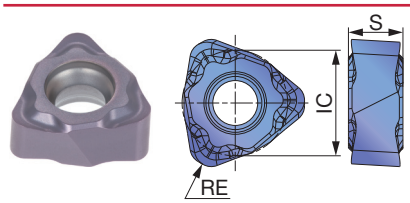
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
HFWX04M...	SR34-514	M-1000	T-7F

*Recommended clamping torque：SR34-514 = 0.9 N·m

INSERT

WXHU-MJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	AH110	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

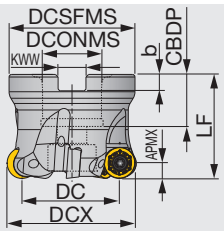
ISO	Workpiece material		Hardness	Grade	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	High carbon steel 1045, 1055, etc.		200 - 300 HB	AH110	328 - 984	0.004 - 0.012
P	Alloy steel 4140, etc.		150 - 300 HB	AH110	328 - 984	0.004 - 0.012
P	Prehardened steel NAK80, PX5, etc.		30 - 40 HRC	AH110	328 - 984	0.002 - 0.012
H	Hardened steel	H13, etc.	40 - 50 HRC	AH110	262 - 427	0.004 - 0.012
H	Hardened steel	D2, etc.	50 - 60 HRC	AH110	164 - 328	0.002 - 0.006

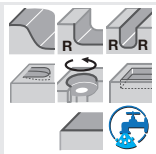
Reference pages: TungFlex → H167

FIXRMILL
TRP12/16

Radius mill with anti-rotation system

GAMP = +4°, GAMF = -4°





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	RPMT1204EN-M*
TRP12R250U0100A06	0.236	2.500	2.028	6	2.323	1.000	1.024	1.969	0.236	0.374	1.32	With	RPMT1204EN-M*
TRP16R250U0100A05	0.315	2.500	1.869	5	2.323	1.000	1.024	1.969	0.236	0.374	1.32	With	RPMT1606EN-M*

SPARE PARTS

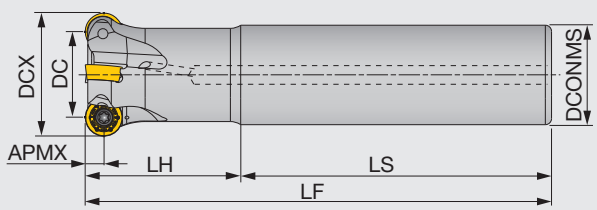
Designation	Clamping screw	Grip	Lubricant	Shell locking bolt (Optional parts)	Torx bit
TRP12R200U0075A05	CSTR-4L100	H-TBS	M-1000	(C0.375X1.125H)	BT15S
TRP12R250U0100A06	CSTR-4L100	H-TBS	M-1000	(C0.500X1.375H)	BT15S
TRP16R250U0100A05	CSPB-5	H-TBS	M-1000	(C0.500X1.375H)	BLDIP20/S7

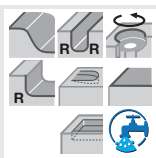
*Recommended clamping torque：CSTR-4L100 = 2.58 lbs·ft, CSPB-5 = 3.69 lbs·ft

FIXRMILL
ERP10/12/16

Radius endmill with anti-rotation system, shank type

GAMP = +10°~ +4°, GAMF = -2°~ -8.5°





Inch	APMX	DCX	DC	CICT	DCONMS	LS	LH	LF	Air hole	Insert
ERP10R100U0100-02	0.197	1.000	0.606	2	1.000	4.000	2.000	6.000	With	RPMT10T3EN-M*
ERP10R125U0125-04	0.197	1.250	0.856	4	1.250	4.000	2.000	6.000	With	RPMT10T3EN-M*
ERP10R150U0125-04	0.197	1.500	1.106	4	1.250	4.000	2.000	6.000	With	RPMT10T3EN-M*
ERP12R125U0125-03	0.236	1.250	0.776	3	1.250	4.000	2.000	6.000	With	RPMT1204EN-M*
ERP12R150U0125-04	0.236	1.500	1.034	4	1.250	4.000	2.000	6.000	With	RPMT1204EN-M*
ERP16R150U0125-02	0.315	1.500	0.866	2	1.250	4.000	2.000	6.000	With	RPMT1606EN-M*

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

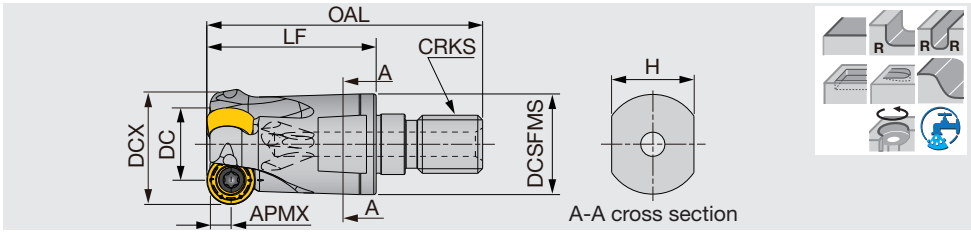
*Recommended clamping torque：CSPB-3.5S/CSTR-4L100 = 2.58 lbs·ft, CSPB-5 = 3.69 lbf·ft

Reference pages: Inserts → H173, Standard cutting conditions → H174 - H175

HRP10/12-M

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

GAMP = 1°~ 4°, GAMF = -8.5°~ 2°



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...

See page **H167** for TungFlex modular shank.

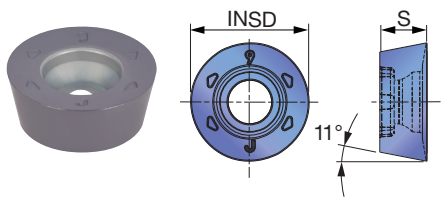
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench	
			Bit	Grip
HRP10R**	CSPB-3.5S	M-1000	BLD IP15/S7	H-TBS
HRP12R**	CSTR-4L100	M-1000	BT15S	H-TBS

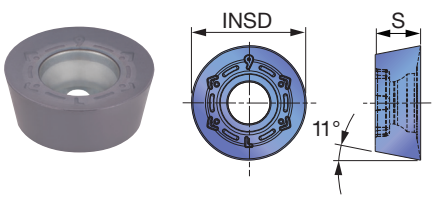
*Recommended clamping torque：CSPB-3.5S/CSTR-4L100 = 3.5 N·m

INSERT

RPMT-MJ



RPMT-ML



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

Reference pages: Standard cutting conditions → H174 - H175, TungFlex → H167

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Carbon steels 1045, 1055, etc.	< 300 HB	First choice	AH725	MJ	400 - 830	0.012 - 0.028
		< 300 HB	Fracture resistance	AH130	MJ	400 - 830	0.012 - 0.028
	Alloy steels 4140 (H), etc.	150 - 300 HB	First choice	AH725	MJ	330 - 830	0.008 - 0.024
		150 - 300 HB	Fracture resistance	AH130	MJ	330 - 830	0.008 - 0.024
	Tool steels W1-10, M2, etc.	< 300 HB	-	AH725	ML	260 - 590	0.008 - 0.016
M	Stainless steels 304, 316, etc.	< 200 HB	First choice	AH130	ML	330 - 830	0.008 - 0.024
		< 200 HB	Fracture resistance	AH130	MJ	330 - 830	0.008 - 0.024
	Stainless steels 420, 430, etc.	< 200 HB	First choice	AH4035	ML	330 - 1000	0.008 - 0.024
		< 200 HB	Fracture resistance	AH4035	MJ	330 - 1000	0.008 - 0.024
K	Gray cast irons No25, No30, etc.	150 - 250 HB	-	AH725	ML	400 - 830	0.012 - 0.028
	Ductile cast irons 60-40-18, etc.	150 - 250 HB	-	AH725	ML	330 - 660	0.012 - 0.028
H	Hardened steels H3, etc.	40 - 50 HRC	-	AH725	MJ	200 - 460	0.004 - 0.012
	Hardened steels D2, etc.	50 - 60 HRC	-	AH725	MJ	70 - 200	0.002 - 0.008

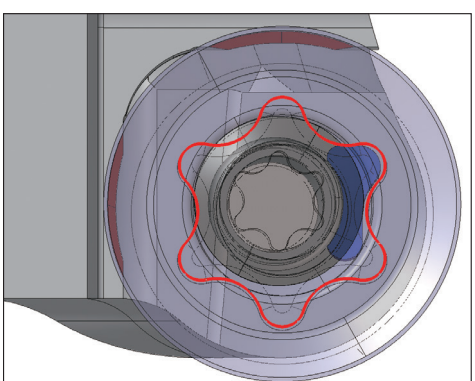
· Use air blast to remove chips from the work area in slot milling or pocketing operation.
· When machining at high cutting speeds of more than *Vc* = 3281 sfm, the dynamic balance of the tools must be adjusted.
· Cutting conditions are limited by machine power, workpiece rigidity and spindle output. When the cutting width or depth is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

Tool dia.: DCX (in), Number of revolutions: *n* (rpm), Feed speed: *Vf* (ipm), Depth of cut: ap = 0.078"

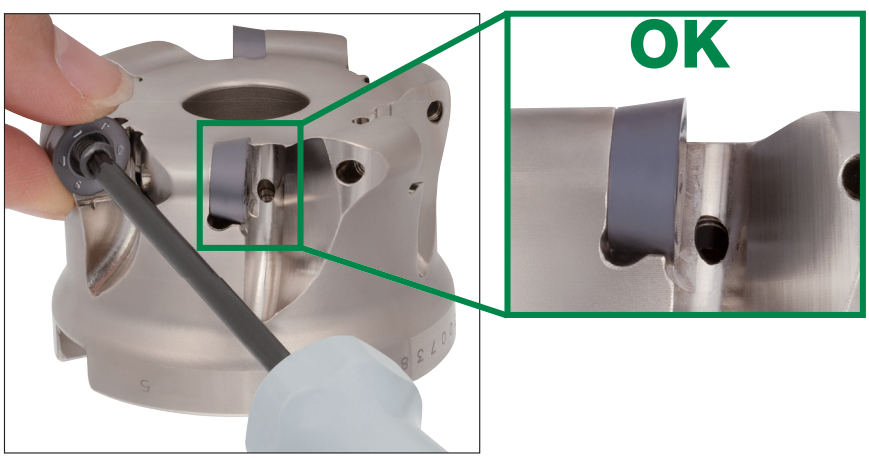
ø1.000		ø1.250			ø1.500			ø2.000		ø2.500		
n	*Vf*	*n*	*Vf*		*n*	*Vf*		*n*	*Vf*	*n*	*Vf*	
			ERP10	ERP12		ERP10/12	ERP16				TRP12	TRP16
2250	90	1790	143	110	1430	120	60	1150	110	910	110	90
						Vc = 590 sfm, *fz* = 0.020 ipt						
2250	90	1790	143	110	1430	120	60	1150	110	910	110	90
						Vc = 590 sfm, *fz* = 0.020 ipt						
2140	68	1690	108	80	1350	90	45	1080	85	860	80	70
						Vc = 560 sfm, *fz* = 0.016 ipt						
2140	51	1690	81	60	1350	90	45	1080	85	860	80	470
						Vc = 560 sfm, *fz* = 0.012 ipt						
1600	38	1290	62	45	1030	50	25	830	50	660	45	40
						Vc = 420 sfm, *fz* = 0.016 ipt						
2140	68	1690	108	80	1350	90	45	1080	52	860	80	70
						Vc = 560 sfm, *fz* = 0.016 ipt						
2140	68	1690	108	80	1350	90	45	1080	52	860	80	70
						Vc = 560 sfm, *fz* = 0.016 ipt						
2520	81	1990	127	95	1590	110	55	1270	100	1010	95	80
						Vc = 660 sfm, *fz* = 0.016 ipt						
2520	81	1990	127	95	1590	110	55	1270	100	1010	95	80
						Vc = 660 sfm, *fz* = 0.016 ipt						
2250	90	1790	143	110	1430	120	60	1150	110	910	110	90
						Vc = 590 sfm, *fz* = 0.020 ipt						
1910	76	1490	119	90	1190	100	50	950	90	760	90	75
						Vc = 500 sfm, *fz* = 0.020 ipt						
1260	20	990	32	25	800	25	15	640	25	510	25	20
						Vc = 330 sfm, *fz* = 0.008 ipt						
530	5	400	8	6	320	10	5	250	10	200	10	8
						Vc = 140 sfm, *fz* = 0.005 ipt						

■ Caution for insert clamping

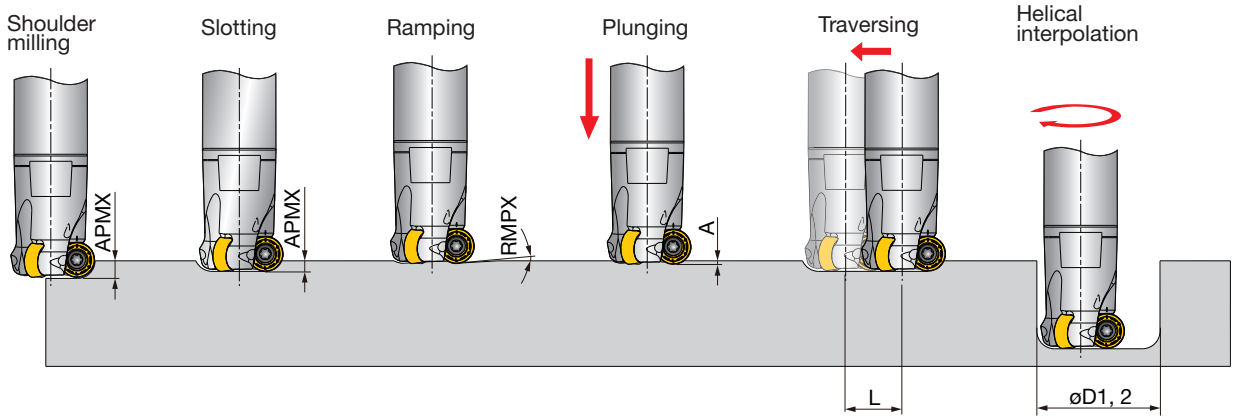
When clamping an insert, please carefully locate it in the seat, fasten the screw, and make sure there is no gap between it and the body.



Set the insert cavity to fit the protrusion on the body.



APPLICATION RANGE



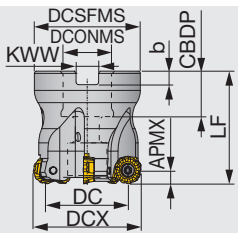
Inch	Tool-ø DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Machining length for removing uncut portion *L*	Min.machining øD1	*Max. machining øD2
ERP10R100U0100-02	1.000	0.197	3	0.0276	0.630	1.457	1.969
ERP10R125U0125-04	1.250	0.197	8	0.0984	0.866	1.811	2.441
ERP10R150U0125-04	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

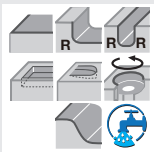
*For flat bottom hole

ROUNDSPLIT
TRC12/16

Face mill, for round inserts with 0.236" (6 mm) or 0.315" (8 mm) radius

GAMP = +0°, GAMF = -1°~ -5°



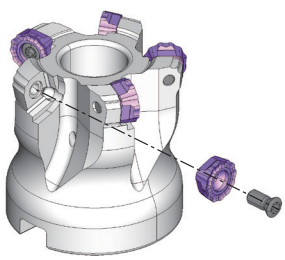


Inch	APMX	DCX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TRC12R200U0075A05	0.236	2.000	1.528	5	1.850	2.000	0.750	0.750	0.320	0.200	0.880	With	RCMT1204...	A
TRC12R250U0075A06	0.236	2.500	2.028	6	2.320	2.000	0.750	0.750	0.320	0.200	1.540	With	RCMT1204...	A
TRC12R300U0100A07	0.315	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	RCMT1204...	A
TRC16R250U0075A05	0.315	2.500	1.870	5	2.320	2.000	0.750	0 .750	0.320	0.200	1.540	With	RCMT1204...	A
TRC16R300U0100A06	0.315	3.000	2.370	6	2.830	2.500	1.000	1.020	0.370	0.240	2.860	With	RCMT1204...	A
TRC16R400U0150A07	0.315	4.000	3.370	7	3.820	2.500	1.500	1.460	0.620	0.390	3.520	With	RCMT1204...	B
TRC16R500U0150A08	0.315	5.000	4.370	8	3.780	2.500	1.500	1.460	0.620	0.390	7.930	With	RCMT1204...	B

SPARE PARTS

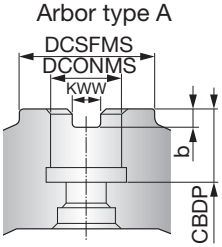
Designation	Clamping screw	Grip	Shell locking bolt (Optional parts)	Torx bit
TRC12R...	CSTB-4L090	H-TBS	(C0.375X1.125H)	BT15S
TRC16R200..., 250...	CSTB-5L120	H-TB	(C0.375X1.125H)	BT20S
TRC16R300...	CSTB-5L120	H-TB	(C0.500X1.375H)	BT20M
TRC16R400..., 500...	CSTB-5L120	H-TB	(TMBA-0.750H)	BT20M

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

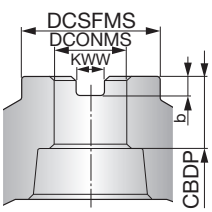


Arbor type

Arbor type A



Arbor type B



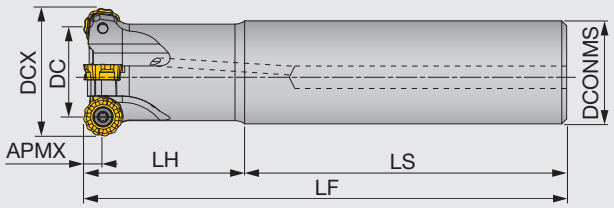
Reference pages: Inserts → H179, Standard cutting conditions → H180

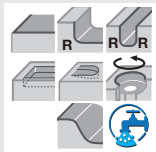
ROUNDSPLIT

ERC12/16

Endmill, shank type, for round inserts with 0.236" (6 mm) or 0.315" (8 mm) radius

GAMP = +0°, GAMF = -1°~ -5°





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*N-***
ERC12R125U0125-03LL	0.236	1.250	0.778	3	1.250	12.000	7.000	5.000	3.370	With	RCMT1204*N-***
ERC12R125U0125-03LM	0.236	1.250	0.778	3	1.250	8.000	4.000	4.000	2.250	With	RCMT1204*N-***
ERC12R125U0125W03	0.236	1.250	0.778	3	1.250	5.000	2.750	2.250	1.320	With	RCMT1204*N-***
ERC12R125U150-03LL	0.236	1.250	0.778	3	1.500	12.000	7.000	5.000	4.190	With	RCMT1204*N-***
ERC12R150U0125-04LM	0.236	1.500	1.028	4	1.250	8.000	4.000	4.000	2.360	With	RCMT1204*N-***
ERC12R150U0125-04LX	0.236	1.500	1.028	4	1.250	12.000	7.000	5.000	3.550	With	RCMT1204*N-***
ERC12R150U0125W04	0.236	1.500	1.028	4	1.250	5.000	2.340	2.660	1.430	With	RCMT1204*N-***
ERC12R150U0150-04L	0.236	1.500	1.028	4	1.500	6.000	2.000	3.750	2.420	With	RCMT1204*N-***
ERC12R150U0150-04LM	0.236	1.500	1.028	4	1.500	8.000	4.000	4.000	3.080	With	RCMT1204*N-***
ERC12R150U0150-04LX	0.236	1.500	1.028	4	1.500	12.000	7.000	5.000	4.410	With	RCMT1204*N-***
ERC12R150U0150W04	0.236	1.500	1.028	4	1.500	5.000	2.340	2.660	1.830	With	RCMT1204*N-***
ERC12R150U150-04LL	0.236	1.500	1.028	4	1.500	12.000	2.000	10.000	5.290	With	RCMT1204*N-***
ERC16R150U0125-02LL	0.315	1.500	0.870	2	1.250	12.000	2.000	10.000	3.810	With	RCMT1606*N-***
ERC16R150U0125-02LM	0.315	1.500	0.870	2	1.250	8.000	2.000	6.000	2.470	With	RCMT1606*N-***
ERC16R150U0125W02	0.315	1.500	0.870	2	1.250	5.000	2.340	2.660	1.430	With	RCMT1606*N-***
ERC16R150U0150-02L	0.315	1.500	0.870	2	1.500	6.000	2.000	4.000	2.380	With	RCMT1606*N-***
ERC16R150U0150-02LM	0.315	1.500	0.870	2	1.500	8.000	4.000	4.000	3.080	With	RCMT1606*N-***
ERC16R150U0150-02LX	0.315	1.500	0.870	2	1.500	12.000	7.000	5.000	4.620	With	RCMT1606*N-***
ERC16R150U0150W02	0.315	1.500	0.870	2	1.500	5.000	2.340	2.660	1.830	With	RCMT1606*N-***
ERC16R150U150-02LL	0.315	1.500	0.870	2	1.500	12.000	2.000	10.000	5.290	Without	RCMT1606*N-***

