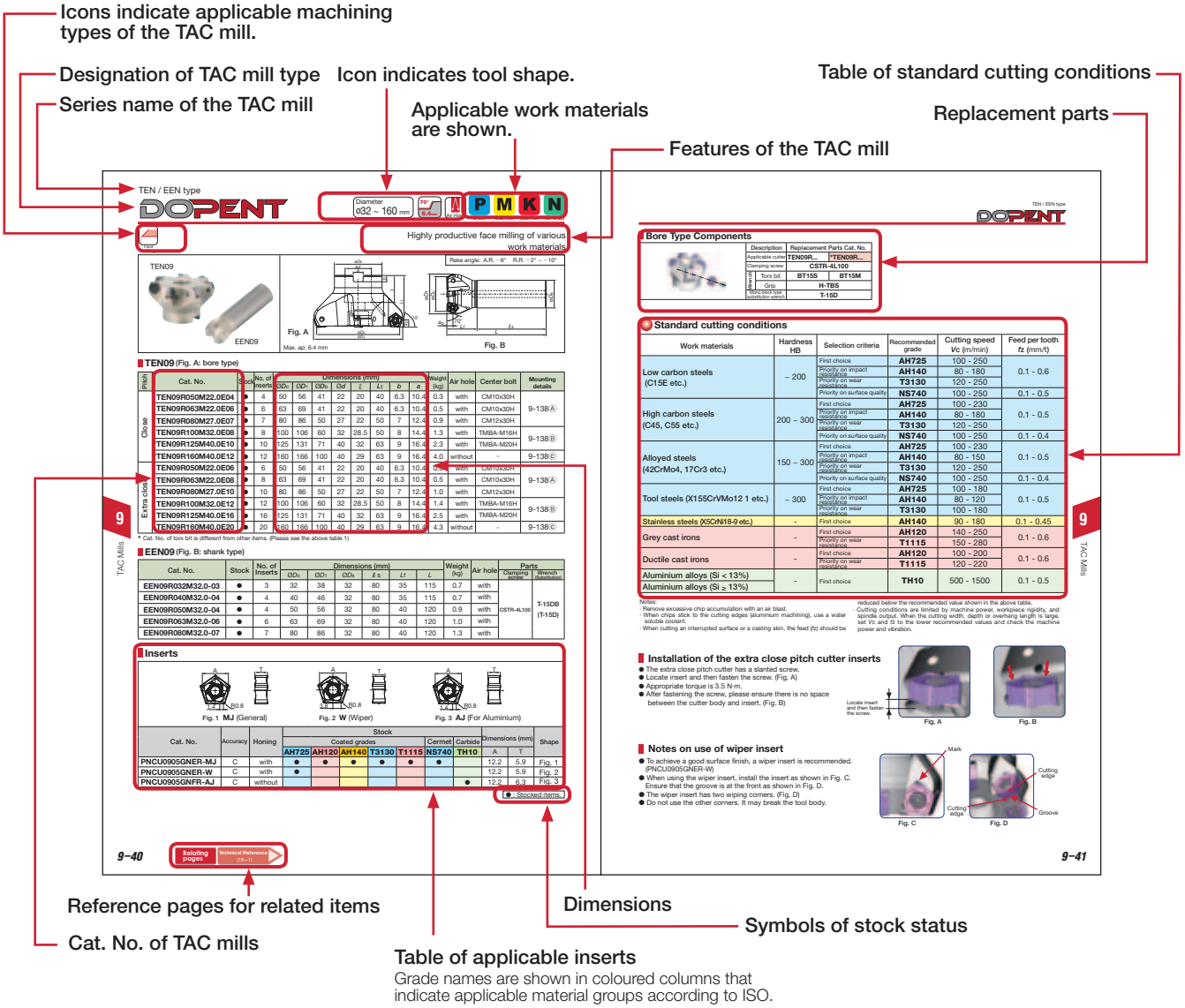
Chapter Composition of TAC Mills

◆ In this chapter, products are arranged by cutter type. Please refer to the index page of this chapter for further details.

◆ The index for each standard product is shown from page 9-30.



Icons overview

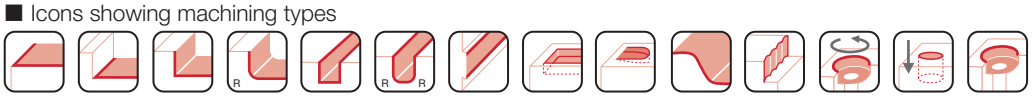
■ Icons showing shape of TAC mills

● Tool diameter range

Tool diameter
ø10~16mm

● Icons indicate corner angle and maximum depth of cut (*a*p)

■ Icons showing machining types



Face Milling | Face Milling | Shoulder Milling | Radius Milling | Slotting | Slotting | Side Milling | Pocketing | Ramping | Profiling | Plunging | Enlarging Hole | Drilling | Counter Milling

■ Ordering information

● When ordering TAC mill, please specify Cat. No. and quantity.
Example: **TPW13R080M27.0E06 1** piece.
- Standard packing quantity is 1 piece.
- Inserts must be ordered separately.

● When ordering TAC milling inserts, please specify Cat. No., grade, and quantity.
Example: **SWMT1304PDPR-MJ AH120 10** pieces.
- Standard packing quantity is 10 pieces.

Guidance

- Designation system for TAC Mills 9–2
- Designation system for TAC Milling Inserts 9–4
- Selection guide for TAC Mills 9–6
- Basic selection for TAC Mills 9–20
- TAC Mills overview 9–32
- Mounting details of TAC Mills 9–138
- Features and selection guide of TAC Mills 9–139

9 TAC Mills

Products

TAC Mills for face milling
- DoPent 9–40
- DoOcto, DoQuad 9–42
- TAW13 9–44
- TME4400I/B 9–48
- TMD5400RIE 9–50
- TGP4100RBAB 9–51
- TGN4200-AE 9–53
- DAD15 (T-DIA tipped) 9–54

TAC Mills for shoulder milling
- DoRec 9–56
- TungRec 9–58
- TecMill 9–67
- TungQuad 9–70
- TPW13 9–72
- EPH Hybrid TAC Mill 9–74
- EVH Hybrid TAC Mill 9–78
- DPD15/EDPD15 (T-DIA tipped) 9–80
- TPP16RIE 9–82
- TSE3000R(IA)E 9–84
- TSE4000R(IA)E 9–86
- TPS/EPS17 9–88

TAC Mills for Super high feed machining
- DoFeed Series 9–92
- DoFeedQuad 9–98
- EXH 9–100
- T/EXP 9–102

Radius TAC Mills
- RoundSplit 9–107
- TRD12/16 9–110

TAC Mills for difficult-to-cut materials
- T/ERF6000 9–112

Multi-functional TAC Endmills
- EVX 9–114
- ESD10 9–116

TAC Ball Endmills
- EBP 9–118
- EBD 9–119
- TBN1000 9–120

TAC Roughing Endmills
- ELP-A 9–121

Z-feed plunging TAC Mills
- TZP12 9–122
- TZF11 9–124

"Tsuppari-Ichiban" modular system
- TMS 9–126

TAC Chamfering Mills
- ECC31 9–127

TAC Counter Boring Cutters
- TCB 9–129

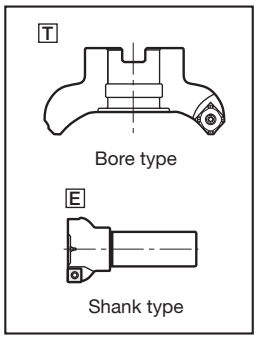
TAC Mills dedicated for finishing
- MSSFP4000 9-130
- MS 9–131
- QPP15 (T-CBN tipped) 9–132

TAC Side Cutters
- TecSlot 9–134
- SVN4000 9–137

TAC Milling Inserts 9–140

Designation System for TAC Mills

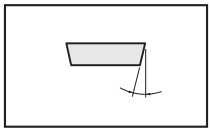
TAC Mills [New products]



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

Symbol	Type
W	Wedge clamp
L	Long shank
LE	Long edge
CS	Carbide shank

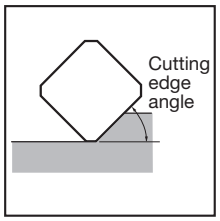
⑪ Additional feature

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
T	A	W	13	R	080	M	27.0	E	06	--

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
E	V	H	07	R	012	M	12.0	-	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

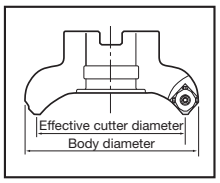


④ Cutting edge length

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
200	200
I: Unit in inch	
200	2
10H	10

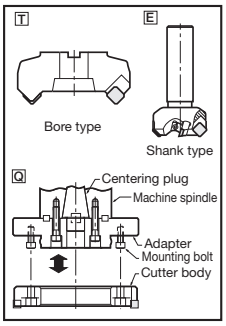


⑧ Attachment size

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

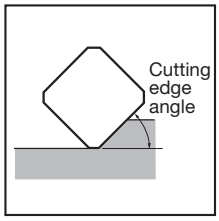
⑩ Number of inserts

TAC Mills [Previous products]



Symbol	Type
V	Vertical insert
Q	Quick change
E	Shank
T	Bore
S	Special
D	All PCD tipped
Q	All PCBN tipped

① Type



Symbol	Cutting edge angle
X	Others
Z	Others
V	Others
P	90° ~ 80°
E	80° ~ 70°
D	60° ~ 50°
A	50° ~ 40°

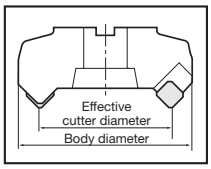
② Angle

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

③ Relief angle

R		S		C		T		Inscribed circle dia. (mm)
Symbol	Size	Symbol	Size	Symbol	Size	Symbol	Size	
		06	6.35	06	6.5	11	11	6.35
		07	7.94	08	8.1	13	13.8	7.94
09	9.525	09	9.525	09	9.7	16	16.5	9.525
10	10	–	–	–	–	–	–	10
12	12	–	–	–	–	–	–	12
12	12.7	12	12.7	12	12.9	22	22	12.7
15	15.875	15	15.875	16	16.1	27	27.5	15.875
16	16	–	–	–	–	–	–	16
19	19.05	19	19.05	19	19.3	33	33	19.05
20	20	–	–	–	–	–	–	20
25	25	–	–	–	–	–	–	25
25	25.4	25	25.4	25	25.8	44	44	25.4
31	31.75	31	31.75	32	32.2	55	55	31.75

④ Cutting edge length



Symbol	Effective diameter (mm)
050	50
063	63
080	80
100	100
125	125
160	160
200	200
250	250
315	315
355	355
400	400

⑤ Effective cutter diameter

Example
Metric system

①	②	③	④	⑤	⑥	⑦	
T	P	S	11	040	R	B	(-) E

Example
Inch system

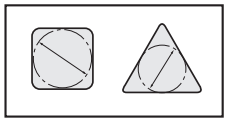
①	⑧	③	⑨	⑩	⑪	⑥	⑦	
T	M	D	5	4	06	R	I	(-) E

⑧ Application,etc.

Symbol	Application, geometry etc.
M	For machining centers
F	For finishing
G	General purpose
S	For square shoulder milling
H	High rake geometry
P	Negative axial, positive radial rake geometry
R	Use round inserts
U	For difficult to cut materials
C	For chamfering
L	Long edge type
T	For threading

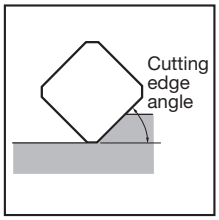
⑨ Size of applicable insert

Symbol	I. C. (mm)
3	9.525
4	12.7
5	15.875
6	19.05
7	22.225
8	25.4
9	31.75



⑩ Angle

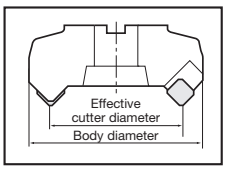
Symbol	Cutting edge angle
0	90° ~ 80°
1	80° ~ 70°
2	70° ~ 60°
3	60° ~ 50°
4	50° ~ 40°
5	40° ~ 30°
6	30° ~ 20°
7	20° ~ 10°



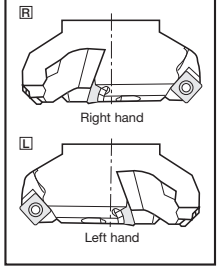
⑪ Effective cutter diameter

Symbol	Effective diameter (mm)
50	50
63	63
03	80
04	100
05	125
06	160
08	200
10	250
12	315
14	355
16	400

Note: For diameter of less than 80mm,nominal dimensions (mm) of effective diameter are shown

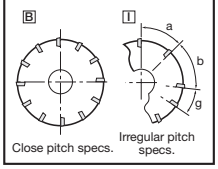


⑥ Direction of cut



⑦ Additional feature

B	Close pitch
I	Irregular pitch
A(-A)	Modified type
S	For distinguishing shank size
L	Long shank



Note: The above nomenclature is not applicable for VSN6000I, MS cutter, TCB, PES1500 and TBN etc.

Designation System for TAC Milling Inserts

Symbol	Hole	Hole shape	Chip groove	Section shape
N	Without	–	Without	
R			On one side	
F			On both sides	
W	With	Partially cylindrical hole with 40° ~ 60° mouth on one side	Without	
T			On one side	
Q		Partially cylindrical hole with 40° ~ 60° mouth on both sides	Without	
U			On both sides	
B		Partially cylindrical hole with 70° ~ 90° mouth on one side	Without	
H			On one side	
C		Partially cylindrical hole with 70° ~ 90° mouth on both sides	Without	
J			On both sides	
X	–	–	–	

❹ Insert type

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

❺ Cutting edge length

*The thickness is different according to the product symbol.

Symbol	Thickness
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

❻ Thickness (mm)

Example

Metric system

❶	❷	❸	❹	❺
S	E	E	N	12

Example

Inch system

❶	❷	❸	❹	❺
S	D	K	N	4

❶ Shape

Symbol	Shape	Included angle (degree)	Outlined 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	Trigon	80°	
W	Special (wiper)	–	
O	Octagonal	135°	
P	Pentagonal	108°	
X	Special	Others angle	
Y	Special	Others angle	
Z	Special	Others angle	

❷ Relief angle

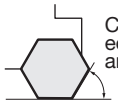
Symbol	Relief angle (degree)
C	7°
D	15°
E	20°
F	25°
G	30°
M	Others
N	0°
P	11°
Q	Others
O	Others
X	Others
S	Others
W	Double relief

❸ Tolerance class (mm)

Symbol	Tolerance on corner height	Tolerance on thickness	Tolerance on inscribed circle
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

Inscribed circle dia.	Tolerance on inscribed circle (ød)		Tolerance on corner height (mm)	
	J, K, L, M, N (class)	U (class)	M, N (class)	U (class)
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°
Z	Other angles



⑦ Angle

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

⑧ Chamfer flat relief angle

Symbol	Condition	Shape
F	Sharp edge	
E	Round honing	
T	Chamfer honing	
S	Combi-nation honing	
P	Combi-nation round honing	

⑨ Cutting edge condition

Symbol	Hand
R	Right
L	Left
N	Neutral

⑩ Hand of insert

Symbol	Applications
12	Chamfer flat width: 1.2 mm
14	Chamfer flat width: 1.4 mm
16	Chamfer flat width: 1.6 mm
20	Chamfer flat width: 2.0 mm
24	Chamfer flat width: 2.4 mm
D	PCD-tipped insert
T	Double-rake edge insert
W	Wiper insert (Multiple corner type)
WS	Wiper insert (Single corner type)
WD	Wiper insert (PCD tipped insert)
BD	Deburring wiper insert (PCD tipped insert)
MJ	Chipbreaker for general purpose
MH	Chipbreaker for high feed (Mill dia.)
ML	Chipbreaker for reduced cutting forces
MS	Functional curvature insert for stainless steels
HJ	Chipbreaker for general purpose
AJ	Functional curvature insert for nonferrous metals
NMJ	Seratted cutting edge insert for general
NAJ	Seratted cutting edge insert for aluminium

⑪

⑥	⑦	⑧	⑨	⑩		⑪
03	A	G	T	N	-	T
2	Z		T	N		16

④ Insert type

Symbol	Chip groove	Hole
A	Without	With
F	On both sides	Without
G	On both sides	With
M	On one side	With
N	Without	With
U	Without	Without
W	Without	With

⑤ Inscribed circle

	Symbol	Inscribed circle dia. (mm)
Inch system	3	9.525
	4	12.7
	5	15.875
	6	19.05

⑥ Thickness

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

⑦ Corner geometry

Symbol	Geometry (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	Explanation
F	Special finishing edge (Example: Insert for MS cutter)
H	Flat chamfer with 60° corner angle
S	Flat chamfer with 15° corner angle
Z	Flat chamfer with various corner angle.

Note on nomenclature for wiper inserts:
For the imperial system, the "W" symbol is used for the insert shape. For the metric system, the symbol shape is the same as for conventional inserts. The wiper is distinguished by placing a symbol such as W, WS or a WD in position 10.

Selection Guide for TAC mills

Face milling

P Steel (≤ 300HB)

1st choice

Body

DOPENT

TEN09

EEN09

Max. ap = 6.4 mm

9-40

Insert

AH725 / MJ

Heavy interrupted: AH140 / MJ

For higher surface quality: NS740 / MJ

High feed per tooth
fz ≥ 0.3 mm/t

Body

DOFEEDQUAD

TXQ12

9-98

Insert

AH725 / MJ

Body

TUNGMILL

TAW13

øDc = ~ ø160 mm
Max. *ap* = 2 mm (HJ insert)

9-44

Insert

AH120 / HJ

Quick change system for insert

Body

TME4400I

Max. *ap* = 5 mm
(Flat insert)

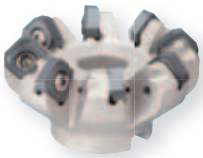
9-48

Insert

AH120 → NS740

Large depth of cut
ap ≥ 6mm

Body



DOQUAD

TAN07

9-42

Insert

Heavy interrupted

AH725 / MJ → AH140 / MJ

Face milling

M Stainless

High feed per tooth
fz ≥ 0.3 mm/t

1st choice

Body

TUNGMILL

TAW13

Max. *ap* = 4 mm (MS insert)

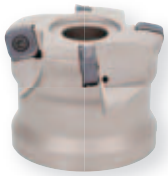
9-44

Insert

AH130 / MS

Body

DOFEEDQUAD



TXQ12

9-98

Insert

AH130 / MJ

Body

TUNGMILL

TAW13

øDc = ~ ø160 mm
Max. *ap* = 2 mm (HJ insert)

9-44

Insert

AH130 / HJ

Quick change system
for insert

Body

TME4400I

Max. *ap* = 4 mm
(MS insert)

9-48

Insert

AH130 / MS

For low cost and high
performance: 10 corners
per insert

Body

DOPENT

TEN09

EEN09

9-40

Insert

AH140 / MJ

Selection Guide for TAC mills

Face milling

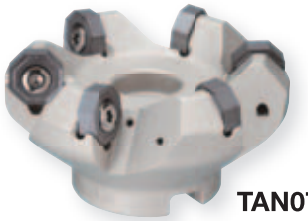
K Cast iron

High feed per tooth
fz ≥ 0.3 mm/t

1st choice

Body

DOOCTO



TAN07

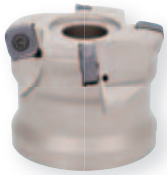
Max. *ap* = 4.7 mm

9-42

Insert

AH120 / ML → Heavy interrupted AH725 / MJ

Body



DOFEEDQUAD

TXQ12

øDc = ~ ø125 mm
Max. *ap* = 2 mm

9-98

Insert

AH120 / MJ

Body

TUNGMILL

TAW13

øDc = ~ ø160 mm
Max. *ap* = 2 mm (HJ insert)

9-44

Insert

T1115 / HJ

Quick change system
for insert

Body

DOOCTO

Max. *ap* = 4.7 mm

TAN07-W

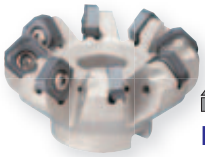
9-42

Insert

AH120 / ML → Heavy interrupted AH725 / MJ

Fluctuating depth of cut
ap ≥ 4.5 mm

Body



DOQUAD

Max. *ap* = 7.5 mm

TAN07

9-42

Insert

AH120 / ML → Heavy interrupted AH725 / MJ

With CBN insert
For high productivity
with high cutting speed

Body

Non-stock standard

Max. *ap* = 1 mm
Vc = ~ 2000 m/min

QPP15

9-132

Insert

BX950

Face milling

N Non-ferrous

With PCD insert
For high productivity and precision machining

Body

DAD15
Max. ap = 5 mm
Non stock standard

9-80

Insert

DX140

1st choice

Body

TUNGMILL

TAW13
Max. ap = 4 mm (AJ insert)

9-44

Insert

DS1100 / AJ

For low cost and high performance: 10 corners per insert

Body

DOPENT

TEN09 **EEN09**
Max. ap = 6.4 mm

9-40

Insert

TH10 / AJ

Quick change system for insert

Body

TME4400I
Max. ap = 4 mm

9-48

Insert

TH10

Face milling

S Superalloys (Heat-resisting alloy etc.)

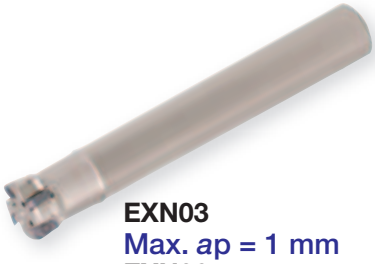
H Hard materials (40 ~ 60HRC)

1st choice

Body

DOFEED SERIES

TXN06
Max. *ap* = 1.5 mm



EXN03
Max. *ap* = 1 mm
EXN06
Max. *ap* = 1.5 mm

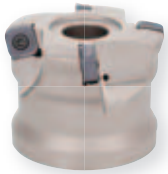
9-92

Insert

Hard materials	Superalloys
AH725 / MJ	AH725 / ML

For low cost and high performance: 8 corners per insert

Body



DOFEEDQUAD

TXQ12

øDc = ~ ø125 mm
Max. *ap* = 2 mm

9-98

Insert

AH725 / MJ

Square shoulder milling

P Steel (≤ 300HB)

1st choice

Body — DOREC

TPQ EPQ

T/EPQ11: Max. *ap* = 9 mm
T/EPQ18: Max. *ap* = 16 mm 9-58

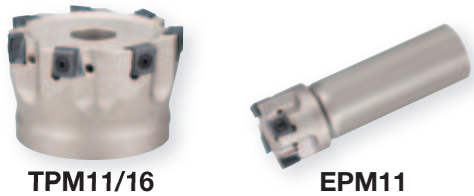
Insert

Heavy interrupted

AH725 / MJ → AH140 / MJ

Heavy interrupted machining on large machines (e.g. BT50)

Body — TECMILL



TPM11/16 EPM11

T/EPM11: Max. *ap* = 9.7 mm
TPM16: Max. *ap* = 15.1 mm 9-67

Insert

For higher chipping resistance

AH725 / MJ → AH140 / MJ

Body — TUNGREC

TPO07/18 TPS11 EPO07/18 EPS11

07 type: Max. *ap* = 7 mm
11 type: Max. *ap* = 10.6 mm
18 type: Max. *ap* = 16.7 mm 9-58

Insert

Heavy interrupted

AH725 / MJ → AH140 / MJ

High productivity, high wall straightness (≤ 50 µm)

Large depth of cut *ap* ≥ 16 mm

Body — TUNGQUAD

ELD05

øDc = ø20, ø25
Max. *ap*:
ø20 = 20.3 mm
ø25 = 24.2 mm

9-70

Insert

AH725 / MJ → AH140 / MJ

For higher chipping resistance

Body — TUNGREC

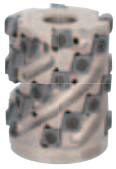
TLS11 ELS11

øDc = ø25 ~ ø50
Max. *ap*: ø25 = 30.4 mm, ø32 = 39.4 mm
ø40 = 40 mm, ø50 = 48.8 mm 9-58

Insert

AH725 / MJ

Body — TECMILL



TLM11

øDc =
ø50 mm, ø63 mm
Max. *ap*:
ø50 mm = 59 mm
ø63 mm = 67.4 mm

9-67

Insert

AH725 / MJ → AH140 / MJ

For higher chipping resistance

Square shoulder milling

M Stainless

Heavy interrupted machining on large machines (e.g. BT50)

1st choice

Body

TUNGREC

TPO07/18, TPS11 — EPO07/18, EPS11

07 type: Max. *ap* = 7 mm
11 type: Max. *ap* = 10.6 mm
18 type: Max. *ap* = 16.7 mm

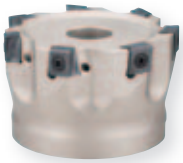
9-58

Insert

TPO07/18	TPS/EPS11
AH140 / MJ	AH130 / MS

Body

TECMILL



TPM11/16 — EPM11

T/EPM11: Max. *ap* = 9.7 mm
TPM16: Max. *ap* = 15.1 mm

9-67

Insert

AH140 / MJ

Body

DOREC

TPQ — EPQ

T/EPQ11: Max. *ap* = 9 mm
T/EPQ18: Max. *ap* = 16 mm

9-56

Insert

AH140 / MJ

For low cost and high performance: 4 corners per insert

Large depth of cut
ap ≥ 16 mm

Body

TUNGQUAD

ELD05

øDc = ø20, ø25
Max. *ap*:
ø20 = 20.3 mm
ø25 = 24.2 mm

9-70

Insert

AH140 / MJ

Body

TUNGREC

TLS11 — ELS11

øDc = ø25 ~ ø50
Max. *ap*: ø25 = 30.4 mm, ø32 = 39.4 mm
ø40 = 40 mm, ø50 = 48.8 mm

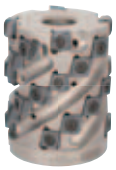
9-58

Insert

AH130 / MS

Body

TECMILL



TLM11

øDc =
ø50 mm, ø63 mm
Max. *ap*:
ø50 mm = 59 mm
ø63 mm = 67.4 mm

9-67

Insert

AH140 / MJ

Square shoulder milling

K Cast iron

1st choice

Body

DOREC

TPQ EPQ

T/EPQ11: Max. *ap* = 9 mm
T/EPQ18: Max. *ap* = 16 mm

9-56

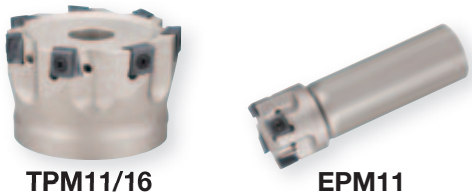
Insert

AH120 / MJ

Heavy interrupted machining on large machines (e.g. BT50)

Body

TECMILL



TPM11/16 EPM11

T/EPM11: Max. *ap* = 9.7 mm
TPM16: Max. *ap* = 15.1 mm

9-67

Insert

For high wear resistance

AH120 / MJ → T1115/ MJ

Body

TUNGREC

TPO07/18 TPS11 EPO07/18 EPS11

07 type: Max. *ap* = 7 mm
11 type: Max. *ap* = 10.6 mm
18 type: Max. *ap* = 16.7 mm

9-58

Insert

T/EPO: AH725 / MJ
T/EPS: T1115 / MJ

High productivity, high wall straightness (≤ 50 µm)

Large depth of cut *ap* ≥ 16 mm

Body

TUNGQUAD

ELD05

øDc = ø20, ø25
Max. *ap*:
ø20 = 20.3 mm
ø25 = 24.2 mm

9-70

Insert

AH725 / MJ

Body

TUNGREC

TLS11 ELS11

øDc = ø25 ~ ø50
Max. *ap*: ø25 = 30.4 mm, ø32 = 39.4 mm
ø40 = 40 mm, ø50 = 48.8 mm

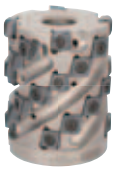
9-58

Insert

AH120 / MJ

Body

TECMILL



TLM11

øDc =
ø50 mm, ø63 mm
Max. *ap*:
ø50 mm = 59 mm
ø63 mm = 67.4 mm

9-67

Insert

AH120 / MJ

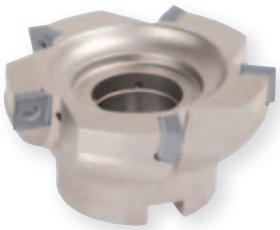
Square shoulder milling

N Non-ferrous

1st choice

Body

TUNGMILL



TPW13

Max. *ap* = 10 mm

9-72

Insert

DS1100 / AJ

High productivity, high wall straightness (≤ 50 µm)

Body

TUNGREC

TPO07/18
TPS11

EPO07/18
EPS11

07 type: Max. *ap* = 7 mm
11 type: Max. *ap* = 10.6 mm
18 type: Max. *ap* = 16.7 mm

9-58

Insert

T/EPO: KS15F / AJ

T/EPS11: DS1100 / AJ

Large depth of cut *ap* ≥ 10 mm

Body

TUNGQUAD

ELD05

øDc = ø20, ø25
Max. *ap*:
ø20 = 20.3 mm
ø25 = 24.2 mm

9-70

Insert

TH10 / MJ

Body

TUNGREC

TLS11

ELS11

øDc = ø25 ~ ø50
Max. *ap*: ø25 = 30.4 mm, ø32 = 39.4 mm
ø40 = 40 mm, ø50 = 48.8 mm

9-58

Insert

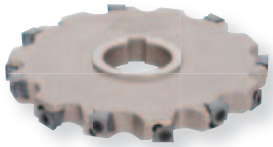
DS1100 / AJ

P Steel (≤ 300HB) **M** Stainless **K** Cast iron

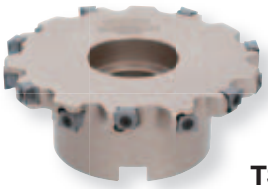
Slotting

TECSLOT

9-134



ASN



TSN

Finishing

Face milling (Finish operation)

SFP4000

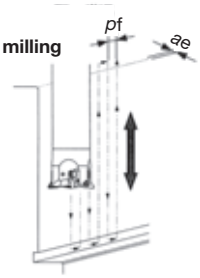
9-176

Finishing wall with plunging

TZF11

9-124

Z-feed milling



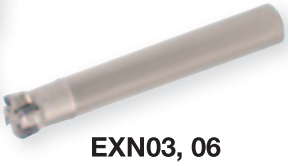
Profiling & pocket milling

P Steel (≤ 300HB) **K** Cast iron

DOFEED SERIES

9-92

TXN03, 06

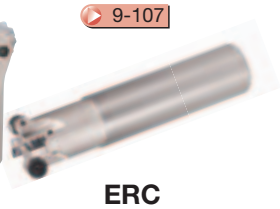


EXN03, 06

ROUNDSPLIT

9-107

TRC



ERC

TZP 9-122

EVX 9-114

TUNGREC

EPO07/18
EPS11 9-58

HYBRIDTACMILL

EPH 9-74

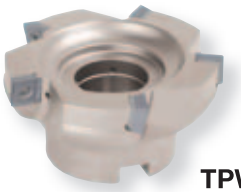
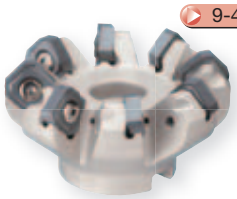
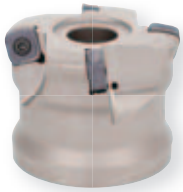
EVH 9-78

EBP 9-118

EBD 9-119

Selection Guide for TAC mills

Selection guide by workpiece shape

Shape of workpiece	Suitable tools (TAC mills)
Low rigidity work (thin plate, easy chattering products)	DOPENT 9-40 TEN09 EEN09 TUNGMILL 9-72  TPW13
Narrow work	DOPENT 9-40 TEN09 Extra close TAN07 Extra close DOOCTO DOQUAD 9-42
Scaled surface, fluctuating depth of cut	DOQUAD 9-42  TAN07 TECMILL 9-67 TPM11/16
Smelted surface	DOFEED SERIES 9-92 TXN06 DOFEEDQUAD 9-98  TXQ12 ROUNDSPLIT 9-107 TRC16

Selection guide for shoulder milling tools by machine tool and application

Machines	Small size machine (e.g. BT30)	Medium size machine (e.g. BT40)	Large size machine (e.g. BT50)
Pocket milling, contouring & ramping	TUNGREC 18 TUNGREC 11 TUNGREC 07		
Face milling, shoulder milling & slot milling	TECMILL 11, 16 DOREC 11, 18 TUNGQUAD		

Chart 1 Application related chart / First priority is economical solution

Application	Setup / operation limitation	Depth of cut ap (mm)		Tool dia øDc	1. Priority (Economical)	2. Priority	3. Priority (High reliability)	Finishing Priority
Shoulder milling	Productivity Priority Stable setup	Small	< 2	Small	TUNGQUAD TPD/EPD05	TUNGREC TPO/EPO07	TUNGREC TPS/EPS11	TUNGREC TPS/EPS11
		Medium	< 4	Small	TUNGREC TPO/EPO07	TUNGREC TPS/EPS11		TUNGREC TPS/EPS11
				Large	DOREC TPQ/EPQ11	TUNGMILL TPW/EPW13	TECMILL TPM/EPM11	DOREC TPQ/EPQ11
	Unstable setup	Small	< 2	Small	TUNGQUAD TPD/EPD05	TUNGREC TPO/EPO07	TUNGREC TPS/EPS11	TUNGREC TPS/EPS11
		Medium	< 4	Small	TUNGREC TPO/EPO07	TUNGREC TPS/EPS11		TUNGREC TPS/EPS11
				Large	TUNGMILL TPW/EPW13	DOREC TPQ/EPQ11	TUNGREC TPO/EPO18	TUNGREC TPO/EPO18
	Interrupted cut	Small	< 2	Small	TUNGREC TPS/EPS11	TUNGREC TPO/EPO07		TUNGREC TPO/EPO18
		Medium	< 4	Small	TUNGREC TPS/EPS11	TUNGREC TPO/EPO18		TUNGREC TPO/EPO18
				Large	TECMILL TPM/EPM11	DOREC TPQ/EPQ11		TUNGREC TPO/EPO18
	Long overhang	Small		Small	TUNGREC TPO/EPO18	TUNGREC TPS/EPS11		HYBRIDTACMILL EPH11/13/18
				Large	TUNGREC TPO/EPO18	DOREC TPQ/EPQ11		TUNGREC TPO/EPO18
	Ramping, Multifunction				TUNGREC TPS/EPS11	TUNGREC TPO/EPO18	TUNGMILL EVX	
Face milling	Productivity Priority Stable setup	Small	< 2	Medium	DOPENT TEN/EEN09	TUNGMILL TAW/EAW13	DOFEEDQUAD TXQ12	DOPENT TEN/EEN09
		Medium	< 4	Medium	DOPENT TEN/EEN09	TUNGMILL TAW/EAW13		DOPENT TEN/EEN09
				Large	DOOCTO TAN07	DOPENT TEN/EEN09	DOQUAD TAN07	DOOCTO TAN07
	Unstable setup	Small	< 2	Medium	DOPENT TEN/EEN09	TUNGMILL TAW/EAW13		TUNGMILL TAW/EAW13
		Medium	< 4	Medium	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09		TUNGMILL TAW/EAW13
				Large	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09		TUNGMILL TAW/EAW13
	Interrupted cut	Small	< 2	Medium	DOPENT TEN/EEN09	DOPENT TEN/EEN09	DOFEEDQUAD TXQ12	TUNGMILL TAW/EAW13
		Medium	< 4	Medium	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09		TUNGMILL TAW/EAW13
				Large	DOOCTO TAN07	DOQUAD TAN07	DOPENT TEN/EEN09	DOOCTO TAN07
	Long overhang	Small		Medium	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09		TUNGMILL TAW/EAW13
				Large	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09		TUNGMILL TAW/EAW13
High feed milling	Productivity Priority Stable setup	Small	< 1	Small	DOFEEDMINI TXN/EXN03	MILLFEED TXP/EXP		
			< 2	Medium	DOFEED TXN/EXN06	DOFEEDQUAD TXQ12	MILLFEED TXP/EXP	MILLFEED TXD15
				Large	DOFEED TXN/EXN06	DOFEEDQUAD TXQ12	MILLFEED TXP/EXP	MILLFEED TXD15
	Unstable setup			Small	DOFEEDMINI TXN/EXN03	MILLFEED TXP/EXP		
				Medium	MILLFEED TXP/EXP	DOFEED TXN/EXN06		
	Interrupted cut			Small	DOFEEDMINI TXN/EXN03			
				Medium	DOFEED TXN/EXN06	DOFEEDQUAD TXQ12		
	Long overhang							
Profiling	Productivity Priority Stable setup			Small	TUNGMILL EWD			
				Medium	ROUNDSPLIT TRC/ERC	FIXRMILL TRP/ERP	TUNGMILL TRD/ERD	
	Unstable setup				ROUNDSPLIT TRC/ERC	FIXRMILL TRP/ERP		
	Interrupted cut				ROUNDSPLIT TRC/ERC	FIXRMILL TRP/ERP		
	Long overhang				ROUNDSPLIT TRC/ERC	FIXRMILL TRP/ERP		