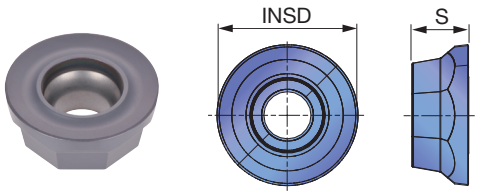
SPARE PARTS

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

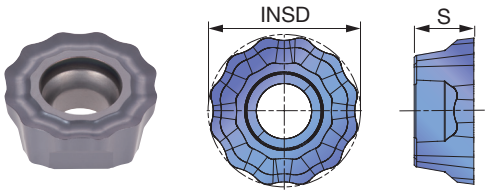
*Recommended clamping torque：CSTB-4L090 = 2.58 lbs･ft, CSTB-5L105 = 3.69 lbs･ft, CSTB-5L120 = 3.69 lbs･ft

Reference pages: Inserts → H179, Standard cutting conditions → H180

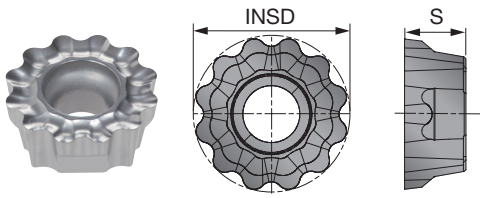
RCMT-MJ



RCMT-NMJ



RCMT-NAJ



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

★ : First choice
☆ : Second choice

Designation	APMX	Coated				Uncoated		INSD	S
		AH120	AH140	AH725		KS15F			
RCMT1204EN-MJ	0.236	●	●	●				0.472	0.189
RCMT1204EN-NMJ	0.236	●	●	●				0.472	0.189
RCMT1204FN-NAJ	0.236					●		0.472	0.189
RCMT1606EN-MJ	0.315	●	●	●				0.630	0.256
RCMT1606EN-NMJ	0.315	●	●	●				0.630	0.256
RCMT1606FN-NAJ	0.315					●		0.630	0.256

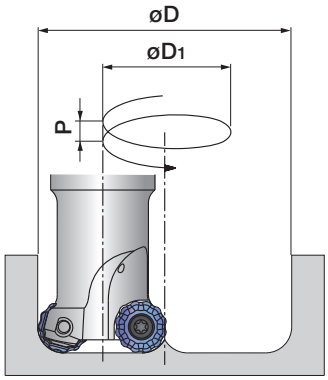
● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hardness HB	Grade	Cutting speed *Vc* (sfm)	Feed per tooth: *fz* (ipt) each chipbreaker		
					MJ	NMJ	NAJ
P	Low carbon steels 1010, 1015, etc.	~ 200	AH725	330 - 720	0.008 - 0.028	0.007 - 0.012	-
	High carbon steels 1045, 1055, etc.	200 ~ 300	AH725	330 - 660	0.008 - 0.028	0.007 - 0.010	-
	Alloyed steels 4140, 5120, etc.	150 ~ 300	AH725	330 - 660	0.008 - 0.028	0.007 - 0.010	-
	Tool steels D3, etc.	~ 300	AH725	330 - 590	0.008 - 0.028	0.007 - 0.010	-
M	Stainless steels 304, 316, etc.	-	AH140	300 - 590	0.008 - 0.024	0.006 - 0.010	-
K	Gray cast irons No.250B, etc.	150 ~ 250	AH120	460 - 820	0.008 - 0.028	0.007 - 0.012	-
	Ductile cast irons 60-40-18, etc.	150 ~ 250	AH120	460 - 820	0.008 - 0.028	0.007 - 0.012	-
N	Aluminum alloys Si < 13%	-	KS15F	1640 - 3940	-	-	0.004 - 0.012
	Aluminum alloys Si ≥ 13%	-	KS15F	330 - 980	-	-	0.004 - 0.012
S	Heat-resistant alloy Inconel 718, Ti-6Al-4V, etc.	-	AH725	70 - 160	0.008 - 0.024	0.006 - 0.010	-

· To remove excessive chip accumulation use an air blast.
· When chips stick to the cutting edges (aluminum machining), use a water soluble cutting fluid.
· Cutting conditions are limited by machine power and material rigidity.
When the cutting width or depth is large, set *Vc* and *fz* below the recommended values and check the machine vibration and spindle load.

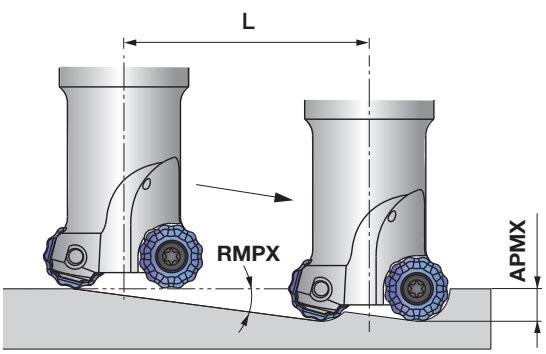
Holemaking with helical feed



Inch	Tool ø DCX (in)	Min. machining diameter (in)		Max. machining diameter (in)		Pitch P (in)
		øD	øD1	øD	øD1	
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



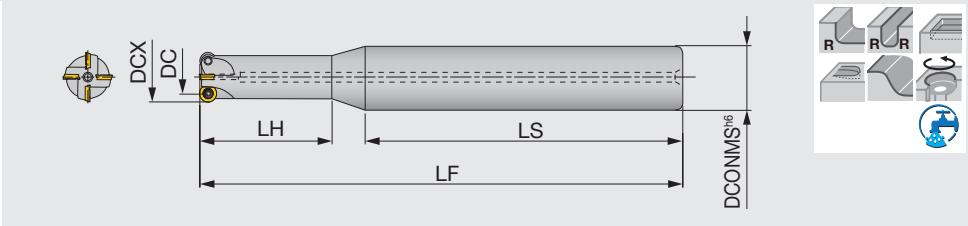
Inch	Tool ø DCX (in)	Max. ramping angle RMPX	L: tool pass length when ramping angle is 2° APMX (in)				
			0.079	0.118	0.158	0.236	0.315
ERC12R125U…	1.250	10°	2.244	3.346	4.488	6.732	–
ERC12R150U…	1.500	7°	2.244	3.346	4.488	6.732	–
TRC12R200U…	2.000	5.5°	2.244	3.346	4.488	6.732	–
TRC12R250U…	2.500	3.5°	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.

EWD05/07/10

Endmill, shank type, for round inserts with 0.098", 0.138", and 0.196" (2.5, 3.5, and 5 mm) radius

GAMP = 0°, GAMF = -3°~ +0.5°



Inch	APMX	DCX	DC	CICT	DCONMS	LS	LH	LF	Air hole	Insert
EWD05050RU	0.098	0.500	0.304	2	0.750	3.250	0.750	5.000	With	RDMW0501M0
EWD05075RU	0.098	0.750	0.554	3	1.000	5.000	1.500	7.000	With	RDMW0501M0
EWD07075RU	0.138	0.750	0.475	4	1.000	5.000	1.500	7.000	With	RDMW0702M0
EWD07100RU	0.138	1.000	0.725	5	1.250	5.250	1.750	8.000	With	RDMW0702M0
EWD07125RU	0.138	1.250	0.975	3	1.500	5.500	1.750	9.000	With	RDMW0702M0
EWD10100RU	0.196	1.000	0.606	3	1.250	5.250	1.750	8.000	With	RDMW1003M0
EWD10125RU	0.196	1.250	0.856	5	1.500	5.500	1.750	9.000	With	RDMW1003M0

SPARE PARTS

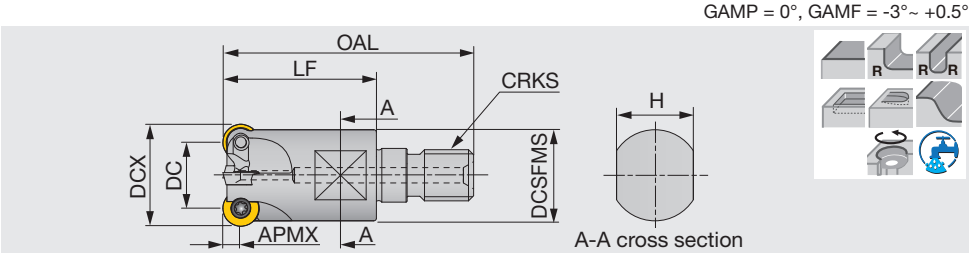
Designation	Clamping screw	Wrench
EWD05050RU	CSTD-1.8	T-6D
EWD05075RU	CSTD-1.8	T-6D
EWD07075RU	CSTB-2.5S	T-8D
EWD07100RU	CSTB-2.5S	T-8D
EWD07125RU	CSTB-2.5S	T-8D
EWD10100RU	CSTB-3.5H	T-15D
EWD10125RU	CSTB-3.5H	T-15D

*Recommended clamping torque：CSTD-1.8 = 0.52 lbs·ft, CSTB-2.5S = 0.74 lbs·ft, CSTB-3.5H = 2.58 lbs·ft

HWD07-M

Endmill, modular type, for round inserts with 3.5 mm radius (TungFlex)

GAMP = 0°, GAMF = -3°~ +0.5°



Metric	APMX	DCX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole
HWD07R015MM08-03	3.5	15	8	3	42	25	10	12.8	M8	0.03	With
HWD07R020MM10-04	3.5	20	13	4	49	30	15	17.8	M10	0.06	With
HWD07R025MM12-05	3.5	25	18	5	57	35	17	20.8	M12	0.1	With
HWD07R030MM16-05	3.5	30	23	5	63	40	22	28.8	M16	0.2	With

See page **H167** for TungFlex modular shank.

SPARE PARTS

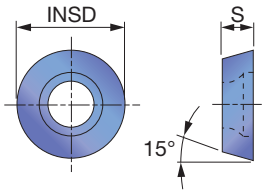
Designation	Clamping screw	Lubricant	Wrench
HWD07**M...	CSTB-2.5S	M-1000	T-8D

*Recommended clamping torque：CSTB-2.5S = 1 N·m

Reference pages: Inserts, Standard cutting conditions → **H183**, TungFlex → **H167**

INSERT

RDMW05/07/10



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

★ : First choice
☆ : Second choice

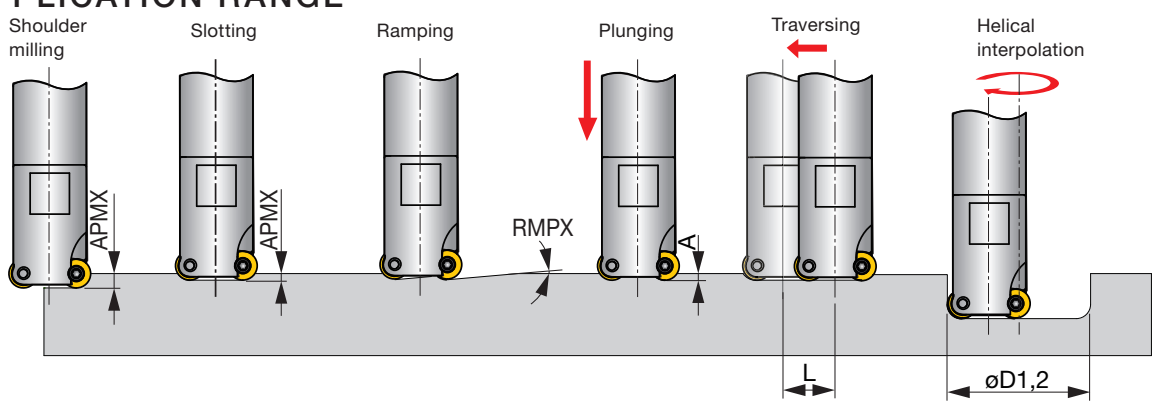
Designation	APMX	Coated AH120	INSD	S
RDMW0501M0	0.098	●	0.197	0.055
RDMW0702M0	0.138	●	0.276	0.094
RDMW1003M0	0.196	●	0.394	3.180

● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)	Depth of cut: APMX (in) Cutter dia. ø0.500"	Cutter dia. ø0.625", ø0.750"	Cutter dia. ø1.000"
P	Carbon steels 1018, 1055, etc. < 300 HB	AH120	650 - 1640	0.006 - 0.018	- 0.020	- 0.028	- 0.039
P	Alloy steels 4140, 4340, etc. < 300 HB	AH120	390 - 1150	0.006 - 0.014	- 0.020	- 0.028	- 0.039
P	Die steels H13, P20, etc. < 300 HB	AH120	330 - 980	0.004 - 0.012	- 0.020	- 0.028	- 0.039
K	Cast irons Class25-40, etc.	AH120	660 - 1640	0.008 - 0.020	- 0.020	- 0.028	- 0.039
H	Hardened steels, Prehardened steels < 40HRC	AH120	230 - 660	0.004 - 0.010	- 0.020	- 0.028	- 0.039

APPLICATION RANGE

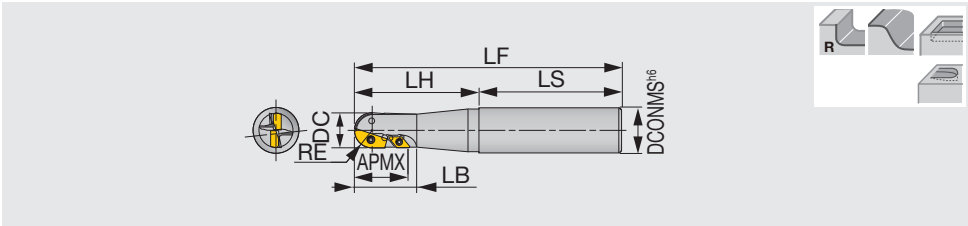


Inch	Tool-ø DCX	Max. depth of cut APMX	Max. ramping RMPX	Max. plunging depth A	Machining length for removing uncut portion L	Max. machining øD1	*Max. machining øD2
EWD05050RU	0.500	0.098	12.5°	0.060	0.342	0.804	0.921
EWD05075RU	0.750	0.098	4°	0.040	0.592	1.304	1.421
EWD07075RU	0.750	0.137	12°	0.080	0.513	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

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	-
EBP100MWU	0.827	1.000	2	1.000	2.280	3.250	5.530	-	0.500	-	ZPET100U-MJ	-
EBP125MWU	1.000	1.250	2	1.250	2.280	3.750	6.030	-	0.625	-	ZPET125U-MJ	-
EBP075LWEU	1.140	0.750	2+2	1.000	2.280	3.750	6.030	1.250	0.375	MK2	ZPET075U-MJ	DCMW070204TN
EBP100LWEU	1.610	1.000	2+2	1.000	2.280	4.250	6.530	-	0.500	-	ZPET100U-MJ	DCMW11T304TN
EBP125LWEU	1.810	1.250	2+2	1.250	2.280	4.750	7.030	-	0.625	-	ZPET125U-MJ	DCMW11T304TN

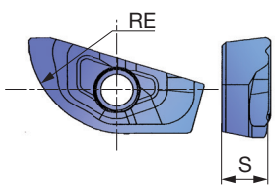
SPARE PARTS

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	-	T-10D	-	-
EBP100MWU	CSTB-4S	-	T-15D	-	-
EBP125MWU	CSTB-5S	-	T-20D	-	-
EBP075LWEU	CSTD-3T	CSTB-2.5S	T-10D	T-8D	T-8D
EBP100LWEU	CSTB-4S	CSTB-4S	T-15D	T-15D	-
EBP125LWEU	CSTB-5S	CSTB-4S	T-20D	T-15D	T-20D

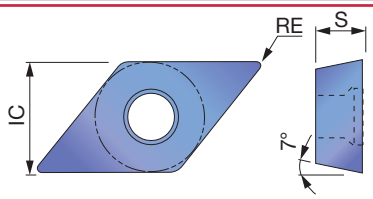
*Recommended clamping torque：CSTB-2.5S = 0.96 lbs･ft, CSTD-3T = 1.84 lbs･ft, CSTB-4S = 2.58 lbs･ft, CSTB-5S = 3.69 lbs･ft

INSERT

ZPET-MJ (For R edge)



DCMW-TN (For P edge)



		AH120	AH330
P	Steel	☆	★
M	Stainless		
K	Cast iron	★	
N	Non-ferrous		
S	Superalloys		
H	Hard materials	☆	

★ : First choice
☆ : Second choice

Designation	RE	Coated AH120	Coated AH330	IC	S
ZPET2004-MJ	0.375	●	●	-	0.169
ZPET2505-MJ	0.500	●	●	-	0.228
ZPET3006-MJ	0.625	●	●	-	0.276
ZPET3206-MJ	0.625	●	●	-	0.276
DCMW070204TN	0.016	●	●	0.252	0.266
DCMW11T304TN	0.016	●	●	0.375	0.094

ZPET30... : 5 piece per package
● : Line up

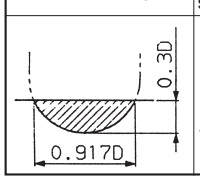
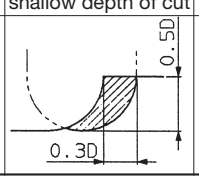
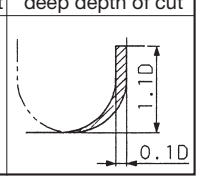
Reference pages: Standard cutting conditions→ H185

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Machining type	Cutting speed *Vc* (sfm)	Table feed: *Vf* (in/min)		
					Tool dia. ø0.787"	Tool dia. ø0.984"	Tool dia. ø1.181"
P	Carbon steels 1055, etc. < 300 HB	AH120	(1)	550 - 750	24 - 30	18 - 30	14 - 26
		AH120	(2)	650 - 850	35 - 51	27 - 43	21 - 37
		AH120	(3)	500 - 650	14 - 23	12 - 24	9 - 21
	Alloy steels 4140, 4340, etc. < 300 HB	AH120	(1)	500 - 690	21 - 33	16 - 28	12 - 24
		AH120	(2)	590 - 780	32 - 47	16 - 32	19 - 34
		AH120	(3)	425 - 590	14 - 26	10 - 22	8 - 19
	Die steels JIS SKD11, etc. < 300 HB	AH330	(1)	400 - 590	17 - 28	12 - 24	9 - 21
		AH330	(2)	500 - 690	26 - 42	19 - 35	15 - 30
		AH330	(3)	330 - 500	10 - 22	7 - 19	5 - 17
K	Cast irons JIS Class 25-40, etc.	AH120	(1)	550 - 750	32 - 43	24 - 36	19 - 31
		AH120	(2)	650 - 850	35 - 55	28 - 47	21 - 41
		AH120	(3)	500 - 650	17 - 28	12 - 24	9 - 21
H	Hardened steels Prehardened steels < 45 HRC	AH120	(1)	200 - 330	6 - 14	4 - 12	4 - 10
		AH120	(2)	230 - 425	6 - 18	4 ~16	4 - 14
		AH120	(3)	130 - 260	6 - 10	4 - 8	3 - 7

- Cutting speeds shown in the above table are of the most outer diameter of the tool.
- When the depth of cut is the upper limit shown in the above figures, set the cutting conditions to the lowest values shown left.
- When using long edge types, set the cutting speed and feed to 60 to 80 % of values shown in the table.
- When using long shank types, set the cutting speed and feed to 20 to 50 % of values shown in the table, bearing in mind the overhang length.

Machining types

(1) Grooving	(2) Shouldering at shallow depth of cut	(3) Shouldering at deep depth of cut
		

EBD

Ball nose endmill for roughing

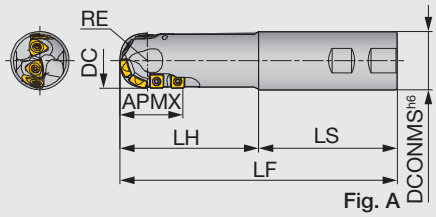


Fig. A

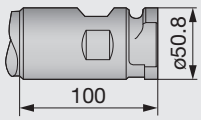
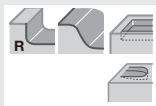


Fig. B



Combination shank

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

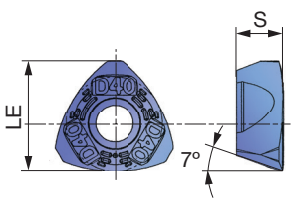
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EBD040*SE	CSTB-4M	M-1000	T-15T
EBD050**-E	CSTB-5	M-1000	T-20T

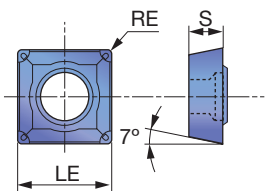
*Recommended clamping torque：CSTB-4M = 3.5 N·m, CSTB-5 = 5 N·m

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 AH120	LE	S
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

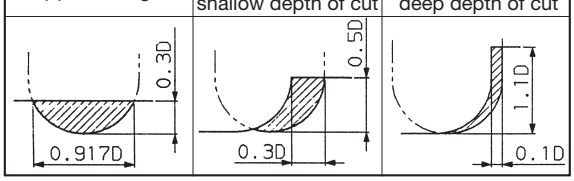
Reference pages: Standard cutting conditions→ H187

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Machining type	Cutting speed *Vc* (sfm)	Table feed: *Vf* (in/min) Tool dia. ø1.570"	Table feed: *Vf* (in/min) Tool dia. ø2.000"
P	Carbon steels 1055, etc. < 300 HB	AH120	(1)	500 - 690	16 - 22	3 - 18
		AH120	(2)	550 - 750	16 - 22	13 - 17
		AH120	(3)	425 - 625	8 - 12	6 - 10
	Alloy steels 4140, 4340, etc. < 300 HB	AH120	(1)	425 - 625	14 - 20	11 - 16
		AH120	(2)	500 - 690	14 - 20	11 - 16
		AH120	(3)	360 - 560	7 - 11	5 - 9
	Die steels JIS SKD11, etc. < 300 HB	AH120	(1)	360 - 560	12 - 18	10 - 15
		AH120	(2)	425 - 625	12 - 18	10 - 14
		AH120	(3)	295 - 500	6 - 10	5 - 8
K	Cast irons JIS Class 25-40, etc.	AH120	(1)	550 - 750	20 - 27	16 - 21
		AH120	(2)	625 - 820	20 - 27	16 - 21
		AH120	(3)	500 - 690	12 - 20	9 - 13
H	Hardened steels Prehardened steels < 45 HRC	AH120	(1)	230 - 360	6 - 10	5 - 8
		AH120	(2)	260 - 400	6 - 10	5 - 8
		AH120	(3)	160 - 300	3 - 6	2 - 5

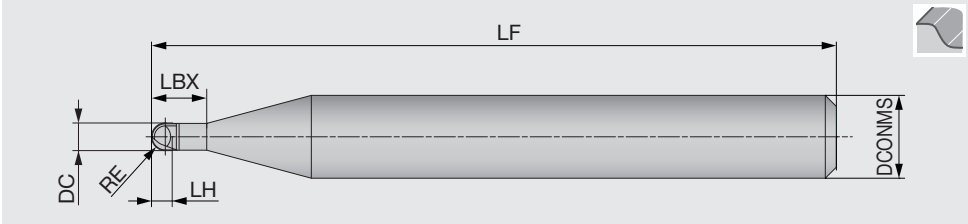
- Cutting speeds shown in the above table are of the most outer diameter of the tool.
- The values of the cutting speeds and feeds shown in the table are of under general cutting conditions.
  The values should be modified depending on the power and rigidity of the machine to be used, and work holding conditions.
- When using the long shank type, the depth of cut, pick feed, cutting speed, and table feed should be reduced to 70 %-90 % of the values shown in the tables.

Machining types

(1) Grooving	(2) Shouldering at shallow depth of cut	(3) Shouldering at deep depth of cut
		

BBB2000

T-CBN ball nose endmill for dies and molds



Metric	BX850	NOF	RE	DC	LH	LBX	LF	DCONMS
BBB2006	●	2	0.3	0.6	0.5	1.2	50	6
BBB2008	●	2	0.4	0.8	0.6	1.6	50	6
BBB2010	●	2	0.5	1	0.7	2	50	6
BBB2020	●	2	1	2	1.5	4	50	6

● : Line up

Tolerance (BBB2000)

R	*R* Tolerance	Tolerance on shank
0.3 ~ 1	±0.005	h6

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Hard-ness	No. of revolutions *n* (min^{-1})	Ball radius (RE) 0.3 Depth of cut APMX × *pf* (mm)	0.3 Feed rate (mm/min)	0.4 Depth of cut APMX × *pf* (mm)	0.4 Feed rate (mm/min)	0.5 Depth of cut APMX × *pf* (mm)	0.5 Feed rate (mm/min)	1 Depth of cut APMX × *pf* (mm)	1 Feed rate (mm/min)
H	Prehardened steel (NAK80, etc.) Die steel (JIS SKD61, etc.)	~ 52 HRC	50,000	0.02 × 0.03	2,000	0.03 × 0.05	2,000	0.05 × 0.05	3,000	0.10 × 0.10	5,000
H	Die steel (JIS SKD11, DRM1 & 2, etc.)	~ 62 HRC	50,000	0.01 × 0.02	2,000	0.02 × 0.03	2,000	0.03 × 0.05	3,000	0.05 × 0.05	5,000
H	High speed steel, Die steel (JIS SKH, DRM3, etc.)	~ 70 HRC	50,000	0.01 × 0.02	1,500	0.01 × 0.03	1,500	0.02 × 0.03	2,000	0.03 × 0.05	3,000

- Depths of cut (APMX) shown in the table are the allowable maximum values.
- Mist cooling or air blow is recommended.
- The maximum number of revolutions of the machine to be used is lower than 50,000 min^{-1}, the revolutions and feed rate should be modified at same rate.
- Use smallest possible overhang.

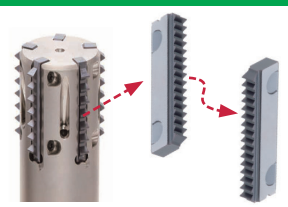
Ball radius (RE)	Inclined angle of workpiece (θ1) / Effective neck length (Z)			
0.3	0°30′/1.25	1°/1.30	2°/1.35	3°/1.45
0.4	0°30′/1.65	1°/1.70	2°/1.80	3°/1.90
0.5	0°30′/2.05	1°/2.10	2°/2.25	3°/2.40
1	0°30′/4.15	1°/4.25	2°/4.50	3°/4.80

MEMO

THREADMILLING

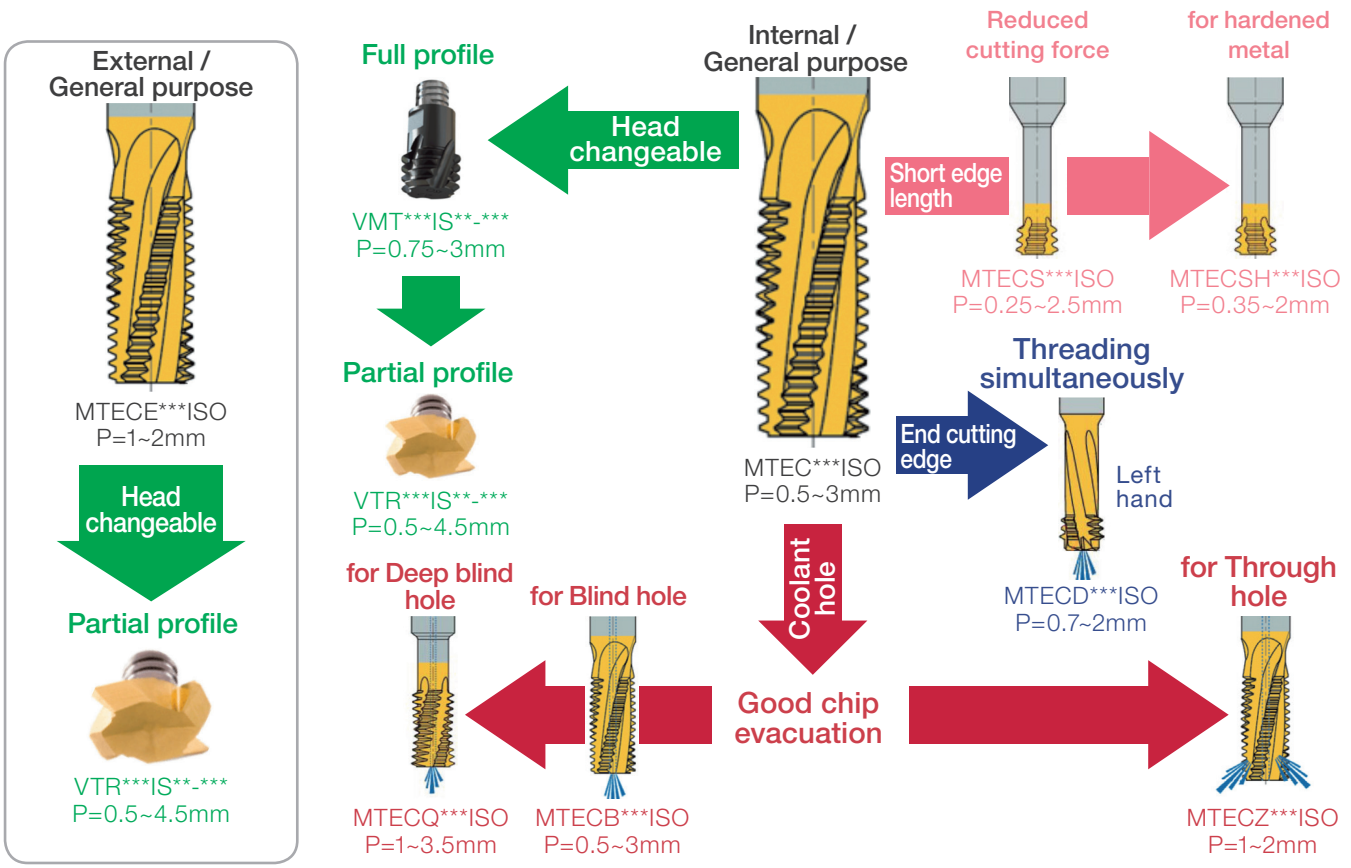
Highly economical tool design

Cost reduction



2-corner double sided inserts

SOLIDTHREAD Selection Guide (for ISO metric)



Reference pages: H191 - H203, L060

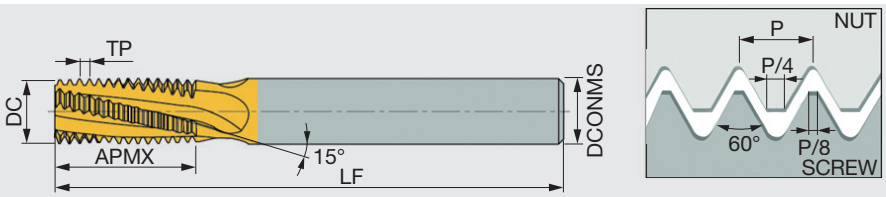
Designation System for Solid Carbide Endmills

MTEC□		06	04	C	10	1.0	ISO
ThreadMilling Endmill Carbide	I - Single Point S - Short SH - Short for Hardened steel B - with Coolant Bore Q - with Coolant Bore with long neck Z - with Coolant hole with through hole D - with Drilling (end mill) cutting edge E - for External thread	Shank Dia.	Tool Dia.	No. of Flutes C = 3 flutes D = 4 flutes E = 5 flutes F = 6 flutes	APMX	TPI	Thread Standard

ISO metric

MTEC-ISO

Solid carbide internal threading endmill, for ISO metric profile



Metric	TPI	Application range Fine	Application range Coarse	DCONMS	DC (in)	DC (mm)	NOF	APMX (in)	APMX (mm)	LF (in)	LF (mm)	Coolant hole	Grade
MTEC06038C100.5ISO	0.5	-	≥M5	6	0.150	3.8	3	0.406	10.3	2.283	58	Without	AH725
MTEC06022C50.5ISO	0.5	M3	≥M4	6	0.087	2.2	3	0.209	5.3	2.283	58	Without	AH725
MTEC06031C70.7ISO	0.7	M4	≥M5	6	0.122	3.1	3	0.291	7.4	2.283	58	Without	AH725
MTEC06045C100.75ISO	0.75	-	≥M6	6	0.177	4.5	3	0.394	10	2.283	58	Without	AH725
MTEC06036C90.8ISO	0.8	M5	≥M6	6	0.142	3.6	3	0.362	9.2	2.283	58	Without	AH725
MTEC0606C121.0ISO	1	-	≥M9	6	0.236	6	3	0.492	12.5	2.283	58	Without	AH725
MTEC0808D161.0ISO	1	-	≥M10	8	0.315	8	4	0.650	16.5	2.520	64	Without	AH725
MTEC0604C101.0ISO	1	M6	≥M7	6	0.157	4	3	0.413	10.5	2.283	58	Without	AH725
MTEC0604C141.0ISO	1	M6	≥M7	6	0.157	4	3	0.571	14.5	2.283	58	Without	AH725
MTEC0605C141.25ISO	1.25	M8	≥M10	6	0.197	5	3	0.567	14.4	2.283	58	Without	AH725
MTEC0605C191.25ISO	1.25	M8	≥M10	6	0.197	5	3	0.764	19.4	2.283	58	Without	AH725
MTEC1010D211.5ISO	1.5	-	≥M14	10	0.394	10	4	0.858	21.8	2.874	73	Without	AH725
MTEC1616F331.5ISO	1.5	-	≥M20	16	0.630	16	6	1.331	33.8	4.134	105	Without	AH725
MTEC0807C171.5ISO	1.5	M10	≥M12	8	0.276	7	3	0.681	17.3	2.520	64	Without	AH725
MTEC0807C241.5ISO	1.5	M10	≥M12	8	0.276	7	3	0.976	24.8	2.992	76	Without	AH725
MTEC0808C201.75ISO	1.75	M12	≥M14	8	0.315	8	3	0.791	20.1	2.520	64	Without	AH725
MTEC0808C281.75ISO	1.75	M12	≥M14	8	0.315	8	3	1.138	28.9	2.992	76	Without	AH725
MTEC1212D272.0ISO	2	-	≥M18	12	0.472	12	4	1.063	27	3.307	84	Without	AH725
MTEC2020F412.0ISO	2	-	≥M26	20	0.787	20	6	1.614	41	4.134	105	Without	AH725
MTEC1010C272.0ISO	2	M16	≥M17	10	0.394	10	3	1.063	27	2.874	73	Without	AH725
MTEC1010C392.0ISO	2	M16	≥M17	10	0.394	10	3	1.535	39	4.134	105	Without	AH725
MTEC1414D332.5ISO	2.5	M20	≥M22	14	0.551	14	4	1.331	33.8	3.307	84	Without	AH725
MTEC1414D482.5ISO	2.5	M20	≥M22	14	0.551	14	4	1.921	48.8	4.134	105	Without	AH725
MTEC1616C403.0ISO	3	M24	≥M25	16	0.630	16	3	1.594	40.5	4.134	105	Without	AH725
MTEC1616C583.0ISO	3	M24	≥M25	16	0.630	16	3	2.303	58.5	4.724	120	Without	AH725

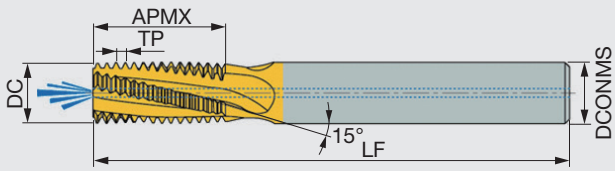
Reference pages: Standard cutting conditions → H206 - H207

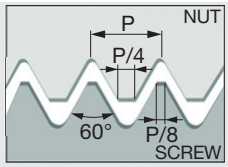
SOLIDTHREAD

ISO metric

MTECB-ISO

Solid carbide internal threading endmill, with coolant hole, for ISO metric profile



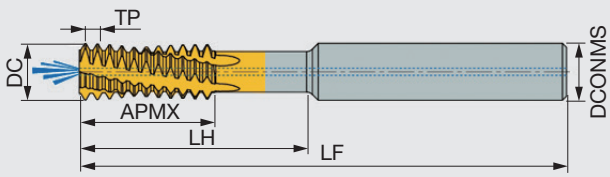


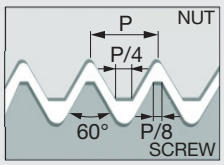
Metric	TP	Application range Fine	Application range Coarse	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECB06038C100.5ISO	0.5	-	≥M5	6	3.8	3	10.3	58	With	AH725
MTECB06031C70.7ISO	0.7	M4	≥M5	6	3.1	3	7.4	58	With	AH725
MTECB06045C100.75ISO	0.75	-	≥M6	6	4.5	3	10.1	58	With	AH725
MTECB1010D240.75ISO	0.75	-	≥M12	10	10	4	24.4	73	With	AH725
MTECB06038C90.8ISO	0.8	M5	≥M6	6	3.8	3	9.2	58	With	AH725
MTECB0606C121.0ISO	1	-	≥M9	6	6	3	12.5	58	With	AH725
MTECB0808D161.0ISO	1	-	≥M10	8	8	4	16.5	64	With	AH725
MTECB1010D241.0ISO	1	-	≥M12	10	10	4	24.5	73	With	AH725
MTECB06046C101.0ISO	1	M6	≥M7	6	4.6	3	10.5	58	With	AH725
MTECB06046C141.0ISO	1	M6	≥M6	6	4.6	3	14.5	58	With	AH725
MTECB0606C141.25ISO	1.25	M8	≥M10	6	6	3	14.4	58	With	AH725
MTECB0606C191.25ISO	1.25	M8	≥M10	6	6	3	19.4	58	With	AH725
MTECB1010D211.5ISO	1.5	-	≥M14	10	10	4	21.8	73	With	AH725
MTECB1616F331.5ISO	1.5	-	≥M20	16	16	6	33.8	105	With	AH725
MTECB1212D261.5ISO	1.5		≥M16	12	12	4	26.3	84	With	AH725
MTECB08078C171.5ISO	1.5	M10	≥M12	8	7.8	3	17	64	With	AH725
MTECB08078C241.5ISO	1.5	M10	≥M12	8	7.8	3	24.8	76	With	AH725
MTECB1009C201.75ISO	1.75	M12	≥M12	10	9	3	20.1	73	With	AH725
MTECB1009C281.75ISO	1.75	M12	≥M12	10	9	3	28.9	73	With	AH725
MTECB1010C272.0ISO	2	M14	≥M15	10	10	3	27	73	With	AH725
MTECB12118D272.0ISO	2	M16	≥M17	12	11.8	4	27	84	With	AH725
MTECB12118D392.0ISO	2	M16	≥M17	12	11.8	4	39	105	With	AH725
MTECB1615E332.5ISO	2.5	M20	≥M22	16	15	5	33.8	105	With	AH725
MTECB1615E482.5ISO	2.5	M20	≥M22	16	15	5	48.8	105	With	AH725
MTECB2018D583.0ISO	3	M24	≥M25	20	18	4	58.5	120	With	AH725