Chart 2

Application	Work materials	Setup / operation
Shoulder milling	P Steel	Productivity priority Stable setup
		Unstable setup
		Interrupted cut
		Long overhang
	M Stainless	Productivity priority Stable setup
		Unstable setup
		Interrupted cut
		Long overhang
	K Cast iron	Productivity priority Stable setup
		Unstable setup
		Interrupted cut
		Long overhang
	N Non-ferrous	Productivity priority Stable setup
		Unstable setup
		Interrupted cut
		Long overhang
Face milling	P Steel	Productivity priority Stable setup
		Unstable setup
		Interrupted cut
		Long overhang
	M Stainless	Productivity priority Stable setup
		Unstable setup
		Interrupted cut
		Long overhang
	K Cast iron	Productivity priority Stable setup
		Unstable setup
		Interrupted cut
		Long overhang
	N Non-ferrous	Productivity priority Stable setup
		Unstable setup
		Interrupted cut
		Long overhang

Guide

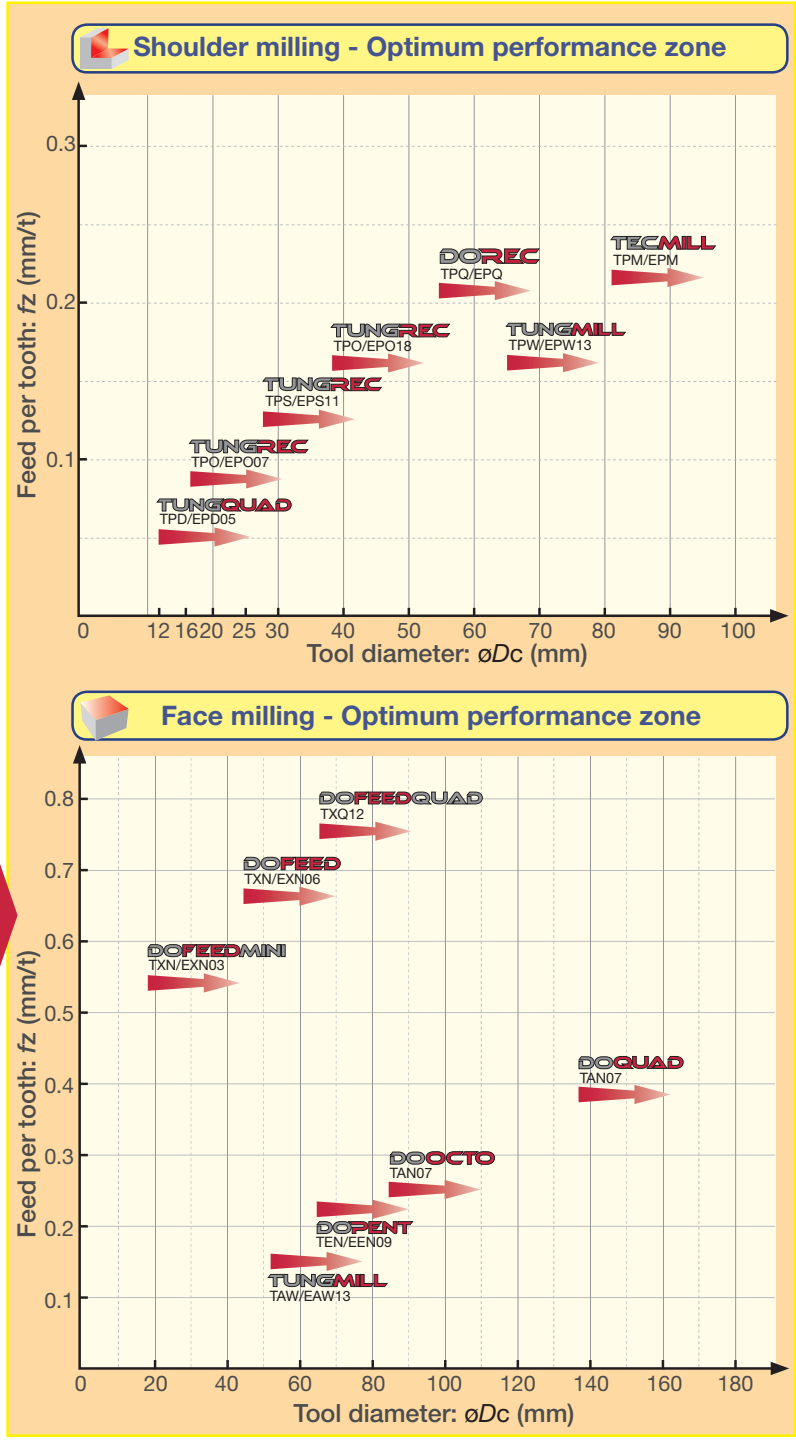
Tungaloy
Member IMC Group

Material related chart / First priority is high reliability

limitation	1. Priority	2. Priority	3. Priority
	High reliability ←		
General	DOREC TPQ/EPQ	TECMILL TPM/EPM	
High DoC	ROUGHINGMILL Roughing series		
	TUNGREC TPO/EPO18	TUNGREC TPS/EPS11	TUNGMILL TPW/EPW13
	TECMILL TPM/EPM	TUNGMILL TPW/EPW13	TUNGREC TPO/EPO18
	TUNGREC TPO/EPO18		
	TUNGREC TPO/EPO	DOREC TPQ/EPQ	TECMILL TPM/EPM
	TUNGREC TPO/EPO		
	TECMILL TPM/EPM	DOREC TPQ/EPQ	
	TUNGREC TPO/EPO		
	TECMILL TPM/EPM	DOREC TPQ/EPQ	
	DOREC TPQ/EPQ		
	TECMILL TPM/EPM	DOREC TPQ/EPQ	
	TUNGREC TPO/EPO		
	TUNGMILL TAW/EAW13	TUNGREC TPO/EPO	
	TUNGMILL TAW/EAW13	TUNGREC TPO/EPO	
	TUNGREC TPO/EPO		
	TUNGREC TPO/EPO		
General	DOPENT TEN/EEN09	DOOCTO TAN07	TUNGMILL TAW/EAW13
High DoC	DOPENT TEN/EEN09	DOQUAD TAN07	
High feed	DOFEEDQUAD TXQ12	MILLFEED TXP	
	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09	
	DOOCTO DOQUAD TAN07	DOPENT TEN/EEN09	TUNGMILL TAW/EAW13
	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09	
General	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09	DOOCTO TAN07
High DoC	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09	DOQUAD TAN07
High feed	DOFEEDQUAD TXQ12	DOFEED TXN/EXN06	
	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09	
	DOOCTO DOQUAD TAN07	DOPENT TEN/EEN09	TUNGMILL TAW/EAW13
	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09	
General	DOOCTO TAN07	DOQUAD TAN07	DOPENT TEN/EEN09
High DoC	DOQUAD TAN07	DOPENT TEN/EEN09	
High feed	DOFEEDQUAD TXQ12	DOFEED TXN/EXN06	
	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09	
	DOOCTO DOQUAD TAN07	DOPENT TEN/EEN09	TUNGMILL TAW/EAW13
	TUNGMILL TAW/EAW13	DOPENT TEN/EEN09	
	TUNGMILL DPD	TUNGMILL TFE	DOPENT TEN/EEN09
	TUNGMILL TAW/EAW	TUNGMILL TFE	DOPENT TEN/EEN09
	TUNGMILL TAW/EAW	DOPENT TEN/EEN09	
	TUNGMILL TFE		

Chart 3

This graph shows the starting range for optimum performance zone for each family of cutters



How to use:

- Please shortlist the recommended product family from chart 1, 2 or both and then cross check if the diameter (*øDc*) and the feed per tooth (*fz*) required by customer is suitable for this family by chart 3.
- Feed per tooth (*fz*) shown in chart 3 is only an indicator and customer can use feeds ±20% of the shown value depending upon the material, parameters.
- For further operating parameters please refer to the recommended cutting conditions in the catalogue for the respective product.

Face Milling

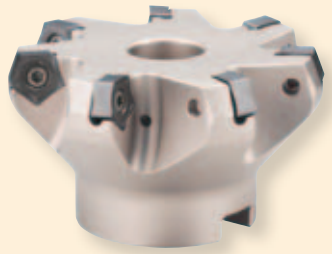
1st choice

DOPENT

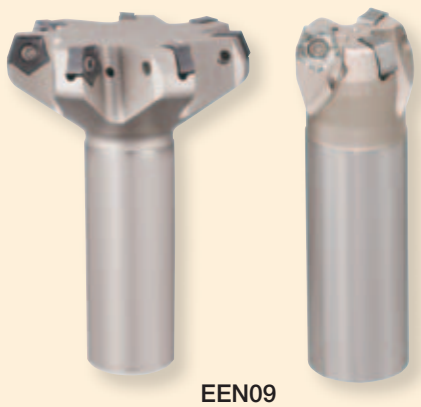
9-40

Work materials

P	M	K	N
Steel	Stainless	Cast Iron	Non-ferrous

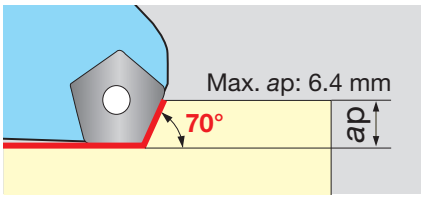


TEN09



EEN09

Pentagonal, double sided insert with 10 cutting edges!
Can be used on a variety of materials and applications that demand superior sharpness!



Pitch / Diameter	Number of inserts	
	Close	Extra close
ø32	3	-
ø40	4	-
ø50	4	6
ø63	6	8
ø80	7	10
ø100	8	12
ø125	10	16
ø160	12	20

Clamping	Air hole
Screw	○
Wiper	**Adjusting**
○	-
Shank type	**Close pitch**
○	○

Accuracy
C

Variations of inserts	
General purpose	MJ
For aluminium alloys	AJ

For cast iron and steel

DOOCTO DOQUAD

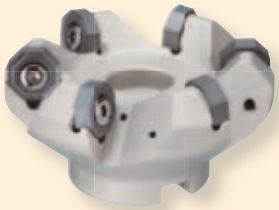
Work materials

P Steel K Cast Iron

9-42

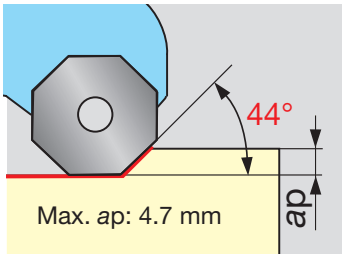
With octagonal or square inserts, please only select one type of cutter body.

DOOCTO



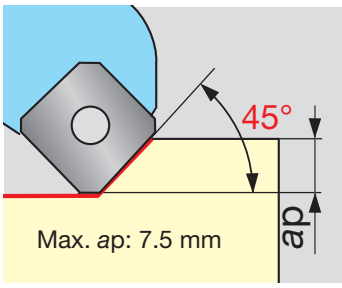
DOOCTO

Economical milling cutter which uses octagonal, double sided insert with 16 cutting edges!

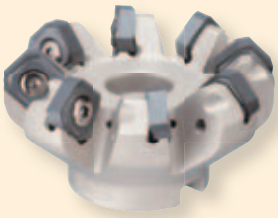


DOQUAD

Productive milling cutter that utilises square inserts.



DOQUAD



Pitch / Diameter	Number of inserts		
	Screw on type		Wedge type
	Coarse	Close	Extra close
ø63	5	6	8
ø80	6	8	10
ø100	7	10	14
ø125	8	12	18
ø160	10	15	22
ø200	12	18	28

Clamping	Air hole
Screw	○
Wedge	-
Wiper	**Adjusting**
○	-
Shank type	**Close pitch**
-	○

Accuracy
M, H

Variations of inserts	
For steel	MJ
For cast iron	ML

Low cutting forces

TUNGMILL

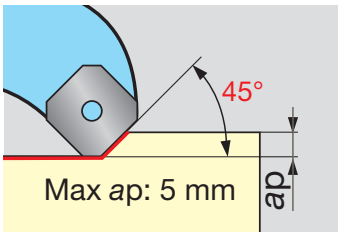
9-44

Work materials

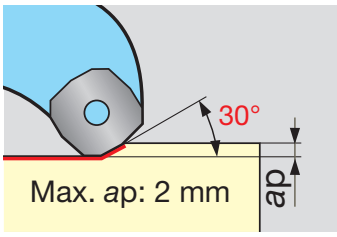
P Steel | M Stainless | K Cast Iron | N Non-ferrous

TAW13

Many items for a wide range of work materials.
Newly designed insert for high feed milling.



General insert



Case of HJ insert

Pitch / Diameter	Number of inserts	
	Standard	Close
ø50	4	5
ø63	5	6
ø80	6	8
ø100	7	10
ø125	8	12
ø160	10	16

Clamping	Air hole	Adjusting
Screw	○	-
Wiper	**Shank type**	**Close pitch**
○	○	○

Variations of inserts	
General purpose	MJ / without
Low resistance	ML
For stainless steels	MS
High feed	HJ
For aluminium alloys	AJ/T-DIA (PCD) Inserts

Accuracy
M, G

Shoulder Milling

High productivity and high wall straightness

TUNGREC

9-58

Work materials

P Steel | M Stainless | K Cast Iron | N Non-ferrous | S Superalloys

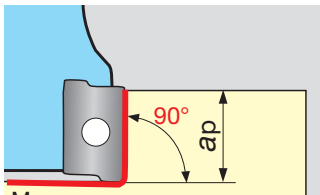
TPO07

EPO07

TPO18

EPO18

High speed, high efficiency mills featuring free cutting action, suitable for a wide range of work materials.



Max. *ap*:
T/EPO07 = 7 mm
T/EPO18 = 16.7 mm

TPO/EPO 07

Pitch / type / Diameter	Number of inserts		
	Coarse	Close	Long
ø12	-	2	2
ø16	2	4	2
ø18	-	4	2
ø20	3	5	3
ø22	-	5	3
ø25	3	7	3
ø28	-	7	3
ø32	8	-	-
ø40	10	-	-
ø50	12	-	-

Clamping	Air hole	Adjusting
Screw	○	-
Wiper	**Shank type**	**Close pitch**
-	○	○

Variations of inserts	
General purpose	MJ
For aluminium alloys	AJ
High feed	HJ (only TPO / EPO07)

Accuracy
M, G

TPO/EPO 18

Pitch / type / Diameter	Number of inserts		
	Coarse	Close	Long
ø25	2	-	2
ø28	2	-	2
ø30	2	3	2
ø32	2	3	2
ø35	2	3	2
ø40	3, 4	4	2
ø50	3, 5	5	-
ø63	6	-	-
ø80	7	-	-
ø100	8	-	-
ø125	9	-	-
ø160	10	-	-

High productivity and high wall straightness

TUNGREC

9-58

Work materials

P	M	K	N	S
Steel	Stainless	Cast Iron	Non-ferrous	Superalloys

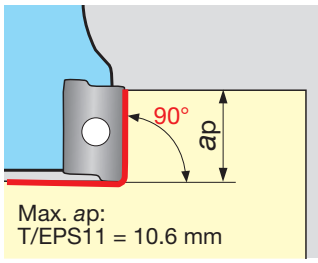
TPS11

EPS11

TLS11

ELS11

High speed, high efficiency mills featuring free cutting action, suitable for a wide range of work materials.



TPS/EPS11

Pitch / type / Diameter	Number of inserts				
	Cylindrical			Weldon	
	Coarse	Close	Long	Coarse	Close
ø12	1	-	1	1	-
ø16	2	-	2	2	-
ø18	2	-	2	-	-
ø20	2	3	2	-	3
ø21	-	3	2	-	-
ø25	3	4	2	-	4
ø26	-	4	2	-	-
ø32	3	5	2	-	5
ø33	-	5	2	-	-
ø40	-	6	-	-	-
ø50	-	7	-	-	-
ø63	-	8	-	-	-

TLS/ELS11

Diameter	Effective No. of edge lines	Number of inserts	Max. ap (mm)
ø25	2	6	30.4
ø32	3	12	39.4
ø40	3	12	40
ø50	4	20	48.8

Clamping	Air hole
Screw	○
Adjusting	**Wiper**
-	-
Shank type	**Close pitch**
○	○

Variations of inserts	
General purpose	MJ
For aluminium alloys	AJ / DLC coated
For stainless steels	MS

Accuracy
M, G

High productivity, high cost performance

DOREC

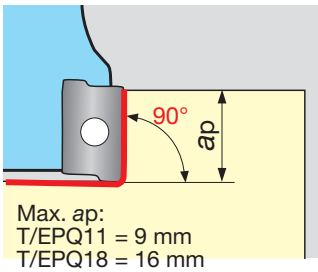
P Steel | M Stainless | K Cast Iron | S Superalloys

9-56

TPQ

EPQ

- Economical 4 cornered insert with high sharpness
- Tough cutting edges provide high productivity machining
- Unique edge design on insert reduces cutting forces



TPQ/EPQ

Pitch / type / Diameter	Number of inserts
	Coarse
ø40	5
ø50	3, 6
ø63	4, 7
ø80	5, 10
ø100	6, 12
ø125	8
ø160	9

Clamping	Air hole	Adjusting
Screw	○	-
Wiper	**Shank type**	**Close pitch**
-	○	-

Variations of inserts	
General purpose	MJ

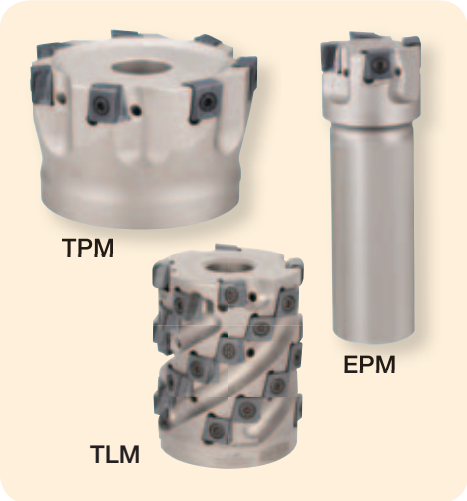
Accuracy
M

High productivity, high reliability

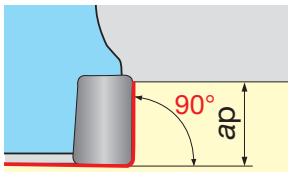
TECMILL

Work materials: P Steel, M Stainless, K Cast Iron, S Superalloys

9-67



- Tangential clamping cutter
- A combination of strength and stability



Max. *ap*:
T/EPM11 = 9.7 mm
TPM16 = 15.1 mm

TPM/EPM

Diameter \ Pitch	Number of inserts: Coarse	Number of inserts: Close
ø32	3	-
ø40	4	-
ø50	4, 5	-
ø63	6	-
ø80	5, 7	9
ø100	6, 8	11
ø125	7	-

TLM

Diameter	Effective No. of edge lines	Number of inserts	Max. *ap* (mm)
ø50	3	21	59
ø63	4	32	67.4

Clamping	Air hole	Adjusting
Screw	○	-
Wiper	**Shank type**	**Close pitch**
-	○	○

Variations of inserts	
General purpose	MJ

Accuracy
M

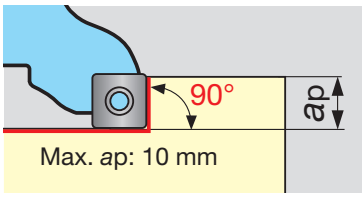
General priority on low cutting force

TUNGMILL

Work materials: P Steel, M Stainless, K Cast Iron, N Non-ferrous

9-72

- Uniquely designed cutting edge geometry ensures free cutting action
- Can suppress chatter in slotting
- Improved shoulder straightness



Max. *ap*: 10 mm

Diameter \ Pitch	Number of inserts: Standard	Number of inserts: Close
ø50	4	5
ø63	5	6
ø80	6	8
ø100	7	10
ø125	8	12

Clamping	Air hole	Adjusting
Screw	○	-
Wiper	**Shank type**	**Close pitch**
-	○	○

Variations of inserts	
General purpose	MJ
Low resistance	ML
For stainless steels	MS
For aluminium alloys	AJ / DLC coated

Accuracy
M, G

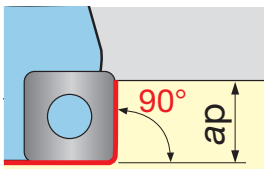
For small & medium machines

TUNGQUAD

9-70

Work materials: P Steel, M Stainless, K Cast Iron, N Non-ferrous

Highly efficient small diameter cutter.



Max. *ap*: 4.0 mm

TPD/EPD05

Diameter	Number of inserts
ø12	2
ø16	3
ø20	4
ø25	5
ø32	6
ø40	8

Clamping	Air hole	Adjusting
Screw	○	-
Wiper	**Shank type**	**Close pitch**
-	○	○

ELD05

Diameter	Effective No. of edge lines	Number of inserts	Max. *ap* (mm)
ø20	2	10	20.3
ø25	3	18	24.2

Variations of inserts	
General purpose	MJ
For aluminium alloys	AJ

Accuracy
M, H

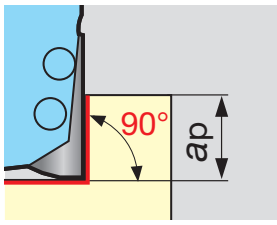
For small & medium machines

HYBRIDTACMILL

9-74

Work materials: P Steel, M Stainless, K Cast Iron, N Non-ferrous

Hybrid TAC Mill, EPH, generates low cutting forces for high productivity and highly accurate machining compared to solid endmills.



Max. *ap*: EPH11: 10 mm
EPH13: 12 mm
EPH18: 16 mm

EPH

Type / Diameter	Number of inserts Standard / long
ø10	2
ø12,13,14	2
ø16	2, 3
ø17,18,20,21	3
ø25, ø26	4

Clamping	Air hole	Helix angle
DD - FiT	-	15°

Variations of inserts	
General purpose	MJ
For aluminium alloys	AJ / DLC coated

Accuracy
G

High Feed Milling

DOFEED SERIES

High productivity, low cutting forces

9-92

Work materials: P Steel, M Stainless, K Cast Iron, S Superalloys, H Hard Materials

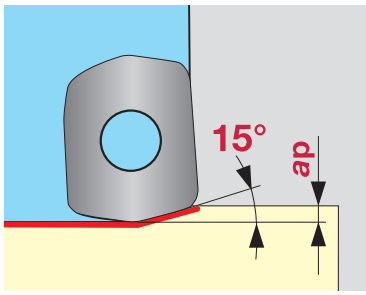
High feed milling cutters with high density insert pockets
Economical double sided insert with low cutting forces

EXN03

EXN06

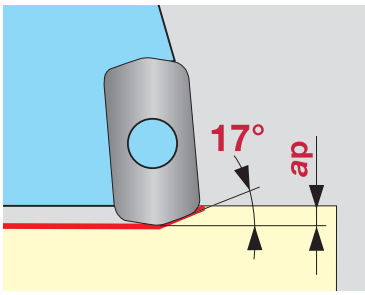
TXN06

TXN06 / EXN06



LNMU06 type: Max. *ap* = 1.5 mm

EXN03



LNMU03 type: Max. *ap* = 1.0 mm

EXN03 / EXN06

Diameter \ Pitch / type	Number of inserts	
	Standard	Long
ø16	2	2
ø18	2	2
ø20	4	3
ø22	4	3
ø25	5	4
ø28	5	4
ø30	5	4
ø32	2, 6	2, 5
ø35	2	2
ø40	3	3

TXN06

Diameter \ Pitch / type	Number of inserts
	Long
ø50	5
ø63	6
ø80	8

Clamping	Air hole	Adjusting
Screw	○	-
Wiper	**Shank type**	**Close pitch**
-	○	○

Variations of inserts	
General purpose	MJ
For low cutting force	ML

Accuracy
M

High productivity, high cost performance

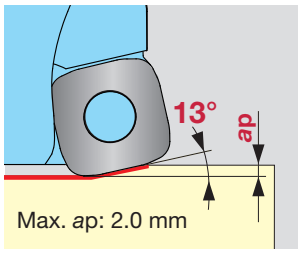
DOFEEDQUAD

Work materials: P Steel, M Stainless, K Cast Iron, S Superalloys, H Hard Materials

9-98

TXQ12

Super high feed milling cutter with high reliability. Applicable for a wide range of work materials. Double sided insert with 8 corners, provides high economical advantages.



Pitch / type / Diameter	Number of inserts Coarse
ø50	3
ø52	3
ø63	4
ø66	4
ø80	5
ø100	6
ø125	7

Clamping	Air hole	Adjusting
Screw	○	-
Wiper	**Shank type**	**Close pitch**
-	-	-

Variations of inserts	
General purpose	MJ

Accuracy
M

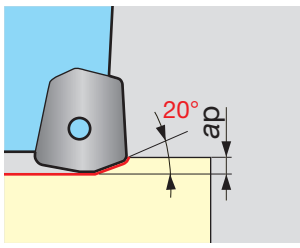
HYBRIDTACMILL

Work materials: P Steel, M Stainless, K Cast Iron, N Non-ferrous

9-100

EXH

"Hybrid TAC Mill" for super high feed milling.
Improved productivity in roughing.



Max. ap: EXH06 = 0.6 mm
EXH07 = 0.6 mm
EXH09 = 0.8 mm

Pitch / Diameter	Number of inserts Standard
ø10	2
ø12	2
ø16	2

Clamping	Air hole	Long shank
SS - FiT	○	○

Variations of inserts	
For high feed	MJ
For aluminium alloys	AJ / DLC coated

Accuracy
G

Die Engraving / Pocketing

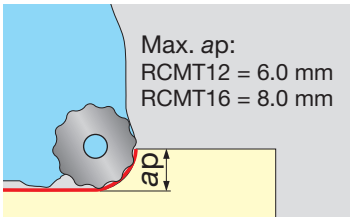
For long overhang applications

ROUNDSPLIT

Work materials: P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys

9-107

Milling without chatter can be achieved by overlapping the serrated cutting edges. Used for long overhang applications.



Diameter \ Pitch	Number of inserts		
	Coarse	Long	Extra Long
ø32	3	3	3
ø33	3	3	3
ø40	2, 4	2, 4	2, 4
ø50	3, 4, 5	3, 5	3, 5
ø52	4, 5	-	-
ø63	5, 6	-	-
ø80	6, 7	-	-
ø100	7	-	-
ø125	8	-	-

Clamping	Air hole
Screw	○
Wiper	**Adjusting**
-	-
Shank type	**Close pitch**
○	-

Accuracy
C

Variations of inserts	
General purpose, with serrated cutting edge	NMJ
General purpose, Round insert	MJ
For aluminium alloys, with serrated cutting edge	NAJ

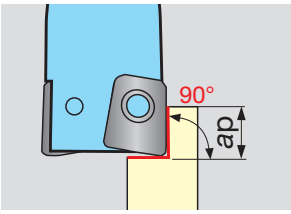
For small & medium machines

HYBRIDTACMILL

Work materials: P Steel, M Stainless, K Cast Iron, N Non-ferrous

9-78

Multi-functional "Hybrid TAC Mill" Can be applied to a variety of machining applications such as shoulder milling, slotting and hole making.



Max. ap: EVH06: 3 mm
EVH07: 3.5 mm
EVH09: 4.5 mm

Diameter \ Pitch	Number of inserts
	Standard
ø10	2
ø12	2
ø16	2

Clamping	Air hole	Long shank
SS - FiT	○	○

Variations of inserts	
General purpose	MJ
For aluminium alloys	AJ / DLC coated

Accuracy
G

Slot Milling

High reliability

TECSLOT

9-134

Work materials

P Steel | M Stainless | K Cast Iron | S Superalloys

ASN
Axial drive

TSN
Radial drive

Highly rigid cutter body and tough tangential insert offer incredibly secure slot milling.

ASN

Diameter \ Pitch/Width	Number of inserts		
	Lf 16 mm	Lf 19 mm	Lf 25 mm
ø100	5/10	5/10	-
ø125	6/12	6/12	5/10
ø160	7/14	7/14	6/12
ø200	8/16	8/16	7/14
ø250	-	9/18	8/16

TSN

Diameter \ Pitch/Width	Number of inserts		
	Lf 16 mm	Lf 19 mm	Lf 25 mm
ø100	5/10	5/10	-
ø125	6/12	6/12	5/10
ø160	7/14	7/14	6/12
ø200	8/16	8/16	7/14
ø250	-	9/18	8/16

Clamping	Air hole
Screw	-
Wiper	**Adjusting**
-	-
Shank type	**Close pitch**
-	-

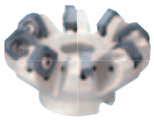
Accuracy
E

Variations of inserts	
General purpose	MJ

TAC Mill Overview

Bore types

Face Milling

Application	Series and type	Applicable inserts	Cutting edge angle / Max.depth of cut / Applications	Tool diameter (mm) / Number of inserts (Small → Large)	Page
High productivity face milling of various work materials	DOPENT TENGALOY **TEN09**	PNCU0905GN** Wiper insert	70° 6.4 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	50 (4,6) 63 (6,8) 80 (7,10) 100 (8,12) 125 (10,16) 160 (12,20); Face Milling	9-40
High productivity face milling of cast iron	DOOCTO DOQUAD TENGALOY **TAN07** 	ONMU0705** ONHU0705** SNMU1706** SNHU1706** Wiper insert	45° 4.7 mm 7.5 mm; K Cast Iron, P Steel	63 (5,6 8) 80 (6,8 10) 100 (7,10 14) 125 (8,12 18) 160 (10,15 22) 200 (12,18 28); Face Milling	9-42
Low cutting force and high productivity milling of various work materials	TUNGMILL TENGALOY **TAW13**	SWMT13T3** SWMW13T3** SWGT13T3** Wiper insert WWCW13T3**	45° 5 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	50 (4,5) 63 (5,6) 80 (6,8) 100 (7,10) 125 (8,12) 160 (10,16); Face Milling, Chamfering	9-44
General purpose face milling of various work materials	Lightning Mill **TME4400I/B** TME4400I TME4400B	SECN1203** SEEN1203** SEKN1203** SEKR1203**	45° 4 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	63 (5) 80 (4,6) 100 (5,7) 125 (6,9) 160 (8,12); Face Milling, Chamfering	9-48
Heavy duty face milling at large depth of cut for various work materials	Heavy duty TAC Mill **TMD5400IRE**	SDCN53Z** SDEN53Z** SDKR53Z**	45° 6 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	100 (4) 125 (6) 160 (6) 200 (8) 250 (10) 315 (12); Face Milling, Chamfering	9-50
High feed face milling and case milling of cast irons (Close pitch type)	TAC Mill **TGP4100RBAE**	SPCN42S** SPEN423** SPEN42S** SPKN42S** SPKR42S** SPGN1203** Wiper insert WPAN42S**	75° 7 mm; K Cast Iron, P Steel, M Stainless	100 (8) 125 (10) 160 (12); Face Milling	9-51
Face milling of cast irons	TAC Mill (Double sided, negative inserts are used) **TGN4200-AE**	SNCN43Z** SNKN43Z** SNKF43Z** SNMN1204**	65° 6 mm; K Cast Iron, P Steel	80 (5) 100 (6) 125 (8) 160 (10); Face Milling	9-53
Milling of difficult to cut materials such as Superalloys and hard materials	TAC radius mill **TRF6000**	RFEN2004**	R 10 mm; S Superalloys, M Stainless, H Hard Materials	80 (4) 100 (5) 125 (6) 160 (8); Face Milling, Radius Milling	9-112

Shoulder Milling

Application	Series and type	Applicable inserts	Cutting edge angle / Max.depth of cut / Applications	Small — Tool diameter (mm) / Number of inserts — Large (30 40 50 60 70 80 100 120 160 180 200 250 300)	Page
High productivity shoulder milling	DOREC TUNGALOY **TPQ11** **TPQ18**	LQMU1107** LQMU1808**	90° 9 mm 16 mm; P Steel, M Stainless, K Cast Iron, S Superalloys	40 50 63 80 100 125 160; 4 3,6 4,7 5,10 6,12 8 9; Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling	9-56
High productivity shoulder milling	TUNGREC TUNGALOY **TPO07**	AOMT0702** AOGT0702**	90° 7 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys	32 40 50; 8 10 12; Face Milling, Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-58
Precision square shoulder and general purpose milling	TUNGREC TUNGALOY **TPS11**	ASMT11T3** ASGT11T3**	90° 10.6 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	40 50 63; 6 7 8; Face Milling, Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-60
High productivity shoulder milling	TUNGREC TUNGALOY **TPO18**	AOMT1805** AOGT1805**	90° 16.7 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys	40 50 63 80 100 125 160; 4 5 6 7 8 9 10; Face Milling, Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-63
High productivity shoulder milling	TECMILL TUNGALOY **TPM11** **TPM16**	LMMU1107** LMMU1607**	90° 9.7 mm 15.1 mm; P Steel, M Stainless, K Cast Iron, S Superalloys	50 63 80 100 125; 5 6 5,7 6,8 7; 9 11; Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling	9-67
Highly efficient shoulder milling	TUNGQUAD TUNGALOY **TPD05**	SDMT0502** SDHT0502**	90° 4 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	32 40; 6 8; Face Milling, Shoulder Milling, Slotting	9-70
Low cutting force and high productivity milling of various work materials	TUNGMILL TUNGALOY **TPW13**	SWMT1304** SWGT1304**	90° 10 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	50 63 80 100 125; 4,5 5,6 6,8 7,10 8,12; Face Milling, Shoulder Milling	9-72
Roughing milling	TUNGREC TUNGALOY **TLS11**	ASMT11T3..., ASGT11T3...	90° 48.8 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys	25 40; 2/6 3/12; 32 3/12; 50 4/20; Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling	9-61

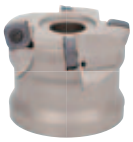
TAC Mill Overview

Bore types

Shoulder Milling

Application	Series and type	Applicable inserts	Cutting edge angle / Max.depth of cut / Applications	Small — Tool diameter (mm) / Number of inserts — Large (30 40 50 60 70 80 100 120 160 180 200 250 300)	Page
Roughing milling	TECMILL TUNGALOY **TLM11**	LMMU1107**	90° / 59, 67.4 mm / P Steel, M Stainless, K Cast Iron, S Superalloys	50 (3/21), 63 (4/32) / Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling	9-68
Heavy duty square shoulder milling of various work materials	Heavy duty TAC Mill **TPP16RIE**	SPMR1605**	90° / 12 mm / P Steel, K Cast Iron, M Stainless	80 (4), 100 (5), 125 (6), 160 (8), 200 (10), 250 (12), 315 (14) / Face Milling, Face Milling, Shoulder Milling	9-82
Square shoulder milling of various work materials (Low cutting force)	TAC Mill **TSE4000IA**	TECN43Z** TEEN43Z** TEKR2204**	90° / 10 mm / P Steel, M Stainless, K Cast Iron, N Non-ferrous	80 (4), 100 (6), 125 (6), 160 (8) / Face Milling, Shoulder Milling	9-86

High Feed Milling

Application	Series and type	Applicable inserts	Corner R / Max.depth of cut / Applications	Small — Tool diameter (mm) / Number of inserts — Large (40 50 52 55 60 65 70 80 100 125 150 200)	Page
For high speed milling of steels, stainless steels, cast irons and titanium alloys	DOFEED TUNGALOY **TXN03 TXN06**	LNMU06X 5ZER-M*	17° / 1.5 mm / P Steel, M Stainless, K Cast Iron, S Superalloys, H Hard Materials	40 (6), 50 (5), 52 (5), 63 (6), 80 (8) / Shoulder Milling, Slotting, Pocketing, Ramping, Plunging, Enlarging Hole	9-92
For high speed milling of steels, stainless steels, cast irons and titanium alloys	DOFEEDQUAD TUNGALOY **TXQ12** 	SQMU1206 ZSR-MJ	13° / 2 mm / P Steel, M Stainless, K Cast Iron, S Superalloys, H Hard Materials	50 (3), 52 (3), 63 (4), 66 (4), 80 (5), 100 (6), 125 (7) / Face Milling	9-98
Super high feed and three-dimensional milling	MILLFEED TUNGALOY **TXP05 TXP06 TXP08 TXP09**	WPMW06X4** WPMT06X4** WPMT0806** WPMT0907**	20°, 10° / 1.5, 3 mm / P Steel, M Stainless, K Cast Iron, H Hard Materials	50 (3), 52 (3), 63 (3,4 5,6), 66 (4), 80 (4,5 6,7), 100 (5,6), 125 (6,7) / Face Milling, Pocketing, Ramping, Enlarging Hole	9-102