Reference pages: Standard cutting conditions → H206 - H207

MTECQ-ISO

Solid carbide deep internal threading endmill, with internal coolant hole, for ISO metric profile

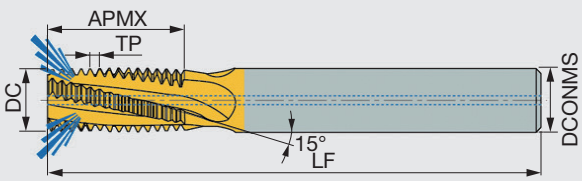


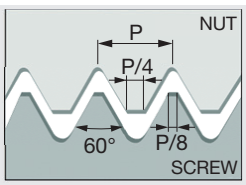


Metric	TP	Application range	DCONMS	DC	NOF	APMX	LH	LF	Coolant hole	Grade
MTECQ1212D381.0ISO	1	≥M14	12	12	4	21	38	84	With	AH725
MTECQ1010D301.5ISO	1.5	≥M13	10	10	4	18	30	73	With	AH725
MTECQ2020F562.0ISO	2	≥M24	20	20	6	34	56	105	With	AH725
MTECQ2020D453.5ISO	3.5	≥M26	20	20	4	28	45.5	105	With	AH725

MTECZ-ISO

Solid carbide internal threading endmill, with coolant hole in the flute, for ISO metric profile





Metric	TP	Application range Fine	Application range Coarse	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECZ0808D161.0ISO	1	-	≥M10	8	8	4	16.5	64	With	AH725
MTECZ06048C101.0ISO	1	M6	≥M7	6	4.8	3	10.5	58	With	AH725
MTECZ0606C141.25ISO	1.25	M8	≥M10	6	6	3	14.4	58	With	AH725
MTECZ0606C191.25ISO	1.25	M8	≥M10	6	6	3	19.4	58	With	AH725
MTECZ1010D211.5ISO	1.5	-	≥M14	10	10	4	21.8	73	With	AH725
MTECZ1212D261.5ISO	1.5	-	≥M16	12	12	4	26.3	84	With	AH725
MTECZ1616E331.5ISO	1.5	-	≥M20	16	16	5	33.8	101	With	AH725
MTECZ08078C171.5ISO	1.5	M10	≥M12	8	7.8	3	17	64	With	AH725
MTECZ1009C281.75ISO	1.75	M12	≥M12	10	9	3	28.9	73	With	AH725
MTECZ1010C272.0ISO	2	M14	≥M15	10	10	3	27	73	With	AH725
MTECZ12118D272.0ISO	2	M16	≥M17	12	11.8	4	27	84	With	AH725

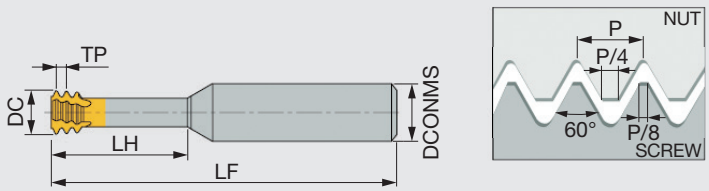
Reference pages: Standard cutting conditions → H206 - H207

SOLIDTHREAD

ISO metric

MTECS-ISO

Small diameter solid carbide internal threading endmill, short edge type, for ISO metric profile

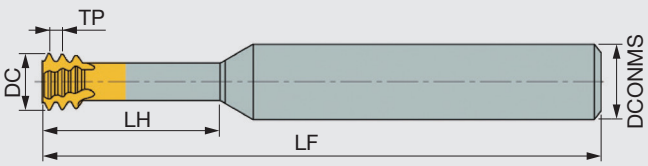


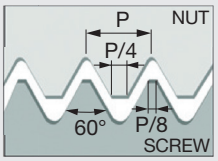
Metric	TP	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS03007C20.25ISO	0.25	≥M1	3	0.72	3	2.5	39	Without	AH725
MTECS03009C30.25ISO	0.25	≥M1.2	3	0.9	3	3	39	Without	AH725
MTECS03011C40.3ISO	0.3	≥M1.4	3	1.05	3	4	39	Without	AH725
MTECS03012C50.35ISO	0.35	≥M1.6	3	1.2	3	4.8	39	Without	AH725
MTECS03016C60.4ISO	0.4	≥M2	3	1.53	3	6	39	Without	AH725
MTECS06016C40.4ISO	0.4	≥M2	6	1.53	3	4.5	58	Without	AH725
MTECS03017C70.45ISO	0.45	≥M2.2	3	1.65	3	7	39	Without	AH725
MTECS06017C50.45ISO	0.45	≥M2.2	6	1.65	3	5	58	Without	AH725
MTECS0602C50.45ISO	0.45	≥M2.5	6	1.95	3	5.5	58	Without	AH725
MTECS0602C70.45ISO	0.45	≥M2.5	6	1.95	3	7.5	58	Without	AH725
MTECS06024C60.5ISO	0.5	≥M3	6	2.37	3	6.5	58	Without	AH725
MTECS06024C90.5ISO	0.5	≥M3	6	2.37	3	9.5	58	Without	AH725
MTECS06024C90.5ISOL	0.5	≥M3	6	2.37	3	9.5	105	Without	AH725
MTECS03024C120.5ISO	0.5	≥M3	3	2.4	3	12.5	39	Without	AH725
MTECS03024C150.5ISO	0.5	≥M3	3	2.4	3	15.5	39	Without	AH725
MTECS06054D200.5ISO	0.5	≥M6	6	5.35	4	20	58	Without	AH725
MTECS06028C100.6ISO	0.6	≥M3.5	6	2.75	3	10.5	58	Without	AH725
MTECS06028C70.6ISO	0.6	≥M3.5	6	2.75	3	7.5	58	Without	AH725
MTECS06031C120.7ISO	0.7	≥M4	6	3.1	3	12.5	58	Without	AH725
MTECS06031C120.7ISOL	0.7	≥M4	6	3.1	3	12.5	105	Without	AH725
MTECS06031C160.7ISO	0.7	≥M4	6	3.1	3	16.7	58	Without	AH725
MTECS06031C90.7ISO	0.7	≥M4	6	3.1	3	9	58	Without	AH725
MTECS0808D250.75ISO	0.75	≥M10	8	8	4	25	64	Without	AH725
MTECS06038C120.8ISO	0.8	≥M5	6	3.8	3	12.5	58	Without	AH725
MTECS06038C160.8ISO	0.8	≥M5	6	3.8	3	16	58	Without	AH725
MTECS06038C160.8ISOL	0.8	≥M5	6	3.8	3	16	105	Without	AH725
MTECS06047C141.0ISO	1	≥M6	6	4.65	3	14	58	Without	AH725
MTECS06047C201.0ISO	1	≥M6	6	4.65	3	20	58	Without	AH725
MTECS06047C201.0ISOL	1	≥M6	6	4.65	3	20	105	Without	AH725
MTECS0606C181.25ISO	1.25	≥M8	6	6	3	18	58	Without	AH725
MTECS0606C241.25ISO	1.25	≥M8	6	6	3	24	58	Without	AH725
MTECS08078C231.5ISO	1.5	≥M10	8	7.8	3	23	64	Without	AH725
MTECS08078C311.5ISO	1.5	≥M10	8	7.8	3	31.5	64	Without	AH725
MTECS1009C261.75ISO	1.75	≥M12	10	9	3	26	73	Without	AH725
MTECS12118D352.0ISO	2	≥M16	12	11.8	4	35	84	Without	AH725
MTECS12118D502.0ISO	2	≥M16	12	11.8	4	50	105	Without	AH725
MTECS1615E432.5ISO	2.5	≥M20	16	15	5	43	100	Without	AH725

Reference pages: Standard cutting conditions → H206 - H207

MTECSH-ISO

Small diameter solid carbide internal threading endmill, short edge type, left hand cutting, for ISO metric profile





Metric	TP	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECSH03012C50.35ISO	0.35	≥M1.6	3	1.2	3	4.8	39	Without	AH750
MTECSH03016C60.4ISO	0.4	≥M2	3	1.55	3	6	39	Without	AH750
MTECSH06016C40.4ISO	0.4	≥M2	6	1.55	3	4.5	58	Without	AH750
MTECSH06017C50.45ISO	0.45	≥M2.2	6	1.65	3	5	58	Without	AH750
MTECSH0602C50.45ISO	0.45	≥M2.5	6	1.95	3	5.5	58	Without	AH750
MTECSH0602C70.45ISO	0.45	≥M2.5	6	1.95	3	7.5	58	Without	AH750
MTECSH06024C60.5ISO	0.5	≥M3	6	2.35	3	6.5	58	Without	AH750
MTECSH06024C90.5ISO	0.5	≥M3	6	2.35	3	9.5	58	Without	AH750
MTECSH06028C70.6ISO	0.6	≥M3.5	6	2.75	3	7.5	58	Without	AH750
MTECSH06031C120.7ISO	0.7	≥M4	6	3.1	3	12.5	58	Without	AH750
MTECSH06038C120.8ISO	0.8	≥M5	6	3.8	3	12.5	58	Without	AH750
MTECSH06047C141.0ISO	1	≥M6	6	4.65	3	14	58	Without	AH750
MTECSH06047C201.0ISO	1	≥M6	6	4.65	3	20	58	Without	AH750
MTECSH0606C181.25ISO	1.25	≥M8	6	5.95	3	18	58	Without	AH750
MTECSH0606C241.25ISO	1.25	≥M8	6	5.95	3	24	58	Without	AH750
MTECSH08078C231.5ISO	1.5	≥M10	8	7.8	3	23	64	Without	AH750
MTECSH1009C261.75ISO	1.75	≥M12	10	9	3	26	73	Without	AH750
MTECSH12118D352.0ISO	2	≥M16	12	11.8	4	35	84	Without	AH750

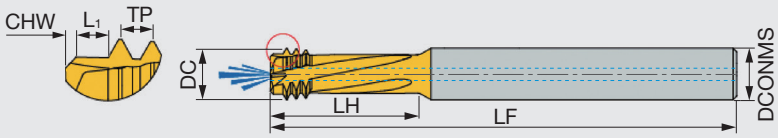
Reference pages: Standard cutting conditions → H206 - H207

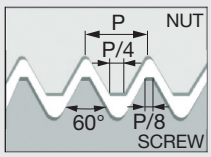
SOLIDTHREAD

ISO metric

MTECD-ISO

Small diameter solid carbide endmill for internal threading, drilling, and chamfering, short edge type, left hand cutting, for ISO metric profile

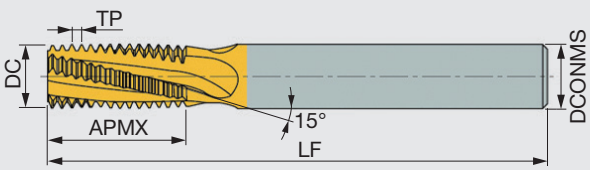


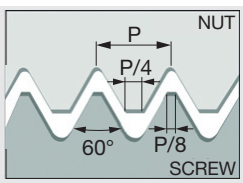


Metric	TP	Application range	DCONMS	DC	NOF	LH	LF	CHW	L1	Coolant hole	Grade
MTECD06032C110.7ISO	0.7	M4	6	3.15	3	11.6	58	0.2	0.7	Without	AH725
MTECD0604C140.8ISO	0.8	M5	6	4	3	14.4	58	0.3	0.8	Without	AH725
MTECD08047C141.0ISO	1	M6-M9	8	4.7	3	14	64	0.4	1	With	AH725
MTECD08061D181.25ISO	1.25	M8-M12	8	6.1	4	18	64	0.5	1.3	With	AH725
MTECD08078D231.5ISO	1.5	M10-M15	8	7.8	4	23	64	0.6	1.5	With	AH725
MTECD1009D261.75ISO	1.75	M12	10	9	4	26	73	0.6	1.8	With	AH725
MTECD12118D352.0ISO	2	M16-M23	12	11.8	4	35	84	0.6	2	With	AH725

MTEC E-ISO

Solid carbide external threading endmill, for ISO metric profile





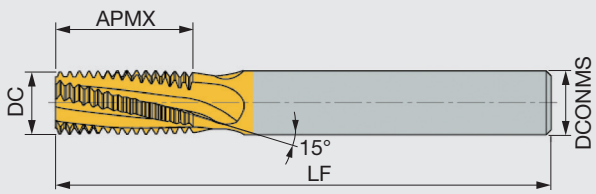
Metric	TP	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECE1010D161.0ISO	1	10	10	4	16.5	73	Without	AH725
MTECE1010D161.25ISO	1.25	10	10	4	16.9	73	Without	AH725
MTECE1010D151.5ISO	1.5	10	10	4	15.8	73	Without	AH725
MTECE1212D201.5ISO	1.5	12	12	4	20.3	84	Without	AH725
MTECE1212D201.75ISO	1.75	12	12	4	20.1	84	Without	AH725
MTECE1212D212.0ISO	2	12	12	4	21	84	Without	AH725

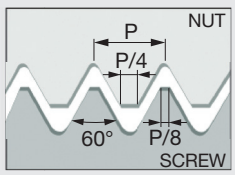
Reference pages: Standard cutting conditions → H206 - H207

Unified

MTEC-UN

Solid carbide internal threading endmill, for UN profile





Metric	TPI	Application range			DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
		UNC	UNF	UNEF							
MTEC06032C632UN	32	#8	#10	#12	6	3.2	3	6.8	58	Without	AH725
MTEC0604C1128UN	28	-	1/4	-	6	4	3	11.3	58	Without	AH725
MTEC0606C1428UN	28	-	-	7/16-1/2	6	6	3	14.5	58	Without	AH725
MTEC0605C1424UN	24	-	5/16	-	6	5	3	14.3	58	Without	AH725
MTEC0807C2124UN	24	-	3/8	9/16-5/8	8	7	3	20	64	Without	AH725
MTEC06045C1220UN	20	1/4	-	-	6	4.5	3	12.1	58	Without	AH725
MTEC0807C2120UN	20	-	7/16-1/2	-	8	7	3	20	64	Without	AH725
MTEC1212E2720UN	20	-	-	3/4-1	12	12	5	27.3	84	Without	AH725
MTEC0605C1418UN	18	5/16	-	-	6	5	3	14.8	58	Without	AH725
MTEC1010D2618UN	18	-	9/16-5/8	1 1/8-1 5/8	10	10	4	26.1	73	Without	AH725
MTEC0606C1616UN	16	3/8	-	-	6	6	3	16.7	58	Without	AH725
MTEC1212D3116UN	16	-	3/4	-	12	12	4	30	84	Without	AH725
MTEC1615E3714UN	14	-	7/8	-	16	15	5	37.2	105	Without	AH725
MTEC0808C2213UN	13	1/2	-	-	8	8	3	22.5	64	Without	AH725
MTEC1010C2612UN	12	9/16	-	-	10	10	3	26.5	73	Without	AH725
MTEC1616E4112UN	12	-	1-1 1/2	-	16	16	5	41.3	105	Without	AH725
MTEC1010C2811UN	11	5/8	-	-	10	10	3	28.9	73	Without	AH725
MTEC1212C3410UN	10	3/4	-	-	12	12	3	34.3	84	Without	AH725
MTEC1615C389UN	9	7/8	-	-	16	15	3	38.1	105	Without	AH725
MTEC1616C428UN	8	1	-	-	16	16	3	42.9	105	Without	AH725

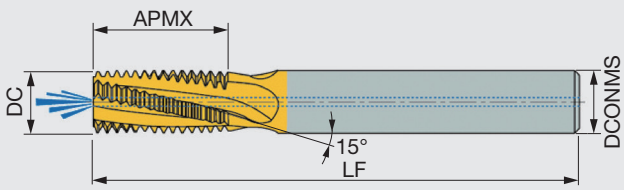
Reference pages: Standard cutting conditions → H206 - H207

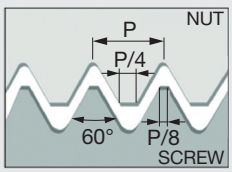
SOLIDTHREAD

Unified

MTECB-UN

Solid carbide internal threading endmill, with coolant hole, for UN profile

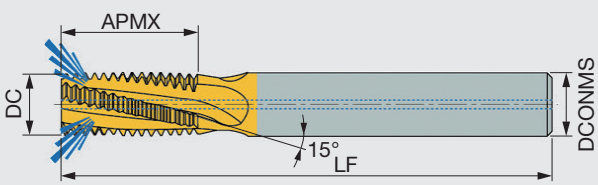


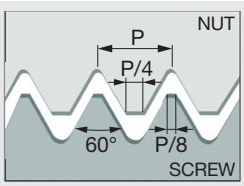


Metric	TPI	Application range UNC	UNF	UNEF	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECB06032C632UN	32	#8	#10	#12	6	3.2	3	6.8	58	With	AH725
MTECB0606C1432UN	32	-	-	7/16-1/2	6	6	3	16	58	With	AH725
MTECB0605C1128UN	28	-	1/4	-	6	5	3	11.3	58	With	AH725
MTECB08066C1424UN	24	-	5/16	-	8	6.6	3	14.3	64	With	AH725
MTECB0808D2124UN	24	-	-	9/16-5/8	8	8	4	20.6	64	With	AH725
MTECB0808C2120UN	20	-	7/16	-	8	8	3	21	64	With	AH725
MTECB1010D2220UN	20	-	1/2	-	10	10	4	22.3	73	With	AH725
MTECB06056C1418UN	18	5/16	-	-	6	5.6	3	14.8	58	With	AH725
MTECB12113D2618UN	18	-	9/16-5/8	1 1/8-1 5/8	12	11.3	4	26.1	84	With	AH725
MTECB08067C1616UN	16	3/8	-	-	8	6.7	3	16.7	64	With	AH725
MTECB1212D3116UN	16	-	3/4	-	12	12	4	31	84	With	AH725
MTECB1616E3714UN	14	-	7/8	-	16	16	5	37.2	105	With	AH725
MTECB10092C2213UN	13	1/2	-	-	10	9.2	3	22.5	73	With	AH725
MTECB12114C2811UN	11	5/8	-	-	12	11.4	3	28.9	84	With	AH725
MTECB16144D3410UN	10	3/4	-	-	16	14.4	4	34.3	105	With	AH725
MTECB20195D428UN	8	1	-	-	20	19.5	4	42.9	105	With	AH725

MTECZ-UN

Solid carbide internal threading endmill, with coolant hole in the flute, for UN profile