Radial Milling

Application	Series and type	Applicable inserts	Corner R Max.depth of cut Applications	Small — Tool diameter (mm) Number of inserts — Large 30 45 40 50 55 60 70 80 90 100 125 130	Page
Die engraving of various work materials	ROUNDSPLIT **TRC12** **TRC16** 	RCMT1204** RCMT1606**	R 6, 8 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys	40: 4 50: 4,5 52: 4,5 63: 5,6 66: 5,6 80: 6,7 100: 7 125: 8 Face Milling, Radius Milling, Slotting, Pocketing, Ramping, Profiling, Enlarging Hole	9-107
Die engraving	TAC Flash radius mill **TRD12** **TRD16** 	RDMT1204** RDMT1604** RDMW1204** RDMW1606**	R 6, 8 mm P Steel, M Stainless, K Cast Iron, H Hard Materials	50: 4 52: 4 63: 4,5 66: 4,5 80: 4,5 100: 5 Face Milling, Radius Milling, Slotting, Pocketing, Ramping, Profiling, Enlarging Hole	9-110

Milling Cutters for Super Finishing

Application	Series and type	Applicable inserts	Max.depth of cut Applications	Small — Tool diameter (mm) Number of inserts — Large 50 60 70 80 100 120 140 160 180 200 250	Page
High precision finishing of steels and cast irons	Super finishing TAC Mill **SFP4000** 	SPHA435FNW	0.2 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous	100: 2 125: 2 160: 4 Face Milling, Face Milling	9-130

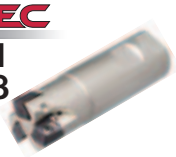
TAC Mill Overview

Shank types

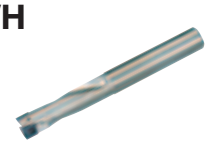
Face Milling

Application	Series and type	Applicable inserts	Cutting edge angle / Max.depth of cut / Applications	Small — Tool diameter (mm) / Number of inserts — Large (25 30 40 50 60 80 100)	Page
Highly productive face milling of various work materials	DOPENT TUNGALOY EEN09	PNCU0905GN** Wiper insert	70° 6.4 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	32 (3), 40 (4), 50 (4), 63 (6), 80 (7); Face Milling	9-40

Shoulder Milling

Application	Series and type	Applicable inserts	Cutting edge angle / Max.depth of cut / Applications	Small — Tool diameter (mm) / Number of inserts — Large (10 16 17 19 20 23 25 30 35 40 60 80)	Page
High productivity shoulder milling	DOREC TUNGALOY EPQ11 EPQ18 	LQMU1107** LQMU1808**	90° 9 mm 16 mm; P Steel, M Stainless, K Cast Iron, S Superalloys	25 (2), 32 (3), 40 (3,4), 50 (4,5), 63 (6), 80 (7); Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling	9-56
High productivity shoulder milling	TUNGREC TUNGALOY EPO07	AOMT0702** AOGT0702**	90° 7 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys	12 (2), 16 (2,4), 18 (2,4), 20 (3,5), 22 (3,5), 25 (3,7), 28 (3,7); Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-58
General purpose multi-function cutter for high precision square shoulder milling	TUNGREC TUNGALOY EPS11	ASMT11T3** ASGT11T3**	90° 10.6 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	12 (1), 16 (2), 18 (2), 20 (2,3), 21 (2,3), 25 (2,3 4), 26 (2,3 4), 30 (2,3 4), 32 (2,3 5), 33 (2,3 5), 40 (2,3 4,6), 50 (3,5 7); Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-60
Highly productive shoulder milling	TUNGREC TUNGALOY EPO18	AOMT1805** AOGT1805**	90° 16.7 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys	25 (2), 28 (2), 30 (2,3), 32 (2,3), 35 (2,3), 40 (2,3 4), 50 (3,5), 63 (3,4 6); Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-62
High productivity shoulder milling	TAC Mill TECMILL TUNGALOY EPM11	LMMU1107**	90° 9.7 mm; P Steel, M Stainless, K Cast Iron, S Superalloys	32 (3), 40 (4), 50 (4); Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling	9-67
Highly efficient roughing milling	TUNGQUAD TUNGALOY EPD05	SDMT0502** SDHT0502**	90° 4 mm; P Steel, M Stainless, K Cast Iron, N Non-ferrous	12 (2), 16 (3), 20 (4), 25 (5), 32 (6), 40 (8); Face Milling, Shoulder Milling, Slotting	9-70

Shoulder Milling

Application	Series and type	Applicable inserts	Cutting edge angle / Max.depth of cut / Applications	Tool diameter (mm) / Number of inserts (Small → Large)	Page
Small diameter multi-functional cutter for high precision milling	HYBRIDTACMILL **EPH11** **EPH13** **EPH18** 	XHGR1102** XHGR1302** XHGR18T2**	90° 10, 12, 16 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous	10 (2), 14 (2), 12 (2), 16 (2,3), 13 (2), 17 (3), 18 (3), 20 (3), 21 (3), 25 (4), 26 (4) Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-74
Small diameter, multi-functional type	HYBRIDTACMILL **EVH** 	Central insert XVGT06H2**C-** XVGT07X3**C-** XVGT09X4**C-** Peripheral insert XVGT06H2**P-** XVGT07X3**P-** XVGT09T4**P-**	90° 3, 3.5, 4.5 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous	10 (2), 16 (2), 12 (2) Shoulder Milling, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole, Drilling	9-78
Roughing milling	TUNGREC **ELS11** 	ASMT11T3** ASGT11T3**	90° ~ 40 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys	25 (2/6), 32 (3/12), 40 (3/12) Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling	9-61
Roughing milling	TUNGQUAD **ELD05** 	SDMT0502** SDHT0502**	90° 20.3 mm 24.2 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous	20 (2/10), 25 (3/18) Shoulder Milling, Slotting	9-70
Multi-functional milling of steels and cast irons	TAC Flash Mill with center cutting edge **EVX** 	XXMU08T2** XXMU10H3** XXMU12X4** XXMU16X5**	90° ~ 15 mm P Steel, M Stainless, K Cast Iron	16 (2), 20 (2), 25 (2), 32 (2) Shoulder Milling, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole, Drilling	9-100
Multi-functional milling of various work materials	TAC Flash Endmill **ESD10** 	GDMT10H3** GDGT10H3**	90° 9, 15 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous	20 (1), 25 (2), 32 (2) Shoulder Milling, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-116
General purpose, multi-functional type for precision square shoulder milling	Top-Feed Mill AD **EPS17** 	ASMT1705** ASGT1705**	90° P Steel, M Stainless, K Cast Iron, N Non-ferrous	25 (2), 32 (2,3), 40 (2,3 4), 50 (3,5), 63 (3,4 6), 26 (2), 30 (2,3), 33 (2,3) Shoulder Milling, Radius Milling, Slotting, Slotting, Side Milling, Pocketing, Ramping, Plunging, Enlarging Hole	9-88
Heavy duty rough milling of steels and cast irons	TAC roughing Endmill **ELP-A** 	APMT0703** APMT09T3** APMT1204** ADMT1203** ADMT17T3** ADMT2104**	90° ~ 44 mm P Steel, M Stainless, K Cast Iron	25 (2), 32 (2), 40 (2) Deep Shoulder Milling, Slotting, Side Milling	9-121

Small → Large

Tool diameter (mm): 10 16 17 19 20 23 25 30 35 40 60 80

TAC Mill Overview

Shank types

High Feed Milling

Application	Series and type	Applicable inserts	Cutting edge angle / Max.depth of cut / Applications	Tool diameter (mm) / Number of inserts (Small → Large)	Page
Multi-functional cutter for super high feed milling	DOFEED SERIES **EXN03** **EXN06** 	LNMU0303**** LNMU06X5****	17° 1 mm P Steel, M Stainless, K Cast Iron, S Hard Materials, H Superalloys	10 15 20 25 30 35 40 50 60 63 80 16: 2; 20: 3,4; 25: 4,5; 30: 4,5; 18: 2; 22: 3,4; 28: 4,5; 32: 2,5,6 Face Milling, Slotting, Pocketing, Ramping, Plunging, Enlarging Hole	9-92
Small-diameter, multi-functional type for super high feed milling	HYBRIDTACMILL **EXH** 	Central insert XXGT06H2**C-** XXGT07X3**C-** XXGT09X4**C-** Peripheral insert XXGT06H2**P-** XXGT07X3**P-** XXGT09X4**P-**	20° 0.6, 0.8 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous	10: 2; 16: 2; 12: 2 Face Milling, Slotting, Pocketing, Ramping, Plunging, Enlarging Hole, Drilling	9-100
For super high feed, three-dimensional machining	MILLFEED **EXP** 	WPMW05H3** WPMT05H3** WPMW06X4** WPMT06X4** WPMT0806** WPMT0907**	20°, 10° 1.5, 3 mm P Steel, M Stainless, K Cast Iron, H Hard Materials	20: 2; 25: 2; 26: 2; 21: 2; 32: 2,3; 33: 2,3; 40: 2,3; 50: 2,3 4 Face Milling, Pocketing, Ramping, Enlarging Hole	9-102

Radial Milling

Application	Series and type	Applicable inserts	Cutting edge angle / Max.depth of cut / Applications	Tool diameter (mm) / Number of inserts (Small → Large)	Page
Die engraving of various work materials	ROUNDSPLIT **ERC12** **ERC16** 	RCMT1204** RCMT1606**	R 6, 8 mm P Steel, M Stainless, K Cast Iron, N Non-ferrous, S Superalloys	10 12 16 18 20 25 30 35 40 50 63 32: 3; 33: 3; 40: 2,4; 50: 3,5 Face Milling, Radius Milling, Slotting, Pocketing, Ramping, Profiling, Enlarging Hole	9-107
Three-dimensional machining and die engraving	Small diameter, TAC Flash radius mill **HWD** 	RDMW0501M0 RDMW0702M0 RDMW1003M0	R ~ 5 mm P Steel, K Cast Iron, H Hard Materials	10: 2; 12: 3; 15: 3,4; 20: 2,4 5; 25: 3,5 6 Face Milling, Radius Milling, Slotting, Pocketing, Ramping, Profiling, Enlarging Hole	9-126
For difficult to cut materials such as super alloys and hard materials	TAC radius mill **ERF6000** 	RFEN2004**	R 10 mm S Superalloys, M Stainless, H Hard Materials	50: 3; 63: 4 Face Milling, Radius Milling	9-112

Ball Endmills

Application	Series and type	Applicable inserts	Corner R Max.depth of cut Applications	Small — Tool diameter (mm) Number of inserts — Large (10 15 20 25 30 35 40 45 50)	Page
Finishing to medium finishing of steels and cast irons	TAC ball Endmill **TBN1000**	ZNCA1002** ZNCA1203** ZNCA1603** ZNCA2004** ZNCA2505** ZNCA3005** ZNMM2004** ZNMM2505** ZNMM3005**	R ~ 15 mm; K Cast Iron, P Steel	10 (1), 12 (1), 16 (1), 20 (1), 25 (1), 30 (1); Pocketing, Ramping, Profiling	9-120
Die engraving and medium finishing of steels and cast irons	TAC Flash ball Endmill **EBP**	Radius edge inserts ZPET2004-MJ ZPET2505-MJ ZPET3006-MJ Peripheral inserts DCMW070204TN DCMW11T304TN	R ~ 15 mm; P Steel, H Hard Materials, K Cast Iron	20 (2), 25 (2), 30 (2); Radius Milling, Pocketing, Ramping, Profiling	9-118
Rough engraving of steel and cast iron dies	TAC Flash ball Endmill (Large diameter type) **EBD**	Radius edge inserts ZDMT4005-MJ ZDMT5006-MJ Peripheral inserts SCMT09T308-23 SCMT120408-23	R ~ 25 mm; P Steel, H Hard Materials, K Cast Iron	40 (4+3), 50 (4+3); Radius Milling, Pocketing, Ramping, Profiling	9-119

Special Purpose TAC Mills

Application	Series and type	Applicable inserts	Cutting edge angle Max.depth of cut Applications	Small — Tool diameter (mm) Number of inserts — Large (10 15 20 25 30 35 40 50 55 60 80 150 200 250)	Page
Chamfering	TAC Flash chamfering mill **ECC31**	XCET310404ER	45° Chamfering, P Steel, M Stainless, K Cast Iron; 30° Chamfering, P Steel, M Stainless, K Cast Iron; 60° Chamfering, P Steel, M Stainless, K Cast Iron	30° 5 ~ 52 (Effective diameter) 1 (No. of inserts); 45° 5 ~ 42 (Effective diameter) 2 (No. of inserts); 60° 5 ~ 33 (Effective diameter) 2 (No. of inserts); Cham-fering, Cham-fering	9-127
Counter boring	TAC counter boring cutter **TCB**	SPMP831DS SPMP042ERD SPMM322ERD SPMM432ERD	90°; P Steel, M Stainless, K Cast Iron	14 (1), 17.5 (2), 20 (2), 23 (2), 26 (2), 29 (2), 32 (2), 35 (2), 39 (2), 43 (2); Cham-fering	9-129
Slotting	TECSLOT **ASN**	LMEU1008** ZNEN-MJ LMEU1208** ZNEN-MJ LMEU1509** ZNEN-MJ	90°; P Steel, M Stainless, K Cast Iron, S Superalloys	100 (5/10 6/12), 125 (5/10 6/12), 160 (6/12 7/14), 200 (7/14 8/16), 250 (8/16 9/18); Slotting	9-134
Slotting	TECSLOT **TSN**	LMEU1008** ZNEN-MJ LMEU1208** ZNEN-MJ LMEU1509** ZNEN-MJ	90°; P Steel, M Stainless, K Cast Iron, S Superalloys	100 (5/10 6/12), 125 (5/10 6/12), 160 (6/12 7/14), 200 (7/14 8/16), 250 (8/16 9/18); Slotting	9-134
Parting off and slotting	TAC side cutter **SVN4000**	SNEN12T2** SNEN1233**	90°; P Steel, K Cast Iron, N Non-ferrous	100 (2,5), 125 (3,6), 160 (4,8), 200 (5,10); Slotting	9-137

DOPENT

Diameter ø32 ~ 160 mm | 70° 6.4mm | Air Hole | P Steel | M Stainless | K Cast Iron | N Non-ferrous

Face Milling

Highly productive face milling of various work materials

TEN09

EEN09

Rake angle: A.R. −6° R.R. −2° ~ −10°

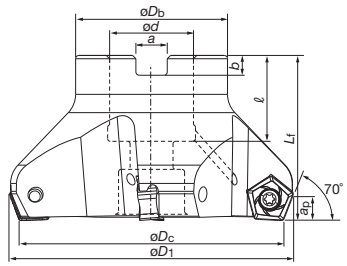


Fig. A

Max. ap: 6.4 mm

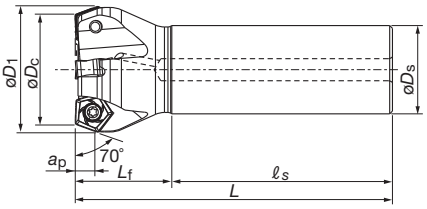


Fig. B

TEN09 (Fig. A: bore type)

Pitch	Cat. No.	Stock	No. of Inserts	Dimensions (mm) ØDc	ØD1	ØDb	Ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Center bolt	Mounting details
Close	TEN09R050M22.0E04	●	4	50	56	41	22	20	40	6.3	10.4	0.3	with	CM10x30H	9-138Ⓐ
	TEN09R063M22.0E06	●	6	63	69	41	22	20	40	6.3	10.4	0.5	with	CM10x30H	
	TEN09R080M27.0E07	●	7	80	86	50	27	22	50	7	12.4	0.9	with	CM12x30H	
	TEN09R100M32.0E08	●	8	100	106	60	32	28.5	50	8	14.4	1.3	with	TMBA-M16H	9-138Ⓑ
	*TEN09R125M40.0E10	●	10	125	131	71	40	32	63	9	16.4	2.3	with	TMBA-M20H	
	*TEN09R160M40.0E12	●	12	160	166	100	40	29	63	9	16.4	4.0	without	-	9-138Ⓒ
Extra close	TEN09R050M22.0E06	●	6	50	56	41	22	20	40	6.3	10.4	0.3	with	CM10x30H	9-138Ⓐ
	TEN09R063M22.0E08	●	8	63	69	41	22	20	40	6.3	10.4	0.5	with	CM10x30H	
	TEN09R080M27.0E10	●	10	80	86	50	27	22	50	7	12.4	1.0	with	CM12x30H	
	TEN09R100M32.0E12	●	12	100	106	60	32	28.5	50	8	14.4	1.4	with	TMBA-M16H	9-138Ⓑ
	TEN09R125M40.0E16	●	16	125	131	71	40	32	63	9	16.4	2.5	with	TMBA-M20H	
	TEN09R160M40.0E20	●	20	160	166	100	40	29	63	9	16.4	4.3	without	-	9-138Ⓒ

* Cat. No. of torx bit is different from other items. (Please see the above table 1)

EEN09 (Fig. B: shank type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) ØDc	ØD1	ØDs	ℓs	Lf	L	Weight (kg)	Air hole	Parts: Clamping screw	Parts: Wrench (Substitution)
EEN09R032M32.0-03	●	3	32	38	32	80	35	115	0.7	with	CSTR-4L100	T-15DB (T-15D)
EEN09R040M32.0-04	●	4	40	46	32	80	35	115	0.7	with		
EEN09R050M32.0-04	●	4	50	56	32	80	40	120	0.9	with		
EEN09R063M32.0-06	●	6	63	69	32	80	40	120	1.0	with		
EEN09R080M32.0-07	●	7	80	86	32	80	40	120	1.3	with		

Inserts

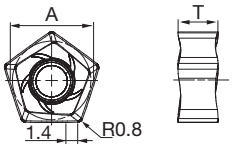


Fig. 1 **MJ** (General)

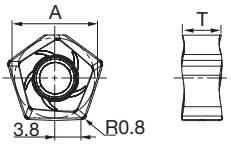


Fig. 2 **W** (Wiper)

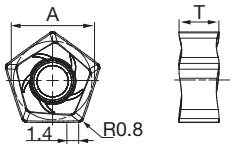


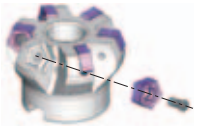
Fig. 3 **AJ** (For Aluminium)

Cat. No.	Accuracy	Honing	Stock: Coated grades AH725	AH120	AH140	T3130	T1115	Cermet NS740	Carbide TH10	Dimensions (mm) A	T	Shape
PNCU0905GNER-MJ	C	with	●	●	●	●	●	●		12.2	5.9	Fig. 1
PNCU0905GNER-W	C	with	●							12.2	5.9	Fig. 2
PNCU0905GNFR-AJ	C	without							●	12.2	6.3	Fig. 3

● : Stocked items.

Relating pages | Technical Reference (15−1)

Bore Type Components



Description		Replacement Parts Cat. No.	
Applicable cutter		TEN09R...	*TEN09R...
Clamping screw		CSTR-4L100	
Wrench	Torx bit	BT15S	BT15M
	Grip	H-TBS	
Mono block type substitution wrench		T-15D	

Standard cutting conditions

Work materials	Hardness HB	Selection criteria	Recommended grade	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Low carbon steels (C15E etc.)	~ 200	First choice	**AH725**	100 - 250	0.1 - 0.6
		Priority on impact resistance	**AH140**	80 - 180	
		Priority on wear resistance	**T3130**	120 - 250	
		Priority on surface quality	**NS740**	100 - 250	0.1 - 0.5
High carbon steels (C45, C55 etc.)	200 ~ 300	First choice	**AH725**	100 - 230	0.1 - 0.5
		Priority on impact resistance	**AH140**	80 - 180	
		Priority on wear resistance	**T3130**	120 - 250	
		Priority on surface quality	**NS740**	100 - 250	0.1 - 0.4
Alloyed steels (42CrMo4, 17Cr3 etc.)	150 ~ 300	First choice	**AH725**	100 - 230	0.1 - 0.5
		Priority on impact resistance	**AH140**	80 - 150	
		Priority on wear resistance	**T3130**	120 - 250	
		Priority on surface quality	**NS740**	100 - 250	0.1 - 0.4
Tool steels (X155CrVMo12 1 etc.)	~ 300	First choice	**AH725**	100 - 180	0.1 - 0.5
		Priority on impact resistance	**AH140**	80 - 120	
		Priority on wear resistance	**T3130**	100 - 180	
Stainless steels (X5CrNi18-9 etc.)	-	First choice	**AH140**	90 - 180	0.1 - 0.45
Grey cast irons	-	First choice	**AH120**	140 - 250	0.1 - 0.6
		Priority on wear resistance	**T1115**	150 - 280	
Ductile cast irons	-	First choice	**AH120**	100 - 200	0.1 - 0.6
		Priority on wear resistance	**T1115**	120 - 220	
Aluminium alloys (Si < 13%)	-	First choice	**TH10**	500 - 1500	0.1 - 0.5
Aluminium alloys (Si ≥ 13%)					

Notes:
· Remove excessive chip accumulation with an air blast.
· When chips stick to the cutting edges (aluminium machining), use a water soluble coolant.
· When cutting an interrupted surface or a casting skin, the feed (*fz*) should be reduced below the 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.

Installation of the extra close pitch cutter inserts

- The extra close pitch cutter has a slanted screw.
- Locate insert and then fasten the screw. (Fig. A)
- Appropriate torque is 3.5 N·m.
- After fastening the screw, please ensure there is no space between the cutter body and insert. (Fig. B)

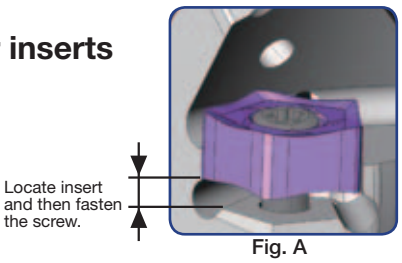


Fig. A

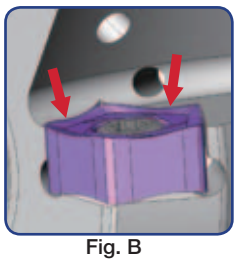


Fig. B

Notes on use of wiper insert

- To achieve a good surface finish, a wiper insert is recommended. (PNCU0905GNER-W)
- When using the wiper insert, install the insert as shown in Fig. C. Ensure that the groove is at the front as shown in Fig. D.
- The wiper insert has two wiping corners. (Fig. D)
- Do not use the other corners. It may break the tool body.

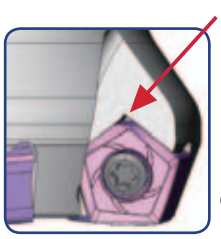


Fig. C

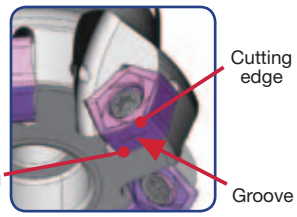


Fig. D

DOOCTO DOQUAD

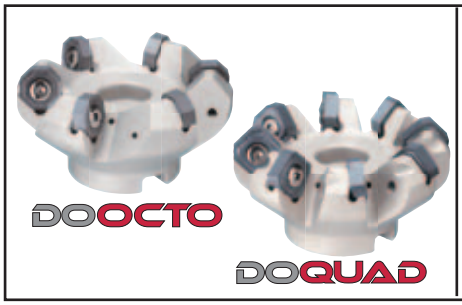
Diameter ø63 ~ 315 mm

45° 4.7 mm 7.5 mm

P Steel K Cast Iron

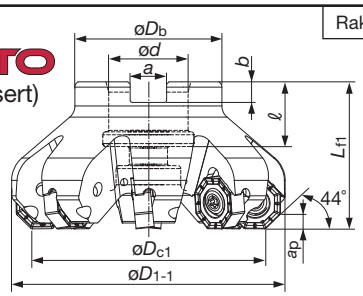
Face Milling

Screw on type



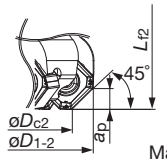
Rake angle: A.R. −6° R.R. +15.5°

DOOCTO (Octagonal insert)



Max. ap: 4.7 mm

DOQUAD (Square insert)



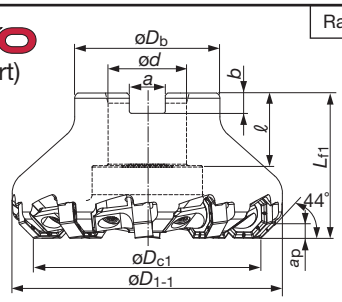
Max. ap: 7.5 mm

Pitch	Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc1	øDc2	øD1-1	øD1-2	øDb	ød	ℓ	Lf1	Lf2	b	a	Weight (kg)	Air hole	Center bolt	Mounting details
Coarse	TAN07R063M22.0E05	●	5	63	60.3	76	76.3	41	22	20	40	41.4	6.3	10.4	0.5	with	CM10x30H	9-138Ⓐ
Coarse	TAN07R080M27.0E06	●	6	80	77.3	93	93.3	50	27	22	50	51.4	7	12.4	1.0	with	CM12x30H	9-138Ⓐ
Coarse	TAN07R100M32.0E07	●	7	100	97.3	113	113.3	60	32	28.5	50	51.4	8	14.4	1.5	with	TMBA-M16H	9-138Ⓑ
Coarse	TAN07R125M40.0E08	●	8	125	122.3	138	138.3	71	40	29	63	64.4	9	16.4	2.5	with	TMBA-M20H	9-138Ⓑ
Coarse	TAN07R160M40.0E10	●	10	160	157.3	173	173.3	100	40	29	63	64.4	9	16.4	4.0	without	-	9-138Ⓒ
Coarse	TAN07R200M60.0E12	●	12	200	197.3	213	213.3	135	60	39	63	64.4	14	25.7	6.5	without	-	9-138Ⓒ
Coarse	NEW TAN07R250M60.0E15	★	15	250	247.3	263	263.3	130	60	39	63	64.4	14	25.7	9.0	without	-	9-138Ⓒ
Coarse	NEW TAN07R315M60.0E18	★	18	315	312.3	328	328.3	220	60	39	80	81.4	14	25.7	18.0	without	-	9-138Ⓒ
Close	TAN07R063M22.0E06	●	6	63	60.3	76	76.3	41	22	20	40	41.4	6.3	10.4	0.5	with	CM10x30H	9-138Ⓐ
Close	TAN07R080M27.0E08	●	8	80	77.3	93	93.3	50	27	22	50	51.4	7	12.4	1.0	with	CM12x30H	9-138Ⓐ
Close	TAN07R100M32.0E10	●	10	100	97.3	113	113.3	60	32	28.5	50	51.4	8	14.4	1.5	with	TMBA-M16H	9-138Ⓑ
Close	TAN07R125M40.0E12	●	12	125	122.3	138	138.3	71	40	29	63	64.4	9	16.4	2.5	with	TMBA-M20H	9-138Ⓑ
Close	TAN07R160M40.0E15	●	15	160	157.3	173	173.3	100	40	29	63	64.4	9	16.4	4.0	without	-	9-138Ⓒ
Close	TAN07R200M60.0E18	●	18	200	197.3	213	213.3	135	60	39	63	64.4	14	25.7	6.5	without	-	9-138Ⓒ
Close	NEW TAN07R250M60.0E21	★	21	250	247.3	263	263.3	130	60	39	63	64.4	14	25.7	9.0	without	-	9-138Ⓒ
Close	NEW TAN07R315M60.0E24	★	24	315	312.3	328	328.3	220	60	39	80	81.4	14	25.7	18.0	without	-	9-138Ⓒ

Wedge type

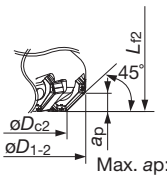
Rake angle: A.R. −6° R.R. +15.5°

DOOCTO (Octagonal insert)



Max. ap: 4.7 mm

DOQUAD (Square insert)



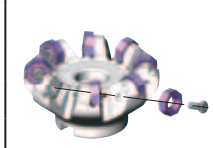
Max. ap: 7.5 mm

Pitch	Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc1	øDc2	øD1c1-	øD2c1-	øDb	ød	ℓ	Lf1	Lf2	b	a	Weight (kg)	Air hole	Mounting details
Extra close	TAN07R063M22.0E08W	●	8	63	60.3	76	76.3	41	22	20	40	41.4	6.3	10.4	0.6	without	9-138Ⓑ
Extra close	TAN07R080M27.0E10W	●	10	80	77.3	93	93.3	50	27	25	50	51.4	7	12.4	1.1	without	9-138Ⓑ
Extra close	TAN07R100M32.0E14W	●	14	100	97.3	113	113.3	60	32	28.5	50	51.4	8	14.4	1.6	without	9-138Ⓑ
Extra close	TAN07R125M40.0E18W	●	18	125	122.3	138	138.3	71	40	29	63	64.4	9	16.4	2.5	without	9-138Ⓑ
Extra close	TAN07R160M40.0E22W	●	22	160	157.3	173	173.3	100	40	29	63	64.4	9	16.4	3.6	without	9-138Ⓒ
Extra close	TAN07R200M60.0E28W	●	28	200	197.3	213	213.3	135	60	39	63	64.4	14	25.7	5.8	without	9-138Ⓒ

● : Stocked items.

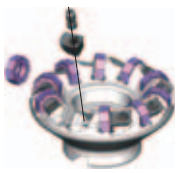
Replacement parts

Screw on type



	Description	Cat. No.	
	Applicable cutter	TAN07R...	*TAN07R...
	Clamping screw	CSPE-5L150	
Wrench	Torx bit	BLD IP20/S7	BLD IP20/M7
Wrench	Grip	H-TB	H-TB
	Mono block type substitution wrench	IP-20T	

Wedge type

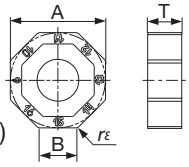


	Description	Cat. No.
	Applicable cutter	TAN07R...W
	Clamping screw	DS-6P
	Wedge	CL ARM-10-TUNG1
Wrench	Torx bit	BLD IP15/S7
Wrench	Grip	H-TBS

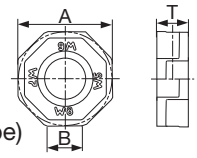
Inserts

Octagonal insert DOOCTO

MJ, ML
(16 corner type)



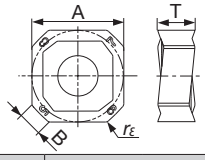
W
(Wiper, 8 corner type)



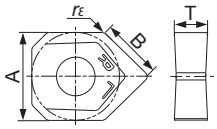
Cat. No.	Accuracy	Honing	Stocked grades			NEW	Dimensions (mm)			
			AH120	AH140	AH725	T1115	A	B	T	rε
ONMU0705ANPN-MJ	M	with		●	●		17.3	7.2	6.2	0.8
ONHU0705ANPN-MJ	H	with		●	●		17.3	7.2	6.2	0.8
ONMU0705ANPN-ML	M	with	●			★	17.3	7.2	6.2	0.8
ONHU0705ANTN-ML	H	with	●	●	●	★	17.3	7.2	6.2	0.8
ONHU0705ANPR-W	H	with	●				17.5	6.4	5.8	-

Square insert DOQUAD

MJ, ML
(8 corner type)



W
(Wiper, 2 corner type)



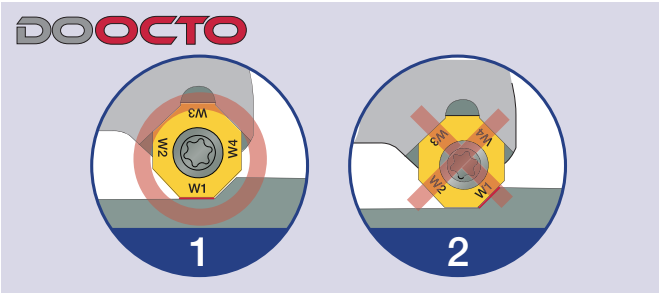
Cat. No.	Accuracy	Honing	Stocked grades			NEW	Dimensions (mm)			
			AH120	AH140	AH725	T1115	A	B	T	rε
SNMU1706ANPR-MJ	M	with		●	●		17.3	4.4	6.98	0.8
SNHU1706ANPR-MJ	H	with		●	●		17.3	4.4	6.98	0.8
SNMU1706ANTR-ML	M	with	●			★	17.3	4.4	6.98	0.8
SNHU1706ANTR-ML	H	with	●			★	17.3	4.4	6.98	0.8
SNHU1706ANFN-W	H	without	●				17.3	11	6.5	0.4

Standard cutting conditions

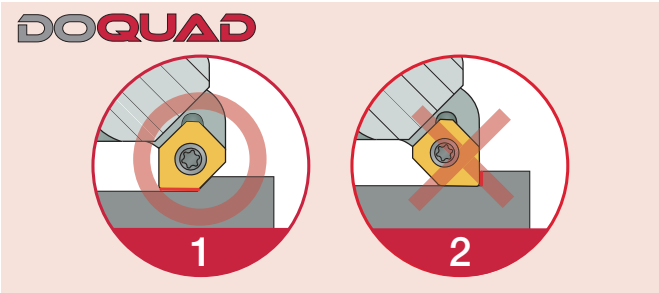
● : Stocked items
★ : Available from 2013

Work material	Hardness HB	Priority	Recommended Grades	Recommended Chipbreaker	Cutting Speed Vc (m/min)	Feed per tooth: fz (mm/t)
Low carbon steels C15E etc.	~ 200	First choice	AH725	MJ	100 - 250	0.2 - 0.5
		For impact resistance	AH140	MJ	80 - 180	
High carbon steels C45E, C55E etc.	200 ~ 300	First choice	AH725	MJ	100 - 230	0.2 - 0.4
		For impact resistance	AH140	MJ	80 - 180	
Alloy steels 42CrMo4, 17Cr3 etc.	150 ~ 300	First choice	AH725	MJ	100 - 230	0.2 - 0.4
		For impact resistance	AH140	MJ	80 - 150	
Tool steels X153CrMoV12, HS6-6-2 etc.	~ 300	First choice	AH725	MJ	100 - 180	0.2 - 0.4
Grey cast irons GG25, GG30 etc.	150 ~ 250	First choice	AH120	ML	150 - 250	0.17 - 0.5
		For impact resistance	AH725	MJ	150 - 250	
		Priority on wear resistance	T1115	ML	180 - 300	
Ductile cast irons GGG40 etc.	150 ~ 250	First choice	AH120	ML	100 - 180	0.17 - 0.5
		For impact resistance	AH725	MJ	100 - 180	
		Priority on wear resistance	T1115	ML	120 - 200	

Attention for wiper inserts



Just one wiper insert is needed in a cutter
Feed rate: f < 5.5 mm/rev



Just one wiper insert is needed in a cutter
Feed rate: f < 9.5 mm/rev

TUNGMILL

Diameter ø50 ~ 160 mm | 45° ~ 5mm | Air Hole

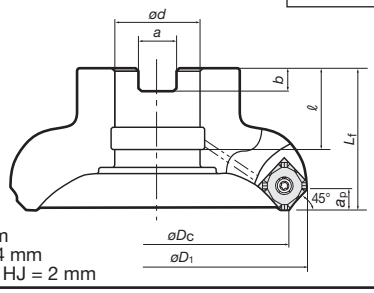
P Steel | M Stainless | K Cast Iron | N Non-ferrous

Face Milling | Chamfering

For general purpose milling of general steels, stainless steels, cast irons, and non-ferrous metals

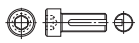
TAW13

Rake angle: A.R. +17° ~ +20° R.R. −16° ~ −11°

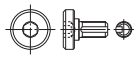


Max. ap:
Flat top = 5 mm
MJ, MS, AJ = 4 mm
ML = 2.5 mm HJ = 2 mm

CM10×30H
CM12×30H



TMBA-M16H
TMBA-M20H



Centre bolt

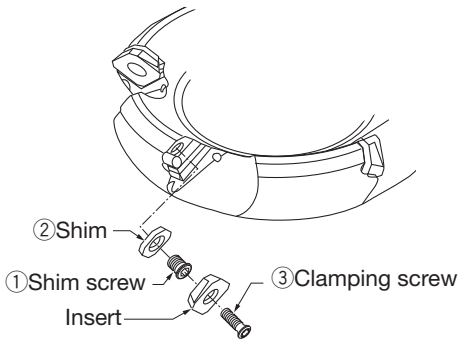
Right hand (R) shown.

TAW13 (Bore type)

Pitch	Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øD1	ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Cutter mounting bolts	Mounting details
Coarse	TAW13R050M22.0E04	●	4	50	63	22	20	40	6.3	10.4	0.4	With	CM10X30H	9-138Ⓐ
	TAW13R063M22.0E05	●	5	63	76						0.6			
	TAW13R080M27.0E06	●	6	80	94	27	22	50	7	12.4	1	With	CM12X30H	
	TAW13R100M32.0E07	●	7	100	114	32	28.5		8	14.4	1.5	With	TMBA-M16H	9-138Ⓑ
	TAW13R125M40.0E08	●	8	125	139	40	32	63	9	16.4	2.7	With	TMBA-M20H	
	TAW13R160M40.0E10	●	10	160	174		29				4.4	Without	–	
Close	TAW13R050M22.0E05	●	5	50	63	22	20	40	6.3	10.4	0.4	With	CM10X30H	9-138Ⓐ
	TAW13R063M22.0E06	●	6	63	76						0.6			
	TAW13R080M27.0E08	●	8	80	94	27	22	50	7	12.4	1	With	CM12X30H	
	TAW13R100M32.0E10	●	10	100	114	32	28.5		8	14.4	1.5	With	TMBA-M16H	9-138Ⓑ
	TAW13R125M40.0E12	●	12	125	139	40	32	63	9	16.4	3	With	TMBA-M20H	
	TAW13R160M40.0E16	●	16	160	174		29				4.4	Without	–	

● : Stocked items.

Replacement parts



No	Descriptions	Cat. No.
①	Shim screw	DTS5-3.5SS
②	Shim	FSSA1102
③	Clamping screw	CSPB-3.5
–	Wrench	P-3.5
–	Wrench	IP-15D

Relating pages
Technical Reference (15–1)

Inserts

SWMT13T3AFPR-MJ

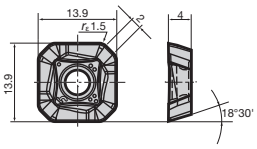


Fig. 1

SWMT13T3AFER-ML

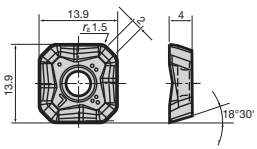


Fig. 2

SWMW13T3AFTR

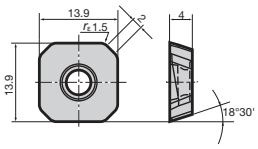


Fig. 3

SWMT13T3AFPR-HJ

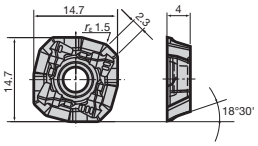


Fig. 4

SWMT13T3AFPR-MS

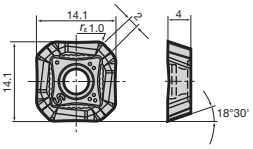


Fig. 5

SWGT13T3AFFR-AJ

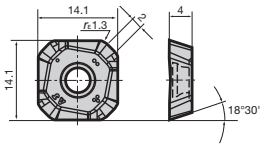


Fig. 6

SWGT13T3AFPR-MJ

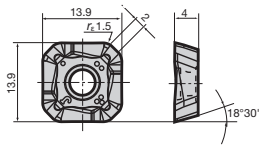


Fig. 7

WWCW13T3AFE/FR-WS

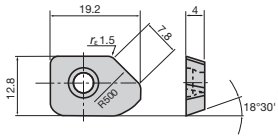


Fig. 8

WWCW13T3AFFR-WD

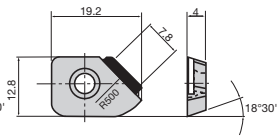


Fig. 9

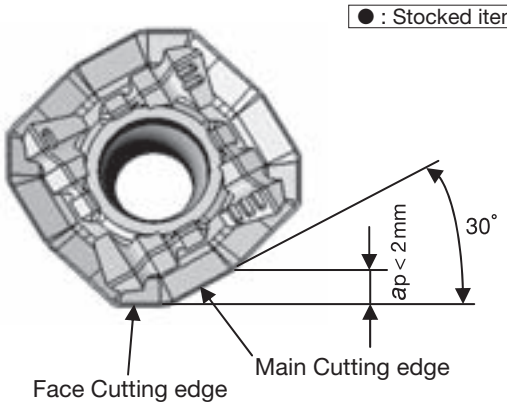
Type	Cat. No.	Accu-racy	Honing	Grades: Coated T3130	Coated T1115	Coated AH120	Coated AH130	Coated AH140	Coated GH110	DLC coated DS1100	Cermet NS740	Carbide KS05F	T-DIA DX140	Figure
General	SWMT13T3AFPR-MJ	M	With	●	●	●	●	●			●			Fig. 1
General	SWMT13T3AFER-ML	M	With			●								Fig. 2
General	SWMW13T3AFTR	M	With	●	●	●					●			Fig. 3
General	SWMT13T3AFPR-HJ	M	With	●	●	●	●	●						Fig. 4
General	SWMT13T3AFPR-MS	M	With				●	●						Fig. 5
General	SWGT13T3AFFR-AJ	G	Without							●		●		Fig. 6
General	SWGT13T3AFPR-MJ	G	With			●					●			Fig. 7
Wiper	WWCW13T3AFER-WS	C	With						●		●			Fig. 8
Wiper	WWCW13T3AFFR-WS	C	Without							●		●		Fig. 8
Wiper	WWCW13T3AFFR-WD	C	Without										●	Fig. 9

"DX140" : Packing Quantity = 1 pcs.
● : Stocked items.

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* = 2 mm. 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. 1. If the insert is installed as shown in Fig. 2, 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

Fig. A

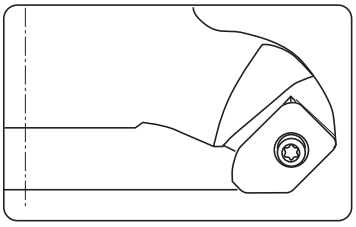
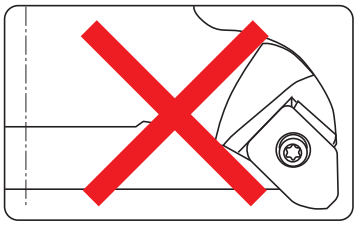


Fig. B



- 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 (*fz* mm/t) 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 1 mm is recommended.

TUNGMILL

Standard cutting conditions

Work materials	Priority	Grades	Cutting speed v_c (m/min)	Roughing (Depth of cut: > 1.0 mm) Feed per tooth: f_z (mm/t)					
				MJ	ML	HJ	MS	Flat	AJ
Mild and low carbon steels (St37, etc.) < 180 HB	First choice	**AH120**	100 - 270	0.05 - 0.3	0.05 - 0.25	0.2 - 0.6	-	0.05 - 0.3	-
	Priority on wear resistance	**T3130**	150 - 300	0.05 - 0.3	-	0.2 - 0.6	-	0.05 - 0.3	-
	Priority on impact resistance	**AH130 AH140**	80 - 180	0.05 - 0.3	-	-	0.1 - 0.25	-	-
	Priority on surface quality	**NS740**	100 - 300	0.05 - 0.23	-	-	-	0.05 - 0.23	-
Carbon and alloy steels (Ck45, 42CrMo4, etc.) < 300 HB	First choice	**AH120**	100 - 230	0.05 - 0.25	0.05 - 0.2	0.2 - 0.5	-	0.05 - 0.25	-
	Priority on wear resistance	**T3130**	150 - 280	0.05 - 0.25	-	0.2 - 0.5	-	0.05 - 0.25	-
	Priority on impact resistance	**AH130 AH140**	80 - 150	0.05 - 0.25	-	0.2 - 0.5	-	-	-
	Priority on surface quality	**NS740**	100 - 230	0.05 - 0.2	-	-	-	0.05 - 0.2	-
Die steels (X96CrMoV12, etc.) < 30 HRC	First choice	**AH120**	100 - 180	0.05 - 0.2	0.05 - 0.2	0.2 - 0.4	-	0.05 - 0.2	-
	Priority on wear resistance	**T3130**	100 - 180	0.05 - 0.2	-	0.2 - 0.4	-	0.05 - 0.2	-
Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc.) < 250 HB	First choice	**AH130 AH140**	80 - 200	0.1 - 0.25	-	0.2 - 0.5	0.1 - 0.2	-	-
	Priority on wear resistance	**AH120**	150 - 250	0.1 - 0.25	0.1 - 0.2	0.2 - 0.5	-	0.1 - 0.25	-
Grey cast irons (FC250, FC300 etc.)	First choice	**T1115**	180 - 300	0.05 - 0.25	-	0.2 - 0.6	-	0.05 - 0.25	-
	Priority on impact resistance	**AH120**	150 - 250	0.05 - 0.25	0.05 - 0.2	0.2 - 0.6	-	0.05 - 0.25	-
Ductile cast irons (FCD400, FCD600 etc.)	First choice	**T1115**	120 - 200	0.05 - 0.25	-	0.2 - 0.6	-	0.05 - 0.25	-
	Priority on impact resistance	**AH120**	100 - 180	0.05 - 0.25	0.05 - 0.2	0.2 - 0.6	-	0.05 - 0.25	-
Aluminium alloys (Si < 13 %)	-	**DS1100 KS05F**	300 - 1000	-	-	-	-	-	0.05 - 0.2
Aluminium alloys (Si ≥ 13%)	-	**DS1100 KS05F**	80 - 300	-	-	-	-	-	0.05 - 0.2
Copper alloys	-	**DS1100 KS05F**	200 - 500	-	-	-	-	-	0.05 - 0.2

Standard cutting conditions

Work materials	Priority	Grades	Cutting speed v_c (m/min)	Light cutting to finishing (Depth of cut: < 1.0 mm) Feed per tooth: f_z (mm/t)					
				MJ	ML	HJ	MS	Flat	AJ
Mild and low carbon steels (St37, etc.) < 180 HB	First choice	**AH120**	100 - 270	0.05 - 0.25	0.05 - 0.2	0.2 - 0.6	-	0.05 - 0.25	-
	Priority on wear resistance	**T3130**	150 - 300	0.05 - 0.25	-	0.2 - 0.6	-	0.05 - 0.25	-
	Priority on impact resistance	**AH130 AH140**	80 - 180	0.05 - 0.25	-	-	0.1 - 0.2	-	-
	Priority on surface quality	**NS740**	100 - 300	0.05 - 0.2	-	-	-	0.05 - 0.2	-
Carbon and alloy steels (Ck45, 42CrMo4, etc.) < 300 HB	First choice	**AH120**	100 - 230	0.05 - 0.2	0.05 - 0.15	0.2 - 0.5	-	0.05 - 0.2	-
	Priority on wear resistance	**T3130**	150 - 280	0.05 - 0.2	-	0.2 - 0.5	-	0.05 - 0.2	-
	Priority on impact resistance	**AH130 AH140**	80 - 150	0.05 - 0.2	-	0.2 - 0.5	-	-	-
	Priority on surface quality	**NS740**	100 - 230	0.05 - 0.18	-	-	-	0.05 - 0.18	-
Die steels (X96CrMoV12, etc.) < 30 HRC	First choice	**AH120**	100 - 180	0.05 - 0.18	0.05 - 0.12	0.2 - 0.4	-	0.05 - 0.18	-
	Priority on wear resistance	**T3130**	100 - 180	0.05 - 0.18	-	0.2 - 0.4	-	0.05 - 0.18	-
Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc.) < 250 HB	First choice	**AH130 AH140**	80 - 200	0.1 - 0.2	-	0.2 - 0.5	0.1 - 0.18	-	-
	Priority on wear resistance	**AH120**	150 - 250	0.1 - 0.2	0.1 - 0.18	0.2 - 0.5	-	0.1 - 0.2	-
Grey cast irons (FC250, FC300 etc.)	First choice	**T1115**	180 - 300	0.1 - 0.2	-	0.2 - 0.6	-	0.1 - 0.2	-
	Priority on impact resistance	**AH120**	150 - 250	0.1 - 0.2	0.05 - 0.18	0.2 - 0.6	-	0.1 - 0.2	-
Ductile cast irons (FCD400, FCD600 etc.)	First choice	**T1115**	120 - 200	0.1 - 0.2	-	0.2 - 0.6	-	0.1 - 0.2	-
	Priority on impact resistance	**AH120**	100 - 180	0.1 - 0.2	0.05 - 0.18	0.2 - 0.6	-	0.1 - 0.2	-
Aluminium alloys (Si < 13 %)	-	**DS1100 KS05F**	300 - 1000	-	-	-	-	-	0.05 - 0.2
Aluminium alloys (Si ≥ 13%)	-	**DS1100 KS05F**	80 - 300	-	-	-	-	-	0.05 - 0.2
Copper alloys	-	**DS1100 KS05F**	200 - 500	-	-	-	-	-	0.05 - 0.2

Notes:
- When cutting at a large depth of cut or a large cutting width, the cutting speed (v_c) and feed (f_z) 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 AH140 grade at speeds lower than vc = 100 m/min.
- 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.

MEMO

TME4400I/B

Diameter
ø63 ~ 160 mm

45° 4mm

P Steel | M Stainless | K Cast Iron | N Non-ferrous

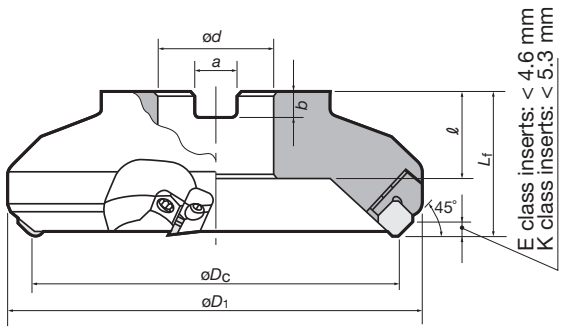
Face Milling | Chamfering

For general purpose, high-feed milling of general steels, stainless steels, cast irons, and non-ferrous metals

TME4400I

TME4400B

Rake angle: TME: A.R. +24° R.R. −8°~−6°



Max. ap: 4 mm

Right hand (R) shown.

TME4400 I (Irregular pitch)

Cat. No.	Stock	No. of inserts	Dimensions (mm)							Weight (kg)	Mounting details
			øDc	øD1	ød	ℓ	Lf	b	a		
TME4403RIE	●	4	80	101.5	27	26	50	7	12.4	1.43	9-138Ⓑ
TME4404RIE	●	5	100	120.2	32	32	63	8	14.4	2.74	
TME4405RIE	●	6	125	145.2	40			9	16.4	4.04	
TME4406RIE	●	8	160	181.2		29				5.82	9-138Ⓒ

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

TME4400B (Close pitch)

Cat. No.	Stock	No. of inserts	Dimensions (mm)							Weight (kg)	Mounting details
			øDc	øD1	ød	ℓ	Lf	b	a		
TME4463RBE	●	5	63	87.2	22	20	40	6.3	10.4	1.00	9-138Ⓐ
TME4403RBE	●	6	80	101.5	27	26	50	7	12.4	1.43	9-138Ⓑ
TME4404RBE	●	7	100	120.2	32	32	63	8	14.4	2.77	
TME4405RBE	●	9	125	145.2	40			9	16.4	4.06	
TME4406RBE	●	12	160	181.2		29				5.86	9-138Ⓒ

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

● : Stocked items.

Relating pages | Technical Reference (15−1)

Inserts

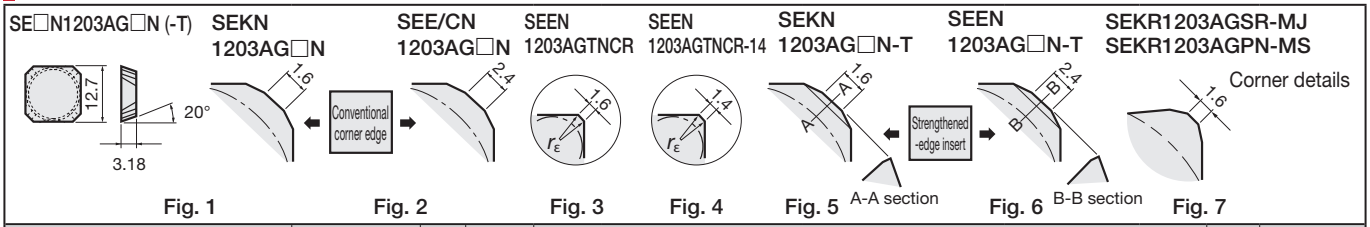
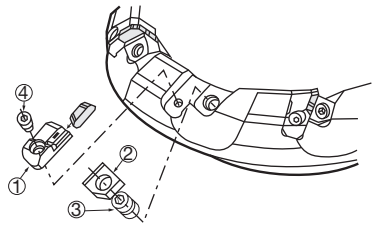


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 A-A section Fig. 6 B-B section Fig. 7

Cat. No.	Corner details	Accu-racy	Honing	Grades: Coated T3130	Coated T1115	Coated AH120	Coated AH130	Coated AH140	Coated AH330	Coated GH330	Cermet NS740	Uncoated UX30	Uncoated TH10	Fig-ure	Application
SECN1203AGFN	Conventional insert	C	Without										●	Fig. 2	Light alloys
SEEN1203AGTN	Conventional insert	E	With		●	●	●	●		●	●	●		Fig. 2	Steels, cast irons
SEEN1203AGFN	Conventional insert	E	Without										●	Fig. 2	Light alloys
SEEN1203AGTNCR	Conventional insert	E	With	●		●	●	●	●					Fig. 3	Steels, cast irons
SEEN1203AGTNCR-14	Conventional insert	E	With								●			Fig. 4	Steels
SEEN1203AGTN-T	Strengthened-edge insert	E	With	●							●	●		Fig. 6	Steels, cast irons
SEEN1203AGFN-T	Strengthened-edge insert	E	Without											Fig. 6	Light alloys
SEKN1203AGTN	Conventional insert	K	With	●		●	●	●	●	●	●	●		Fig. 1	Steels, cast irons
SEKN1203AGFN	Conventional insert	K	Without											Fig. 1	Light alloys
SEKN1203AGTNCR	Conventional insert	K	With								●			Fig. 3	Steels, cast irons
SEKN1203AGTN-T	Strengthened-edge insert	K	With	●	●					●	●	●		Fig. 5	Steels, cast irons
SEKN1203AGFN-T	Strengthened-edge insert	K	Without										●	Fig. 5	Light alloys
SEKR1203AGSR-MJ	With 3-dimensional chipbreaker	K	With	●		●			●	●				Fig. 7	Steels, cast irons
SEKR1203AGPN-MS	With 3-dimensional chipbreaker	K	With				●	●						Fig. 7	Stainless steels

Notes:
- SE□N1203AG□N (conventional type) and SE□N1203AG□N-T (strengthened type) inserts should not be used together in the same cutter body.
- SE□N1203 (42) AF□N type inserts should not be used in the T/EME4400-type body.
- SECN1203AGFN type is exclusively used for milling aluminium alloys and other non-ferrous light alloys. Its top flat face is ground to mirror-like finish.
- The strengthened type inserts have greater edge strength to prevent edge chipping.

Replacement parts



No	Descriptions	Cat. No. TME4403RIE ~ 4405RIE TME4403RBE ~ 4405RBE	Cat. No. TME4406RIE TME4406RBE
①	Locator	LE444R	LE446R
②	Insert locking wedge	WF444R	WF444R
③	Wedge fixing screw	FDS-8S	FDS-8S
④	Locator fixing screw	CM4X0.7X14	CM4X0.7X14
–	T-handle wrench	TP-4	TP-4

Standard cutting conditions

Work materials	Grades	Roughing (Depth of cut: ap 1.5 ~ 4 mm) Cutting speed vc (m/min)	Roughing Feed per tooth fz (mm/t)	Finishing (Depth of cut: ap 0.3 ~ 0.7 mm) Cutting speed vc (m/min)	Finishing Feed per tooth fz (mm/t)
Mild steels Unhardened steels (< 180 HB)	T3130	150 ~ 300	0.1 ~ 0.28	180 ~ 300	0.1 ~ 0.3
	NS740	150 ~ 250	0.1 ~ 0.2	150 ~ 250	0.1 ~ 0.25
	AH120 • GH330	150 ~ 200	0.1 ~ 0.25		0.1 ~ 0.28
	AH330	150 ~ 280	0.1 ~ 0.28	180 ~ 300	0.1 ~ 0.3
	AH130•AH140•UX30	100 ~ 180		130 ~ 200	
Carbon steels Alloy steels (< 300 HB)	T3130	150 ~ 280	0.1 ~ 0.25	200 ~ 280	0.1 ~ 0.28
	NS740	100 ~ 180	0.1 ~ 0.18	150 ~ 200	0.1 ~ 0.23
	AH120 • GH330	100 ~ 200	0.1 ~ 0.23		0.1 ~ 0.25
	UX30	80 ~ 130	0.1 ~ 0.25	100 ~ 150	0.1 ~ 0.28
Die steels (< 30 HRC)	AH120 • GH330	100 ~ 150	0.1 ~ 0.15	100 ~ 150	0.1 ~ 0.2
	UX30	80 ~ 130		80 ~ 130	
Stainless steels (< 250 HB)	AH130 • AH140	80 ~ 180	0.15 ~ 0.25	100 ~ 200	0.15 ~ 0.28
	AH120	150 ~ 230	0.15 ~ 0.23	200 ~ 250	0.15 ~ 0.25
	UX30	150 ~ 180		180 ~ 200	
Cast irons Ductile cast irons	T1115	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
	TH10 • UX30	80 ~ 130		80 ~ 130	
Aluminium alloys (Si < 13%)	TH10	200 ~ 1000	0.1 ~ 0.2	350 ~ 1000	0.1 ~ 0.3
Copper alloy	TH10	200 ~ 500	0.1 ~ 0.2	200 ~ 500	0.1 ~ 0.25

Notes:
- Dry cutting is recommended for all materials except for aluminium alloys.
- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

● : Stocked items.

TAC Mills for large depth of cut

TMD5400RIE

Diameter ø100 ~ 315 mm

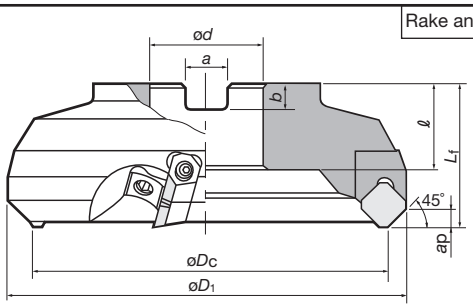
45° 6mm

P Steel | M Stainless | K Cast Iron | N Non-ferrous

Face Milling | Chamfering

For general purpose, large depth milling of general steels, stainless steels, cast irons, and non-ferrous metals

Rake angle: A.R. +15° R.R. −3°



Max. ap: 6 mm

Right hand (R) shown.

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øD1	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
TMD5404RIE	●	4	100	118	32	32	63	8	14.4	2.5	9-138Ⓑ
TMD5405RIE	●	6	125	142	40			9	16.4	3.7	
TMD5406RIE	●		160	176		29				5.8	9-138Ⓒ
TMD5408RIE	●	8	200	216	60	38		14	25.7	9.0	
TMD5410RIE	●	10	250	265						16.3	
TMD5412RIE	●	12	315	330						25.2	9-138Ⓓ

Inserts

SDKN1504AE□N

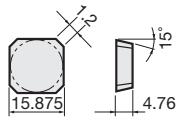


Fig. 1

SDEN1504AETN20 SDKN1504AETN16

Corner details

Fig. 2

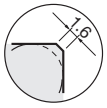
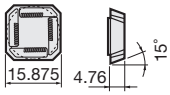


Fig. 3

SDKR1504AESR-MJ

(With 3-dimensional chipbreaker)



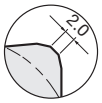


Fig. 4

SDEN1504AETNCR

Corner details

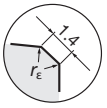


Fig. 5

SDKN1504AETNCR

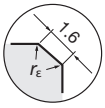


Fig. 6

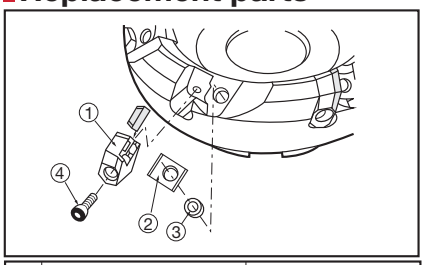
Right hand (R) shown.

Cat. No. (Inch)	ISO Cat. No. (Metric)	Accuracy	Honing	Grades: Coated T3130	AH120	AH130	AH140	GH330	Cermet NS740	N308	Uncoated UX30	TH10	Figure
SDCN53ZTN	SDCN1504AETN	C	With						●	●			Fig. 1
SDEN53ZTN	SDEN1504AETN	E	With					●	●	●	●		Fig. 1
SDEN53ZTNCR	SDEN1504AETNCR	E	With						●				Fig. 5
SDEN53ZTN20	SDEN1504AETN-20	E	With	●									Fig. 2
SDEN53ZFN	SDEN1504AEFN	E	Without									●	Fig. 1
SDKN53ZTN	SDKN1504AETN	K	With		●	●	●	●	●	▲	●		Fig. 1
SDKN53ZTNCR	SDKN1504AETNCR	K	With						●				Fig. 6
SDKN53ZTN16	SDKN1504AETN-16	K	With	●									Fig. 3
SDKN53ZFN	SDKN1504AEFN	K	Without									●	Fig. 1
SDKR53ZSR-MJ	SDKR1504AESR-MJ	K	With	●				●					Fig. 4

Notes: Inserts can be used for former PS-series TAC mills.

● : Stocked items
▲ : Discontinued items

Replacement parts



No.	Part	Part Cat. No.
①	Locator	LD540R
②	Insert locking wedge	WF500R
③	Wedge fixing screw	FDS-8S
④	Locator fixing screw	CM4×0.7×20
–	T-handle wrench	TP-4

Notes:
- Dry cutting is recommended for all materials except for aluminium alloys.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

Standard cutting conditions

Work materials	Grades	Roughing (Depth of cut: ap 1.5 ~ 6 mm) Cutting speed vc (m/min)	Feed per tooth fz (mm/t)	Finishing (Depth of cut: ap 0.3 ~ 0.7 mm) Cutting speed vc (m/min)	Feed per tooth fz (mm/t)
Mild steels Unhardened steels (< 180 HB)	NS740 • N308	150 ~ 250	0.1 ~ 0.25	150 ~ 250	0.1 ~ 0.3
	AH120 • GH330		0.1 ~ 0.35		0.1 ~ 0.35
	T3130	150 ~ 300		180 ~ 300	
	UX30• AH130	100 ~ 180		130 ~ 200	
Carbon steels Alloy steels (< 300 HB)	T3130	150 ~ 280	0.1 ~ 0.35	180 ~ 280	0.1 ~ 0.35
	NS740 • N308	100 ~ 180	0.1 ~ 0.25	150 ~ 200	0.1 ~ 0.3
	AH120 • GH330	100 ~ 200	0.1 ~ 0.3		0.1 ~ 0.35
	UX30	80 ~ 130		100 ~ 150	
Die steels (< 30 HRC)	T3130 • AH120	100 ~ 150	0.1 ~ 0.2	100 ~ 150	0.1 ~ 0.2
	UX30	80 ~ 130		80 ~ 130	
Stainless steels (< 250 HB)	AH130 • AH140	80 ~ 180	0.15 ~ 0.3	100 ~ 200	0.15 ~ 0.33
	AH120 • GH330	150 ~ 230	0.15 ~ 0.3	200 ~ 250	0.15 ~ 0.3
	UX30	150 ~ 180		180 ~ 200	
Cast irons, Ductile cast irons	TH10 • UX30	80 ~ 130	0.1 ~ 0.3	80 ~ 130	0.1 ~ 0.3
Aluminium alloys (Si < 13%)	TH10	200 ~ 1000	0.05 ~ 0.3	350 ~ 1000	0.1 ~ 0.3
Copper alloys	TH10	200 ~ 500	0.1 ~ 0.2	200 ~ 500	0.1 ~ 0.25

TGP4100RBAE

Diameter ø100 ~ 160 mm

75° 7mm

K Cast Iron | P Steel | M Stainless

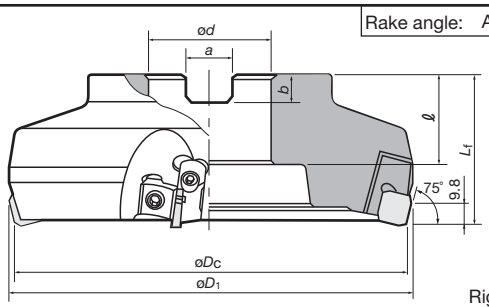
Face Milling

For general purpose, high-feed milling of cast irons, general steels and stainless steels,

TGP4100 I A

TGP4100BA

Rake angle: A.R. +7° R.R. +1°



Max. ap: 7 mm

Right hand (R) shown.

TGP4100BA (Close pitch)

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øD1	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
TGP4104RBAE	●	8	100	108	32	25	63	8	14.4	2.4	9-138Ⓐ
TGP4105RBAE	●	10	125	132	40	32		9	16.4	3.6	9-138Ⓑ
TGP4106RBAE	●	12	160	167		29				5.8	9-138Ⓒ

Inserts

SP□N1203ED□R/L

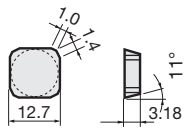


Fig. 1

SPEN120312□N
Corner details

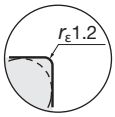
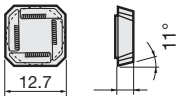


Fig. 2

SPKR1203EDSR-MJ
(With 3-dimensional chipbreaker)



Corner details

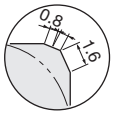


Fig. 3

Wiper insert
One-corner type

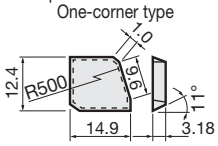


Fig. 4

Two-corner type

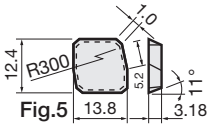


Fig.5

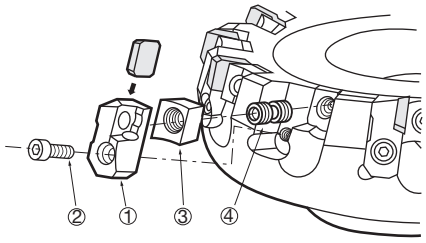
Right hand (R) shown.

Type	Cat. No.		ISO Cat. No. (Metric)	Accuracy	Honing	Grades: Coated T3130	T1115	AH120	AH140	GH330	Cermet NS740	N308	Uncoated UX30	TH10	Ceramics FX105	Figure
Genaral	SPCN42STR		SPCN1203EDTR	C	With						●	●	●			Fig. 1
	SPCN42SFR		SPCN1203EDFR		Without									●		
	SPEN423TN*		SPEN120312TN	E	With	●					●		●			Fig. 2
	SPEN423FN*		SPEN120312FN		Without									●		
	SPEN42STR		SPEN1203EDTR								●					
	SPKN42STR		SPKN1203EDTR	K	With	●	●	●	●	●	●	●	●		●*	Fig. 1
	SPKN42STL		SPKN1203EDTL								●		●			
	SPKN42SFR		SPKN1203EDFR		Without									●		
	SPKN42SFL		SPKN1203EDFL											●		
	SPKR42SSR-MJ		SPKR1203EDSR-MJ		With	●	●			●						Fig. 3
	SPGN120312TN			G											●*	Fig. 2
Wiper	Two-corner	WPAN42SFR	SPAX1203EDFR-W	A	Without									●		Fig. 5
	One-corner	WPAN42SFRS	SPAX1203EDFR-WS											●		Fig. 4

Notes: * marked inserts should not be used with wiper inserts.
Inserts can be used for former PS-series TAC mills.

● : Stocked items.

Replacement parts



No	Descriptions	Cat. No.
①	Locator	LP413R
②	Locator fixing screw	CM4X0.7X14
③	Insert locking wedge	WF310R
④	Wedge fixing screw	FDS-8S
–	T-handle wrench	TP-4

Relating pages | Technical Reference (15–1)

TGP4100RBAE

Standard cutting conditions

Work materials	Grades	Roughing (Depth of cut: *ap* 1.5 ~ 4 mm)		Finishing (Depth of cut: *ap* 0.3 ~ 0.7 mm)	
		Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)	Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)
Cast irons Ductile cast irons	**T1115**	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.23
	TH10 • UX30	80 ~ 130		80 ~ 130	
	FX105	200 ~ 500		200 ~ 600	0.1 ~ 0.3
Mild steels Unhardened steels (< 180 HB)	**NS740 • N308**	150 ~ 250	0.1 ~ 0.18	150 ~ 250	0.1 ~ 0.23
	AH120 • GH330		0.1 ~ 0.23		0.1 ~ 0.25
	T3130	150 ~ 300	0.1 ~ 0.25	180 ~ 300	0.1 ~ 0.28
	UX30	100 ~ 180		130 ~ 200	
Carbon steels Alloy steels (< 300 HB)	**T3130**	150 ~ 280	0.1 ~ 0.23	180 ~ 280	0.1 ~ 0.25
	NS740 • N308	100 ~ 180	0.1 ~ 0.18	150 ~ 200	0.1 ~ 0.23
	AH330 • AH120	100 ~ 200	0.1 ~ 0.2		
	UX30	80 ~ 130	0.1 ~ 0.23	100 ~ 150	0.1 ~ 0.25
Carbon steels Alloy steels (> 300 HB)	**T3130 • GH330**	150 ~ 230	0.1 ~ 0.23	180 ~ 280	0.1 ~ 0.25
	NS740 • N308	100 ~ 180	0.1 ~ 0.18	150 ~ 200	0.1 ~ 0.23
	UX30	80 ~ 130	0.1 ~ 0.23	100 ~ 150	0.1 ~ 0.25
Die steels (< 30 HRC)	**T3130**	100 ~ 150	0.1 ~ 0.15	100 ~ 150	0.1 ~ 0.2
	UX30	80 ~ 130		80 ~ 130	
Stainless steels (< 250 HB)	**AH120 • AH140**	150 ~ 230	0.15 ~ 0.2	200 ~ 250	0.15 ~ 0.23
	UX30	150 ~ 180	0.15 ~ 0.2	180 ~ 200	

Notes: • Dry cutting is recommended for above materials.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

• No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

Relating pages
Technical Reference (15–1)

Economy type TAC Mills

TGN4200-AE

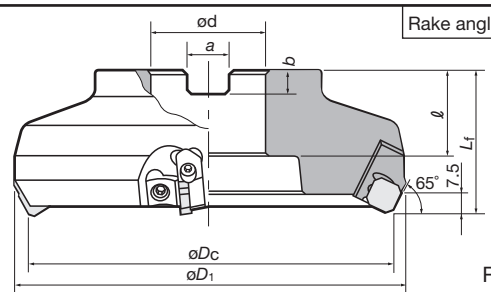
Diameter ø80 ~ 160 mm

65° 6mm

K Cast Iron P Steel

Face Milling

For general purpose milling of cast irons and steels



Rake angle: A.R. −5° R.R. −5°

Max. ap: 6 mm

Right hand (R) shown.

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øD1	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
TGN4203R-AE	●	5	80	92	27	22	50	7	12.4	1.5	9-138Ⓐ
TGN4204R-AE	●	6	100	112	32	32	63	8	14.4	2.4	9-138Ⓑ
TGN4205R-AE	●	8	125	136	40			9	16.4	3.9	
TGN4206R-AE	●	10	160	171		29				6.1	9-138Ⓒ

Inserts

SNKN1204ZNTN

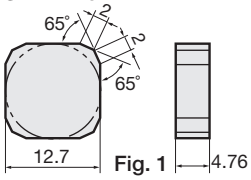


Fig. 1

SNMN1204□□TN
Corner details

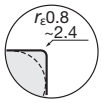


Fig. 2

SNKF1242NTN

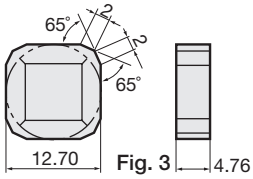
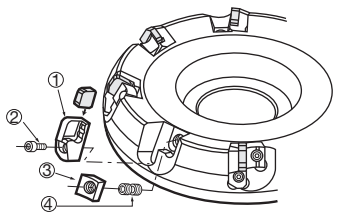


Fig. 3

Cat. No.	ISO Cat. No. (Metric)	Accuracy	Honing	Grades: Coated T3130	Coated T1115	Cermet NS740	Cermet N308		Uncoated UX30	Uncoated TH10	Ceramics FX105	Ceramics CX710	Figure
SNCN43ZTN	SNCN1204ZNTN	C	With			●	●		●				Fig. 1
SNCN43ZFN	SNCN1204ZNFN		Without							●			
SNKN43ZTN	SNKN1204ZNTN	K	With	●	●	●			●		●		
SNKN43ZFN	SNKN1204ZNFN		Without										
SNKF43ZTN	SNKF1204ZNTN		With		●				●				Fig. 3
SNKF43ZFN	SNKF1204ZNFN		Without							●			
SNMN120408TN		M	With								●		Fig. 2
SNMN120412TN				●	●				●		●		
SNMN120416TN											●		
SNMN120420TN											●		
SNMN120424TN											●		

Notes: Inserts can be used for former PS-series TAC mills.

Replacement parts



No.	Part	Part Cat. No.
①	Locator	LN423R/L
②	Locator fixing screw	CM4×0.7×14
③	Insert locking wedge	WP440R/L
④	Wedge fixing screw	FDS-8S
–	T-handle wrench	TP-4

Standard cutting conditions

Work materials	Grades	Roughing (Depth of cut: 1.5 ~ 4 mm) Cutting speed v_c (m/min)	Roughing Feed per tooth f_z (mm/t)	Finishing (Depth of cut: 0.3 ~ 0.7 mm) Cutting speed v_c (m/min)	Finishing Feed per tooth f_z (mm/t)
Cast irons Ductile cast irons	TH10•UX30	80 ~ 130	0.1 ~ 0.25	80 ~ 130	0.1 ~ 0.3
	T1115	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
	FX105	200 ~ 500	0.1 ~ 0.35	200 ~ 600	0.1 ~ 0.4
Mild steels Unhardened steels (< 180 HB)	T3130	150 ~ 250	0.1 ~ 0.3	180 ~ 250	0.1 ~ 0.3
	NS740•N308	100 ~ 200	0.1 ~ 0.2	150 ~ 250	0.1 ~ 0.25
	UX30	100 ~ 180	0.1 ~ 0.3	130 ~ 200	0.1 ~ 0.3
Carbon steels Alloy steels (< 300 HB)	T3130	130 ~ 250	0.1 ~ 0.3	150 ~ 250	0.1 ~ 0.3
	NS740•N308	100 ~ 180	0.1 ~ 0.2	150 ~ 200	0.1 ~ 0.25
	UX30	80 ~ 130	0.1 ~ 0.3	100 ~ 150	0.1 ~ 0.3

Notes:
- Dry cutting is recommended for above materials.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

● : Stocked items.