Metric	TPI	Application range UNC	UNF	UNEF	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECZ1010D2220UN	20	-	1/2	-	10	10	4	22.3	73	With	AH725
MTECZ12113D2618UN	18	-	9/16-5/8	1 1/8-1 5/8	12	11.3	4	26.1	84	With	AH725
MTECZ08067C1616UN	16	3/8	-	-	8	6.7	3	16.7	64	With	AH725
MTECZ16144D3410UN	10	3/4	-	-	16	14.4	4	34.3	101	With	AH725

Reference pages: Standard cutting conditions → H206 - H207

MTECS-UN

Small diameter solid carbide internal threading endmill, short edge type, for UN profile

Metric	TPI	Application range UNC	Application range UNF	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS03012C880UN	80	-	#0	3	1.15	3	8	39	Without	AH725
MTECS03015C672UN	72	-	#1	3	1.45	3	6	39	Without	AH725
MTECS06016C656UN	56	#2	#3	6	1.65	3	6.6	58	Without	AH725
MTECS06016C456UN	56	#2	#3	6	1.65	3	4.4	58	Without	AH725
MTECS06019C548UN	48	#3	#4	6	1.9	3	5.2	58	Without	AH725
MTECS03021C1240UN	40	#4	-	3	2.1	3	12	39	Without	AH725
MTECS06021C840UN	40	#4	-	6	2.1	3	8	58	Without	AH725
MTECS06024C940UN	40	#5	#6	6	2.45	3	9.6	58	Without	AH725
MTECS06021C640UN	40	#4	-	6	2.1	3	6.3	58	Without	AH725
MTECS06033C936UN	36	-	#8	6	3.3	3	9	58	Without	AH725
MTECS06025C732UN	32	#6	-	6	2.55	3	7.1	58	Without	AH725
MTECS06025C1032UN	32	#6	-	6	2.55	3	10.5	58	Without	AH725
MTECS06032C932UN	32	#8	#10	6	3.2	3	9.5	58	Without	AH725
MTECS06032C1232UN	32	#8	#10	6	3.2	3	12.5	58	Without	AH725
MTECS06037C1032UN	32	-	#10	6	3.7	3	10.5	58	Without	AH725
MTECS06037C1532UN	32	-	#10	6	3.7	3	15	58	Without	AH725
MTECS0605C1428UN	28	-	1/4	6	5	3	14.5	58	Without	AH725
MTECS0605C1928UN	28	-	1/4	6	5	3	19	58	Without	AH725
MTECS08066C1724UN	24	-	5/16	8	6.6	3	17	64	Without	AH725
MTECS08066C2424UN	24	-	5/16	8	6.6	3	24	64	Without	AH725
MTECS06047C1420UN	20	1/4	-	6	4.75	3	14	58	Without	AH725
MTECS06047C1920UN	20	1/4	-	6	4.75	3	19	58	Without	AH725
MTECS06047C1920UN-L	20	1/4	-	6	4.75	3	19	105	Without	AH725
MTECS0808C2520UN	20	-	7/16	8	8	3	25	64	Without	AH725
MTECS0606C1718UN	18	5/16	-	6	6	3	17	58	Without	AH725
MTECS0606C2318UN	18	5/16	-	6	6	3	23	58	Without	AH725
MTECS1212D3518UN	18	-	5/8	12	12	4	35	84	Without	AH725
MTECS08067C2216UN	16	3/8	-	8	6.7	3	22	64	Without	AH725
MTECS08067C3016UN	16	3/8	-	8	6.7	3	30.2	64	Without	AH725
MTECS08077C2514UN	14	7/16	-	8	7.7	3	25	64	Without	AH725
MTECS10092C2713UN	13	1/2	-	10	9.2	3	27.5	73	Without	AH725
MTECS12114C3411UN	11	5/8	-	12	11.4	3	34.5	84	Without	AH725
MTECS12114C5011UN	11	5/8	-	12	11.4	3	50	105	Without	AH725

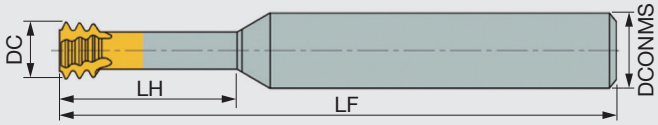
Reference pages: Standard cutting conditions → H206 - H207

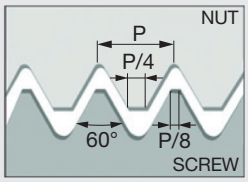
SOLIDTHREAD

Unified

MTECSH-UN

Small diameter solid carbide internal threading endmill, short edge type, left hand cutting, for UN profile

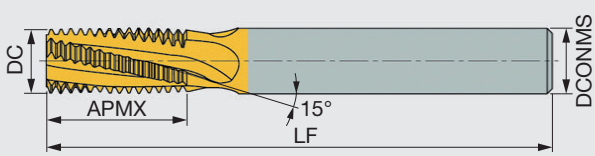


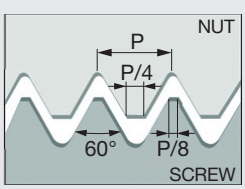


Metric	TPI	Application range UNC	Application range UNF	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECSH06012C480UN	80	-	#0	6	1.15	3	4	58	Without	AH725
MTECSH06016C656UN	56	#2	#3	6	1.65	3	6.6	58	Without	AH725
MTECSH06019C548UN	48	#3	#4	6	1.9	3	5.2	58	Without	AH725
MTECSH06021C640UN	40	#4	-	6	2.1	3	6.3	58	Without	AH725
MTECSH06024C740UN	40	#5	#6	6	2.45	3	7	58	Without	AH725
MTECSH06021C840UN	40	#4	-	6	2.1	3	8	58	Without	AH725
MTECSH06024C940UN	40	#5	#6	6	2.45	3	9.6	58	Without	AH725
MTECSH06025C1032UN	32	#6	-	6	2.55	3	10.5	58	Without	AH725
MTECSH06032C932UN	32	#8	-	6	3.2	3	9.5	58	Without	AH725
MTECSH06037C1032UN	32	-	#10	6	3.7	3	10.5	58	Without	AH725
MTECSH06037C1532UN	32	-	#10	6	3.7	3	15	58	Without	AH725
MTECSH06042C1128UN	28	-	#12	6	4.2	3	11	58	Without	AH725
MTECSH0605C1428UN	28	-	1/4	6	5	3	14.5	58	Without	AH725
MTECSH06035C1024UN	24	#10-#12	-	6	3.5	3	10.6	58	Without	AH725
MTECSH08066C1724UN	24	-	5/16	8	6.6	3	17	64	Without	AH725
MTECSH08066C2424UN	24	-	5/16	8	6.6	3	24	64	Without	AH725
MTECSH06047C1920UN	20	1/4	-	6	4.75	3	19	58	Without	AH725
MTECSH0808C2520UN	20	-	7/16	8	8	3	25	64	Without	AH725
MTECSH0606C1718UN	18	5/16	-	6	6	3	17	58	Without	AH725
MTECSH0606C2318UN	18	5/16	-	6	6	3	23	58	Without	AH725
MTECSH08067C2216UN	16	3/8	-	8	6.7	3	22	64	Without	AH725
MTECSH08077C2514UN	14	7/16	-	8	7.7	3	25	64	Without	AH725
MTECSH10092C2713UN	13	1/2	-	10	9.2	3	27.5	73	Without	AH725
MTECSH12114C3411UN	11	5/8	-	12	11.4	3	34.5	84	Without	AH725

MTEC E-UN

Solid carbide external threading endmill, for UN profile





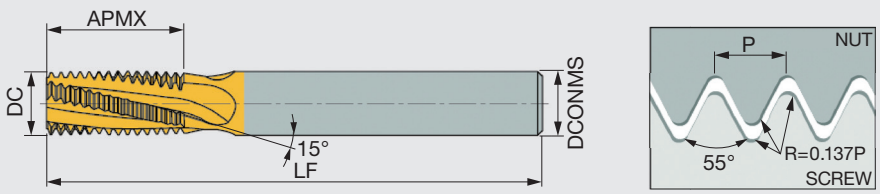
Metric	TPI	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECE1010D1624UN	24	10	10	4	16.4	73	Without	AH725
MTECE1212E2120UN	20	12	12	5	21	84	Without	AH725

Reference pages: Standard cutting conditions → H206 - H207

Whitworth

MTEC-W

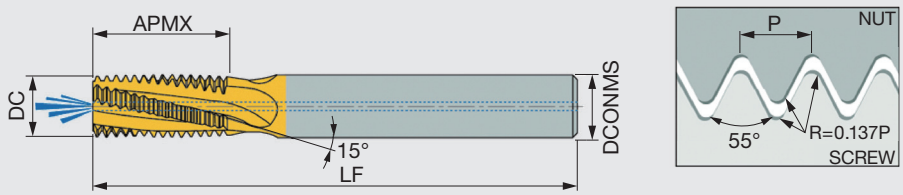
Solid carbide internal and external threading endmill, for BSP profile



Metric	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTEC0606C928W	28	1/8	6	6	3	9.5	58	Without	AH725
MTEC0808C1419W	19	1/4-3/8	8	8	3	14	64	Without	AH725
MTEC1212D1914W	14	1/2-7/8	12	12	4	19.3	84	Without	AH725
MTEC1212D2614W	14	1/2-7/8	12	12	4	26.3	84	Without	AH725
MTEC1212C2411W	11	1-1 1/2	12	12	3	24.2	84	Without	AH725
MTEC1616D3811W	11	1-3	16	16	4	38.1	105	Without	AH725

MTECB-W

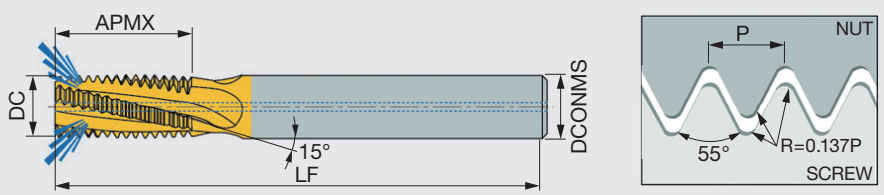
Solid carbide internal and external threading endmill, with coolant hole, for BSP profile



Metric	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECB08078C1428W	28	1/8	8	7.8	3	14.1	64	Without	AH725
MTECB1010D1619W	19	1/4-3/8	10	10	4	16.7	73	Without	AH725
MTECB1616E2614W	14	1/2-7/8	16	16	5	26.3	105	Without	AH725
MTECB1616D3811W	11	≥1	16	16	4	38.1	105	Without	AH725
MTECB2020E4711W	11	≥1	20	20	5	47.3	105	Without	AH725

MTECZ-W

Solid carbide internal and external threading endmill, with coolant hole, for BSP profile



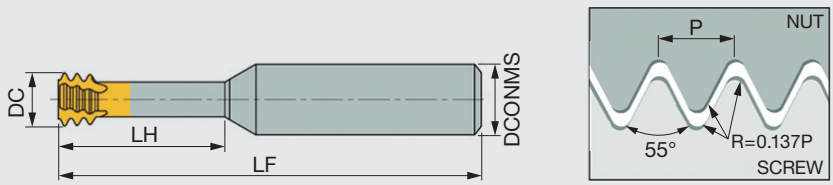
Metric	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECZ08078C1428W	28	1/8	8	7.8	3	14.1	64	With	AH725
MTECZ1010D1619W	19	1/4-3/8	10	10	4	16.7	73	With	AH725
MTECZ1616E2614W	14	1/2-7/8	16	16	5	26.3	101	With	AH725

Reference pages: Standard cutting conditions → H206 - H207

SOLIDTHREAD

MTECS-W

Solid carbide internal and external threading endmill, short edge type, for BSP/BSF profile

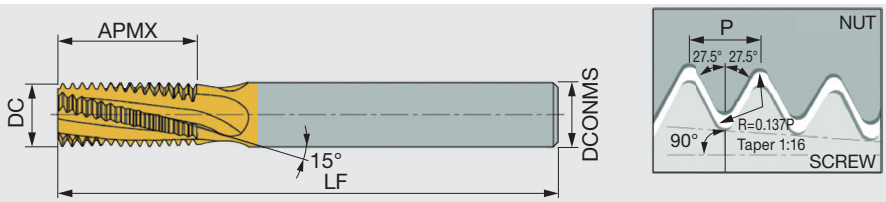


Metric	TPI	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS08078C1928W	28	1/8	8	7.8	3	19.5	64	Without	AH725
MTECS1010D3019W	19	1/4-3/8	10	10	4	30	73	Without	AH725
MTECS1212D3714W	14	1/2-7/8	12	12	4	37	84	Without	AH725

BSPT

MTEC-BSPT

Solid carbide internal and external threading endmill. for BSPT profile



Metric	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTEC0606C928BSPT	28	1/8	6	6	3	9.5	58	Without	AH725
MTEC0808C1419BSPT	19	1/4-3/8	8	8	3	14	64	Without	AH725
MTEC1212D1914BSPT	14	1/2-7/8	12	12	4	19.1	84	Without	AH725
MTEC1616D2811BSPT	11	1-2	16	16	4	28.9	105	Without	AH725

NPT

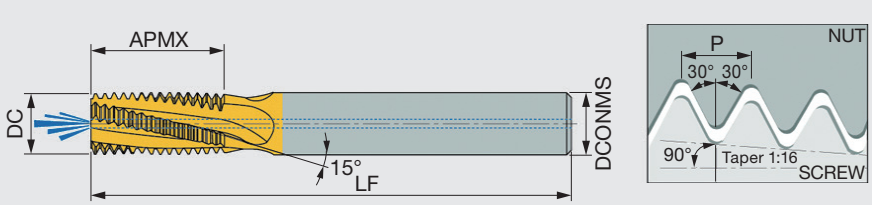
MTEC-NPT

Solid carbide internal and external threading endmill. for NPT profile

Metric	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTEC0606C927NPT	27	1/16-1/8	6	6	3	9.9	58	Without	AH725
MTEC0808C1418NPT	18	1/4-3/8	8	8	3	14.8	64	Without	AH725
MTEC1212D2014NPT	14	1/2-3/4	12	12	4	20.9	84	Without	AH725
MTEC1616D2711.5NPT	11.5	1-2	16	16	4	27.6	105	Without	AH725
MTEC2020D398NPT	8	≥2 1/2	20	20	4	39.7	105	Without	AH725

MTECB-NPT

Solid carbide internal and external threading endmill, with coolant hole, for NPT profile

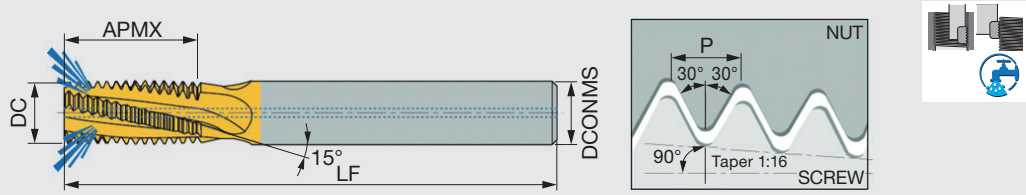


Metric	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECB08076C1027NPT	27	1/8	8	7.6	3	10.8	64	With	AH725
MTECB1010D1618NPT	18	1/4-3/8	10	10	4	16.2	73	With	AH725
MTECB16155D2214NPT	14	1/2-3/4	16	15.5	4	22.7	105	With	AH725

NPTF

MTECZ-NPTF

Solid carbide internal and external threading endmill, with coolant hole in the flute, for NPTF profile

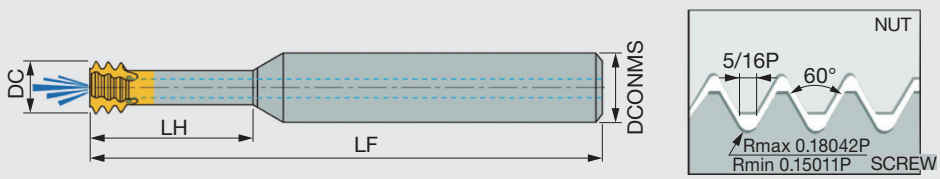


Metric	TPI	Application range	DCONMS	DC	NOF	APMX	LF	Coolant hole	Grade
MTECZ08076C1027NPTF	27	1/8	8	7.6	3	10.8	64	With	AH725
MTECZ1010D1618NPTF	18	1/4-3/8	10	10	4	16.2	73	With	AH725

MJ

MTECS-MJ

Small diameter solid carbide internal threading endmill, short edge type, with coolant hole, for MJ profile

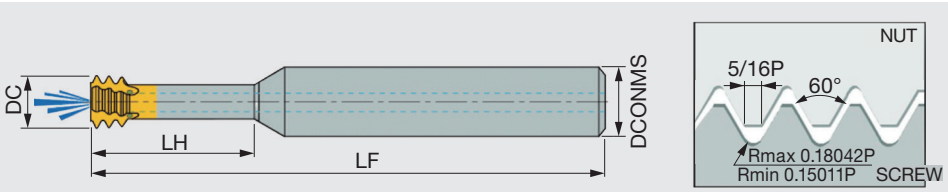


Metric	TP	Application range	DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
MTECS06039C120.8MJ	0.8	5	6	3.9	3	12.5	58	With	AH725
MTECS08061C201.25MJ	1.25	8	8	6.1	3	20	64	With	AH725
MTECS10092C301.75MJ	1.75	12	10	9.2	3	30	73	With	AH725

UNJ

MTECS-UNJ

Small diameter solid carbide internal threading endmill, short edge type, with coolant hole, for UNJ profile



Metric	TPI	Application range		DCONMS	DC	NOF	LH	LF	Coolant hole	Grade
		UNJC	UNJF							
MTECS08051C1628UNJ	28	-	1/4	8	5.1	3	16	64	With	AH725
MTECS08067C2024UNJ	24	-	5/16-3/8	8	6.7	3	20	64	With	AH725
MTECS06049C1620UNJ	20	1/4	-	6	4.9	3	16	58	Without	AH725
MTECS0808C2820UNJ	20	-	7/16	8	8	3	28	64	With	AH725
MTECS08061C2018UNJ	18	5/16	-	8	6.15	3	20	64	With	AH725

Reference pages: Standard cutting conditions → H206 - H207

TUNGMEISTER

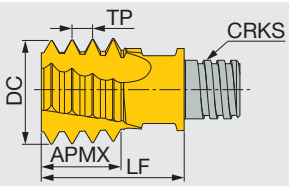
Designation System for TungMeister

VMT	100	L06	IS	15	-	4	S05
TungMeister ThreadMilling VMT : Full profile VTR : Partial profile	Tool Dia. x10	Cutting Length	Thread Profile ISO UN W	Pitch x10 TPI		No. of Flutes	Connection Size

ISO metric

VMT***IS

Internal threading head, for ISO metric profile (TungMeister)

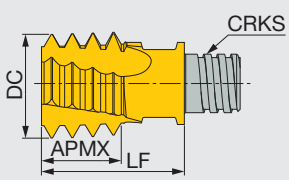


Metric	TP	Application range Fine	Application range Coarse	DC	NOF	APMX	LF	CRKS	Grade	Wrench
VMT100L06IS07-4S05	0.75	-	≥M12	10	4	6	12.8	S05	AH725	KEYV-S05
VMT100L06IS10-4S05	1	-	≥M12	10	4	6	12.8	S05	AH725	KEYV-S05
VMT100L06IS15-4S05	1.5	-	≥M14	10	4	6	12.8	S05	AH725	KEYV-S05
VMT120L09IS15-4S06	1.5	-	≥M16	12	4	9	14.3	S06	AH725	KEYV-T25
VMT120L10IS20-4S06	2	M16	≥M17	12	4	10	14.3	S06	AH725	KEYV-T25
VMT160L12IS15-6S08	1.5	-	≥M20	16	6	12	19	S08	AH725	KEYV-T30L
VMT160L12IS20-5S08	2	-	≥M19	16	5	12	19	S08	AH725	KEYV-T30L
VMT150L13IS25-5S08	2.5	M20	≥M22	15.4	5	12.5	19	S08	AH725	KEYV-T30L
VMT160L12IS30-3S08	3	M24	≥M25	16	3	12	19	S08	AH725	KEYV-T30L