All PCD-tipped TAC Mills for high feeds

DAD15

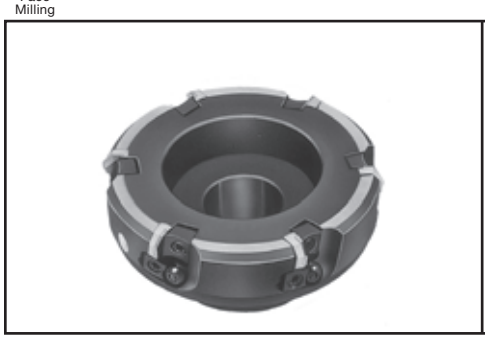
Diameter
ø80 ~ 315 mm

45° 5mm

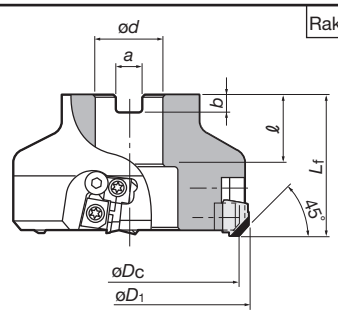
N Non-ferrous

Face Milling

For high speed milling of aluminium alloys and non-ferrous metals



Rake angle: A.R. +8.5° R.R. +5.0°



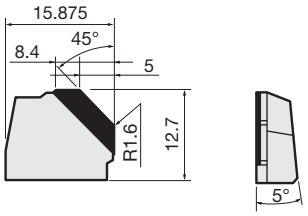
Max. ap: 5 mm

Right hand (R) shown.

Cat. No.	Stock	No. of inserts	Dimensions (mm)							Weight (kg)	Mounting details
			øDc	øD1	ød	ℓ	Lf	b	a		
DAD15080R-E		4	80	90	27	40	26	7	12.4	1.4	9-138Ⓐ
DAD15100R-E			100	110	32		28.5	8	14.4	2.4	
DAD15125R-E		6	125	135	40	63	32	9	16.4	3.6	9-138Ⓑ
DAD15160R-E			160	170			29			5.5	
DAD15200R-E		8	200	210	60		38	14	25.7	8.9	9-138Ⓒ
DAD15250R-E		10	250	260						14.6	
DAD15315R-E		12	315	325						24.0	9-138Ⓓ

Inserts

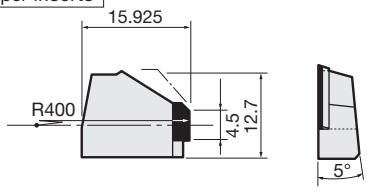
General insert



Right hand (R) shown.

Cat. No.	Grades T-DIA	Stock
YDEN1505ADFR-D	DX140	●

Wiper inserts

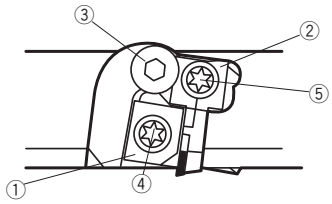


Right hand (R) shown.

Cat. No.	Grades T-DIA	Stock
YDEN1505ADFR-WD	DX140	●

"DX140" : Packing Quantity = 1 pcs.

Replacement parts



Right hand (R) shown.

No.	Descriptions	Part Cat. No.
①	Insert locking wedge	FW304R-D
②	Locator adjusting wedge	FW325R-D
③	Screw for preventing wedge from flying out	BHM615-GT
④	Wedge fixing screw (øD = 80)	FDS-8ST-18
	Wedge fixing screw (for øD > 80)	FDS-8ST
⑤	Adjusting wedge fixing screw	FDS-8ST-18
–	Wrench	T-27T

Cautionary Points in Use

- To avoid a danger of unbalanced revolution, the TAC mill should not be used in a state of reduced number of inserts.
- Use the cutter within the maximum revolutions written on the cutter body.
- When using the cutter at a cutting speed more than 1500 m/min, the balance quality of the arbor and toolholder should be prepared within class G16.
- When installing the inserts, recommended clamping torque for the wedge fixing screw is 9.8 N·m.

Standard cutting conditions

Work materials	Grades	Cutter dia. øDc	80	100	125	160	200	250	315
Aluminium alloys (Si < 13%)	DX140 (T-DIA)	Maximum cutting speed V_{cmax} (m/mim)	4000						
		Maximum revolution n_{max} (min^{-1})	16000	12700	10200	8000	6400	5100	4000
		Depth of cut a_p (mm)	~ 5						
		Feed f_z (mm/t)	0.05 ~ 0.28						
Aluminium alloys (Si ≥ 13%)		Cutting speed v_c (m/min)	200 ~ 500						

- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

● : Stocked items.

Relating pages
Technical Reference (15–1)

MEMO

DOREC

JIS Diameter ø25 ~ 160 mm

90° 9.16 mm

Air Hole

P Steel | M Stainless | K Cast Iron | S Superalloys

Face Milling | Radius Milling | Slotting | Slotting | Side Milling

Rake angle: A.R. +4° ~ +5° R.R. +13° ~ +15°

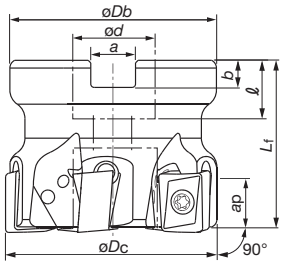


Fig. A

Max. *ap*:
LQMU11 type = 9 mm
LQMU18 type = 16 mm

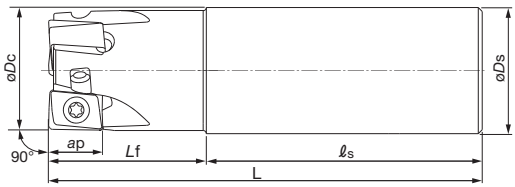


Fig. B

Right hand (R) shown.

TPQ11, 18 (Fig. A: bore type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc	øDb	ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Center bolt	Inserts	Mounting details
TPQ11R040M16.0E04	●	4	40	35	16	20	40	5.6	8.4	0.2	with	CM8x30H	LQMU1107**PNER-MJ	9-138Ⓐ
TPQ11R050M22.0E06	●	6	50	41	22	20	40	6.3	10.4	0.4	with	CM10x30H		
TPQ11R063M22.0E07	●	7	63	47	22	20	40	6.3	10.4	0.6	with	CM10x30H		
TPQ11R080M27.0E10	●	10	80	46	27	22	50	7	12.4	1.0	with	CM12x30H		
TPQ11R100M32.0E12	●	12	100	60	32	28.5	50	8	14.4	1.4	with	TMBA-M16H		9-138Ⓑ
TPQ18R050M22.0E03	●	3	50	47	22	20	40	6.3	10.4	0.4	with	CM10x30H	LQMU1808**PNER-MJ	9-138Ⓐ
TPQ18R063M27.0E04	●	4	63	55	27	26	50	7	12.4	0.5	with	CM10x30H		
TPQ18R080M27.0E05	●	5	80	55	27	26	50	7	12.4	0.9	with	CM12x30H		
TPQ18R100M32.0E06	●	6	100	70	32	32	50	8	14.4	1.4	with	TMBA-M16H		9-138Ⓑ
TPQ18R125M40.0E08	●	8	125	80	40	38	63	9	16.4	2.9	with	TMBA-M20H		
TPQ18R160M40.0E09	●	9	160	100	40	38	63	9	16.4	4.1	without	-		

EPQ11, 18 (Fig. B: shank type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc	øDs	ℓs	Lf	L	Weight (kg)	Air hole	Shank type	Inserts
EPQ11R025M25.0-02	●	2	25	25	70	30	100	0.3	with	Cylindrical	LQMU1107**PNER-MJ
EPQ11R032M32.0-03	●	3	32	32	80	35	115	0.7	with		
EPQ11R040M32.0-04	●	4	40	32	80	35	115	0.8	with		
EPQ11R050M32.0-05	●	5	50	32	80	40	120	0.9	with		
EPQ11R063M32.0-06	●	6	63	32	80	40	120	1.1	with		
EPQ11R080M32.0-07	●	7	80	32	80	40	120	1.4	with		
EPQ18R040M32.0W03	●	3	40	32	75	35	110	0.7	with	Weldon	LQMU1808**PNER-MJ
EPQ18R050M32.0W04	●	4	50	32	75	40	115	0.9	with		

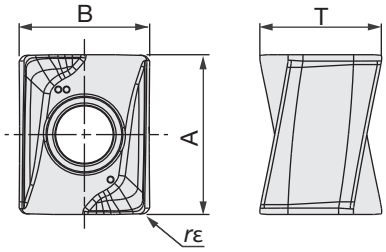
Bore type Components

Description		Replacement Parts Cat. No.	
Applicable cutter		T/EPQ11R...	T/EPQ18R...
Clamping screw		CSTB-3.5L115	SR14-591
Wrench	Torx bit	BLDT10/S7	BT20M
	Grip	SW6-SD	H-TB
Mono block type substitution wrench		T-10D	T-20D

● : Stocked items.

Relating pages | Technical Reference (15–1)

Inserts



Cat. No.	Accuracy	Honing	Stock			Dimensions (mm)				Cutter
			Coated			A	B	T	R	
			AH725	AH120	AH140					
LQMU110704PNER-MJ	M	with	●	●	●	11.0	9.0	8.3	0.4	EPQ11 TPQ11
LQMU110708PNER-MJ	M	with	●	●	●	11.0	9.0	8.3	0.8	
LQMU110716PNER-MJ	M	with	●	●	●	11.0	9.0	8.3	1.6	
LQMU180804PNER-MJ	M	with	●	●	●	17.5	11.5	10.9	0.4	EPQ18 TPQ18
LQMU180808PNER-MJ	M	with	●	●	●	17.5	11.5	10.9	0.8	
LQMU180816PNER-MJ	M	with	●	●	●	17.5	11.5	10.9	1.6	
LQMU180824PNER-MJ	M	with	●	●	●	17.5	11.5	10.9	2.4	

● : Stocked items.

Standard cutting conditions

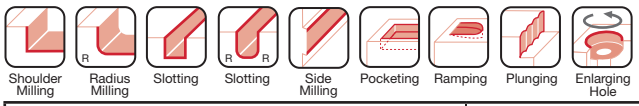
Work Materials	Hardness HB	Grades	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Low carbon steel (C15E etc.)	~ 200	AH725	100 - 250	0.10 - 0.25
High carbon steel (C45, C55 etc.)	200 ~ 300		100 - 230	0.10 - 0.20
Alloyed steel (42CrMo4, 17Cr3 etc.)	150 ~ 300			
Tool steel (X155 CrVMo121 etc.)	~ 300		100 - 180	
Stainless stee (300 series, X5CrNi189 etc.)	-	AH140	90 - 180	0.10 - 0.25
Grey cast iron (GG25 / 250 etc.)	150 ~ 250	AH120	140 - 250	0.10 - 0.25
Ductile cast iron (GGG40 / 450-10S etc.)			110 - 200	0.10 - 0.25
Heat-resisting alloy (Ti-6AL-4V, Inconel 718 etc.)	-	AH725	20 - 50	0.08 - 0.20

· To remove excessive chip accumulation use an air blast.
· 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, work piece 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

Diameter
ø12 ~ 50 mm

P Steel | M Stainless | K Cast Iron | N Non-ferrous | S Superalloys



For high speed milling of steels, stainless, and superalloys

Rake angle: A.R. + 7° R.R. + 13°~ + 18°

TPO07

EPO07

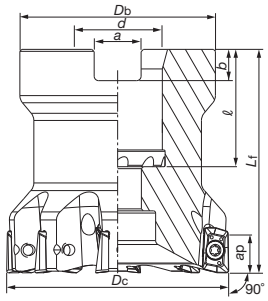
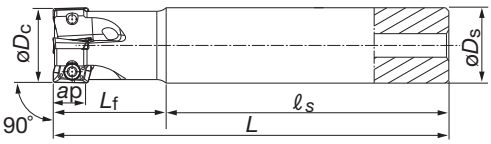


Fig. A



Max. ap : 7 mm (MJ)
: 6.4 mm (AJ)
: 0.8 mm (HJ)

Fig. B

TPO07 (Fig. A: bore type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) *ØDc	ØDb	Ød	ℓ	**Lf	b	a	Weight (kg)	Air hole	Center bolt	Clamping Screw	Inserts	Mounting details
TPO07R032M16.0E08	●	8	32	30	16	21	40	5.6	8.4	0.1	with	CM8x30H	CSTB-2.5L046	AOMT0702... AOGT0702...	9-138Ⓐ
TPO07R040M16.0E10	●	10	40	35	16	21	40	5.6	8.4	0.2	with	CM8x30H			
TPO07R050M22.0E12	●	12	50	41	22	22	40	6.3	10.4	0.3	with	CM10x30H			

EPO07 (Fig. B: shank type)

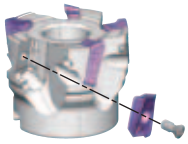
Type	Cat. No.	Stock	No. of Inserts	Dimensions (mm) *ØDc	ØDs	ℓ s	**Lf	**L	Weight (kg)	Air hole	Clamping Screw	Inserts
Coarse pitch	EPO07R016M12.0-02	●	2	16	12	50	20	70	0.1	with	CSTB-2.5L046	AOMT0702... AOGT0702...
	EPO07R020M16.0-03	●	3	20	16	60	30	90	0.1	with		
	EPO07R025M20.0-03	●	3	25	20	60	35	95	0.3	with		
Close pitch	EPO07R012M12.0-02	●	2	12	12	50	18	68	0.1	with		
	EPO07R016M16.0-04	●	4	16	16	60	24	84	0.1	with		
	EPO07R018M16.0-04	●	4	18	16	60	24	84	0.1	with		
	EPO07R020M20.0-05	●	5	20	20	70	30	100	0.2	with		
	EPO07R022M20.0-05	●	5	22	20	70	30	100	0.2	with		
	EPO07R025M25.0-07	●	7	25	25	80	35	115	0.4	with		
	EPO07R028M25.0-07	●	7	28	25	80	35	115	0.4	with		
Long shank	EPO07R012M12.0-02L	●	2	12	12	95	30	125	0.1	with		
	EPO07R016M16.0-02L	●	2	16	16	105	40	145	0.2	with		
	EPO07R018M16.0-02L	●	2	18	16	105	40	145	0.2	with		
	EPO07R020M20.0-03L	●	3	20	20	135	50	185	0.4	with		
	EPO07R022M20.0-03L	●	3	22	20	135	50	185	0.4	with		
	EPO07R025M25.0-03L	●	3	25	25	150	70	220	0.7	with		
	EPO07R028M25.0-03L	●	3	28	25	150	70	220	0.7	with		

*The øDc in the above table shows the diameter when MJ and AJ chipbreakers are used. When HJ chipbreaker is used, the tool diameter is equal to the above shown øDc + 0.6 mm.

**The Lf and L in the above table show the lengths when MJ chipbreaker is used. When AJ chipbreaker is used, the lengths are equal to Lf, L + 0.1 mm. When HJ chipbreaker is used, the lengths are equal to Lf, L + 0.5 mm.

Replacement parts

Description	Replacement parts Cat. No.
Wrench	T-7DB



Inserts

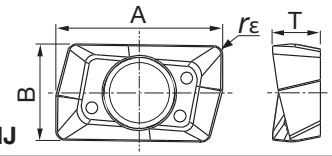


Fig. 1 **MJ**

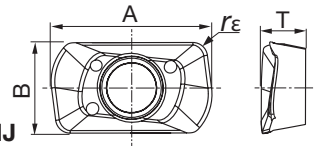


Fig. 2 **HJ**

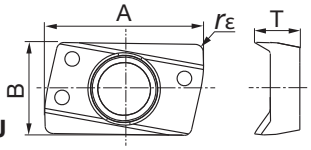


Fig. 3 **AJ**

Cat. No.	Accuracy	Honing	Grades Coated AH725	Coated AH140	Carbide KS15F	Dimensions (mm) A	B	T	rε	Shape	Cutter
AOMT070202PDPR-MJ	M	with	●	●		8.0	4.7	2.3	0.2	Fig. 1	EPO07 TPO07
AOMT070204PDPR-MJ	M	with	●	●		8.0	4.7	2.3	0.4	Fig. 1	
AOMT070208PDPR-MJ	M	with	●	●		8.0	4.7	2.3	0.8	Fig. 1	
AOMT070216PDPR-MJ	M	with	●	●		8.0	4.7	2.3	1.6	Fig. 1	
AOMT070208PDPR-HJ	M	with	●	●		8.8	4.9	2.4	0.8	Fig. 2	
AOGT070204PDFR-AJ	G	without			●	8.1	4.7	2.3	0.4	Fig. 3	

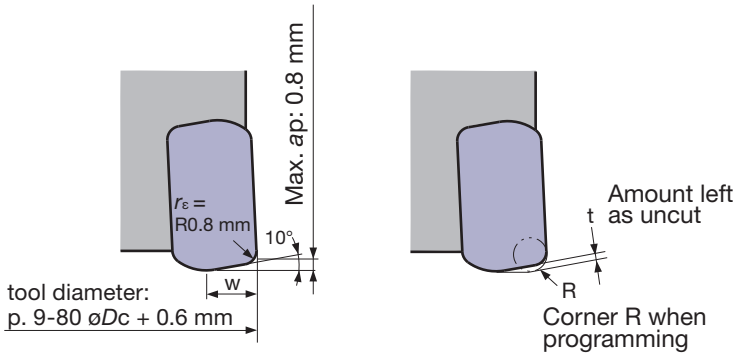
● : Stocked items.

Standard cutting conditions

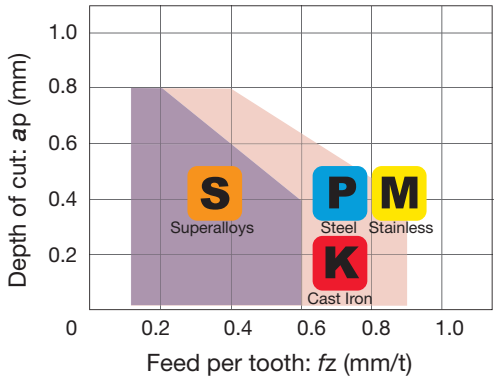
Work material	Brinell hardness HB	Grades	Cutting Speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t)		
				MJ	**HJ**	**AJ**
Low carbon steels (C15E etc.)	~ 200	**AH725**	90 - 200	0.05 - 0.1	0.4 - 0.9	-
High carbon steels and Alloyed steels (C45, C55 etc.)	200 ~ 300	**AH725**	90 - 150	0.05 - 0.1	0.4 - 0.9	-
Tool Steel (X153CrMoV12 etc.)	150 ~ 300	**AH725**	80 - 120	0.05 - 0.1	0.4 - 0.9	-
Stainless steel (X5CrNi18-9 etc.)	-	**AH140**	90 - 150	0.05 - 0.1	0.4 - 0.9	-
Grey cast iron (GG25, GG30 etc.)	150 ~ 250	**AH725**	100 - 180	0.05 - 0.1	0.4 - 0.9	-
Ductile cast iron (GGG45 etc.)	150 ~ 250	**AH725**	80 - 150	0.05 - 0.1	0.4 - 0.9	-
Aluminium alloys (Si < 13%)	-	**KS15F**	300 - 1000	-	-	0.08 - 0.2
Aluminium alloys (Si ≥ 13%)	-	**KS15F**	100 - 200	-	-	0.08 - 0.2
Titanium alloys (Ti-6Al-4V etc.)	-	**AH725**	20 - 50	0.05 - 0.1	0.4 - 0.9	-
Heat resistant alloys (Inconel718 etc.)	-	**AH725**	20 - 35	0.05 - 0.08	0.2 - 0.6	-

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 peripheral 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, program it as a radius cutter. The table below shows the corner R in programming and the uncut area (t).
4. With HJ inserts, the tool diameter is equal to the diameters shown on p. 9-80 ø*Dc* + 0.6 mm



TungRec 07 type HJ inserts Standard conditions

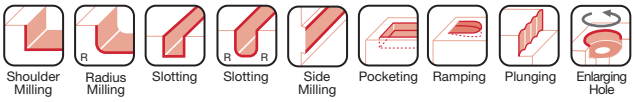


Max. depth of cut max ap (mm)	Main cutting edge length W (mm)	Amount left as uncut t (mm)	Corner R when program-ming
0.8	3.0	0.4	R 0.5
		0.3	R 1.0

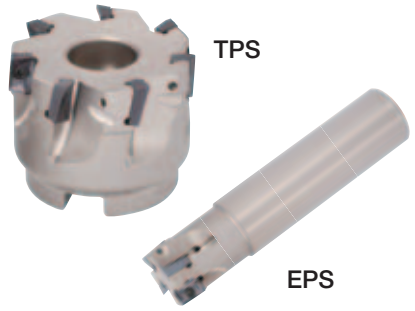
TUNGREC

Diameter
ø12~63 mm

P Steel | M Stainless | K Cast Iron | N Non-ferrous



For high speed milling of steels, stainless, and superalloys



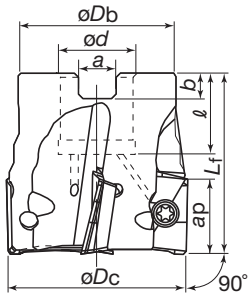


Fig. A

Rake angle: TPS11: A.R. +15.5° ~ +18° R.R. -8° ~ -6.5°
EPS11: A.R. +9° ~ +17.5° R.R. -20° ~ -7°

Cylindrical

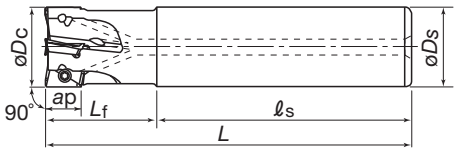


Fig. B

Max. ap: 10.6 mm

TPS11 (Fig. A: bore type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc	øDb	ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Center bolt	Clamping screw	Inserts	Mounting details
TPS11040RB-E	●	6	40	35	16	19	40	5.6	8.4	0.2	without	CM8X30	CSPB-2.5	ASMT11T3... ASGT11T3...	9-138Ⓐ
TPS11050RB-E	●	7	50	41	22	20	40	6.3	10.4	0.4	without	CM10X30			
TPS11063RB-E	●	8	63	41	22	20	45	6.3	10.4	0.6	without				

EPS11 (Fig. B: shank type)

Type	Cat. No.	Stock	No. of Inserts	Dimensions (mm) ØDc	ØDs	ℓs	Lf	L	Weight (kg)	Air hole	Clamping Screw	Inserts
Coarse pitch	EPS11012RS	●	1	12	16	60	25	85	0.1	with	CSPB-2.5S	ASMT11T3... ASGT11T3...
	EPS11016RS	●	2	16					0.1	with		
	EPS11018RS	●	2	18					0.1	with		
	EPS11020RS	●	2	20	20	70	30	100	0.2	with		
	EPS11021RS	●	2	21					0.2	with		
	EPS11025RS	●	3	25	25	80	35	115	0.4	with	CSPB-2.5	
	EPS11026RS	●	3	26					0.4	with		
	EPS11030RS	●	3	30					0.4	with		
	EPS11032RS	●	3	32	32		40	120	0.7	with		
	EPS11033RS	●	3	33					0.7	with		
	EPS11040RS	●	4	40					0.8	with		
	EPS11050RS	●	5	50					1.0	with		
Close pitch	EPS11020RSB	●	3	20	20	70	30	100	0.2	with	CSPB-2.5S	
	EPS11021RSB	●	3	21					0.2	with		
	EPS11025RSB	●	4	25	25	80	35	115	0.4	with	CSPB-2.5	
	EPS11026RSB	●	4	26					0.4	with		
	EPS11030RSB	●	4	30					0.4	with		
	EPS11032RSB	●	5	32	32	80	40	120	0.7	with		
	EPS11033RSB	●	5	33					0.7	with		
	EPS11040RSB	●	6	40					0.8	with		
	EPS11050RSB	●	7	50					1.0	with		

The next page is followed.

● : Stocked items.

Relating pages
Technical Reference (15–1)

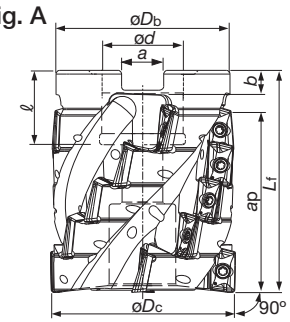
EPS11 (Fig. B: shank type)

Type	Cat. No.	Stock	No. of Inserts	Dimensions (mm) ØDc	ØDs	ℓs	Lf	L	Weight (kg)	Air hole	Clamping Screw	Inserts
Long shank	EPS11012RL	●	1	12	16	95	30	125	0.2	with	CSPB-2.5S	ASMT11T3... ASGT11T3...
	EPS11016RL	●	2	16		105	40	145	0.2	with		
	EPS11018RL	●	2	18					0.2	with		
	EPS11020RL	●	2	20	20	135	50	185	0.4	with		
	EPS11021RL	●	2	21					0.4	with		
	EPS11025RL	●	2	25	25	150	70	220	0.8	with	CSPB-2.5	
	EPS11026RL	●	2	26					0.8	with		
	EPS11030RL	●	2	30					0.9	with		
	EPS11032RL	●	2	32	32	175	80	255	1.5	with		
	EPS11033RL	●	2	33					1.5	with		
	EPS11040RL	●	2	40		205	50		1.6	with		
	EPS11040RLS42	●	2	40	42	210	100	310	3.0	with		
	EPS11050RL	●	3	50		310	50	360	3.9	with		
For BT30 taper MC	EPS11025RSS20	●	2	25	20	60	35	95	0.2	with		
	EPS11030RSS20	●	2	30					0.3	with		
	EPS11032RSS20	●	2	32					0.3	with		
	EPS11040RSS20	●	3	40					0.4	with		
	EPS11050RSS20	●	3	50					0.5	with		

Type		Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øDs	ℓs	Lf	L	Weight (kg)	Air hole	Clamping Screw	Inserts
Weldon	Coarse pitch	EPS11012RS-E	●	1	12	16	55	25	80	0.1	with	CSPB-2.5S	ASMT11T3... ASGT11T3...
		EPS11016RS-E	●	2	16		60		85	0.1	with		
	Close pitch	EPS11020RSB-E	●	3	20	20		30	90	0.2	with		
		EPS11025RSB-E	●	4	25	25		35	95	0.4	with	CSPB-2.5	
		EPS11032RSB-E	●	5	32	32	70	40	110	0.7	with		

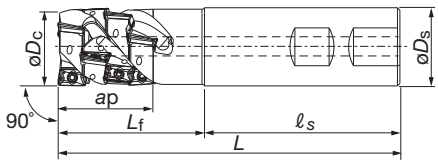
TLS11 / ELS11
For roughing milling

Fig. A



Rake angle: TLS11: A.R. +11.4° R.R. -7°
ELS11: A.R. +6.3° ~ +9.4° R.R. -10° ~ -8°

Fig. B



(Fig. A: bore type)

Cat. No.	Stock	No. of eff. edge lines	Dimensions (mm) øDc	øDb	ød	ℓ	Lf	b	a	Max. ap	Weight (kg)	Air hole	Center bolt	No. of inserts	Inserts	Mounting details
TLS11R050M22.0E04	●	4	50	47	22	20	60	6.3	10.4	48.8	0.5	with	CM10X40H	20	ASMT11T3... ASGT11T3...	9-138Ⓐ

(Fig. B: shank type)

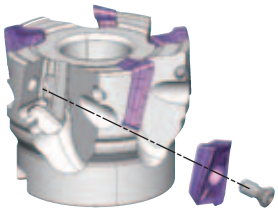
Cat. No.	Stock	No. of eff. edge lines	Dimensions (mm) øDc	øDs	ℓs	Lf	L	Max. ap	Weight (kg)	Air hole	No. of inserts	Inserts
ELS11R025M25.0W02	●	2	25	25	80	40	120	30.4	0.4	with	6	ASMT11T3... ASGT11T3...
ELS11R032M32.0W03	●	3	32	32	80	60	140	39.4	0.8	with	12	
ELS11R040M42.0W03	●	3	40	42	90	60	150	40	1.4	with	12	

● : Stocked items.

Relating pages
Technical Reference (15–1)

TUNGREC

Replacement Parts



TPS / EPS11

Description	Replacement parts Cat. No.
Wrench	**IP-8D**

TLS / ELS11

Descriptions	Cat. No.
Clamping screw	**CSPB-2.5**
Wrench	**IP-8D**

Inserts

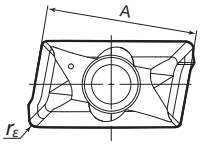


Fig. 1 **MJ**

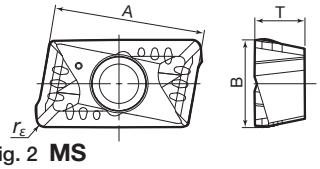


Fig. 2 **MS**

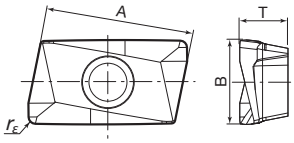


Fig. 3 **AJ**

Cat. No.	Accuracy	Honing	Grades: Coated						DLC coated	Cermet	Uncoated	Dimensions (mm)				Shape	Cutter
			AH725	AH120	AH130	AH140	T3130	T1115	DS1100	NS740	KS05F	A	B	T	r_ε		
ASMT11T304PDPR-MJ	M	with	●	●			●	●		●		11.6	6.7	3.7	0.4	Fig. 1	EPS11 TPS11
ASMT11T308PDPR-MJ		with	●	●			●	●		●					0.8	Fig. 1	
ASMT11T312PDPR-MJ		with	●	●			●								1.2	Fig. 1	
ASMT11T316PDPR-MJ		with	●	●			●			●					1.6	Fig. 1	
ASMT11T320PDPR-MJ		with		●											2.0	Fig. 1	
ASMT11T330PDPR-MJ		with		●											3.0	Fig. 1	
ASMT11T304PDPR-MS		with			●	●									0.4	Fig. 2	
ASGT11T304PDFR-AJ	G	without							●		●				0.4	Fig. 3	
ASGT11T308PDFR-AJ		without							●		●				0.8	Fig. 3	

● : Stocked items.

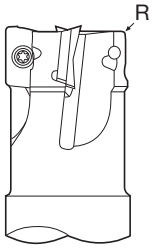
Cautionary point in modifying cutter bodies

TPS / EPS11, TLS / ELS11

When using inserts with corner radius $r_\varepsilon \geq 2.0$ mm, standard cutter bodies have to be modified "R".

TLS / ELS11

From 2nd row onwards, please use insert with $r\varepsilon$ = 0.4 or 0.8 mm



Corner radius r_ε (mm)	The dimension of modifying (mm)
0.4 ~ 1.6	Unnecessary
2.0 ~ 3.0	2

Standard cutting conditions

Work material	Brinell hardness HB	Priority	Grade	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t) MJ	MS	AJ
Low carbon steels (C15E etc.)	~ 200	First choice	**AH725**	100 - 250	0.1 - 0.2	-	-
		For wear resistance	**T3130**				
		For surface appearance	**NS740**		0.05 - 0.15		
High carbon steels and Alloyed steels (C45, C55 etc.)	200 ~ 300	First choice	**AH725**	100 - 200	0.1 - 0.15	-	-
		For wear resistance	**T3130**				
		For surface appearance	**NS740**		0.05 - 0.12		
Tool Steel (X155CrVMo12 1 etc.)	150 ~ 300	First choice	**AH725**	100 - 150	0.1 - 0.15	-	-
		For wear resistance	**T3130**				
Stainless steel (X5CrNi18-9 etc.)	-	-	**AH130**	80 - 200	-	0.08 - 0.2	-
Grey cast iron (GG25, GG30 etc.)	150 ~ 250		**AH120**	100 - 250	0.12 - 0.2	-	-
		First choice	**T1115**				
Ductile cast iron (GGG45 etc.)	150 ~ 250	For wear resistance	**AH120**	80 - 200	0.12 - 0.2	-	-
		First choice	**T1115**				
Aluminium alloys (Si < 13%)	-	For wear resistance	**DS1100**	300 - 1000	-	-	0.05 - 0.2
Aluminium alloys (Si ≥ 13%)	-	-	**DS1100**	100 - 200	-	-	0.05 - 0.2
Copper alloys	-	-	**KS05F**	200 - 500	-	-	0.05 - 0.2
Titanium alloys (Ti-6Al-4V etc.)	-	-	**AH130**	20 - 60	-	0.08 - 0.15	-
Heat resistant alloys (Inconel718 etc.)	-	-	**AH725**	20 - 40	0.08 - 0.13	-	-

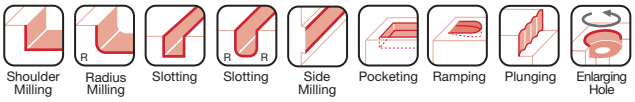
Roughing type TLS11 / ELS11

Work material	Brinell hardness HB	Priority	Grade	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t)		
					MJ	**MS**	**AJ**
Low carbon steels (C15E etc.)	~ 200	First choice	**AH725**	100 - 250	0.10 - 0.18	-	-
		For wear resistance	**T3130**				
High carbon steels and Alloyed steels (C45, C55 etc.)	200 ~ 300	First choice	**AH725**	100 - 200	0.08 - 0.14	-	-
		For wear resistance	**T3130**				
Tool Steel (X153CrMoV12 1 etc.)	150 ~ 300	First choice	**AH725**	100 - 150	0.08 - 0.14	-	-
		For wear resistance	**T3130**				
Stainless steel (X5CrNi18-9 etc.)	-	-	**AH130**	100 - 150	-	0.08 - 0.15	-
Grey cast iron (GG25, GG30 etc.)	150 ~ 250	First choice	**AH120**	100 - 250	0.10 - 0.18	-	-
		For wear resistance	**T1115**				
Ductile cast iron (GGG45 etc.)	150 ~ 250	First choice	**AH120**	80 - 200	0.10 - 0.18	-	-
		For wear resistance	**T1115**				
Aluminium alloys (Si < 13%)	-	-	**DS1100**	200 - 500	-	-	0.05 - 0.18
Aluminium alloys (Si ≥ 13%)	-	-	**DS1100**	100 - 200	-	-	0.05 - 0.18
Titanium alloys (Ti-6Al-4V etc.)	-	-	**AH130**	20 - 60	-	0.08 - 0.14	-
Heat resistant alloys (Inconel718 etc.)	-	-	**AH725**	20 - 40	0.06 - 0.12	-	-

TUNGREC

Diameter
ø25~160 mm

P Steel | M Stainless | K Cast Iron | N Non-ferrous | S Superalloys



For high speed milling of steels, stainless, and superalloys

TPO18

EPO18

Rake angle: A.R. +14°~+17° R.R. +22°~+31°

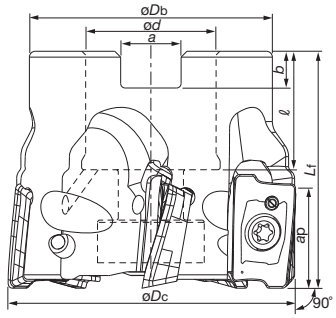


Fig. A

Max. ap: 16.7 mm

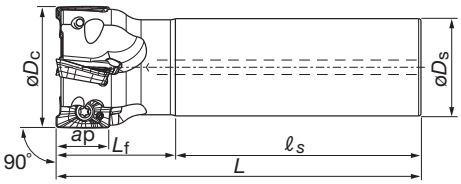


Fig. B

TPO18 (Fig. A: bore type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) *ØDc	ØDb	Ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Center bolt	Clamping screw	Inserts	Mounting details
TPO18R040M16.0E04	●	4	40	35	16	18	40	5.6	8.4	0.2	with	FSHM8-30H	CSTB-4L093	AOMT1805... AOGT1805...	9-138Ⓐ
TPO18R050M22.0E05	●	5	50	41	22	20	40	6.3	10.4	0.3	with	CM10x30H			
TPO18R063M22.0E06	●	6	63	41	22	20	40	6.3	10.4	0.5	with	CM10x30H			
TPO18R080M27.0E07	●	7	80	50	27	22	50	7	12.4	1.0	with	CM12x30H	CSTB-4L120		9-138Ⓐ
TPO18R100M32.0E08	●	8	100	60	32	28.5	50	8	14.4	1.4	with	TMBA-M16H			9-138Ⓑ
TPO18R125M40.0E09	●	9	125	71	40	32	63	9	16.4	2.8	with	TMBA-M20H			
TPO18R160M40.0E10	●	10	160	100	40	29	63	9	16.4	4.9	without	-			

EPO18 (Fig. B: shank type)

Type	Cat. No.	Stock	No. of Inserts	Dimensions (mm) *ØDc	ØDs	ℓ s	Lf	L	Weight (kg)	Air hole	Clamping Screw	Inserts
Coarse pitch	EPO18R025M25.0-02	●	2	25	25	80	35	115	0.4	with	CSTB-4L085	AOMT1805... AOGT1805...
	EPO18R028M25.0-02	●	2	28	25	80	35	115	0.4	with		
	EPO18R030M32.0-02	●	2	30	32	80	40	120	0.6	with		
	EPO18R032M32.0-02	●	2	32	32	80	40	120	0.7	with	CSTB-4L093	
	EPO18R035M32.0-02	●	2	35	32	80	40	120	0.7	with		
	EPO18R040M32.0-03	●	3	40	32	80	40	120	0.7	with		
	EPO18R050M32.0-03	●	3	50	32	80	40	120	0.8	with		
	EPO18R063M32.0-04	●	4	63	32	80	45	125	1.0	with	CSTB-4L120	
Close pitch	EPO18R030M32.0-03	●	3	30	32	80	40	120	0.6	with	CSTB-4L085	
	EPO18R032M32.0-03	●	3	32	32	80	40	120	0.6	with	CSTB-4L093	
	EPO18R035M32.0-03	●	3	35	32	80	40	120	0.7	with		
	EPO18R040M32.0-04	●	4	40	32	80	40	120	0.7	with		
	EPO18R050M32.0-05	●	5	50	32	80	40	120	0.8	with		
	EPO18R063M32.0-06	●	6	63	32	80	45	125	1.1	with	CSTB-4L120	
Long shank	EPO18R025M25.0-02L	●	2	25	25	150	70	220	0.8	with	CSTB-4L085	AOMT1805... AOGT1805...
	EPO18R028M25.0-02L	●	2	28	25	150	70	220	0.8	with		
	EPO18R030M32.0-02L	●	2	30	32	175	80	255	1.4	with		
	EPO18R032M32.0-02L	●	2	32	32	175	80	255	1.5	with	CSTB-4L093	
	EPO18R035M32.0-02L	●	2	35	32	175	80	255	1.5	with		
	EPO18R040M32.0-02L	●	2	40	32	205	50	255	1.6	with		
	EPO18R040M42.0-02L	●	2	40	42	210	100	310	3.0	with		
	EPO18R050M42.0-03L	●	3	50	42	310	50	360	3.8	with		
	EPO18R063M42.0-03L	●	3	63	42	310	50	360	4.0	with	CSTB-4L120	

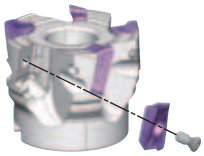
* The øDc in the above table shows the diameter when MJ chipbreaker is used. When AJ chipbreaker is used, the diameter is equal to the above shown øDc + 0.2 mm.