Unified

VMT***UN

Internal threading head, for UN profile (TungMeister)



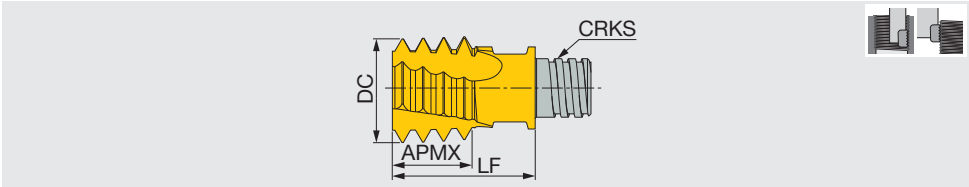
Metric	TPI	Application range UNC	Application range UNF	Application range UNEF	DC	NOF	APMX	LF	CRKS	Grade	Wrench
VMT100L06UN24-4S05	24	-	-	9/16-5/8	10	4	5.3	12.8	S05	AH725	KEYV-S05
VMT100L06UN20-4S05	20	-	1/2	-	10	4	5.1	12.8	S05	AH725	KEYV-S05
VMT100L06UN18-4S05	18	-	9/16-5/8	1 1/8-1 5/8	10	4	5.6	12.8	S05	AH725	KEYV-S05
VMT120L10UN16-4S06	16	-	3/4	-	12	4	9	14.3	S06	AH725	KEYV-T25
VMT120L10UN14-4S06	14	-	7/8	-	12	4	9	14.3	S06	AH725	KEYV-T25
VMT160L13UN12-5S08	12	-	1-1 1/2	-	16	5	12.7	19	S08	AH725	KEYV-T30L
VMT150L13UN10-4S08	10	3/4	-	-	15.4	4	12.7	19	S08	AH725	KEYV-T30L
VMT160L11UN09-3S08	9	7/8	-	-	16	3	11.3	19	S08	AH725	KEYV-T30L
VMT160L12UN08-3S08	8	1	-	-	16	3	12.7	19	S08	AH725	KEYV-T30L

Reference pages: ThreadMilling → H191 - H203

Whitworth

VMT***W

Internal and external threading head, for 55° BSP profile (TungMeister)

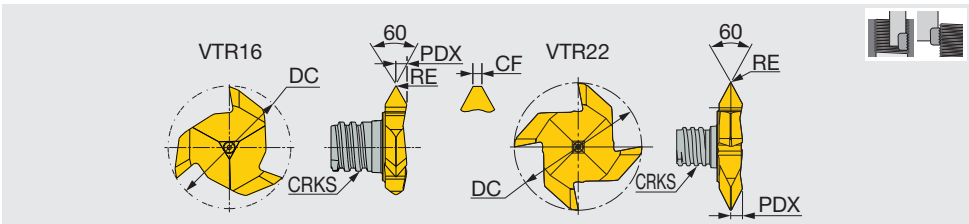


Metric	TPI	Application range	DC	NOF	APMX	LF	CRKS	Grade	Wrench
VMT100L06W19-4S05	19	1/4-3/8	10	4	5.3	12.8	S05	AH725	KEYV-S05
VMT160L12W14-4S08	14	1/2-7/8	16	4	12.7	19	S08	AH725	KEYV-T30L
VMT160L11W11-4S08	11	≥1	16	4	11.6	19	S08	AH725	KEYV-T30L

60° partial profile

VTR***IS

Internal and external threading head, for 60° partial profile (TungMeister)

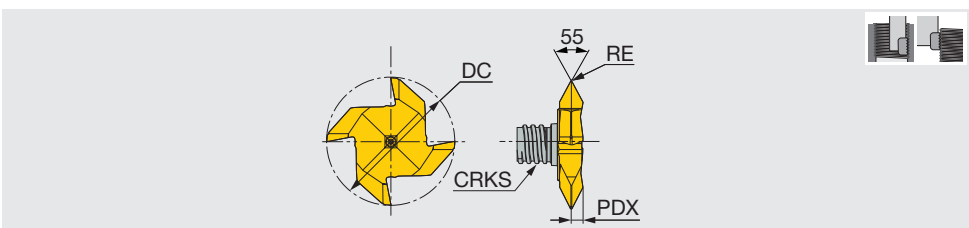


Metric	TP TPN	TP TPX	Smallest Possible thread	DC	NOF	RE	CF	PDX	CRKS	Grade	Wrench
VTR160L12IS05-3S06	0.5	2	M20	15.7	3	-	0.05	1.4	S06	GH130	KEYV-177
VTR160L12IS15-3S06	1.5	2	M22	15.7	3	0.05	-	1.4	S06	GH130	KEYV-177
VTR220L28IS30-4S08	3	4.5	M36	21.7	4	0.2	-	2.8	S08	GH130	KEYV-217

55° partial profile

VTR***W

Internal and external threading head, for 55° partial profile



Metric	TPI TPIN	TPI TPIX	Smallest Possible thread	DC	NOF	RE	PDX	CRKS	Grade	Wrench
VTR220L24W14-4S08	14	11	3/4	21.7	4	0.2	2.4	S08	GH130	KEYV-217

Reference pages: ThreadMilling → H191 - H203

THREADMILLING

STANDARD CUTTING CONDITIONS

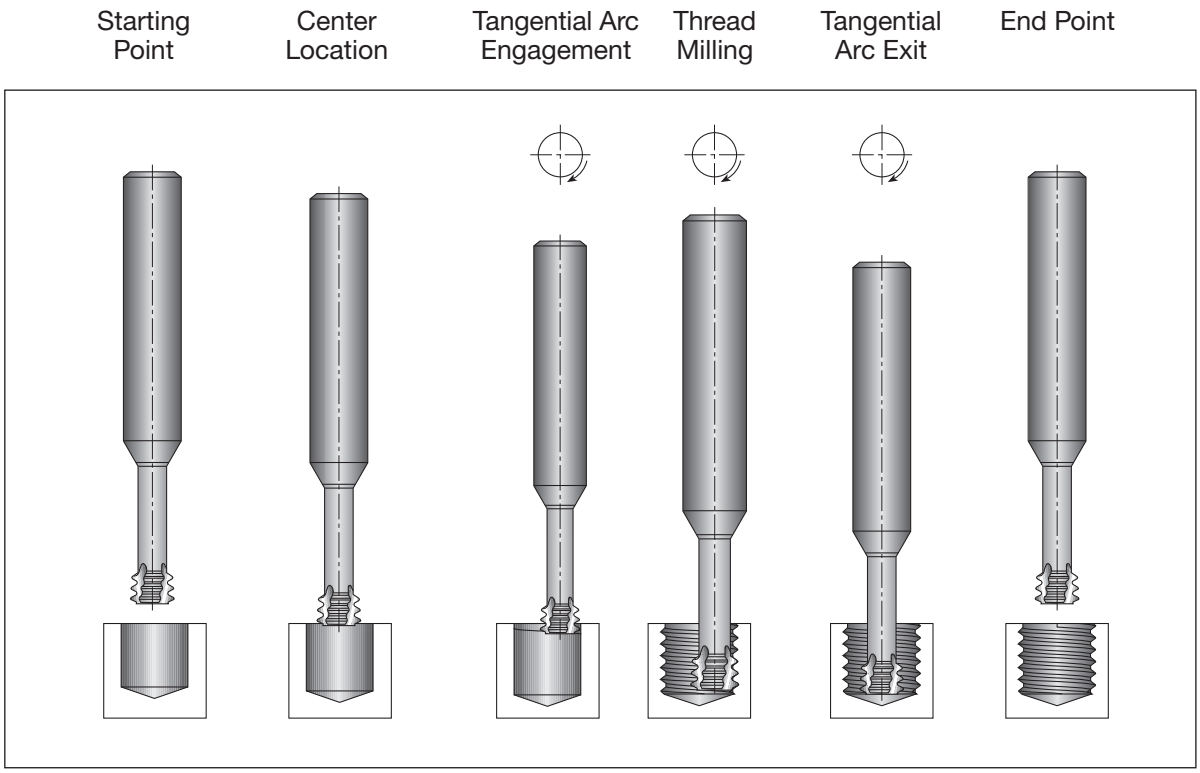
ISO	Material		Condition	Tensile strength [N/mm²]	Hardness HB	Cutting speed (sfm) AH725
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	328 - 820
		≥ 0.25 %C	Annealed	650	190	262 - 689
		< 0.55 %C	Quenched and tempered	850	250	213 - 558
		≥ 0.55 %C	Annealed	750	220	361 - 591
			Quenched and tempered	1000	300	312 - 525
	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	600	200	295 - 525
			Quenched and tempered	930	275	213 - 656
				1000	300	230 - 689
				1200	350	312 - 525
	High alloyed steel, cast steel, and tool steel		Annealed	680	200	427 - 558
			Quenched and tempered	1100	325	246 - 328
	Stainless steel and cast steel		Ferritic/martensitic	680	200	361 - 558
			Martensitic	820	240	230 - 509
M	Stainless steel		Annealed	600	180	279 - 328
K	Cast iron nodular (GGG)		Ferritic/martensitic		180	394 - 525
			Pearlitic		260	246 - 525
	Gray cast iron (GG)		Ferritic		160	230 - 492
			Pearlitic		250	361 - 459
	Malleable cast iron		Ferritic		130	394 - 525
			Pearlitic		230	361 - 459
N	Aluminum- wrought alloy		Not cureable		60	525 - 984
			Cured		100	
	Aluminum-cast, alloyed	≤12% Si	Not cureable		75	492 - 1148
			Cured		90	
		>12% Si	High temperature		130	328 - 820
	Copper alloys	>1% Pb	Free cutting		110	
			Brass		90	
			Electrolitic copper		100	
	Non-metallic		Duroplastics, fiber plastics			328 - 1312
			Hard rubber			
S	High temp. alloys	Fe based	Annealed		200	
			Cured		280	
		Ni or Co based	Annealed		250	66 - 262
			Cured		350	
			Cast		320	
	Titanium Ti alloys			RM 400		
			Alpha+beta alloys cured	RM 1050		66 - 262
H	Hardened steel		Hardened		55 HRC	180 - 213
			Hardened		60 HRC	148 - 180
	Chilled cast iron		Cast		400	295 - 344
	Cast iron		Hardened		55 HRC	180 - 213

Tool dia. : mm (in)											
Feed (ipr)											
ø2 (0.079")	ø3 (0.118")	ø4 (0.157")	ø6 (0.236")	ø8 (0.315")	ø10 (0.394")	ø12 (0.472")	ø14 (0.551")	ø16 (0.630")	ø20 (0.787")	ø25 (0.984")	ø30 (1.181")
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0008	0.0012	0.0012	0.002	0.0024	0.0028	0.0031	0.0035	0.0039	0.0047	0.0059	0.0071
0.0008	0.0012	0.0012	0.002	0.0024	0.0028	0.0031	0.0035	0.0039	0.0047	0.0059	0.0071
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0043
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0043
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0043
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0043
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0043
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0043
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0043
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0043
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0083	0.0059	0.0071	0.0083
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0012	0.0016	0.0016	0.0024	0.0028	0.0031	0.0035	0.0043	0.0047	0.0059	0.0071	0.0083
0.0008	0.0008	0.0012	0.0012	0.0016	0.002	0.002	0.0024	0.0028	0.0031	0.0039	0.0047
0.002	0.0024	0.0028	0.0035	0.0039	0.0043	0.0047	0.0051	0.0059	0.0071	0.0087	0.0098
0.0008	0.0008	0.0008	0.0012	0.0012	0.0012	0.0012	0.0016	0.0016	0.0016	0.002	0.002
0.0008	0.0008	0.0008	0.0012	0.0012	0.0012	0.0012	0.0016	0.0016	0.0016	0.002	0.002

With long edge, reduce feed rate to 40%.

MTECS
Small Diameter, Short type

Thread Milling - Recommended Procedure



STANDARD CUTTING CONDITIONS

ISO	Material	Cutting speed (sfm)	ø0.059" (ø1.5 mm)	ø0.079" (ø2 mm)	ø0.118" (ø3 mm)	ø0.157" (ø4 mm)	ø0.197" (ø5 mm)	ø0.236" (ø6 mm)	ø0.276" (ø7 mm)	ø0.315" (ø8 mm)	ø0.354" (ø9 mm)	ø0.394" (ø10 mm)	ø0.472" (ø12 mm)	ø0.551" (ø14 mm)	ø0.591" (ø15 mm)
			Feed (ipr)												
P	Low & medium carbon steels	197 - 394	0.002	0.002	0.0028	0.0035	0.0043	0.0051	0.0055	0.0059	0.0063	0.0063	0.0067	0.0071	0.0071
P	High carbon steels	197 - 295	0.0016	0.002	0.0024	0.0031	0.0035	0.0039	0.0047	0.0051	0.0055	0.0055	0.0063	0.0067	0.0071
P	Alloy steels, treated steels	164 - 262	0.0016	0.0016	0.002	0.002	0.0024	0.0028	0.0028	0.0031	0.0035	0.0039	0.0047	0.0051	0.0055
P	Cast steels	230 - 295	0.0016	0.0016	0.002	0.002	0.0024	0.0028	0.0028	0.0031	0.0035	0.0039	0.0047	0.0051	0.0055
M	Stainless steels	197 - 295	0.0012	0.0012	0.0016	0.002	0.0024	0.0024	0.0028	0.0031	0.0035	0.0039	0.0043	0.0047	0.0051
S	Nickel alloys, titanium alloys	66 - 131	0.0012	0.0012	0.0016	0.0016	0.002	0.0024	0.0024	0.0024	0.0028	0.0028	0.0028	0.0031	0.0031
K	Cast iron	131 - 262	0.002	0.002	0.0028	0.0035	0.0043	0.0051	0.0055	0.0059	0.0063	0.0063	0.0067	0.0071	0.0071
N	Aluminum	262 - 492	0.002	0.002	0.0028	0.0035	0.0043	0.0051	0.0055	0.0059	0.0063	0.0063	0.0067	0.0071	0.0071
N	Synthetics, duroplastics, thermoplastics	164 - 656	0.0039	0.0043	0.0047	0.0055	0.0063	0.0071	0.0075	0.0075	0.0075	0.0075	0.0075	0.0079	0.0079

MTECS
Small Diameter, Short type

SolidThread MTECS is used for the production of small internal threads. These thread mills feature a short 3-tooth cutting zone with 3 flutes and a released neck between the cutting zone and the shank.

This unique tool design offers very precise profiles and a high performance AH725 submicron carbide grade with PVD titanium aluminum nitride coating.
The very short profile exerts a low force which minimizes tool bending. This facilitates parallel and high thread precision for the entire length.

Compared to taps, the **SOLIDTHREAD** is more accurate, thread machining is substantially faster and there is no danger of a broken tap being stuck in the hole.

SolidThread vs. Tap

Criteria	Thread mill	Taps
Thread surface quality	High	Medium
Thread geometry	Very accurate	Medium
Thread tolerance	4H, 5H, 6H with std. cutter	6H with standard tap, 4H with special tap
Machining time	Shorter or same as tap	Short
Machining load	Very low	High
Range of thread diameters	Wide range of diameters	Specific tap for each thread size
Right-/Left-hand threading	Same cutter	Specific tap for right- and left-hand
Geometric shape	Full profile	Partial profile

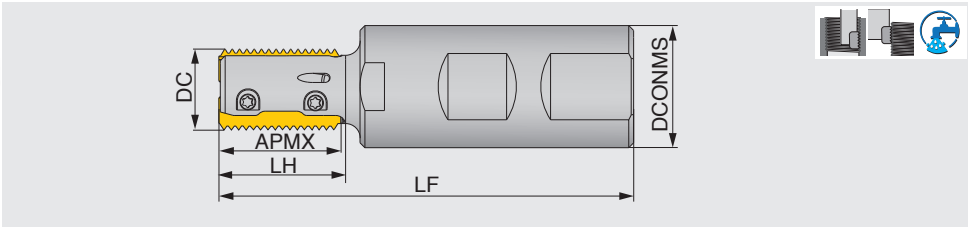
Features

- Minimum thread size of MTECS: **M1x0.25** (0.75 mm pre hole diameter) up to M20x2.50
- 2xD and 3xD threading lengths
- High cutting speeds
- Short cycle time
- Low cutting forces due to the short contact profile resulting in accurate and parallel thread
- Prevents oval threads near thin walls
- No more dealing with broken taps
- Reliable threading in blind holes
- Excellent performance on hardened steel, high temperature alloys and titanium

THREADMILLING

Thread milling cutter

Indexable thread milling cutter, long edge



Metric	DC	APMX	CICT	DCONMS	LH	LF	Oil hole	Insert
ETTL25M017W25.0F026R02 (1)	17	25	2	25	26	85	With	TL25D...
ETTL25M017W25.0F036R02 (1)	17	25	2	25	36	95	With	TL25D...
ETTL25M019W25.0F032R02	19	25	2	25	32	92	With	TL25D...
ETTL25M019W25.0F044R02	19	25	2	25	44	104	With	TL25D...
ETTL25M021W25.0F037R03	20.5	25	3	25	37	96	With	TL25D...
ETTL25M021W25.0F044R03	20.5	25	3	25	44	103	With	TL25D...
ETTL25M022W25.0F043R03	22	25	3	25	43	102	With	TL25D...
ETTL25M022W25.0F055R03	22	25	3	25	55	114	With	TL25D...
ETTL25M030W25.0F055R05	30	25	5	25	55	115	With	TL25D...

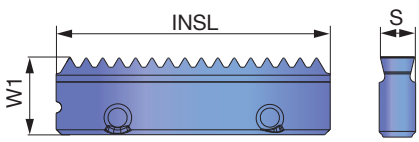
(1) Inserts with a thread pitch of ≥ 3 mm or ≥ 8TPI are not mountable.

SPARE PARTS

Designation	Clamping screw	Wrench
ETTL25...	SSTM4-3.6P	T-8D

INSERT

TL25D...



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

★ : First choice
☆ : Second choice

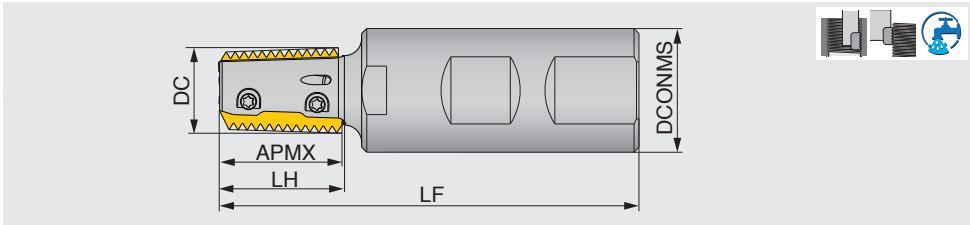
Thread type	Application	Designation	Pitch	Threads per inch	Number of threads per edge	Coated AH725	INSL	W1	S
ISO Metric	Internal	TL25DIR1.5ISO	1.5	-	16	●	0.984	0.276	0.122
		TL25DIR2.0ISO	2	-	12	●	0.984	0.276	0.122
		TL25DIR3.0ISO (2)	3	-	8	●	0.984	0.276	0.122
Unified	Internal	TL25DIR20UN	-	20	19	●	0.984	0.276	0.122
		TL25DIR12UN	-	12	11	●	0.984	0.276	0.122
		TL25DIR9UN	-	9	8	●	0.984	0.276	0.122
		TL25DIR8UN (2)	-	8	7	●	0.984	0.276	0.122
Whitworth	Internal and external	TL25DEIR14W	-	14	13	●	0.984	0.276	0.122
		TL25DEIR11W	-	11	10	●	0.984	0.276	0.122

(2) Does not fit the DC 17 holder

● : Line up

Reference pages: Standard cutting conditions → H213

Indexable thread milling cutter, long edge for Taper threads



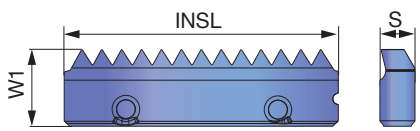
Metric	DC	APMX	CICT	DCONMS	LH	LF	Oil hole	Insert
ETTL25M017W25.0F026R02-PT	17.47	25	2	25	25.5	85	With	TL25SEIR...
ETTL25M022W25.0F043R03-PT	22.2	25	3	25	43	102	With	TL25SEIR...

SPARE PARTS

Designation	Clamping screw	Wrench
ETTL...-PT	SSTM4-3.6P	T-8D

INSERT

TL25SEIR...



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

★ : First choice
☆ : Second choice

Thread type	Application	Designation	Pitch	Threads per inch	Number of threads per edge	Coated AH725	INSL	W1	S
BSPT	Internal and external	TL25SEIR14BSPT	-	14	13	●	0.984	0.276	0.122
		TL25SEIR11BSPT	-	11	10	●	0.984	0.276	0.122
NPT	Internal and external	TL25SEIR14NPT	-	14	13	●	0.984	0.276	0.122
		TL25SEIR11.5NPT	-	11.5	11	●	0.984	0.276	0.122
NPTF	Internal and external	TL25SEIR14NPTF	-	14	13	●	0.984	0.276	0.122

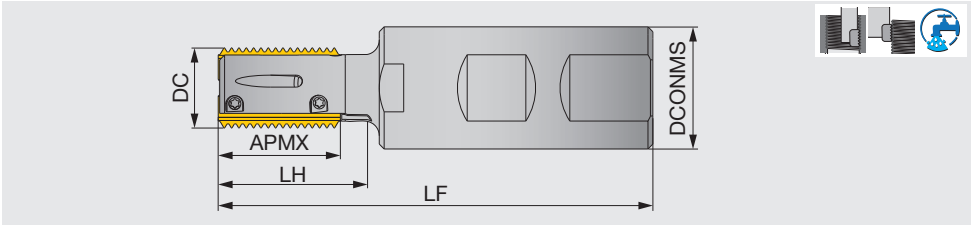
● : Line up

Reference pages: Standard cutting conditions → H213

THREADMILLING

Thread milling cutter

Indexable thread milling cutter, long edge type



Metric	DC	APMX	CICT	DCONMS	LH	LF	Coolant hole	Insert
ETLN25M017W25.0F026R02 (1)	17	25	2	25	26	85	With	LN25....
ETLN25M017W25.0F036R02 (1)	17	25	2	25	36	95	With	LN25....
ETLN25M019W25.0F032R02	19	25	2	25	32	92	With	LN25....
ETLN25M019W25.0F044R02	19	25	2	25	44	104	With	LN25....
ETLN25M021W25.0F037R03	20.5	25	3	25	37	96	With	LN25....
ETLN25M021W25.0F044R03	20.5	25	3	25	44	103	With	LN25....
ETLN25M022W25.0F043R03	22	25	3	25	43	102	With	LN25....
ETLN25M022W25.0F055R03	22	25	3	25	55	114	With	LN25....
ETLN25M030W25.0F055R05	30	25	5	25	55	115	With	LN25....

(1) Inserts with a thread pitch of ≥ 3 mm or ≥ 8TPI do not fit.

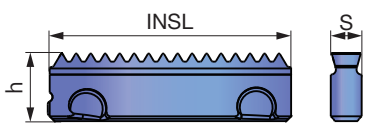
SPARE PARTS

Designation	Clamping screw	Wrench
ETLN25...	SSTM3-3	T-6F

* Recommended clamping torque: SSTM3-3 = 1 N·m

INSERT

LN25...



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

★ : First choice
☆ : Second choice

Thread type	Application	Designation	Pitch	Threads per inch	Coated AH725	INSL	h	S
ISO Metric	Internal	LN25DIR1.5ISO	1.5	-	●	0.984	0.276	0.122
		LN25DIR2.0ISO	2	-	●	0.984	0.276	0.122
		LN25DIR3.0ISO (2)	3	-	●	0.984	0.276	0.122
Unified	Internal	LN25DIR20UN	-	20	●	0.984	0.276	0.122
		LN25DIR12UN	-	12	●	0.984	0.276	0.122
		LN25DIR8UN (2)	-	8	●	0.984	0.276	0.122
Whitworth	Internal and external	LN25DEIR14W	-	14	●	0.984	0.276	0.122
		LN25DEIR11W	-	11	●	0.984	0.276	0.122

(2) Does not fit the DC 17 holder

● : Line up

Reference pages: Standard cutting conditions → H213

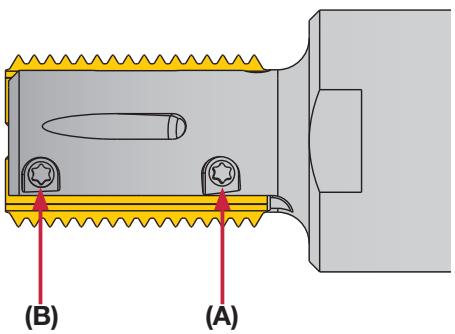
STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grades	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel	AH725	328 - 656	0.004 - 0.012
	High carbon steel	AH725	230 - 492	0.004 - 0.012
	High carbon steels	AH725	230 - 558	0.004 - 0.012
	Cast steel	AH725	230 - 558	0.004 - 0.012
M	Stainless steel	AH725	295 - 459	0.004 - 0.012
K	Cast iron	AH725	197 - 427	0.002 - 0.012
N	Aluminum alloys	AH725	262 - 1312	0.004 - 0.016
S	Heat-resistant alloys	AH725	33 - 98	0.001 - 0.004
	Titanium alloy	AH725	66 - 295	0.001 - 0.004

Climb milling is recommended.

Insert installation

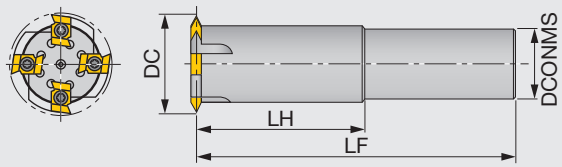
1. Use airgun or rag to thoroughly clean all the insert pockets free from dust or chips.
2. Lightly tighten Screw "A" first, then Screw "B" until the insert becomes stationary.
3. Lightly tighten the screws for other insert(s) in the same matter as mentioned in #2 above.
4. Firmly tighten Screw "A", then Screw "B".
   Use the recommended torque strengths when tightening the screws.
5. Firmly tighten the screws for other insert(s) in the same manner as mentioned in #4 above.
6. Inspect to make sure there is no gap between the insert and the insert seat. Measure the radial runout before use.



THREADMILLING

Thread milling cutter

Indexable thread milling cutter, single tooth



Right hand, 4 inserts

Metric	DC	CICT	DCONMS	LH	LF	Range of internal thread	Insert
D23-D25-45R	23	1	25	45	115	M28 - M30	T1-R...
D25-D25-45R	25	1	25	45	115	M32 - M42	T1-R...
D38-D32-85R	38	2	32	85	165	M45 - M56	T1-R...
D50-D42-100R	50	4	42	100	190	M58 - M68	T1-R...
D55-D42-100R	55	4	42	100	190	M64 - M85	T2-R...
D60-D42-100R	60	4	42	100	190	M70 - M85	T2-R...
D80-D42-100R	80	6	42	100	190	M90 -	T2-R...

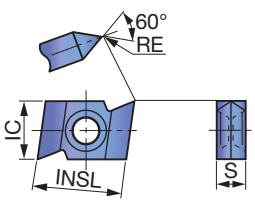
SPARE PARTS

Designation	Clamping screw	Wrench
D23-D25... - D50-D42...	CSTB-4	T-15F
D55-D42... - D80-D42...	CSTB-5	T-20F

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

INSERT

T*-R...



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

★ : First choice
☆ : Second choice

Designation	RE	Coated GH330	INSL	IC	S
T1-R14	0.14	●	0.567	0.375	0.187
T1-R28	0.28	●	0.567	0.375	0.187
T2-R14	0.14	●	0.701	0.500	0.250
T2-R28	0.28	●	0.701	0.500	0.250

● : Line up

Reference pages: Standard cutting conditions → H215

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grades	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Mild steels / Unhardened steels < 200HB	GH330	490 - 660	0.012 - 0.016
	Carbon steels / Alloy steels < 300HB	GH330	490 - 660	0.007 - 0.010
	Die steels < 50HRC	GH330	100 - 160	0.006 - 0.008
M	Stainless steels < 300HB	GH330	270 - 400	0.002 - 0.005

Climb milling is recommended.
When threading a blind hole, use the right hand cutter in right-hand rotation. Cut up from the bottom to prevent chip recutting.

THREADING MILLS AND APPLICABLE THREADS

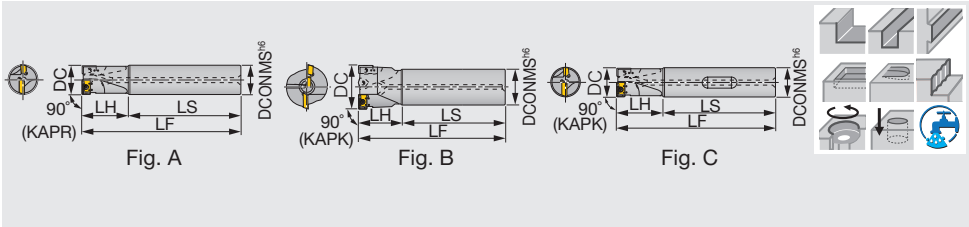
Cutter dia.	Applicable Thread							Minor diameter of max.pitch thread	
	Thread type	Coarse screw thread	Fine screw thread					Coarse screw thread	Fine screw thread
D23 X 1 tooth T1-type of inserts	M28					2	1.5		25.835
	M30	3.5			3	2	1.5	26.211	
D25 X 1 tooth T1-type of inserts	M32					2	1.5		29.835
	M33	3.5			3	2	1.5	29.211	
	M35						1.5		33.376
	M36	4			3	2	1.5	31.670	
	M38						1.5		36.376
	M39	4			3	2	1.5	34.670	
	M40				3	2	1.5		36.752
	M42	4.5		4	3	2	1.5	37.129	
D38 X 2 teeth T1-type of inserts	M45				3	2	1.5		40.152
	M48			4	3	2	1.5		43.670
	M50				3	2	1.5		46.752
	M52			4	3	2	1.5		47.670
	M55			4	3	2	1.5		50.670
	M56			4	3	2	1.5		51.670
D50 X 4 teeth T1-type of inserts	M58			4	3	2	1.5		53.670
	M60			4	3	2	1.5		55.670
	M62			4	3	2	1.5		57.670
	M64			4	3	2	1.5		59.670
	M65			4	3	2	1.5		60.670
	M68			4	3	2	1.5		63.670
D55 X 4 teeth T2-type of inserts	M64			4	3	2	1.5		59.670
	M65			4	3	2	1.5		60.670
	M68	6		4	3	2	1.5	61.505	
D60 X 4 teeth T2-type of inserts	M70			4	3	2	1.5		63.505
	M72		6	4	3	2	1.5		65.505
	M75			4	3	2	1.5		70.670
	M76		6	4	3	2	1.5		69.505
	M78					2			75.835
	M80		6	4	3	2	1.5		73.505
	M82					2			79.835
	M85		6	4	3	2			78.505
D80 X 6 teeth T2-type of inserts	M90		6	4	3	2			83.505
	M95		6	4	3	2			88.505

(Unit: mm)

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	With	C	XXMU08...
EVX10020RSU	0.276	0.787	2	0.750	2.031	1.250	3.281	With	C	XXMU10...
EVX12100RSU	0.276	1.000	2	1.000	2.281	1.625	3.906	With	C	XXMU12...
EVX16125RSU	0.276	1.250	2	1.250	2.281	2.000	4.281	Without	C	XXMU16...
EVX08062RLHU	0.276	0.625	2	0.625	5.375	1.625	7.000	With	A	XXMU08...
EVX10020RLHU	0.276	0.787	2	0.750	5.500	2.000	7.500	Without	A	XXMU10...
EVX12100RLHU	0.354	1.000	2	1.000	6.000	2.750	8.750	With	A	XXMU12...
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

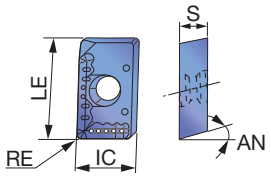
Designation	Clamping screw 1	Clamping screw 2	Lubricant	Wrench
EVX08...	-	CSPB-2.2	M-1000	IP-7D
EVX10...	-	CSPB-2.5	M-1000	IP-8D
EVX12...	-	CSPD-3	M-1000	IP-10D
EVX16...	CSPB-3.5	-	M-1000	IP-15D

* 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

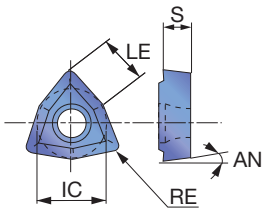
Reference pages: Insert, Standard cutting conditions → H217

INSERT

XXMU-MJ



WCMT-D4



		AH3135	AH120	AH140
P	Steel	★	★	
M	Stainless	★		★
K	Cast iron		★	
N	Non-ferrous			
S	Superalloys			
H	Hard materials	★		

★ : First choice
☆ : Second choice

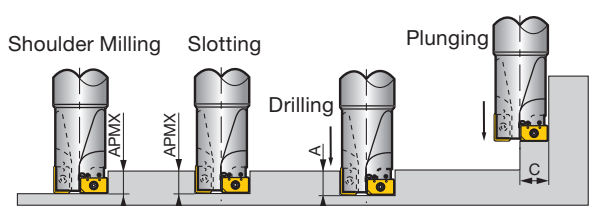
Designation	RE	Coated AH3135	Coated AH120	Coated AH140	LE	IC	S	AN
XXMU08T204PR-MJ	0.016	●	●	●	0.323	0.220	0.109	10°
XXMU10H308PR-MJ	0.031	●	●	●	0.417	0.268	0.138	11°
XXMU12X408PR-MJ	0.031	●	●	●	0.520	0.311	0.165	11°
XXMU16X508PR-MJ	0.031	●	●	●	0.661	0.437	0.197	11°
WCMT050308-D4	0.031		●	●	0.213	0.313	0.125	7°
WCMT06T308-D4	0.031		●	●	0.256	0.375	0.156	7°

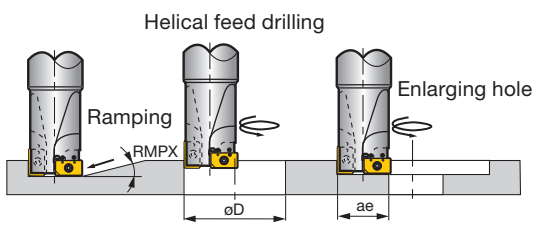
● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Tool diameter: ø0.625" - ø0.787" Cutting speed *Vc* (sfm)	Feed per tooth: *fz* (ipt) Slotting	Feed per tooth: *fz* (ipt) Drilling	Tool diameter: ø1.000" - ø1.250" Cutting speed *Vc* (sfm)	Feed per tooth: *fz* (ipt) Slotting	Feed per tooth: *fz* (ipt) Drilling
P	Carbon steels 1018, 1055, etc. < 300 HBt	AH3135	330 - 590	0.002 - 0.008	0.001 - 0.003	400 - 650	0.003 - 0.010	0.002 - 0.004
P	Alloy steels 4140, 4340, etc. < 300 HB	AH3135	260 - 525	0.002 - 0.006	0.001 - 0.003	330 - 590	0.003 - 0.008	0.002 - 0.004
P	Die steels H-13, etc. < 300 HB	AH3135	200 - 400	0.002 - 0.005	0.001 - 0.002	260 - 500	0.003 - 0.006	0.001 - 0.003
M	Stainless steels 304SS, etc.	AH3135	230 - 460	0.002 - 0.006	0.001 - 0.003	300 - 525	0.003 - 0.008	0.001 - 0.003
K	Cast irons Class 25, etc.	AH120	330 - 590	0.002 - 0.010	0.001 - 0.004	400 - 650	0.003 - 0.010	0.002 - 0.004

APPLICATION RANGE

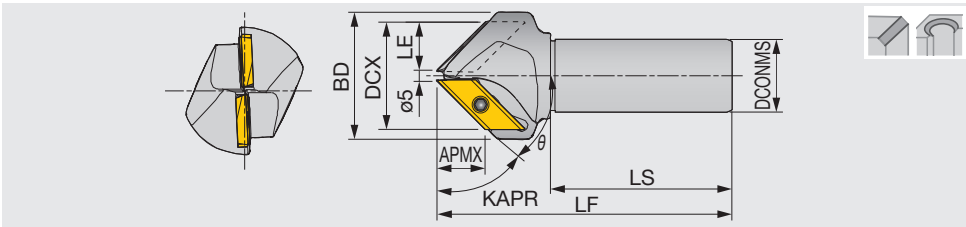




Inch	Tool dia. DC	Max. depth of cut APMX	Max. drilling depth A	Max. cutting width in plunging C	Max. ramping angle RMPX	Min. machining hole dia. øDmin	Max. machining hole dia. øDmax	Max. cutting width in enlarging hole ae
EVX08062RSU/RLHU	0.625	0.276	0.315	0.315	3°	0.756	1.250	0.551
EVX10020RSU/RLHU	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

ECC31

Chamfering endmill, screw clamp system, for large parallelogram inserts



Inch	DCX	CICT	KAPR	θ	BD	LE	APMX	DCONMS	LS	LF	Insert
ECC31005RU-45	1.846	2	45°	45°	2.205	0.197	0.827	1.000	2.281	4.250	XCET3104...
ECC31005RU-30	1.338	1	60°	30°	1.575	0.197	1.004	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...
ECC31005RU-41	1.698	2	49°	41°	2.205	0.197	0.866	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...