● : Stocked items.

Relating pages
Technical Reference (15–1)

Replacement Parts

Description		Replacement parts Cat. No.	
Applicable cutter		TPO18R...	EPO18R...
Wrench	Torx bit	**BT15M**	-
	Grip	**H-TBS**	-
Mono block type substitution wrench		-	**T-15DB**



Inserts

Fig. 1 **MJ**

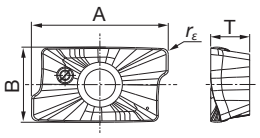
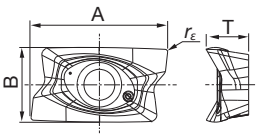


Fig. 2 **AJ**



Cat. No.	Accuracy	Honing	Grades			Dimensions (mm)				Shape	Cutter
			Coated		Carbide						
			AH725	**AH140**	**KS15F**	A	B	T	r_ε		
AOMT180508PDPR-MJ	M	with	●	●		19.5	10.7	5.6	0.8	Fig. 1	**EPO18 TPO18**
AOMT180516PDPR-MJ	M	with	●	●		19.5	10.7	5.6	1.6	Fig. 1	
AOMT180524PDPR-MJ	M	with	●	●		19.5	10.7	5.6	2.4	Fig. 1	
AOMT180532PDPR-MJ	M	with	●	●		19.5	10.7	5.6	3.2	Fig. 1	
AOGT180504PDFR-AJ	G	with			●	19.8	10.8	6.1	0.4	Fig. 2	
AOGT180508PDFR-AJ	G	without			●	19.7	10.8	6.1	0.8	Fig. 2	

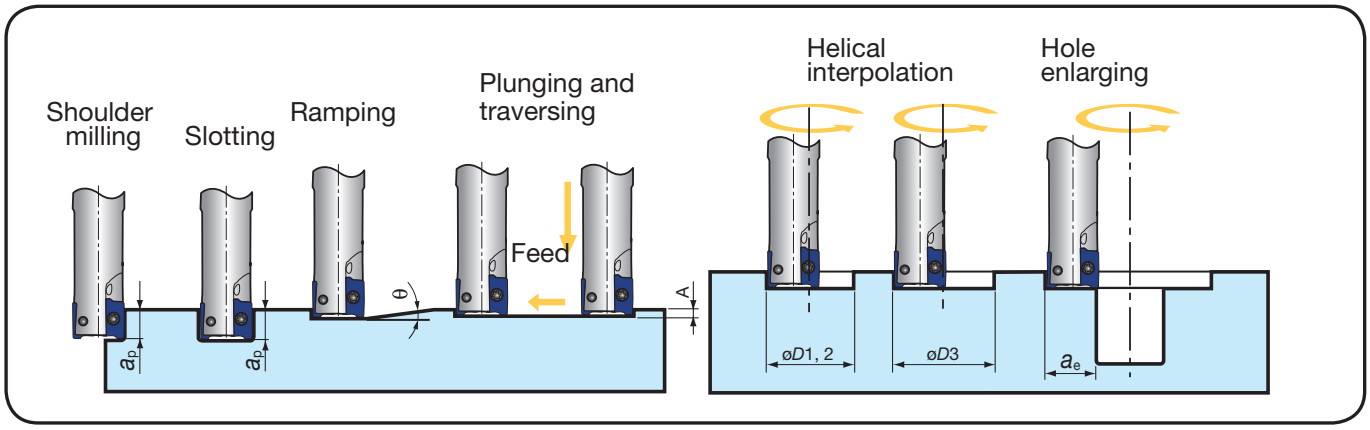
● : Stocked items.

Standard cutting conditions

Work material	Brinell hardness HB	Grades	Cutting Speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t)	
				MJ	**AJ**
Low carbon steels (C15E etc.)	~ 200	**AH725**	100 - 250	0.08 - 0.25	-
High carbon steels and Alloyed steels (C45, C55 etc.)	200 ~ 300	**AH725**	100 - 230	0.08 - 0.2	-
Tool Steel (X153CrMoV12 1 etc.)	150 ~ 300	**AH725**	100 - 180	0.08 - 0.2	-
Stainless steel (5CrNi18-9 etc.)	-	**AH140**	90 - 200	0.08 - 0.2	-
Grey cast iron (GG25, GG30 etc.)	150 ~ 250	**AH725**	140 - 250	0.08 - 0.25	-
Ductile cast iron (GGG45 etc.)	150 ~ 250	**AH725**	110 - 200	0.08 - 0.25	-
Aluminium alloys (Si < 13%)	-	**KS15F**	300 - 1000	-	0.05 - 0.25
Aluminium alloys (Si ≥ 13%)	-	**KS15F**	100 - 200	-	0.05 - 0.25
Titanium alloys (Ti-6Al-4V etc.)	-	**AH725**	20 - 60	0.08 - 0.18	-
Heat resistant alloys (Inconel718 etc.)	-	**AH725**	20 - 40	0.07 - 0.15	-

· To remove excessive chip accumulation use an air blast.
· When chips stick to the cutting edges (aluminium 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, work piece 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.

Machining modes



Cat. No.	Tool-ø	Max. depth of cut *ap* (mm)	Max. ramping angle *θ*	Max. plunging A (mm)	Min. machining *øD*1 (mm)	Max. machining *øD*2 (mm)	*Max. machining *øD*3 (mm)	Max. cutting width in enlarging *ae* (mm)
EPO07R012...	ø12	7	8°	0.5	16	23	20.5	11.5
EPO07R016...	ø16	7	5°	0.5	24	31	28.5	15.5
EPO07R018...	ø18	7	4°	0.5	28	35	32.5	17.5
EPO07R020...	ø20	7	3.5°	0.5	32	39	36.5	19.5
EPO07R022...	ø22	7	3°	0.5	36	43	40.5	21.5
EPO07R025...	ø25	7	2.5°	0.5	42	49	46.5	24.5
EPO07R028...	ø28	7	2°	0.5	48	55	52.5	27.5
TPO07R032M16.0E08	ø32	7	1.8°	0.5	56	63	60.5	31.5
TPO07R040M16.0E10	ø40	7	1.2°	0.5	72	79	76.5	39.5
TPO07R050M22.0E12	ø50	7	0.9°	0.5	92	99	96.5	49.5
EPS11012R...	ø12	10.6	6°	0.5	15	23	21	11.5
EPS11016R...	ø16	10.6	5°	0.5	20	31	29	15.5
EPS11018R...	ø18	10.6	4°	0.5	26	35	33	17.5
EPS11020R...	ø20	10.6	3°	0.5	28	39	37	19.5
EPS11021R...	ø21	10.6	3°	0.5	30	41	39	20.5
EPS11025R...	ø25	10.6	2°	0.5	38	49	47	24.5
EPS11026R...	ø26	10.6	2°	0.5	40	51	49	25.5
EPS11030R...	ø30	10.6	1.5°	0.5	48	59	57	29.5
EPS11032R...	ø32	10.6	1.5°	0.5	52	63	61	31.5
EPS11033R...	ø33	10.6	1.5°	0.5	54	65	63	32.5
EPS/TPS11040R...	ø40	10.6	1°	0.5	68	79	77	39.5
EPS11040RLS42	ø40	10.6	1°	0.5	68	79	77	39.5
EPS/TPS11050R...	ø50	10.6	0.7°	0.5	68	99	97	49.5
TPS11063RB	ø63	10.6	0.5°	0.5	114	125	123	62.5
TPS11080RB	ø80	10.6	0.4°	0.5	148	159	157	79.5
TPS11100RB	ø100	10.6	0.3°	0.5	188	199	197	99.5
EPO18R025...	ø25	16.7	6°	1	31.5	48	44	24
EPO18R028...	ø28	16.7	4.5°	1	37.5	54	50	27
EPO18R030...	ø30	16.7	4°	1	41.5	58	54	29
EPO18R032...	ø32	16.7	3.5°	1	45.5	62	58	31
EPO18R035...	ø35	16.7	3°	1	51.5	68	64	34
TPO/EPO18R040...	ø40	16.7	2.5°	1	61.5	78	74	39
TPO/EPO18R050...	ø50	16.7	1.9°	1	81.5	98	94	49
TPO/EPO18R063...	ø63	16.7	1.4°	1	107.5	124	120	62
TPO18R...	ø80	16.7	1°	1	141.5	158	154	79
TPO18R...	ø100	16.7	0.8°	1	181.5	198	194	99
TPO18R...	ø125	16.7	0.6°	1	231.5	248	244	124
TPO18R...	ø160	16.7	0.4°	1	301.5	318	314	159

*Flat bottom hole

Notes: Corner r_ε for dimensions of *øD*1, *øD*2, and *øD*3: r_ε 0.4 for EPO 07 / EPS 11 and r_ε 0.8 for EPO 18.

TPM / EPM type

TECMILL

ISO Diameter ø32 ~ 125 mm | 90° 9.7, 15.1 mm | Air Hole | P Steel | M Stainless | K Cast Iron | S Superalloys

Face Milling | Shoulder Milling | Radius Milling | Slotting | Slotting | Side Milling

High productivity shoulder milling

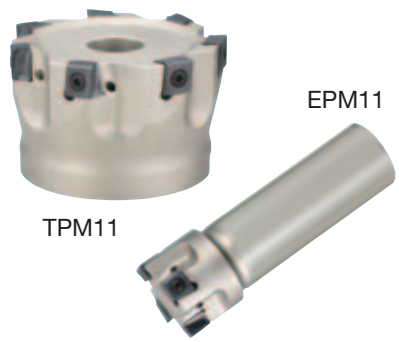
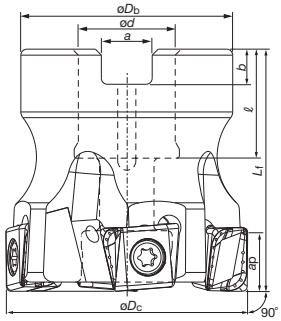


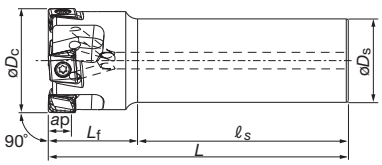
Fig. A



Max. ap:
T/EPM11 = 9.7 mm
TPM16 = 15.1 mm

Rake angle: A.R. + 5° ~ + 6° R.R. + 9° ~ + 13°

Fig. B



Right hand (R) shown.

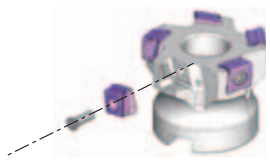
TPM11, 16 (Fig. A: bore type)

Pitch	Cat. No.	Stock	No. of Inserts	Dimensions (mm) ØDc	ØDb	Ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Center bolt	Inserts	Mounting details
Coarse	TPM11R050M22.0E05	●	5	50	41	22	20	40	6.3	10.4	0.3	with	CM10x30H	LMMU1107**PNER-MJ	9-138Ⓐ
	TPM11R063M22.0E06	●	6	63	41	22	20	40	6.3	10.4	0.5	with	CM10x30H		
	TPM11R080M27.0E07	●	7	80	50	27	22	50	7	12.4	1.0	with	CM12x30H		
	TPM11R100M32.0E08	●	8	100	60	32	28.5	50	8	14.4	1.4	with	TMBA-M16H		9-138Ⓑ
	TPM16R080M27.0E05	●	5	80	50	27	22	50	7	12.4	1.0	with	CM12x30H	LMMU1609**PNER-MJ	9-138Ⓐ
	TPM16R100M32.0E06	●	6	100	60	32	28.5	50	8	14.4	1.5	with	TMBA-M16H		9-138Ⓑ
	TPM16R125M40.0E07	●	7	125	71	40	32	63	9	16.4	2.7	with	TMBA-M20H		
Close	TPM11R080M27.0E09	●	9	80	50	27	22	50	7	12.4	1.0	with	CM12x30H	LMMU1107**PNER-MJ	9-138Ⓐ
	TPM11R100M32.0E11	●	11	100	60	32	28.5	50	8	14.4	1.5	with	TMBA-M16H		9-138Ⓑ

EPM11 (Fig. B: shank type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) ØDc	ØDs	ℓs	Lf	L	Weight (kg)	Air hole	Inserts
EPM11R032M32.0-03	●	3	32	32	80	35	115	0.6	with	LMMU1107**PNER-MJ
EPM11R040M32.0-04	●	4	40	32	80	35	115	0.7	with	
EPM11R050M32.0-04	●	4	50	32	80	40	120	0.9	with	
EPM11R063M32.0-06	●	6	63	32	80	40	120	1.2	with	
EPM11R080M32.0-07	●	7	80	32	80	40	120	1.6	with	

Bore type Components



Description		Replacement Parts Cat. No.	
Applicable cutter		TPM11R...	TPM16R...
Clamping screw		CSTB-3.5L110	CSTB-5L159
Wrench	Torx bit	BT15S	BT20S
	Grip	H-TB	H-TB
Mono block type substitution wrench		T-15T	T-20T

Shank type Components

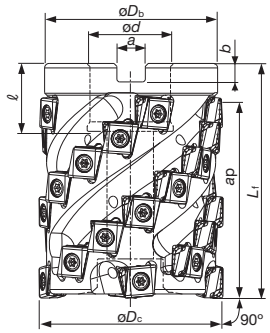
Description	Parts Cat. No.
Clamping screw	CSTB-3.5L110
Wrench (Substitution Wrench)	T-15DB (T-15D)

● : Stocked items.

Roughing type

TLM11

Rake angle: A.R. +5.1° ~ +5.3° R.R. +13.4° ~ +13.8°

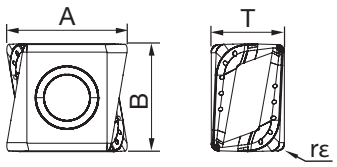


Cat. No.	Stock	No. of eff. edge lines	Dimensions (mm)								Weight (kg)	Air hole	Center bolt	Number of inserts	Inserts	Mounting details
			øDc	øDb	ød	ℓ	Lf	b	a	ap						
TLM11R050M22.0E03	●	3	50	47	22	20	70	6.3	10.4	58.5	0.8	with	SD06-A3	21	**LMMU1107**PNER-MJ**	9-138Ⓐ
TLM11R063M27.0E04	●	4	63	59	27	22	80	7	12.4	66.9	1.4	with	SD08-98	32		

Roughing type: Replacement parts

Description		Cat. No.	
Applicable cutter		**TLM11R050…**	**TLM11R063…**
Clamping screw		**CSTB-3.5L110**	
Wrench	Torx bit	**BT15S**	
	Grip	**H-TB**	
Mono block type substitution wrench		**T-15T**	

Inserts



Cat. No.	Accuracy	Honing	Stock Coated grades					Dimensions (mm)				Cutter
			AH725	AH120	AH140	T3130	T1115	A	B	T	rε	
LMMU110708PNER-MJ	M	with	●	●	●	●	●	11.7	10.5	7.1	0.8	TLM11 EPM11 TPM11
LMMU110716PNER-MJ	M	with	●	●	●	●	●	11.5	10.5	7.1	1.6	
LMMU110724PNER-MJ	M	with	●	●	●	●	●	11.3	10.5	7.1	2.4	
LMMU110732PNER-MJ	M	with	●	●	●	●	●	11.1	10.5	7.1	3.2	
LMMU160908PNER-MJ	M	with	●	●	●	●	●	17.3	16.0	9.5	0.8	TPM16
LMMU160916PNER-MJ	M	with	●	●	●	●	●	17.1	16.0	9.5	1.6	
LMMU160924PNER-MJ	M	with	●	●	●		●	16.9	16.0	9.5	2.4	
LMMU160932PNER-MJ	M	with	●	●	●		●	16.8	16.0	9.5	3.2	

● : Stocked items.

Standard cutting conditions

Work material	Brinell hardness HB	Priority	Grade	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Low carbon steels (C15E etc.)	~ 200	First choice	**AH725**	100 - 250	0.12 - 0.3
		For impact resistance	**AH140**	80 - 180	
		For wear resistance	**T3130**	120 - 250	
High carbon steels (C45, C55 etc.)	200 ~ 300	First choice	**AH725**	100 - 230	0.12 - 0.25
		For impact resistance	**AH140**	80 - 180	
		For wear resistance	**T3130**	120 - 250	
Alloyed steels (42CrMo4, 17Cr3 etc.)	150 ~ 300	First choice	**AH725**	100 - 230	0.12 - 0.25
		For impact resistance	**AH140**	80 - 150	
		For wear resistance	**T3130**	120 - 250	
Tool steels (X155CrVMo12 1 etc.)	~ 300	First choice	**AH725**	100 - 180	0.12 - 0.25
		For impact resistance	**AH140**	80 - 120	
		For wear resistance	**T3130**	100 - 180	
Stainless steels (X5CrNi18-9 etc.)	-	First choice	**AH140**	90 - 180	0.12 - 0.3
Grey cast irons (GG25, GG30 etc.)	150 ~ 250	First choice	**AH120**	140 - 250	0.12 - 0.3
		For wear resistance	**T1115**		
Ductile cast irons (GGG45 etc.)		First choice	**AH120**	110 - 200	0.12 - 0.3
		For wear resistance	**T1115**		
Heat-resisting alloy (Inconel 718, Ti-6AL-4V etc.)	-	First choice	**AH725**	20 - 50	0.1 - 0.2

Note:
· To remove excessive chip accumulation use an air blast.
· When cutting interrupted surfaces like a casting skin, the cutting feed (*fz*) should be set below the values shown in the above table.
· Tool overhang should be minimized.
When machining with long overhang applications the tool tends to chatter. Please reduce the feed rate *fz*.
· 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.

Roughing type

Work material	Brinell hardness HB	Priority	Grade	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Low carbon steels (C15E etc.)	~ 200	First choice	**AH725**	100 - 250	0.10 - 0.23
		Priority for impact resistance	**AH140**	80 - 180	
		Priority for wear resistance	**T3130**	100 - 250	
High carbon steels (C45, C55 etc.)	200 ~ 300	First choice	**AH725**	100 - 200	0.08 - 0.21
		Priority for impact resistance	**AH140**	80 - 150	
		Priority for wear resistance	**T3130**	100 - 200	
Alloyed steels (42CrMo4 etc.)	150 ~ 300	First choice	**AH725**	100 - 200	0.08 - 0.21
		Priority for impact resistance	**AH140**	80 - 150	
		Priority for wear resistance	**T3130**	100 - 200	
Tool steels (X155CrVMo12 1 etc.)	~ 300	First choice	**AH725**	100 - 150	0.08 - 0.21
		Priority for impact resistance	**AH140**	80 - 120	
		Priority for wear resistance	**T3130**	100 - 150	
Stainless steels (X5CrNi18-9 etc.)	-	First choice	**AH140**	90 - 150	0.08 - 0.21
Grey cast irons (GG25, GG30 etc.)	150 ~ 250	First choice	**AH120**	100 - 250	0.10 - 0.25
		Priority for wear resistance	**T1115**		
Ductile cast irons (GGG45 / 450-10S etc.)		First choice	**AH120**	100 - 250	0.10 - 0.25
		Priority for wear resistance	**T1115**		
Heat-resisting alloy (Inconel 718 / Ti-6AL-4V etc.)	-	First choice	**AH725**	20 - 50	0.06 - 0.15

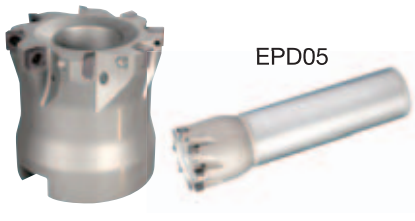
• On the 1st row of roughing type cutter, all type of insert can be used
• From 2nd row onwards, please use insert with r_ε = 0.4 or 0.8 mm

TUNGQUAD

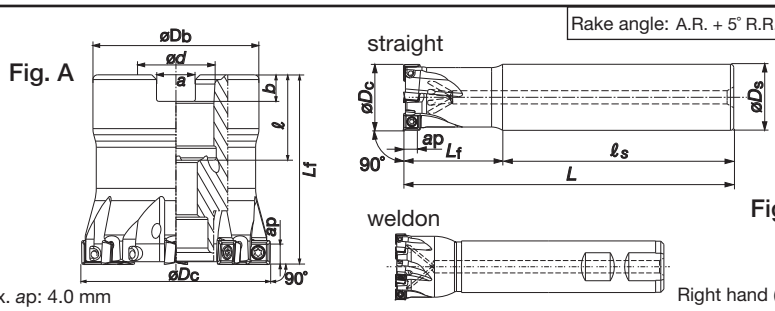
Diameter ø12 ~ 40 mm | 90° 4 mm | Air Hole | P Steel | M Stainless | K Cast Iron | N Non-ferrous

Face Milling | Shoulder Milling | Slotting

High efficiency shoulder milling



Rake angle: A.R. + 5° R.R. - 7° ~ + 12°



TPD05 (Fig. A: bore type)

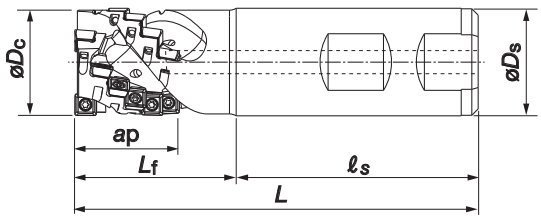
Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc	øDb	ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Cutter mounting screw	Inserts	Mounting details
TPD05R032M16.0E06	●	6	32	30	16	20	32	5.6	8.4	0.1	with	CM8x30H	SDMT050204PN-MJ SDHT050204FN-AJ	9-138Ⓐ
TPD05R040M22.0E08	●	8	40	38	22	22	40	6.3	10.4	0.2	with	CM10x30H		

EPD05 (Fig. B: shank type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc	øDs	ℓs	Lf	L	Weight (kg)	Air hole	Shank type	Inserts
EPD05R012M12.0-02	●	2	12	12	62	18	80	0.1	with	straight	SDMT050204PN-MJ SDHT050204FN-AJ
EPD05R016M16.0-03	●	3	16	16	90	20	110	0.2	with	straight	
EPD05R020M20.0W04	●	4	20	20	80	25	105	0.2	with	weldon	
EPD05R025M20.0W05	●	5	25	20	90	25	115	0.3	with	weldon	
EPD05R032M25.0W06	●	6	32	25	98	32	130	0.5	with	weldon	
EPD05R040M32.0W08	●	8	40	32	100	40	140	0.8	with	weldon	

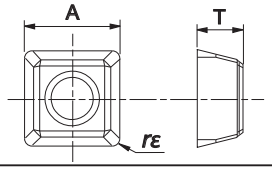
Roughing type

Rake angle: A.R. + 5° R.R. - 3°



Cat. No.	Stock	No. of eff. edge lines	Dimentions (mm) øDc	øDs	ℓ s	Lf	L	ap	Weight (kg)	Air hole	Number of inserts	Inserts
ELD05R020M20.0W02	●	2	20	20	53	32	85	20.3	0.2	with	10	SDMT050204PN-MJ SDHT050204FN-AJ
ELD05R025M25.0W03	●	3	25	25	59	36	95	24.2	0.3	with	18	

Inserts



Cat. No.	Accuracy	Honing	Stock Coated grades AH725	AH140	Carbide TH10	Dimensions (mm) A	T	rε	Cutter
SDMT050204PN-MJ	M	with	●	●		5.09	2.38	0.4	TPD05... EPD05... ELD05...
SDHT050204FN-AJ	H	without			●	5.09	2.39	0.4	

Replacement parts

Descriptions	Parts Cat. No.
Clamping screw	CSPB-2L043
Wrench	IP-6DB

● : Stocked items.

Relating pages | Technical Reference (15–1)

Standard cutting conditions

Work material	Brinell hardness HB	Grades	Cutting Speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Low carbon steels (C15E4 etc.)	~ 200	**AH725**	230 - 320	0.04 - 0.10
High carbon steels (C45 etc.)	200 ~ 300		150 - 230	
Alloyed steels (42CrMo4 etc.)	150 ~ 300			
Tool steels (X153CrMoV12 etc.)	~ 300		110 - 130	0.03 - 0.09
Stainless steels (X5CrNi18-9 etc.)	–	**AH140**	100 - 200	0.03 - 0.09
Grey cast irons (GG25 etc.)	150 ~ 250	**AH725**	200 - 300	0.05 - 0.12
Ductile cast irons (GGG45 etc.)			160 - 240	
Aluminium alloys (Si < 13%)	–	**TH10**	350 - 500	0.05 - 0.15
Aluminium alloys (Si ≥ 13%)	–		100 - 200	

* 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

Work material	Brinell hardness HB	Grades	Cutting Speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Low carbon steels (C15E4 etc.)	< 200	**AH725**	100 - 250	0.04 - 0.10
High carbon steels (C45 etc.)	200 - 300		100 - 200	
Alloyed steels (42CrMo4 etc.)	150 - 300			
Tool steels (X153CrMoV12 etc.)	< 300		100 - 130	0.03 - 0.09
Stainless steels (X5CrNi18-9 etc.)	-	**AH140**	100 - 150	0.03 - 0.09
Grey cast irons (GG25 etc.)	150 - 250	**AH725**	100 - 250	0.05 - 0.12
Ductile cast irons (GGG45 etc.)			80 - 200	
Aluminium alloys (Si < 13%)	-	**TH10**	200 - 500	0.05 - 0.15
Aluminium alloys (Si ≥ 13%)	-		100 - 200	

TUNGMILL

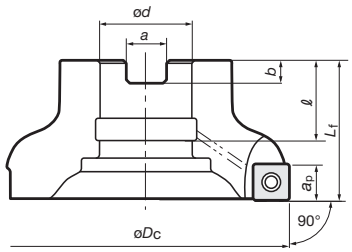
Diameter ø50 ~ 125 mm | 90° 10 mm | Air Hole | P Steel | M Stainless | K Cast Iron | N Non-ferrous

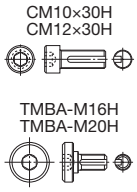
Face Milling | Shoulder Milling

For square shoulder milling of general steels, stainless steels, cast irons and non-ferrous metals

TPW13

Rake angle: A.R. +11.5° R.R. −13° ~ −10.5°





Mill body fixing screw

Max. ap: 10 mm

Right hand (R) shown.

TPW13 (Bore type)

Pitch	Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Mill body fixing screw	Mounting details
Coarse	TPW13R050M22.0E04	●	4	50	22	20	40	6.3	10.4	0.3	With	CM10×30H	9-138Ⓐ
	TPW13R063M22.0E05	●	5	63						0.4			
	TPW13R080M27.0E06	●	6	80	27	22	50	7	12.4	0.8	With	CM12×30H	
	TPW13R100M32.0E07	●	7	100	32	28.5		8	14.4	1.2	With	TMBA-M16H	9-138Ⓑ
	TPW13R125M40.0E08	●	8	125	40	32	63	9	16.4	2.4	With	TMBA-M20H	
Extra close	TPW13R050M22.0E05	●	5	50	22	20	40	6.3	10.4	0.3	With	CM12x30H	9-138Ⓐ
	TPW13R063M22.0E06	●	6	63						0.4			
	TPW13R080M27.0E08	●	8	80	27	22	50	7	12.4	0.8	With	CM12X30H	
	TPW13R100M32.0E10	●	10	100	32	28.5		8	14.4	1.2	With	TMBA-M16H	9-138Ⓑ
	TPW13R125M40.0E12	●	12	125	40	32	63	9	16.4	2.5	With	TMBA-M20H	

Inserts

SWMT1304PDPR-MJ

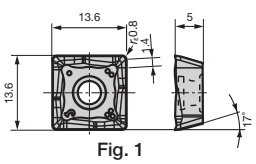


Fig. 1

SWMT1304PDER-ML

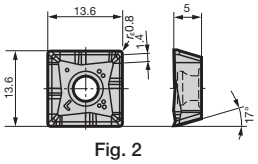


Fig. 2

SWMT1304PDPR-MS

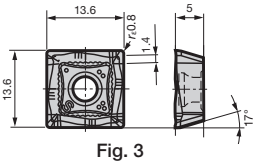


Fig. 3

SWGT1304PDPR-MJ

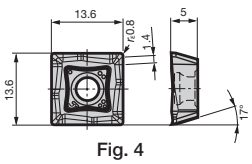


Fig. 4

SWGT1304PDFR-AJ

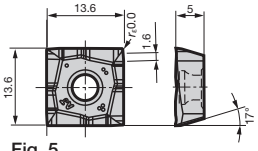


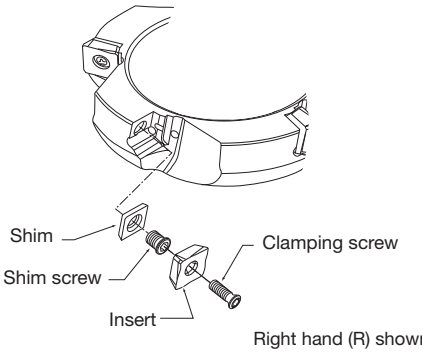
Fig. 5

Right hand (R) shown.

Cat. No.	Accu-racy	Honing	Grades: Coated T3130	T1115	AH120	AH130	AH140	DLC coated DS1100	Cermet NS740	Uncoated KS05F	Figure
SWMT1304PDPR-MJ	M	With	●	●	●	●	●		●		Fig. 1
SWMT1304PDER-ML					●						Fig. 2
SWMT1304PDPR-MS						●	●				Fig. 3
SWGT1304PDPR-MJ	G				●				●		Fig. 4
SWGT1304PDFR-AJ		Without						●		●	Fig. 5

● : Stocked items.

Replacement parts



Right hand (R) shown.

No	Part	Part Cat. No. TPW13R...
①	Shim screw	DTS5-3.5SS
②	Shim	FSSP1102
③	Clamping screw	CSPB-3.5
-	Wrench	P-3.5
-	Wrench	IP-15D

Relating pages | Technical Reference (15–1)

Standard cutting conditions

Work materials	Priority	Grades	Cutting speed v_c (m/min)	Roughing (Depth of cut: > 1.0 mm) Feed per tooth f_z (mm/t)			
				MJ	ML	MS	AJ
Mild & Low carbon steels (St37, etc.) < 180 HB	First choice	AH120	100 - 270	0.05 - 0.25	0.05 - 0.2	-	-
	Priority on wear resistance	T3130	150 - 300	0.05 - 0.25	-	-	-
	Priority on impact resistance	AH130·AH140	80 - 180	0.05 - 0.25	-	0.05 - 0.2	-
	Priority on surface quality	NS740	100 - 300	0.05 - 0.15	-	-	-
Carbon & alloy steels (Ck45, 42CrMo4, etc.) < 300 HB	First choice	AH120	100 - 230	0.05 - 0.2	0.05 - 0.15	-	-
	Priority on wear resistance	T3130	150 - 280	0.05 - 0.2	-	-	-
	Priority on impact resistance	AH130·AH140	80 - 150	0.05 - 0.2	-	-	-
	Priority on surface quality	NS740	100 - 230	0.05 - 0.15	-	-	-
Die steels (X96CrMoV12, etc.) < 30 HRC	First choice	AH120	100 - 180	0.05 - 0.15	0.05 - 0.12	-	-
	Priority on wear resistance	T3130	100 - 180	0.05 - 0.15	-	-	-
Stainless steels (X5CrNi18-10, X5CrNiMo17-13-2 etc.) < 250 HB	First choice	AH130·AH140	80 - 200	0.05 - 0.2	-	0.05 - 0.18	-
	Priority on wear resistance	AH120	150 - 250	0.05 - 0.2	0.05 - 0.15	-	-
Grey cast Irons (GG25, GG30 etc.)	First choice	T1115	180 - 300	0.05 - 0.2	-	-	-
	Priority on impact resistance	AH120	150 - 250	0.05 - 0.2	0.05 - 0.15	-	-
Ductile cast Irons (GGG40, GGG60 etc.)	First choice	T1115	120 - 200	0.05 - 0.2	-	-	-
	Priority on impact resistance	AH120	100 - 180	0.05 - 0.2	0.05 - 0.15	-	-
Aluminium alloys (Si < 13 %)	-	DS1100·KS05F	300 - 1000	-	-	-	0.05 - 0.2
Aluminium alloys (Si ≥ 13%)	-	DS1100·KS05F	80 - 300	-	-	-	0.05 - 0.2
Copper alloys	-	DS1100·KS05F	200 - 500	-	-	-	0.05 - 0.2

Work materials	Priority	Grades	Cutting speed v_c (m/min)	Light cutting to finishing (Depth of cut: < 1.0 mm) Feed per tooth f_z (mm/t)			
				MJ	ML	MS	AJ
Mild & Low carbon steels (St37, etc.) < 180 HB	First choice	AH120	100 - 270	0.05 - 0.2	0.05 - 0.18	-	-
	Priority on wear resistance	T3130	150 - 300	0.05 - 0.2	-	-	-
	Priority on impact resistance	AH130·AH140	80 - 180	0.05 - 0.2	-	0.05 - 0.18	-
	Priority on surface quality	NS740	100 - 300	0.05 - 0.12	-	-	-
Carbon & alloy steels (Ck45, 42CrMo4, etc.) < 300 HB	First choice	AH120	100 - 230	0.05 - 0.18	0.05 - 0.12	-	-
	Priority on wear resistance	T3130	150 - 280	0.05 - 0.18	-	-	-
	Priority on impact resistance	AH130·AH140	80 - 150	0.05 - 0.18	-	-	-
	Priority on surface quality	NS740	100 - 230	0.05 - 0.12	-	-	-
Die steels (X96CrMoV12, etc.) < 30 HRC	First choice	AH120	100 - 180	0.05 - 0.12	0.05 - 0.1	-	-
	Priority on wear resistance	T3130	100 - 180	0.05 - 0.12	-	-	-
Stainless steels (X5CrNi18-10, X5CrNiMo17-13-2 etc.) < 250 HB	First choice	AH130·AH140	80 - 200	0.05 - 0.18	-	0.05 - 0.15	-
	Priority on wear resistance	AH120	150 - 250	0.05 - 0.18	0.05 - 0.12	-	-
Grey cast Irons (GG25, GG30 etc.)	First choice	T1115	180 - 300	0.05 - 0.18	-	-	-
	Priority on impact resistance	AH120	150 - 250	0.05 - 0.18	0.05 - 0.12	-	-
Ductile cast Irons (GGG40, GGG60 etc.)	First choice	T1115	120 - 200	0.05 - 0.18	-	-	-
	Priority on impact resistance	AH120	100 - 180	0.05 - 0.18	0.05 - 0.12	-	-
Aluminium alloys (Si < 13 %)	-	DS1100·KS05F	300 - 1000	-	-	-	0.05 - 0.2
Aluminium alloys (Si ≥ 13%)	-	DS1100·KS05F	80 - 300	-	-	-	0.05 - 0.2
Copper alloys	-	DS1100·KS05F	200 - 500	-	-	-	0.05 - 0.2

Notes:
- When cutting at a large depth of cut or a large cutting width, the cutting speed (v_c) and feed (f_z) 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 such as when machining stainless steel, use a water soluble cutting fluid.
- When wet machining mild steels, carbon steels, and alloy steels, use T3130 at lower cutting conditions.
- TPW13 type TAC mills can not be used for axial-feed cutting such as ramping, plunging, and drilling.

EPH

HYBRIDTACMILL

Diameter ø10 ~ 26 mm

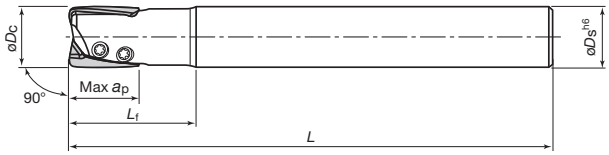
90° 10, 12, 16 mm

P Steel | M Stainless | K Cast Iron | N Non-ferrous

Shoulder Milling | Radius Milling | Slotting | Slotting | Side Milling | Pocketing | Ramping | Plunging | Enlarging Hole

For multi-functional milling of steels, stainless steels, cast irons and aluminium alloys

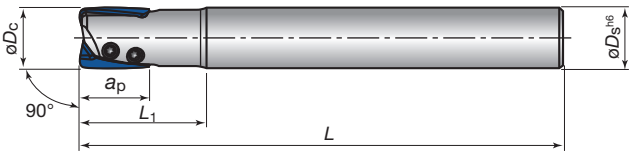
Helix angle 15°



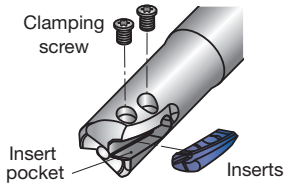
Max. ap: 9-75

Right hand (R) shown.

●Straight type

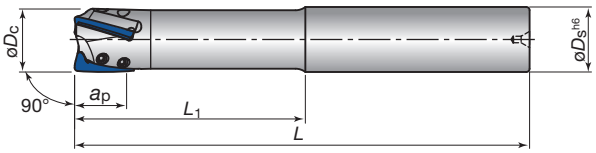


Tool assembly and replacement parts

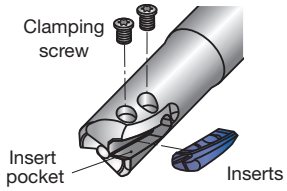


Cat. No.	Stock	No.of inserts	Dimensions (mm) øDc	øDs	Max. ap	L	L_1	Clamping screw (Std. fastening torque)	Wrench	Applicable inserts
EPH11R010M10.0-2	●	2	10	10	10	80	21	CSP-2L033 (0.7 N·m)	IP-6F	XHGR1102□□□R-□□
EPH13R012M12.0-2	●	2	12	12	12	80	25	CSPB-2.2SH (1.1 N·m)	IP-7D	XHGR1302□□□R-□□
EPH18R016M16.0-2	●	2	16	16	16	100	33	CSPB-2.5SH (1.1 N·m)	IP-7D	XHGR18T2□□□R-□□
EPH18R016M16.0-3	●	3	16	16	16	100	33			
EPH18R020M20.0-3	●	3	20	20	16	110	41			
EPH18R025M25.0-4	●	4	25	25	16	120	51			

●Long type



Tool assembly and replacement parts

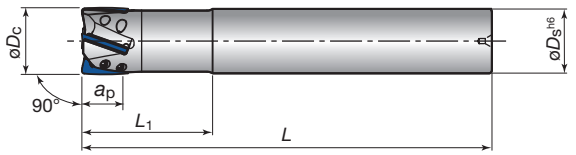


Cat. No.	Stock	No.of inserts	Dimensions (mm) øDc	øDs	Max. ap	L	L_1	Clamping screw (Std. fastening torque)	Wrench	Applicable inserts
EPH11R010M10.0-2L	●	2	10	10	10	100	36	CSP-2L033 (0.7 N·m)	IP-6F	XHGR1102□□□R-□□
EPH13R012M12.0-2L	●	2	12	12	12	110	43	CSPB-2.2SH (1.1 N·m)	IP-7D	XHGR1302□□□R-□□
EPH18R016M16.0-2L	●	2	16	16	16	130	56	CSPB-2.5SH (1.1 N·m)	IP-7D	XHGR18T2□□□R-□□
EPH18R016M16.0-3L	●	3	16	16	16	130	56			
EPH18R020M20.0-3L	●	3	20	20	16	140	71			
EPH18R025M25.0-4L	●	4	25	25	16	160	88.5			

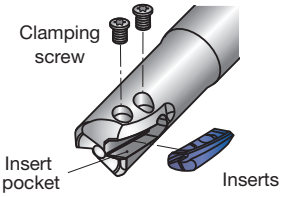
● : Stocked items.

Relating pages | Technical Reference (15–1)

●Undercut type

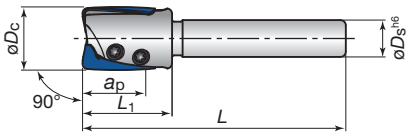


Tool assembly and replacement parts

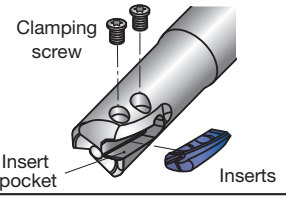


Cat. No.	Stock	No.of inserts	Dimensions (mm) øDc	øDs	Max. ap	L	L_1	Clamping screw (Std. fastening torque)	Wrench	Applicable inserts
EPH13R013M12.0-2	●	2	13	12	12	110	25	CSPB-2.2SH (1.1 N·m)	IP-7D	XHGR1302□□□R-□□
EPH13R014M12.0-2	●	2	14	12	12	110	25			
EPH18R017M16.0-3	●	3	17	16	16	130	33	CSPB-2.5SH (1.1 N·m)	IP-7D	XHGR18T2□□□R-□□
EPH18R018M16.0-3	●	3	18	16	16	130	33			
EPH18R021M20.0-3	●	3	21	20	16	140	41			
EPH18R026M25.0-4	●	4	26	25	16	160	51			

● Reduced shank for automatic lathes

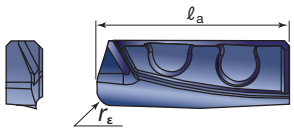


Tool assembly and replacement parts



Cat. No.	Stock	No.of inserts	Dimensions (mm) øDc	øDs	Max. ap	L	L_1	Clamping screw (Std. fastening torque)	Wrench	Applicable inserts
EPH11R010M06.0-2	●	2	10	6	10	50	15	CSP-2L033 (0.7N·m)	IP-6F	XHGR1102□□□R-□□
EPH13R012M07.0-2	●	2	12	7	12	50	17	CSPB-2.2SH (1.1N·m)	IP-7D	XHGR1302□□□R-□□
EPH18R016M10.0-3	●	3	16	10	16	60	22	CSPB-2.5SH (1.1N·m)	IP-7D	XHGR18T2□□□R-□□
EPH18R020M10.0-3	●	3	20	10	16	60	22			

Inserts



Cat. No.	Grade AH730	Dimensions (mm) ℓa	Corner R rε	Applications	Applicable cutter
XHGR110202ER-MJ	●	11	0.2	P Steel, M Stainless, K Cast Iron	EPH11R□□
XHGR110204ER-MJ	●		0.4		
XHGR110205ER-MJ	●		0.5		
XHGR110208ER-MJ	●		0.8		
XHGR110210ER-MJ	●		1.0		
XHGR110212ER-MJ	●		1.2		
XHGR110215ER-MJ	●		1.5		
XHGR110216ER-MJ	●		1.6		
XHGR110220ER-MJ	●		2.0		
XHGR130202ER-MJ	●	13	0.2		EPH13R□□
XHGR130204ER-MJ	●		0.4		
XHGR130205ER-MJ	●		0.5		
XHGR130208ER-MJ	●		0.8		
XHGR130210ER-MJ	●		1.0		
XHGR130212ER-MJ	●		1.2		
XHGR130215ER-MJ	●		1.5		
XHGR130216ER-MJ	●		1.6		
XHGR130220ER-MJ	●		2.0		
XHGR18T202ER-MJ	●	18	0.2		EPH18R□□
XHGR18T204ER-MJ	●		0.4		
XHGR18T205ER-MJ	●		0.5		
XHGR18T208ER-MJ	●		0.8		
XHGR18T210ER-MJ	●		1.0		
XHGR18T212ER-MJ	●		1.2		
XHGR18T215ER-MJ	●		1.5		
XHGR18T216ER-MJ	●		1.6		
XHGR18T220ER-MJ	●		2.0		

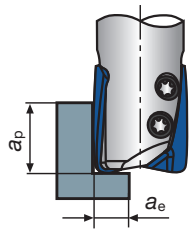
Note: When using inserts with a corner radius in excess of 1 mm, additional work to the cutter body is needed.

Cat. No.	Grade DS1200	Dimensions (mm) ℓa	Corner R rε	Applications	Applicable cutter
XHGR110200FR-AJ	●	11	0	N Non-ferrous	EPH11R□□
XHGR110202FR-AJ	●		0.2		
XHGR110204FR-AJ	●		0.4		
XHGR110205FR-AJ	●		0.5		
XHGR110208FR-AJ	●		0.8		
XHGR110210FR-AJ	●		1.0		
XHGR110212FR-AJ	●		1.2		
XHGR110215FR-AJ	●		1.5		
XHGR110216FR-AJ	●		1.6		
XHGR110220FR-AJ	●		2.0		
XHGR130200FR-AJ	●	13	0		EPH13R□□
XHGR130202FR-AJ	●		0.2		
XHGR130204FR-AJ	●		0.4		
XHGR130205FR-AJ	●		0.5		
XHGR130208FR-AJ	●		0.8		
XHGR130210FR-AJ	●		1.0		
XHGR130212FR-AJ	●		1.2		
XHGR130215FR-AJ	●		1.5		
XHGR130216FR-AJ	●		1.6		
XHGR130220FR-AJ	●		2.0		
XHGR18T200FR-AJ	●	18	0		EPH18R□□
XHGR18T202FR-AJ	●		0.2		
XHGR18T204FR-AJ	●		0.4		
XHGR18T205FR-AJ	●		0.5		
XHGR18T208FR-AJ	●		0.8		
XHGR18T210FR-AJ	●		1.0		
XHGR18T212FR-AJ	●		1.2		
XHGR18T215FR-AJ	●		1.5		
XHGR18T216FR-AJ	●		1.6		
XHGR18T220FR-AJ	●		2.0		

● : Stocked items.

Standard cutting conditions

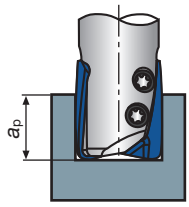
● Shoulder milling



ap: Axial depth of cut
ae: Radial depth of cut

Work material	Cutting speed V_c (m/min)	Feed per tooth f_z (mm/t)	Cutting conditions		
			ø10 ≤ øD_c < ø12	ø12 ≤ øD_c < ø16	ø16 ≤ øD_c ≤ ø26
Carbon steels Alloy steels (< 30HRC)	60 ~ 180	0.03 ~ 0.1	V_c = 120 m/mim, f_z = 0.08 mm/t		
			a_p ≤ 7.5 mm a_e ≤ 1.5 mm	a_p ≤ 9.0 mm a_e ≤ 1.5 mm	a_p ≤ 12.0 mm a_e ≤ 2.0 mm
Alloy steels prehardened steels (30 ~ 40HRC)	50 ~ 150	0.03 ~ 0.08	V_c = 100 m/min, f_z = 0.05 mm/t		
			a_p ≤ 5.5 mm a_e ≤ 1.5 mm	a_p ≤ 6.5 mm a_e ≤ 1.5 mm	a_p ≤ 9.0 mm a_e ≤ 2.0 mm
Stainless steels (< 250HB)	50 ~ 150	0.03 ~ 0.06	V_c = 100 m/min, f_z = 0.04 mm/t		
			a_p ≤ 4.5 mm a_e ≤ 1.5 mm	a_p ≤ 5.5 mm a_e ≤ 1.5 mm	a_p ≤ 7.5 mm a_e ≤ 2.0 mm
Grey cast iron	80 ~ 200	0.03 ~ 0.1	V_c = 140 m/min, f_z = 0.08 mm/t		
			a_p ≤ 9.5 mm a_e ≤ 2.0 mm	a_p ≤ 11.5 mm a_e ≤ 2.0 mm	a_p ≤ 15.5 mm a_e ≤ 3.0 mm
Ductile cast iron	60 - 160	0.03 ~ 0.1	V_c = 110 m/min, f_z = 0.08 mm/t		
			a_p ≤ 9.5 mm a_e ≤ 2.0 mm	a_p ≤ 11.5 mm a_e ≤ 2.0 mm	a_p ≤ 15.5 mm a_e ≤ 3.0 mm
Aluminium alloys (Si < 13%)	100 ~ 300	0.03 ~ 0.1	V_c = 200 m/min, f_z = 0.07 mm/t		
			a_p ≤ 9.5 mm a_e ≤ 2.0 mm	a_p ≤ 11.5 mm a_e ≤ 2.0 mm	a_p ≤ 15.5 mm a_e ≤ 3.0 mm
Aluminium alloys (Si ≥ 13%)	80 ~ 180	0.03 ~ 0.08	V_c = 130 m/min, f_z = 0.06 mm/t		
			a_p ≤ 9.5 mm a_e ≤ 2.0 mm	a_p ≤ 11.5 mm a_e ≤ 2.0 mm	a_p ≤ 15.5 mm a_e ≤ 3.0 mm

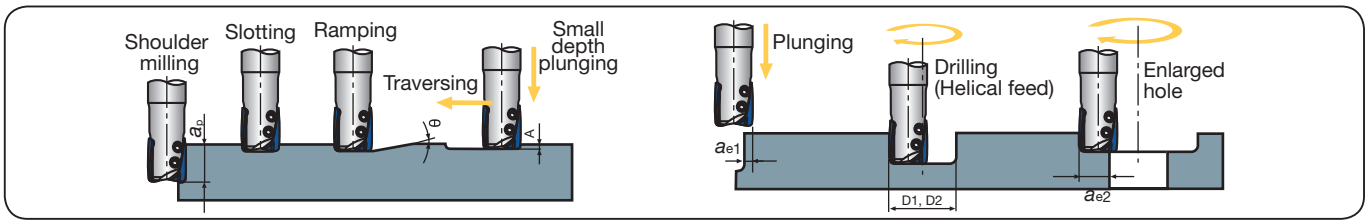
● Slotting



Work material	Cutting speed V_c (m/min)	Feed per tooth f_z (mm/t)	Cutting conditions				
			ø10 ≤ øD_c < ø12	ø12 ≤ øD_c < ø16	ø16 ≤ øD_c ≤ ø18	ø18 < øD_c ≤ ø21	ø21 < øD_c ≤ ø26
Carbon steels Alloy steels (< 30HRC)	60 ~ 180	0.03 ~ 0.1	V_c = 100 m/mim, f_z = 0.06 mm/t				
			a_p ≤ 1.5 mm	a_p ≤ 2.0 mm	a_p ≤ 3.0 mm	a_p ≤ 2.5 mm	a_p ≤ 2.5 mm
Alloy steels prehardened steels (30 ~ 40HRC)	50 ~ 150	0.03 ~ 0.08	V_c = 70 m/min, f_z = 0.05 mm/t				
			a_p ≤ 1.0 mm	a_p ≤ 1.5 mm	a_p ≤ 2.0 mm	a_p ≤ 1.5 mm	a_p ≤ 1.5 mm
Stainless steels (< 250HB)	50 ~ 150	0.03 ~ 0.06	V_c = 70 m/min, f_z = 0.04 mm/t				
			a_p ≤ 1.0 mm	a_p ≤ 1.0 mm	a_p ≤ 1.5 mm	a_p ≤ 1.5 mm	a_p ≤ 1.5 mm
Grey cast iron	80 ~ 200	0.03 ~ 0.1	V_c = 120 m/min, f_z = 0.07 mm/t				
			a_p ≤ 3.5 mm	a_p ≤ 4.0 mm	a_p ≤ 4.5 mm	a_p ≤ 3.5 mm	a_p ≤ 3.0 mm
Ductile cast iron	60 ~ 160	0.03 ~ 0.1	V_c = 80 m/min, f_z = 0.07 mm/t				
			a_p ≤ 3.5 mm	a_p ≤ 4.0 mm	a_p ≤ 4.5 mm	a_p ≤ 3.5 mm	a_p ≤ 3.0 mm
Aluminium alloys (Si < 13%)	100 ~ 300	0.03 ~ 0.1	V_c = 150 m/min, f_z = 0.07 mm/t				
			a_p ≤ 3.5 mm	a_p ≤ 4.0 mm	a_p ≤ 4.5 mm	a_p ≤ 3.5 mm	a_p ≤ 3.0 mm
Aluminium alloys (Si ≥ 13%)	80 ~ 180	0.03 ~ 0.08	V_c = 110 m/min, f_z = 0.06 mm/t				
			a_p 3.5 mm	a_p 4.0 mm	a_p 4.5 mm	a_p 3.5 mm	a_p 3.0 mm

Notes:
- ●When slotting, use a rigid machine.
- ●When chips stay in the cutting zone during slotting or pocketing, use air to remove chips from the work area.
- ●If chips tend to stick to the cutting edge (such as aluminium alloy machining), use a water soluble cutting fluid.
- ●If cutting a casting skin or heavily interrupted work surface, decrease the feed per tooth and maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- ●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 whilst making sure the machine is running normally.

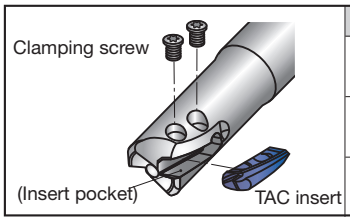
Machining modes



type	Cat. No.	Tool ø øDc (mm)	Max. depth of cut ap (mm)	Max. ramping angle θ	Max. plunging depth A (mm)	Max. cutting width in plunging ae1 (mm)	Min. machinable hole ø øD1 (mm)	Max. machinable hole ø øD2* (mm)	Max. cutting width in enlarged hole ae2* (mm)
Straight	**EPH11R010M10.0-2**	ø10	10	3°	0.3	3	13	19.5	9.7
	EPH13R012M12.0-2	ø12	12	3.5°	0.3	3	16	23.5	11.7
	EPH18R016M16.0-2	ø16	16	3.5°	0.3	4	22	31.5	15.7
	EPH18R016M16.0-3	ø16	16	3.5°	0.3	4	22	31.5	15.7
	EPH18R020M20.0-3	ø20	16	2°	0.3	4	29	39.5	19.7
	EPH18R025M25.0-4	ø25	16	1.5°	0.3	4	39	49.5	24.7
Long	**EPH11R010M10.0-2L**	ø10	10	3°	0.3	3	13	19.5	9.7
	EPH13R012M12.0-2L	ø12	12	3.5°	0.3	3	16	23.5	11.7
	EPH18R016M16.0-2L	ø16	16	3.5°	0.3	4	22	31.5	15.7
	EPH18R016M16.0-3L	ø16	16	3.5°	0.3	4	22	31.5	15.7
	EPH18R020M20.0-3L	ø20	16	2°	0.3	4	29	39.5	19.7
	EPH18R025M25.0-4L	ø25	16	1.5°	0.3	4	39	49.5	24.7
Undercut	**EPH13R013M12.0-2**	ø13	12	2°	0.3	3	17	25.5	12.7
	EPH13R014M12.0-2	ø14	12	1.5°	0.3	3	19	27.5	13.7
	EPH18R017M16.0-3	ø17	16	3°	0.3	4	23	33.5	16.7
	EPH18R018M16.0-3	ø18	16	2.5°	0.3	4	25	35.5	17.7
	EPH18R021M20.0-3	ø21	16	2°	0.3	4	31	41.5	20.7
	EPH18R026M25.0-4	ø26	16	1.5°	0.3	4	41	51.5	25.7
For automatic lathes	**EPH11R010M06.0-2**	ø10	10	3°	0.3	3	13	19.5	9.7
	EPH13R012M07.0-2	ø12	12	3.5°	0.3	3	16	23.5	11.7
	EPH18R016M10.0-3	ø16	16	3.5°	0.3	4	22	31.5	15.7
	EPH18R020M10.0-3	ø20	16	2°	0.3	4	29	39.5	19.7

*Where the insert corner radius ≤ 0.2 mm

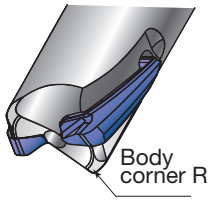
Replacement parts



Cat. No.	Clamping screw	Wrench
EPH11R010**	CSP-2L033	IP-6F
EPH13R012**	CSPB-2.2SH	IP-7D
EPH18R016**	CSPB-2.5SH	IP-7D

Notes on using large radius inserts

When using the inserts which have a large corner radius in excess of 1.0 mm, additional work is needed to the corner of the body.

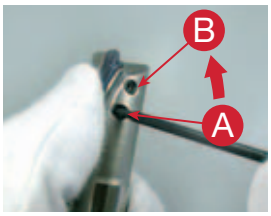


Insert corner radius r_ε (mm)	Required rework to body corner R (mm)
$0 \le r_\varepsilon \le 1.0$	No additional work
$1.0 < r_\varepsilon \le 2.0$	R2.0

Insert mounting procedure (EPH-type)

Fasten the inserts in order of Ⓐ to Ⓑ

①After loosening the clamping screws, insert the insert in the insert pocket of the body whilst pushing it with your finger.
②Lightly fasten the clamping screws in order of A and B.
③For all the inserts, carry out the above steps ① and ②.
④Securely tighten the clamping screws in order of Ⓐ and Ⓑ.
(Refer to the standard tightening torque values.)
⑤For all the inserts, carry out the above step ④.
⑥Check the condition of insert seating, clearance between the insert and insert pocket, the tool diameter, and the peripheral edge runout.



EVH

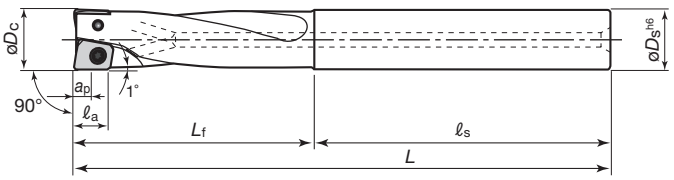
HYBRIDTACMILL

Diameter ø10 ~ 16 mm | 90° ~ 4.5 mm | Air Hole | P Steel | M Stainless | K Cast Iron | N Non-ferrous

Shoulder Milling | Slotting | Side Milling | Pocketing | Ramping | Plunging | Enlarging Hole | Drilling

For multi-functional milling of steels, stainless steels, cast irons and aluminium alloys

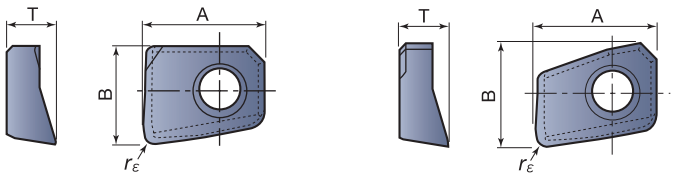
Rake angle: A.R. + 20° R.R. + 12°



Right hand (R) shown.

Cat. No.	Stock	No. of inserts	Dimensions (mm) Tool dia. øDc	Shank dia. øDs	Effective edge length ap	Max. edge length ℓa	Overall length L	Neck length Lf	Shank length ℓs	Clamping screw (Std. fastening torque)	Wrench	Applicable inserts
EVH06R010M10.0-02	●	2	10	10	3	5	90	40	50	CSPD-1.8S (0.7N·m)	IP-6F	XVGT06H205□□-□□
EVH07R012M12.0-02	●	2	12	12	3.5	6	98	48	50	CSPB-2H (0.7N·m)	IP-6F	XVGT07X305□□-□□
EVH09R016M16.0-02	●	2	16	16	4.5	8	124	64	60	CSPB-2.5S (1.3N·m)	IP-8D	XVGT09X405□□-□□

Inserts

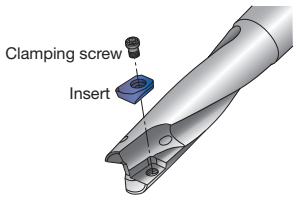


Center edge inserts | Peripheral edge inserts

	Cat. No.	Grade AH730	Dimensions (mm) A	B	T	Corner R rε	Application	Applicable cutter
Center edge	XVGT06H205EC-MJ	●	6.2	5	2.5	0.5	P Steel, M Stainless, K Cast Iron	EVH06R010M10.0-02
Center edge	XVGT07X305EC-MJ	●	7.1	6.1	3			EVH07R012M12.0-02
Center edge	XVGT09X405EC-MJ	●	9	8.2	4			EVH09R016M16.0-02
Peripheral edge	XVGT06H205EP-MJ	●	6.2	5.3	2.5	0.5		EVH06R010M10.0-02
Peripheral edge	XVGT07X305EP-MJ	●	7.1	6.4	3			EVH07R012M12.0-02
Peripheral edge	XVGT09X405EP-MJ	●	9	8.2	4			EVH09R016M16.0-02

	Cat. No.	Grade DS1200	Dimensions (mm) A	B	T	Corner R rε	Application	Applicable cutter
Center edge	XVGT06H205FC-AJ	●	6.2	5	2.5	0.5	N Non-ferrous	EVH06R010M10.0-02
Center edge	XVGT07X305FC-AJ	●	7.1	6.1	3			EVH07R012M12.0-02
Center edge	XVGT09X405FC-AJ	●	9	8.2	4			EVH09R016M16.0-02
Peripheral edge	XVGT06H205FP-AJ	●	6.2	5.3	2.5	0.5		EVH06R010M10.0-02
Peripheral edge	XVGT07X305FP-AJ	●	7.1	6.4	3			EVH07R012M12.0-02
Peripheral edge	XVGT09X405FP-AJ	●	9	8.2	4			EVH09R016M16.0-02

Replacement parts



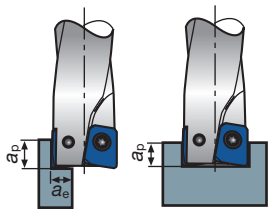
Cat. No.	Clamping screw	Wrench
EVH06R010**	CSPD-1.8S	IP-6F
EVH07R012**	CSPB-2H	IP-6F
EVH09R016**	CSPB-2.5S	IP-8D

● : Stocked items.

Relating pages | Technical Reference (15–1)

Standard cutting conditions

●Shoulder milling, Slotting

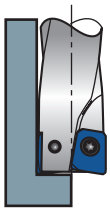


Side cutting Slotting

a_p: Axial depth of cut
a_e: Radial depth of cut

Work material		Carbon steels and alloy steels		Alloy steels and prehardened steelst		Stainless steels		Cast irons		Aluminium alloys (Si < 13%)		Aluminium alloys (Si ≥ 13%)	
Hardness		< 30HRC		30 ~ 40HRC		< 250HB		–		–		–	
Cutting speed		V_c = 50 ~ 120 m/min		V_c = 30 ~ 100 m/min		V_c = 50 ~ 120 m/min		V_c = 60 ~ 140 m/min		V_c = 100 ~ 300 m/min		V_c = 100 ~ 200 m/min	
Conditions		No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min
Tool dia. (mm)	ø10	2550	380	1910	190	2550	380	3180	510	6370	1020	4770	670
	ø12	2120	320	1590	160	2120	320	2650	420	5300	850	3980	560
	ø16	1590	240	1190	120	1590	240	1990	320	3980	640	2980	420
Depth of cut	Side cutting	a_p < 0.25D a_e < 0.2D		a_p < 0.25D a_e < 0.2D		a_p < 0.25D a_e < 0.2D		a_p < 0.25D a_e < 0.3D		a_p < 0.25D a_e < 0.3D		a_p < 0.25D a_e < 0.3D	
	Slotting	a_p < 0.1D		a_p < 0.1D		a_p < 0.1D		a_p < 0.15D		a_p < 0.2D		a_p < 0.2D	

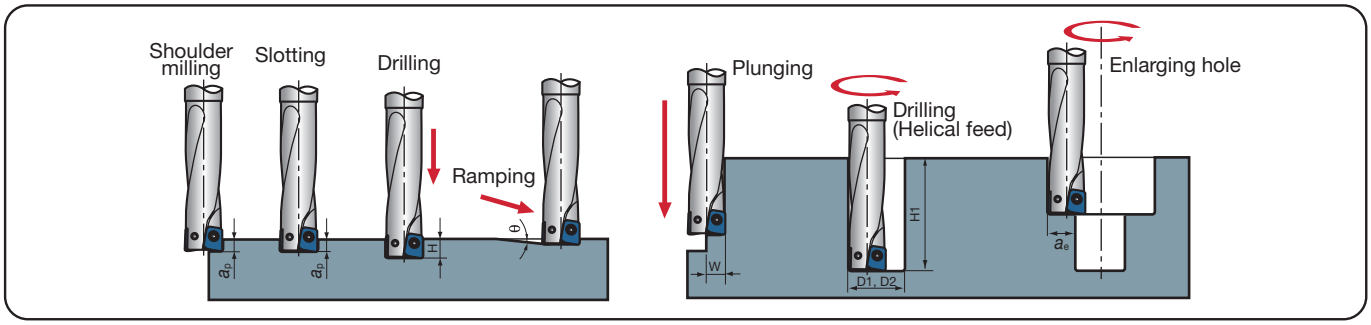
●Drilling•Plunging



Work material		Carbon steels and alloy steels		Alloy steels and prehardened steelst		Stainless steels		Cast irons		Aluminium alloys (Si < 13%)		Aluminium alloys (Si ≥ 13%)	
Hardness		< 30HRC		30 ~ 40HRC		< 250HB		–		–		–	
Cutting speed		V_c = 50 ~ 120 m/min		V_c = 30 ~ 100 m/min		V_c = 50 ~ 120 m/min		V_c = 60 ~ 140 m/min		V_c = 100 ~ 300 m/min		V_c = 100 ~ 300 m/min	
Conditions		No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min	No. of rev. n min^{-1}	Feed speed V_f mm/min
Tool dia. (mm)	ø10	2550	130	1910	80	2550	130	3180	190	6370	450	4770	290
	ø12	2120	110	1590	65	2120	110	2650	160	5300	370	3980	240
	ø16	1590	80	1190	50	1590	80	1990	120	3980	280	2980	180

Note:
- In slotting or pocketing where chips tend to stay in the cutting zone, use an air blast to remove chips to prevent chip recutting.
- When chips tend to weld excessively on the cutting edge such as in machining aluminium alloys, use a water soluble cutting fluid.
- In the case of cutting a casting skin or a heavily interrupted work surface, decrease the feed per tooth and the maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- 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 whilst making sure that the machine is running normally.

Machining modes



Cat. No.	Tool dia.	Effective edge length a_p (mm)	Max.drilling depth H (mm)	Max.cutting width in plunging W (mm)	Max. ramping angle θ	Min. machinable hole dia. øD1 (mm)	Min. machinable hole dia. øD2 (mm)	Max. cutting width in enlarging hole a_e (mm)	Max.depth of boring H1 (mm)
EVH06R010M10.0-02	ø10	3	5	5	5°	12	19	9	30
EVH07R012M12.0-02	ø12	3.5	6	6	5°	14	23	11	36
EVH09R016M16.0-02	ø16	4.5	8	8	5°	18	31	15	48

All PCD-tipped TAC Mills for high feeds

DPD15・EDPD15

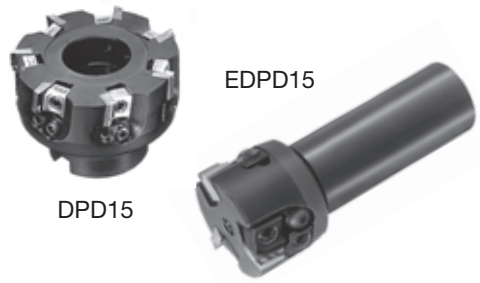
Diameter ø50~315 mm

90° 7 mm

N Non-ferrous

Face Milling | Face Milling | Shoulder Milling

For high speed milling of aluminium alloys and non-ferrous metals



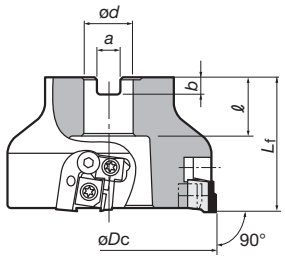


Fig. A

Max. ap: 7 mm

Rake angle: DPD A.R. + 8.5° R.R. + 5
EDPD A.R. + 7° R.R. 0°

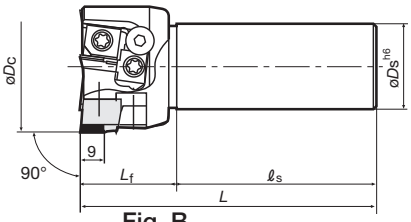


Fig. B

Right hand (R) shown.

DPD15 (Fig. A: bore type)

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
DPD15080R-E		4	80	27	26	40	7	12.4	1.2	9-138Ⓐ
DPD15100R-E			100	32	28.5		8	14.4	2.2	
DPD15125R-E		6	125	40	32	63	9	16.4	3.6	9-138Ⓑ
DPD15160R-E			160		29				5.2	
DPD15200R-E		8	200	60	38		14	25.7	8.2	9-138Ⓒ
DPD15250R-E		10	250						13.4	
DPD15315R-E		12	315						22.5	9-138Ⓓ

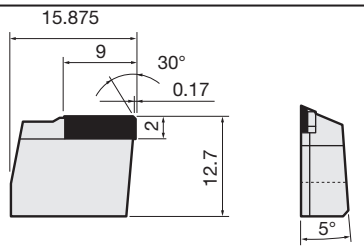
Note: Use hexagon-socket head screw CM12×30 for fitting the cutter to AO-3M/W, CM16×40 for fitting the cutter to AO-4M/W.

EDPD15 (Fig. B: shank type)

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øDs	ℓs	Lf	L
EDPD15050R/L		3	50	32	80	35	115
EDPD15063R/L		4	63				

Inserts

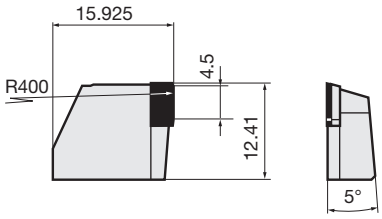
General insert



Right hand (R) shown.

Cat. No.	Grade	Stock
	T-DIA	R
YDEN1505PDFR/L-D	DX140	●

Wiper insert



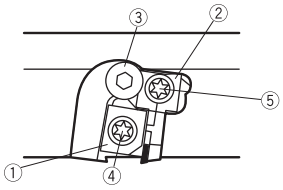
Right hand (R) shown.

Cat. No.	Grade	Stock
	T-DIA	R
YDEN1505PDFR/L-WD	DX140	●

"DX140" : Packing Quantity = 1pcs.

● : Stocked items.

Replacement parts



Right hand (R) shown.