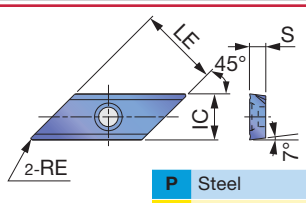
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
ECC31...	CSTB-5S	M-1000	T-20D

* Recommended clamping torque: CSTB-5S = 3.69 lbs·ft, 5 N·m

INSERT

XCET31



		AH3135	AH330	AH120	NS740	UX30	TH10
		Coated			Cermet	Un-coated	
P	Steel	★	☆	☆	★	☆	
M	Stainless	★	★				
K	Cast iron		★	★			
N	Non-ferrous						
S	Superalloys						
H	Hard materials	☆					

★ : First choice
☆ : Second choice

Designation	RE	AH3135	AH330	AH120	NS740	UX30	TH10	LE	IC	S
XCET310404ER	0.016	●	●	●	●	●	●	0.866	0.500	0.177

●: Line up

STANDARD CUTTING CONDITIONS

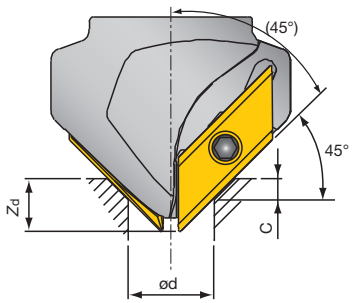
ISO	Workpiece material	Grade	No. of revolutions: *n* (min-1)	Feed per tooth: *fz* (ipt)
P	Carbon steels 1055, etc. Alloy steels 4140, etc. < 300 HB	NS740	1000 - 3000 - 7000	0.004 - 0.010
		UX30	700 - 2000 - 4900	0.004 - 0.010
	Die steels H13, etc. < 300 HB	AH3135	1000 - 3000 - 7000	0.004 - 0.008
M	Stainless steels S30400, etc. < 250 HB	AH3135	1000 - 3000 - 7000	0.004 - 0.010
K	Cast irons No.250B, etc.	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 ø0.400") in a plungemilling mode, peck-feeding should not be used.
- When the hole diameter to be chamfered is smaller than ø0.400" 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 Zd (in) in 45° chamfering of hole

Hole dia. ød (in)	Size of chamfering C (in)						
	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	-	-	-	-

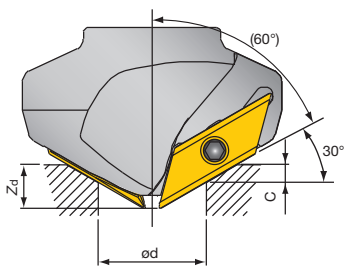


Tool: ECC31005R-45

When the hole depth is smaller than the Z-axis plunging depth (Zd), 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 Zd (in) in 30° chamfering of hole

Hole dia. ød (in)	Size of chamfering C (in)						
	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	-	-	-	-	-	-

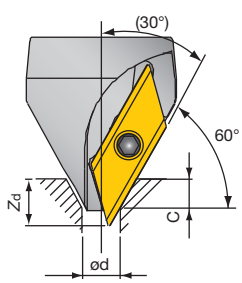


Tool: ECC31005R-60

When the hole depth is smaller than the Z-axis plunging depth (Zd), 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 Zd (in) in 60° chamfering of hole

Hole dia. ød (in)	Size of chamfering C (in)							
	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	-	-	-	-	-	-

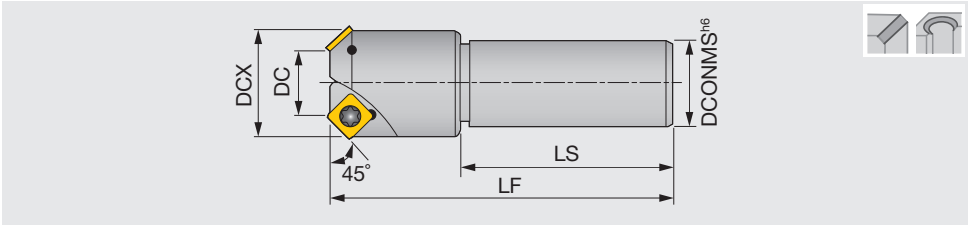


Tool: ECC31005R-30

When the hole depth is smaller than the Z-axis plunging depth (Zd), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

ECP4400R

Chamfering endmill, screw clamp system, for square inserts



Inch	DC	CICT	DCX	DCONMS	LF	LS	Insert
ECP440AR-U	0.394	1	1.083	1.250	4.500	2.480	SPMA422*N
ECP4423R-U	0.906	2	1.587	1.250	4.500	2.480	SPMA422*N
ECP4436R-U	1.417	3	2.098	1.250	4.500	2.480	SPMA422*N

Metric	DC	CICT	DCX	DCONMS	LF	LS	Insert
ECP440AR	10	1	27.5	32	130	80	SPMA422*N
ECP4423R	23	2	40.3	32	130	80	SPMA422*N
ECP4436R	36	3	53.3	32	130	80	SPMA422*N

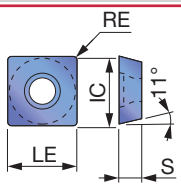
SPARE PARTS

Designation	Clamping screw	Wrench
ECP44...	CSTA-4	T-15D

* Recommended clamping torque: CSTA-4 = 2.58 lbs·ft, 3.5 N·m

INSERT

SPMA42



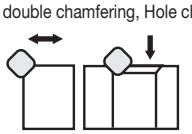
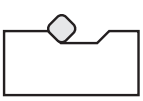
		Cermet			Uncoated		
P	Steel	★	☆		☆		
M	Stainless						
K	Cast iron					★	
N	Non-ferrous						
S	Superalloys						
H	Hard materials						

★ : First choice
☆ : Second choice

Designation	RE	NS740	N308		UX30	TH10										LE	IC	S
SPMA422TN	0.031	●	●		●											0.500	0.500	0.215
SPMA422FN	0.031					●										0.500	0.500	0.215

●: Line up

STANDARD CUTTING CONDITIONS

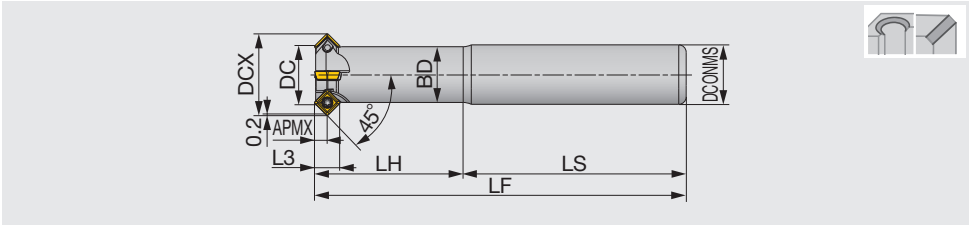
Operations		Workpiece material	Grade	Cutting speed *Vc* (sfm)	Maximum depth of cut *ap* (in)	Feed per tooth *fz* (ipt)
Single or double chamfering, Hole chamfering 	P	Carbon steels, Alloy steels < 300HB	NS740 · N308 UX30	330 - 490	-	0.008 - 0.029
		Die steels < 30HRC	NS740 · N308 UX30	164 - 230	-	0.006 -0.016
	K	Cast irons	TH10	90 - 110	-	0.008 - 0.024
Facing, Grooving 	P	Carbon steels, Alloy steels < 300HB	NS740 · N308 UX30	330 - 490	0.118	0.004 - 0.006
		Die steels < 30HRC	UX30	164 - 230	0.079	0.004 - 0.006
	K	Cast irons	TH10	295 - 360	0.118	0.004 - 0.006

When chamfering stainless steel, down-milling is recommended. Conventional milling may cause edge chipping.
When chamfering above C3.0, the feed per tooth should be set at the lower side of the value shown in the above table.

TUNGQUAD
EASD05

Chamfering endmill, for SDMT/SDHT05 inserts

GAMP = +5°, GAMF = -7° ~ +12°



Metric	DCX	CICT	DC*	BD	APMX	DCONMS	LH	L3	LS	LF	Air hole	Insert
EASD05M006C12.0R01	12 (0.472")	1	5.7 (0.224")	7.5 (0.295")	3 (0.118")	12 (0.472")	40 (1.575")	6.8 (0.268")	60 (2.362")	100 (3.937")	Without	SD*T0502...
EASD05M008C12.0R02	14 (0.551")	2	7.8 (0.307")	9.1 (0.358")	3 (0.118")	12 (0.472")	40 (1.575")	6.8 (0.268")	60 (2.362")	100 (3.937")	Without	SD*T0502...
EASD05M016C16.0R04	22 (0.866")	4	15.7 (0.618")	15 (0.591")	3 (0.118")	16 (0.630")	40 (1.575")	6.8 (0.268")	60 (2.362")	100 (3.937")	Without	SD*T0502...

The minimum chamfering diameter (DC) measures up to the point where the insert's nose radius ends.
This will offset the total tool length by shortening 0.012".

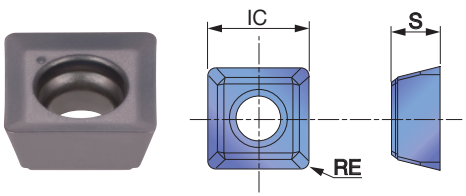
SPARE PARTS

Designation	Clamping screw	Wrench
EASD05...	CSPB-2L043	IP-6DB

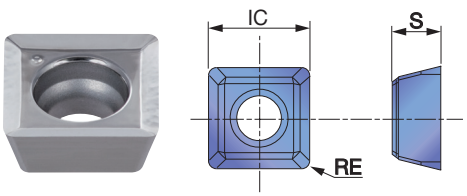
*Recommended clamping torque：CSPB-2L043 = 0.7 N·m

INSERT

SDMT05-MJ



SDHT05-AJ



		Coated AH140	Coated AH725	Uncoated TH10
P	Steel		★	
M	Stainless	★	☆	
K	Cast iron		★	
N	Non-ferrous			★
S	Superalloys		★	
H	Hard materials			

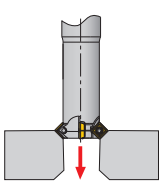
★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated AH140	Coated AH725	Uncoated TH10	S	IC
SDMT050204PN-MJ	0.016	0.157	●	●		0.094	0.200
SDHT050204FN-AJ	0.016	0.157			●	0.094	0.200

● : Line up

CUTTING PERFORMANCE

Chamfering & countersinking

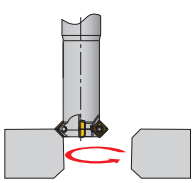


■ C2.5 (45° x 0.098")

Workpiece material: 1055

Designation	Cutting speed *Vc* (sfm)	Feed rate *fz* (in/z)
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

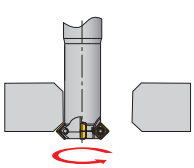


■ C2.5 (45° x 0.098")

Workpiece material: 1055

Designation	Cutting speed *Vc* (sfm)	Feed rate *fz* (in/z)
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* (in/z)
EASD05M006C12.0R01	262 - 394	0.003 - 0.005
EASD05M008C12.0R02	262 - 394	0.003 - 0.005
EASD05M016C16.0R04	262 - 394	0.003 - 0.005

Interpolated or back chamfering type

ISO	Workpiece material	Grade	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1018, 1020, 1026, etc.	AH725	755 - 1050	0.002 - 0.004
	High carbon steel 1045, 1055, etc.	AH725	492 - 755	0.002 - 0.004
	Alloyed steel 4140, 8620, etc.	AH725	492 - 755	0.002 - 0.004
	Tool steel W1-8, etc.	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.	AH725	492 - 820	0.002 - 0.005
	Ductile cast iron 60-40-18, 60-55-06, etc.	AH725	328 - 591	0.002 - 0.005
N	Aluminum alloys Si < 13%	TH10	1148 - 1640	0.002 - 0.006
	Aluminum alloys Si ≥ 13%	TH10	328 - 656	0.002 - 0.006

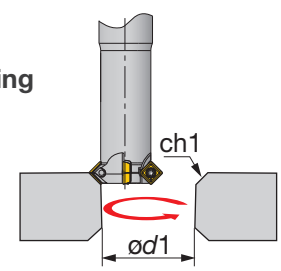
Front chamfering type

ISO	Workpiece material	Grade	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1018, 1020, 1026, etc.	AH725	525 - 722	0.002 - 0.004
	High carbon steel 1045, 1055, etc.	AH725	361 - 525	0.002 - 0.004
	Alloyed steel 4140, 8620, etc.	AH725	361 - 525	0.002 - 0.004
	Tool steel W1-8, etc.	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.	AH725	361 - 591	0.002 - 0.005
	Ductile cast iron 60-40-18, 60-55-06, etc.	AH725	230 - 427	0.002 - 0.005
N	Aluminum alloys Si < 13%	TH10	820 - 1148	0.002 - 0.006
	Aluminum alloys Si ≥ 13%	TH10	230 - 459	0.002 - 0.006

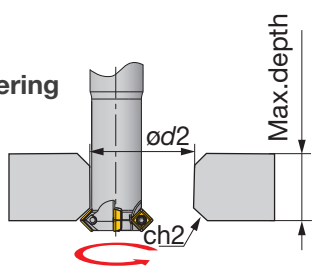
* When chamfering over C1.0 (45° x 0.039"), decrease the cutting parameters to 70% of the above parameters.

APPLICATION RANGE

Front chamfering



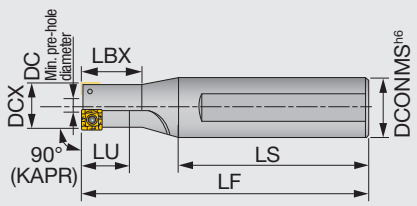
Back chamfering



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

TCB

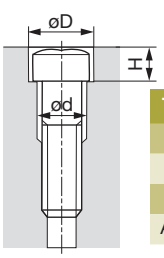
Counterboring endmill, monoblock type



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

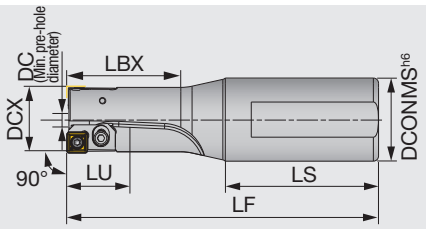
Designation	Clamping screw	Wrench
TCB100... - TCB160...	CSTB-2L040	T-6D
TCB-140...	CSTB-2.2S	T-7D
TCB170... - TCB190...	CSTB-2.2	T-7D
TCB200... - TCB260...	CSTA-NO3	T-9D
TCB-290 - TCB-320	CSTA-NO5	T-9D
TCB-350 - TCB-430	CSTA-4	T-15D

* 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, Standard cutting conditions → H226 - H227

TCB

Counterboring endmill, cartridge type



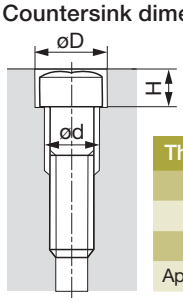
LU: Maximum hole depth

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...

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, Standard cutting conditions → H226 - H227

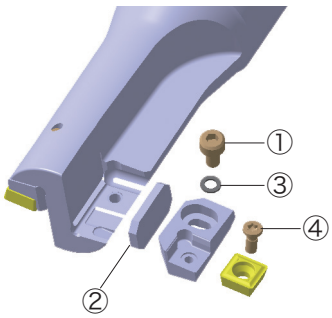
Body
SPARE PARTS

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.
- Ensure to locate the shim plate fit within the cartridge pocket. (Fig.2)
- Use thin shim plates (not included) for fine diameter adjustments in ø0.1 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

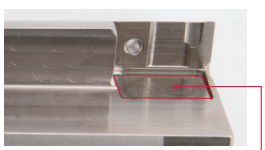


Fig.2

Cartridge pocket

Fine adjustment shim plate

Shim plates

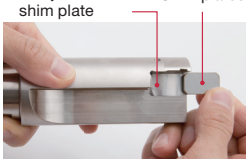


Fig.3

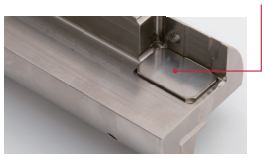


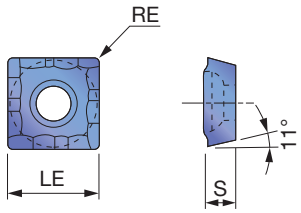
Fig.4

CUSTOM-BUILT TOOL SERVICE

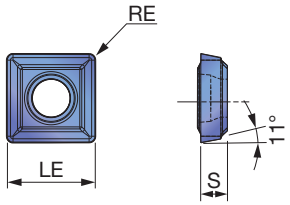
Tungaloy also designs and fabricates semi-standard or tailor-made tools with the TCB inserts according to the desired tool specifications.
Contact your Tungaloy representative for further details.

INSERT

SPMP/SPMM



SPMP/SPMM-CG



		T313W	AH6030
P	Steel	★	★
M	Stainless	★	★
K	Cast iron	★	★
N	Non-ferrous	☆	☆
S	Superalloys	☆	☆
H	Hard materials	☆	☆

★ : First choice
☆ : Second choice

Designation	RE	Coated T313W	Coated AH6030	LE	S
SPMP771-CG	0.0157		●	0.2126	0.063
SPMP831-CG	0.0157		●	0.2500	0.094
SPMP042ER-CG	0.0315		●	0.3126	0.125
SPMM322ER-CG	0.0315		●	0.3752	0.125
SPMM432ER-CG	0.0315		●	0.5000	0.187
SPMP831DS	0.0157	●		0.2500	0.094
SPMP042ERD	0.0315	●		0.3126	0.125
SPMM322ERD	0.0315	●		0.3752	0.125
SPMM432ERD	0.0315	●		0.5000	0.187

●: Line up

STANDARD CUTTING CONDITIONS

Counterboring

ISO	Workpiece material	Cutting speed *Vc* (sfm)	Feed : *f* (ipr) ø10 - 12 (z = 1)	Feed : *f* (ipr) ø13 - 59 (z = 2)
P	Carbon steel	260 - 660	0.001 - 0.003	0.004 - 0.012
M	Stainless steel	260 - 490	0.001 - 0.002	0.002 - 0.006
K	Grey cast iron	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	160 - 260	0.001 - 0.002	0.002 - 0.006
H	Hard materials	160 - 260	0.001 - 0.002	0.002 - 0.006

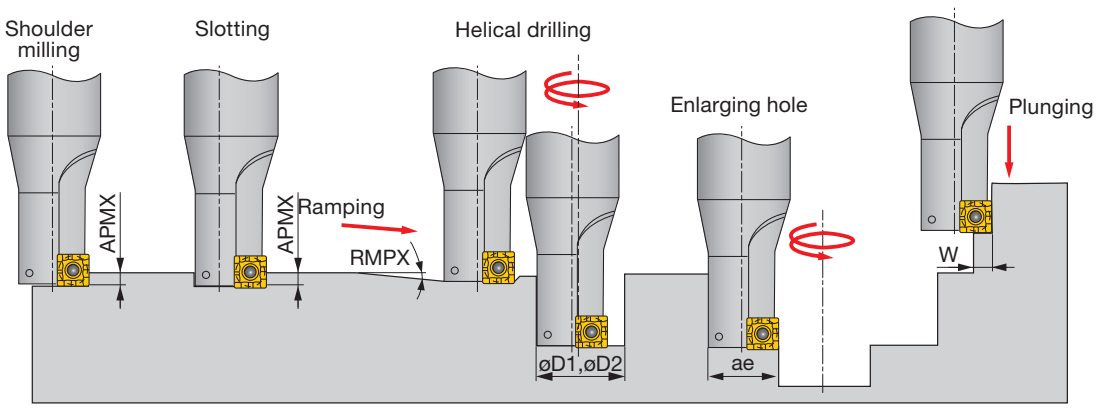
Milling

ISO	Workpiece material	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Carbon steel	260 - 660	0.002 - 0.006
M	Stainless steel	260 - 490	0.002 - 0.004
K	Grey cast iron	260 - 660	0.002 - 0.008
N	Non-ferrous	330 - 980	0.004 - 0.008
S	Superalloys	160 - 260	0.002 - 0.003
H	Hard materials	160 - 260	0.002 - 0.003

Internal boring (With one cutting edge)

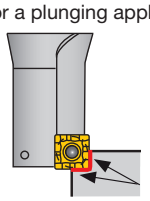
ISO	Workpiece material	Cutting speed *Vc* (sfm)	Depth of cut *ap* (in)	Feed : *f* (ipr)
P	Carbon steel	260 - 660	0.020 -	0.002 - 0.006
M	Stainless steel	260 - 490	0.020 -	0.002 - 0.004
K	Grey cast iron	260 - 660	0.020 -	0.002 - 0.008
N	Non-ferrous	330 - 980	0.020 -	0.004 - 0.008
S	Superalloys	160 - 260	0.020 -	0.002 - 0.003
H	Hard materials	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

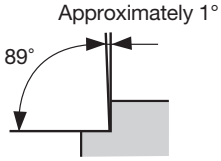
The insert can be used for a maximum 2 indexings.
(full 4 indexing for a plunging application.)



2 cutting edges in engagement

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.



MEMO