No.	Parts	Part Cat. No. DPD15	EDPD15
①	Insert locking wedge	FW304R-D	FW304R-D
②	Locator adjusting wedge	FW325R-D	FW325R-D
③	Screw for preventing wedge from flying out	BHM615-GT	BHM611-GT
④	Wedge fixing screw (øD = 80)	FDS-8ST-18	FDS-8SST
	Wedge fixing screw (for øD > 80)	FDS-8ST	–
⑤	Adjusting wedge fixing screw	FDS-8ST-18	FDS-8SST
–	Wrench	T-27T	T-27T

Relating pages | Technical Reference (15–1)

Standard cutting conditions

DPD15/EDPD15

Work material		Grades	Cutter dia. $øD_c$	50	63	80	100	125	160	200	250	315
Aluminium alloys	(Si < 13%)	DX140 (T-DIA)	Maximum cutting speed v_{cmax} (m/min)	3100	3900	4000						
			Maximum No. of revolution n_{max} (min^{-1})	19700		16000	12700	10200	8000	6400	5100	4000
			Depth of cut a_p (mm)	~ 7								
			Feed per tooth f_z (mm/t)	0.05 ~ 0.2								
	(Si ≥ 13%)		Cutting speed v_c (m/min)	200 ~ 500								

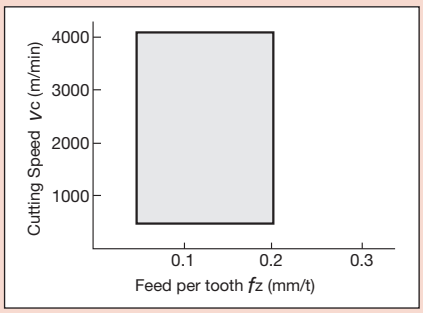
- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

Applicable work materials

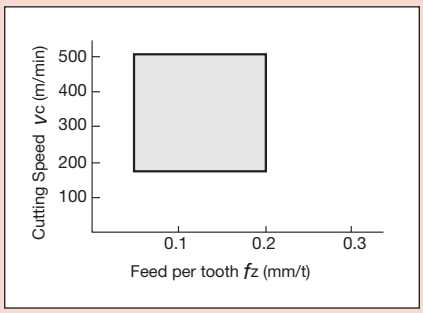
Aluminium alloys (Si < 13%)	Cast aluminium alloys: JIS AC2C–T6, AC4B–T6, etc. Aluminium die castings: JIS ADC12, etc. Various forged and rolled workpiece: 2017, 5056, 7075, etc.
Aluminium alloys (Si ≥ 13%)	A390, etc. (Use at speeds up to 500 m/min)
Non-ferrous metals	Copper alloys, etc.

Cutting condition range

[Aluminium alloys (Si < 13%)] (Insert grade: DX140 (T-DIA))



[Aluminium alloys (Si ≥ 13%)] (Insert grade: DX140 (T-DIA))



Notes: • Wet cutting is recommended. Use a water-soluble cutting fluid.
• Dry cutting is also possible. However, wet cutting excels in chipbreaking and attaining superior surface quality.

Cautionary points for use

- To avoid the danger of unbalanced revolution, the TAC mill should not be used in a state of reduced number of inserts.
- Use the cutter within the maximum revolutions written on the cutter body.
- When using the cutter at a cutting speed less than v_c = 1500 m/min, the balance quality of the arbor and toolholder should be prepared within class G16.
- When installing the inserts, recommended clamping torque for the wedge fixing screw is 9.8 N·m.

TAC Mills for large depth of cut

TPP16RIE

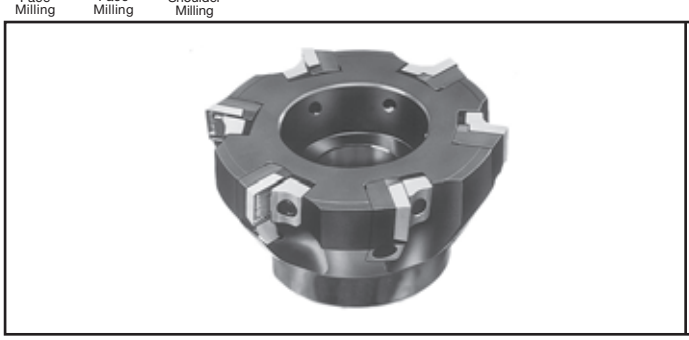
Diameter ø80 ~ 315 mm

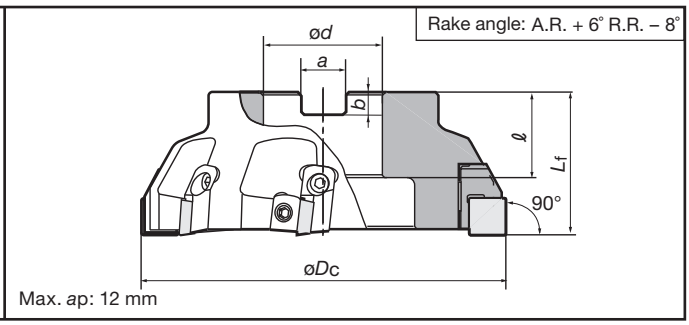
90° 12 mm

P Steel | K Cast Iron | M Stainless

Face Milling | Face Milling | Shoulder Milling

For large depth, square shoulder milling of general steels, cast irons and stainless steels

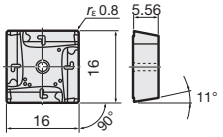




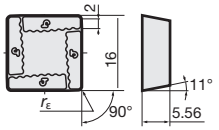
Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
TPP16080RIE	●	4	80	27	26	50	7	12.4	1.0	9-138Ⓑ
TPP16100RIE	●	5	100	32	32	63	8	14.4	1.8	
TPP16125RIE	●	6	125	40			9	16.4	2.8	
TPP16160RIE	●	8	160		29				4.6	
TPP16200RIE	●	10	200	60	38		14	25.7	6.9	9-138Ⓒ
TPP16250RIE	●	12	250						13.0	
TPP16315RIE	●	14	315						22.2	9-138Ⓓ

Inserts

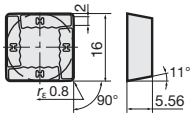
SPMR1605PPPR-ML



SPMR1605PPTR-MJ

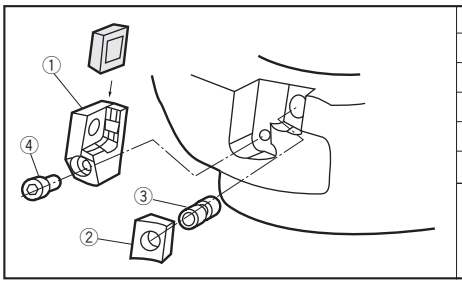


SPMR1605PPTR-MH



Cat. No.	Accu-racy	Honing	Grades: Coated T3130	Coated T1115	Coated GH330	Uncoated UX30
SPMR1605PPPR-ML	M	With			●	
SPMR1605PPTR-MJ			●	●	●	●
SPMR1605PPTR-MH			●		●	●

Replacement parts



No.	Descriptions	Cat. No
①	Locator	LPP16R
②	Insert locking wedge	WPP16R
③	Wedge fixing screw	FDS-8S (FDS-8SS)
④	Locator fixing screw	CM5X0.8X12
–	T-handle wrench	TP-4

Notes : Part cat. No. in ( ) is used for TPP16080R and TPP16100RIE.

● : Stocked items.

Relating pages | Technical Reference (15–1)

Standard cutting conditions

●For MJ-chipbreaker inserts (General purpose)

Work materials	Grades	Roughing (Depth of cut: ap > 1.5 mm)		Finishing (Depth of cut: ap = 0.3 ~ 0.7 mm)	
		Cutting speed vc (m/min)	Feed per tooth fz (mm/t)	Cutting speed vc (m/min)	Feed per tooth fz (mm/t)
Mild steels Unhardened steels (< 180 HB)	**GH330**	100 ~ 230	0.1 ~ 0.25	130 ~ 250	0.1 ~ 0.3
	T3130	130 ~ 300	0.1 ~ 0.28	180 ~ 300	
	UX30	100 ~ 180	0.1 ~ 0.25	130 ~ 200	
Carbon steels Alloy steels (< 300 HB)	**GH330**	100 ~ 180	0.1 ~ 0.2	130 ~ 200	0.1 ~ 0.28
	T3130	130 ~ 280	0.1 ~ 0.25	180 ~ 280	
	UX30	80 ~ 130	0.1 ~ 0.2	100 ~ 150	
Die steels (< 30 HRC)	**GH330**	100 ~ 150	0.1 ~ 0.18	100 ~ 150	0.1 ~ 0.2
	UX30	80 ~ 130		80 ~ 130	
Cast irons Ductile cast irons	**T1115**	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
	UX30	80 ~ 130	0.1 ~ 0.2	80 ~ 130	
Stainless steels (< 250 HB)	**GH330**	150 ~ 200	0.15 ~ 0.23	200 ~ 250	0.15 ~ 0.25

●For ML-chipbreaker inserts (Sharpness-priority)

Work materials	Grades	Roughing (Depth of cut: ap > 1.5 mm)		Finishing (Depth of cut: ap = 0.3 ~ 0.7 mm)	
		Cutting speed vc (m/min)	Feed per tooth fz (mm/t)	Cutting speed vc (m/min)	Feed per tooth fz (mm/t)
Mild steels Unhardened steels (< 180 HB)	**GH340**	100 ~ 200	0.05 ~ 0.17	100 ~ 230	0.05 ~ 0.2
	GH330	130 ~ 230		150 ~ 250	
	AH330	130 ~ 370		150 ~ 400	
Carbon steels Alloy steels (< 300 HB)	**GH340**	100 ~ 170	0.05 ~ 0.12	100 ~ 200	0.05 ~ 0.15
	GH330	150 ~ 180		150 ~ 200	
Stainless steels (< 250 HB)	**GH340**	100 ~ 170	0.05 ~ 0.12	100 ~ 200	0.05 ~ 0.15
	GH330	150 ~ 200		200 ~ 250	

●For MH-chipbreaker inserts (Toughness-priority)

Work materials	Grades	Roughing (Depth of cut: ap > 1.5 mm)		Finishing (Depth of cut: ap = 0.3 ~ 0.7 mm)	
		Cutting speed vc (m/min)	Feed per tooth fz (mm/t)	Cutting speed vc (m/min)	Feed per tooth fz (mm/t)
Mild steels Unhardened steels (< 180 HB)	**GH330**	100 ~ 230	0.15 ~ 0.3	130 ~ 250	0.15 ~ 0.35
	T3130	130 ~ 300	0.15 ~ 0.33	180 ~ 300	0.15 ~ 0.38
	UX30	100 ~ 180	0.15 ~ 0.3	130 ~ 200	0.15 ~ 0.35
Carbon steels Alloy steels (< 300 HB)	**GH330**	100 ~ 180	0.15 ~ 0.24	130 ~ 200	0.15 ~ 0.35
	T3130	130 ~ 280	0.15 ~ 0.3	180 ~ 280	
	UX30	80 ~ 130	0.15 ~ 0.24	100 ~ 150	
Die steels (< 30 HRC)	**GH330**	100 ~ 150	0.15 ~ 0.22	100 ~ 150	0.15 ~ 0.28
	UX30	80 ~ 130		80 ~ 130	
Cast irons Ductile cast irons	**T1115**	100 ~ 200	0.15 ~ 0.24	100 ~ 200	0.15 ~ 0.3
	UX30	80 ~ 130	0.15 ~ 0.24	80 ~ 130	

Notes:
- As a rule, dry cutting (or air-blowing) is generally recommended.
- If a cutting fluid is used, the cutting speed should be set to the lower side of the values shown in the above table.
- When being used in square shoulder milling, climb milling is recommended.
- In square shoulder milling of stainless steel, when chips tend to be recut during cutting, change to up-milling mode.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

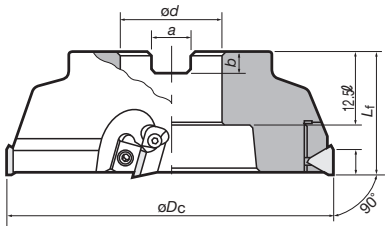
TSE3000R(IA)E

Diameter ø50 ~ 100 mm | 90° 8 mm | P Steel | M Stainless | K Cast Iron | N Non-ferrous

Face Milling | Shoulder Milling

For square shoulder milling of general steels, stainless steels, cast irons and non-ferrous metals

Rake angle: A.R. + 17° R.R. + 5°



Max. ap: 8 mm

Right hand (R) shown.

TSE3000 I (Irregular pitch)

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
TSE3050RE	●	3	50	22	20	40	6.3	10.4	0.3	9-138Ⓐ
TSE3063RE	●	3	63						0.5	
TSE3003RIAE	●	4	80	27	26	50	7	12.4	1.0	
TSE3004RIAE	●	6	100	32	32	63	8	14.4	2.0	

Note: TSE3050R/L and TSE3063R/L are not irregular pitch spec.

Inserts

TECN1603PETR

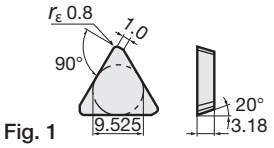


Fig. 1

TECN1603PEFR-D

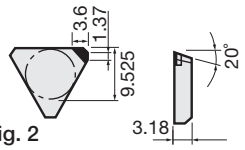


Fig. 2

TEKR1603PEPR-MS

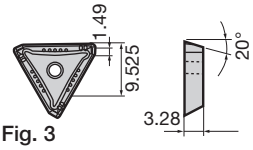


Fig. 3

Corner details

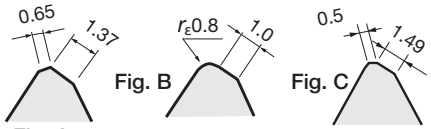


Fig. A Fig. B Fig. C

Right hand (R) shown.

Cat. No.	ISO Cat. No. (Metric)	Corner Detail	Accuracy	Honing	Grades: Coated T3130	T1115	AH120	AH130	AH140	AH330	GH330	Cermet NS740	N308	Uncoated UX30	TH10	T-DIA DX140	DX160	Shape
TECN32ZTR	TECN1603PETR	Fig. B	C	With								●	●	●				Fig. 1
TECN32ZFR	TECN1603PEFR	Fig. A		Without											●			
TECN32ZFR-DIA	TECN1603PEFR-D															●		Fig. 2
TEEN32ZTR	TEEN1603PETR	Fig. B	E	With	●	●	●	●	●	●	●	●	●	●				Fig. 1
TEEN32ZFR	TEEN1603PEFR	Fig. A		Without											●			
TEKR1603PEPR-MS		Fig. C	K	With					●									Fig. 3

Note: T-DIA is trade name for Tungaloy's PCD grade. Available in one-corner type.

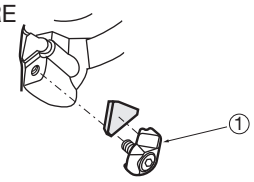
"DX140","DX160" : Packing Quantity = 1 pcs.

● : Stocked items.

Relating pages | Technical Reference (15–1)

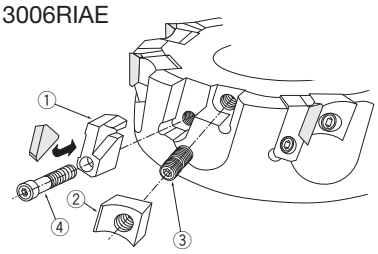
Replacement parts (Used for TSE3000IA·TSE4000IA)

TSE3050E ~ TSE3063RE



No.	Descriptions	Cat. No.
①	Clamp-set	CSL-4
–	Wrench	P-3

TSE3003RIAE ~ 3006RIAE



No.	Descriptions	Cat. No.
①	Locator	LE303R
②	Insert locking wedge	WF330R
③	Wedge fixing screw	FDS-8S
④	Locator fixing screw	CM4X0.7X12
–	T-handle	TP-4

- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

Standard cutting conditions

Applied to cutter dia. ≥ ø50 mm

Work materials	Grades	Roughing (Depth of cut: > 1.5mm)		Finishing (Depth of cut: 0.3 ~ 0.7 mm)	
		Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)	Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)
Mild steels Unhardened steels (< 180 HB)	AH120 • GH330	130 ~ 230	0.1 ~ 0.2	130 ~ 250	0.1 ~ 0.23
	T3130	130 ~ 300	0.1 ~ 0.23	150 ~ 300	0.1 ~ 0.25
	NS740 • N308	130 ~ 200	0.1 ~ 0.18	150 ~ 250	0.1 ~ 0.2
	UX30 • AH130	100 ~ 180	0.1 ~ 0.2	130 ~ 200	0.1 ~ 0.23
Carbon steels Alloy steels (< 300 HB)	AH120 • GH330	100 ~ 200	0.1 ~ 0.18	130 ~ 230	0.1 ~ 0.2
	T3130	130 ~ 280	0.1 ~ 0.2	180 ~ 280	0.1 ~ 0.23
	NS740 • N308	100 ~ 150	0.1 ~ 0.15	150 ~ 200	0.1 ~ 0.18
	UX30	80 ~ 130	0.1 ~ 0.18	100 ~ 150	0.1 ~ 0.2
Die steels (< 30 HRC)	T3130 • AH120	100 ~ 150	0.1 ~ 0.15	100 ~ 150	0.1 ~ 0.2
	UX30	80 ~ 130		80 ~ 130	
Stainless steels (< 250 HB)	AH130 • AH140	80 ~ 180	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
	AH120 • GH330	150 ~ 200	0.1 ~ 0.18	200 ~ 250	
Cast irons	T1115	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.2
	TH10	80 ~ 130		80 ~ 130	0.1 ~ 0.25
Aluminium alloys (Si < 13%)	TH10	200 ~ 1000	0.05 ~ 0.25	350 ~ 1000	0.1 ~ 0.25
	DX140		0.05 ~ 0.15		0.1 ~ 0.2
Copper alloys	TH10	200 ~ 500	0.1 ~ 0.15	200 ~ 500	0.1 ~ 0.2

Note:
- Dry cutting is recommended except for aluminium alloys
- Maximum depth of cut for TECN32ZFR-DIA is 2.5 mm.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

● : Stocked items.

TSE4000RIAE

Diameter ø80 ~ 160mm

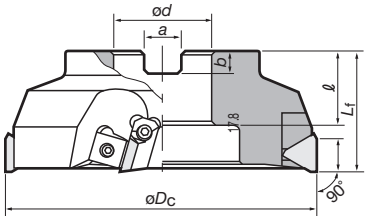
90° 10 mm

P Steel | M Stainless | K Cast Iron | N Non-ferrous

Face Milling | Shoulder Milling

For large depth, square shoulder milling of general steels, stainless steels, cast irons and non-ferrous metals

Rake angle: TSE A.R. + 17° R.R. + 5°
Rake angle: ESE A.R. + 17° R.R. + 1° ~ + 4°



Max. ap: 10 mm

Right hand (R) shown.

TSE4000 I A (Bore type, Irregular pitch)

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
TSE4003RIAE	●	4	80	27	26	50	7	12.4	1.0	9-138Ⓐ
TSE4004RIAE	●	6	100	32	32	63	8	14.4	1.9	
TSE4005RIAE	●		125	40			9	16.4	2.9	9-138Ⓑ
TSE4006RIAE	●	8	160		29				4.9	9-138Ⓒ

Inserts

TE□N43Z□R/L

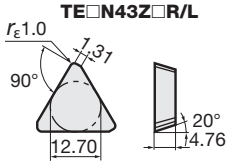


Fig. 1

TECN2204PEFR-D

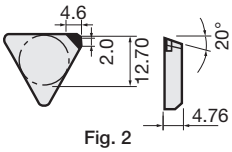


Fig. 2

TEKR2204PEPR-MS

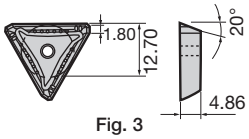


Fig. 3

Corner details

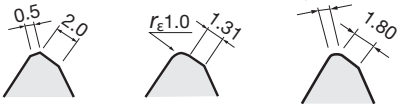


Fig. A | Fig. B | Fig. C

Right hand (R) shown.

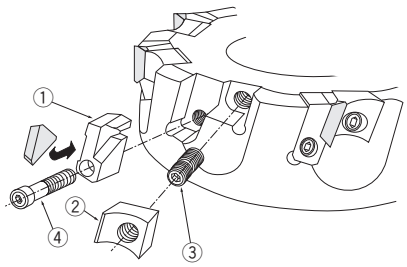
Note: E-class insert are a little different from above figure in detail.

Cat. No.	ISO Cat. No. (Metric)	Corner Detail	Accuracy	Honing	Grades: Coated T3130	T1115	AH120	AH130	AH140	AH330	GH330	Cermet NS740	N308	Uncoated UX30	T-DIA TH10	DX140	DX160	Shape
TECN43ZTR	TECN2204PETR	Fig. B	C	With								●	●	●				Fig. 1
TECN43ZFR	TECN2204PEFR	Fig. A		Without											●			
TECN43ZFR-DIA	TECN2204PEFR-D															●	▲	Fig. 2
TEEN43ZTR	TEEN2204PETR	Fig. B	E	With	●	●	●	●	●	●	●	●	●	●				Fig. 1
TEEN43ZFR	TEEN2204PEFR	Fig. A		Without											●			
TEKR2204PEPR-MS		Fig. C	K	With					●									Fig. 3

Note: T-DIA is trade name for Tungaloy's PCD grade.Available in one-corner type

"DX140","DX160" : Packing Quantity = 1 pcs.

Replacement parts



No	Descriptions	Cat. No. TSE4003RIAE TSE4004RIAE	TSE4005RIAE ~TSE4006RIAE
①	Locator	LE403R	LE405R
②	Insert locking wedge	WF330N	WF500R
③	Wedge fixing screw	FDS-8S	FDS-8S
④	Locator fixing screw	CM4X0.7X14	CM4X0.7X14
–	T-handle wrench	TP-4	TP-4

● : Stocked items.
▲ : Shortly unavailable

Standard cutting conditions

Work materials	Grades	Roughing (Depth of cut *ap*: > 1.5 mm)		Finishing (Depth of cut *ap*: 0.3 ~ 0.7 mm)	
		Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)	Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)
Mild steels Unhardened steels (< 180 HB)	**AH330**	130 ~ 370	0.1 ~ 0.2	150 ~ 400	0.1 ~ 0.23
	AH120 • GH330	130 ~ 230		150 ~ 250	
	T3130	130 ~ 300	0.1 ~ 0.23	180 ~ 300	0.1 ~ 0.25
	NS740 • N308	130 ~ 200	0.1 ~ 0.18	150 ~ 250	0.1 ~ 0.2
	UX30 • AH140	100 ~ 180	0.1 ~ 0.2	130 ~ 200	0.1 ~ 0.23
Carbon steels Alloy steels (< 300 HB)	**AH330**	100 ~ 300	0.1 ~ 0.18	150 ~ 320	0.1 ~ 0.2
	AH120 • GH330	100 ~ 180		150 ~ 200	
	T3130	130 ~ 280	0.1 ~ 0.2	180 ~ 280	0.1 ~ 0.23
	AH140	80 ~ 130	0.1 ~ 0.18	100 ~ 200	0.1 ~ 0.18
	NS740 • N308	100 ~ 150	0.1 ~ 0.15	150 ~ 200	0.1 ~ 0.18
	UX30	80 ~ 130	0.1 ~ 0.18	100 ~ 150	0.1 ~ 0.2
Die steels (< 30 HRC)	**AH330**	100 ~ 250	0.1 ~ 0.15	100 ~ 250	0.1 ~ 0.2
	T3130 • AH120 • GH330	100 ~ 150		100 ~ 150	
	UX30	80 ~ 130		80 ~ 130	
Stainless steels (< 250 HB)	**AH130 • AH140**	80 ~ 180	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
	AH120	150 ~ 200	0.1 ~ 0.18	200 ~ 250	
Cast irons Ductile cast irons	**T1115**	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
	TH10	80 ~ 130		80 ~ 130	
Aluminium alloys (Si < 13%)	**TH10**	200 ~ 1000	0.05 ~ 0.25	350 ~ 1000	0.1 ~ 0.25
	DX140		0.05 ~ 0.15		0.1 ~ 0.2
Copper alloys	**TH10**	200 ~ 500	0.1 ~ 0.15	200 ~ 500	

Note:
- Dry cutting is recommended for all materials except for aluminium alloys.
- Maximum depth of cut for TECN2204PEFR-D is 3.5 mm.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

TPS/EPS17

Diameter ø25 ~ 63 mm | 90° | Air Hole

P Steel | M Stainless | K Cast Iron | N Non-ferrous

Shoulder Milling | Radius Milling | Slotting | Slotting | Side Milling | Pocketing | Ramping | Plunging | Enlarging Hole

For multi-functional milling of general steels, stainless steels, cast irons and aluminium alloys

TPS

EPS

Rake angle: EPS11: A.R. +9° ~ +17.5° R.R. -20° ~ -7°

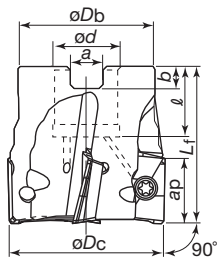


Fig. A

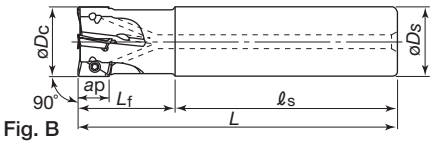
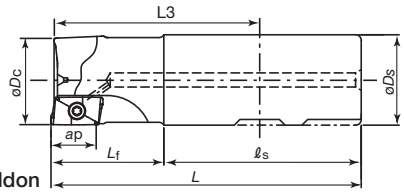


Fig. B



Weldon

9-90

Max. ap: 10.6 mm

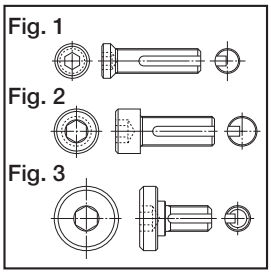
Right hand (R) shown.

TPS17 (Fig. A: bore type)

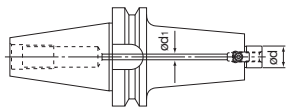
Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	ød	ℓ	Lf	b	a	Weight (kg)	Applicable inserts	Clamping screw	Wrench	Center bolts		Mounting details
TPS17040RB-E	▲	4	40	16	19	40	5.6	8.4	0.2	AS□T1705□□ PD□R-□□	CSPB-4S	IP-15D	FSHM8-30	Fig. 1	-
TPS17050RB-E	▲	5	50	22	20		6.3	10.4	0.3				CM10X30	Fig. 2	9-138Ⓐ
TPS17063RB-E	▲	6	63			45			0.6						

● : Stocked items.
▲ : Shortly unavailable

Center bolts



Cautionary point on modifying arbors when using "TPS" cutter with air hole



Mounting diameter ød (mm)	16	22
Applicable arbor type	SMA SM1	FMC SM1
Hole diameter ød1 (mm)	4 ~ 6	5 ~ 8

Note: When using "TPS" cutter in internal air blow cutting, use corresponding arbor.

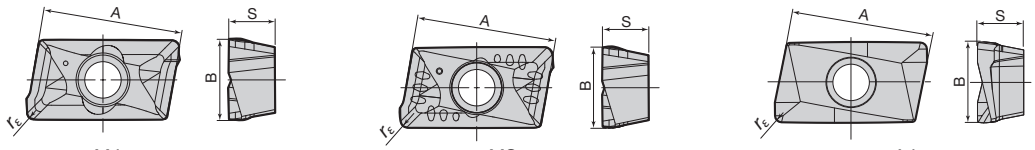
EPS17 (Fig. B: shank type)

Pitch	Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	L	Lf	ℓs	øDs	L3	Applicable inserts	Clamping screw	Wrench
Coarse	EPS17025RS	▲	2	25	115	35	80	25	-	AS□T1705□□ PD□R-□□	CSPB-4S	IP-15D
	EPS17026RS	▲	2	26					-			
	EPS17032RS	▲	2	32	120	40		32	-			
Close	EPS17032RSB	▲	3	32	120	40	80	32	-			
	EPS17033RSB	▲	3	33					-			
Long shank	EPS17025RL	▲	2	25	220	70	150	25	-			
	EPS17026RL	▲	2	26					-			
	EPS17032RL	▲	2	32	255	80	175	32	-			
Weldon	EPS17025RS-E	▲	2	25	95	35	60	25	63			
	EPS17032RSB-E	▲	3	32	110	40	70	32	74			

● : Stocked items.

Relating pages | Technical Reference (15–1)

Inserts



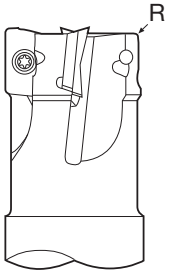
-MJ -MS -AJ

Cat. No.	Corner r_ε	Accuracy	Grades								Dimensions (mm)		
			Coated					DLC coated	Cermet	Uncoated	A	B	S
			AH120	AH130	AH140	T3130	T1115	DS1100	NS740	KS05F			
ASMT170504PDPR-MJ	0.4	M	●			●	●		●		16.9	9.8	5.6
ASMT170508PDPR-MJ	0.8		●			●	●		●				
ASMT170512PDPR-MJ	1.2		●			●							
ASMT170516PDPR-MJ	1.6		●			●			●				
ASMT170520PDPR-MJ	2.0		●										
ASMT170530PDPR-MJ	3.0		●										
ASMT170532PDPR-MJ	3.2		●			●			●				
ASMT170508PDPR-MS	0.8			●	●								
ASGT170504PDFR-AJ	0.4	G						●		●			
ASGT170508PDFR-AJ	0.8							●		●			

● : Stocked items.

Cautionary point in modifying cutter bodies

When using inserts with corner radius $r_\varepsilon \geq 2.0$ mm, standard cutter bodies have to be modified "R".



Corner radius r_ε (mm)	The dimension of modifying (mm)
0.4 ~ 1.6	Unnecessary
2.0 ~ 3.2	2

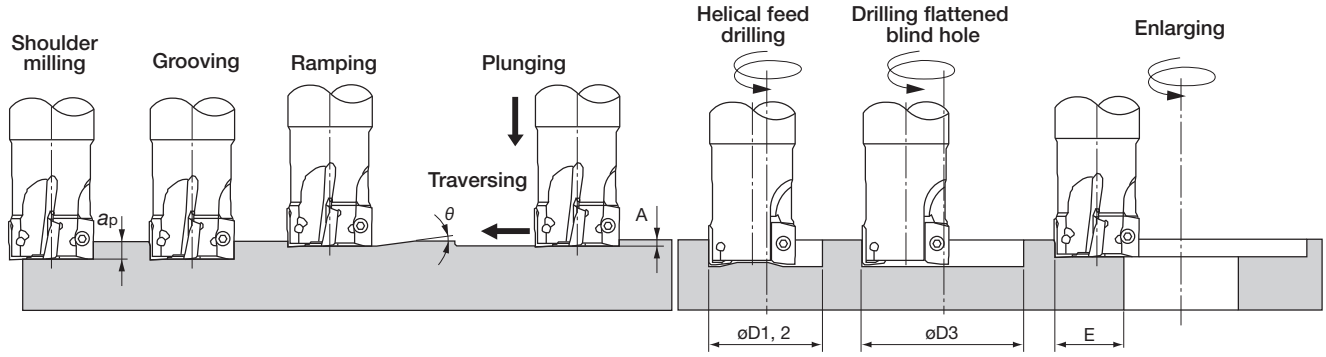
Standard cutting conditions

Work materials	Grades	Chip-breaker	Cutting speed V_C (m/min)			Feed per tooth f_Z (mm/t)		
			Cutter dia. ø12	Cutter dia. ø16, ø20	Cutter dia. > ø25	Cutter dia. ø12	Cutter dia. ø16, ø20	Cutter dia. > ø25
Mild steel, Low Carbon steels (St37 etc.) < 180HB	NS740	MJ	80 ~ 100	100 ~ 120	100 ~ 150	0.05 ~ 0.08	0.05 ~ 0.12	0.05 ~ 0.15
	AH120	MJ	80 ~ 100	100 ~ 150	100 ~ 150	0.05 ~ 0.10	0.12 ~ 0.20	0.12 ~ 0.20
Carbon steels, Alloy steels (Ck45, 42CrMo4etc) < 300HB	NS740	MJ	80 ~ 100	80 ~ 100	80 ~ 120	0.05 ~ 0.08	0.05 ~ 0.08	0.05 ~ 0.10
	T3130	MJ	80 ~ 100	80 ~ 120	100 ~ 200	0.05 ~ 0.10	0.10 ~ 0.15	0.10 ~ 0.20
Die steels (X96CrMoV12etc.) < 300HB	T3130	MJ	80 ~ 100	80 ~ 120	100 ~ 150	0.05 ~ 0.10	0.10 ~ 0.15	0.12 ~ 0.20
Stainless steels (X5CrNi18 9etc.) < 250HB	AH130 • AH140	MS	80 ~ 100	100 ~ 150	100 ~ 200	0.05 ~ 0.10	0.12 ~ 0.15	0.12 ~ 0.20
Grey Cast irons, DuctileCast irons etc. (GG25, GGG40 etc.)	T1115	MJ	80 ~ 100	100 ~ 150	100 ~ 200	0.08 ~ 0.12	0.12 ~ 0.20	0.15 ~ 0.25
Aluminium alloys (Si < 13%)	DS1100	AJ	300 ~ 1000			0.05 ~ 0.2		
Aluminium alloys (Si ≥ 13%)	DS1100	AJ	100 ~ 200			0.05 ~ 0.2		
Copper alloys	KS05F	AJ	200 ~ 500			0.05 ~ 0.2		

Notes:
- When using at L/D ≥ 4, machining at the lower feed rate.
- This TAC mill is not designed to cope with the centrifugal force and dynamic balance at high speeds over 1000 m/mim.
  Therefore, the cutting speed in the outer diameter of the mill should not exceed 1000 m/min.

TPS/EPS17

Machining capability



Cat. No.	Tool ø	Max. depth of cut a_p (mm)	Max. ramping angle θ	Max. depth of plunging A (mm)	Min. machining hole dia. øD1 (mm)*	Max. machining hole dia. øD2 (mm)*	Hole dia. in drilling (Blind hole) øD3 (mm)*	Max. cutting width in enlarging hole E (mm)
EPS17025·····	ø25	16.3	5°	1.0	32	48	46 ~ 48	24
EPS17026·····	ø26	16.3	5°		34	51	49 ~ 51	25.5
EPS17030·····	ø30	16.2	4°		42	59	57 ~ 59	29.5
EPS17032·····	ø32	16.2	3.5°		46	62	60 ~ 62	31
EPS17033·····	ø33	16.2	3.5°		48	65	63 ~ 65	32.5
E/TPS17040·····	ø40	16.2	2.5°		62	78	76 ~ 78	39
EPS17040·····	ø40	16.2	2.5°		62	78	76 ~ 78	39
E/TPS17050·····	ø50	16.1	1.5°		82	98	96 ~ 98	49
E/TPS17063·····	ø63	16	1°		108	124	122 ~ 124	62

Notes : Corner r_ε for dimensions of øD1, øD2, and øD3: r_ε= 0.8.

Relating pages
Technical Reference (15–1)

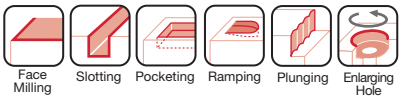
MEMO

DOFEED SERIES

Diameter ø16 ~ 80 mm

15°·17° 1 mm Air Hole

P Steel | M Stainless | K Cast Iron | S Superalloys | H Hard Materials



For high speed milling of steels, stainless steels, cast irons and titanium alloys

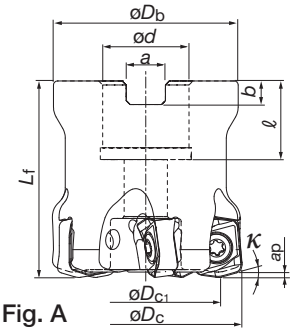


Fig. A

Rake angle: T/EXN03 = A.R. +6° R.R = +5°~ +11°
T/EXN06 = A.R. +10° R.R. -2° ~ +4°

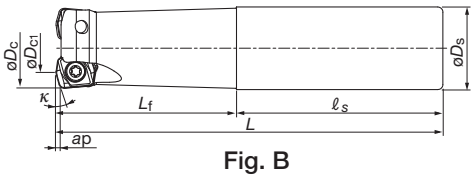


Fig. B

Max.ap: EXN03 = 1 mm
TXN06 = 1.5 mm
EXN06 = 1.5 mm

TXN (Fig. A: bore type)

type	Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc	øDc1	øDb	ød	ℓ	Lf	b	a	κ	Weight (kg)	Air hole	Center bolt	Insert	Mounting details
Coarse	New TXN06R050M22.0E04	●	4	50	37.6	47	22	20	50	6.3	10.4	15°	0.4	with	FSHM10-40H	LNMU06...	9-138Ⓐ
	New TXN06R052M22.0E04	★	4	52	39.6	50	22	20	50	10.4	6.3	15°	0.5		FSHM10-40H		
	New TXN06R063M22.0E04	●	4	63	50.6	59	22	20	50	6.3	10.4	15°	0.8		CM10X30H		
	New TXN06R066M27.0E04	★	4	66	53.6	63	27	22	50	12.4	7	15°	0.8		CM12X30H		
	New TXN06R080M27.0E05	★	5	80	67.6	76	27	22	63	7	12.4	15°	1.6		CM12X30H		
Close	New TXN03R040M16.0E06	●	6	40	33.6	47	16	20	40	6.3	10.4	17°	0.2		CM8X30H	LNMU03...	
	New TXN03R050M22.0E08	●	8	50	43.6	47	22	20	50	5	8	17°	0.5		CM10X30H		
	TXN06R050M22.0E05	●	5	50	37.6	47	22	20	50	6.3	10.4	15°	0.4		FSHM10-40H	LNMU06...	
	TXN06R052M22.0E05	●	5	52	39.6	49	22	20	50	6.3	10.4	15°	0.5		FSHM10-40H		
	TXN06R063M22.0E06	●	6	63	50.6	59	22	20	50	6.3	10.4	15°	0.8		CM10X30H		
	TXN06R066M27.0E06	●	6	66	53.6	63	27	22	50	7	12.4	15°	0.8		CM12X30H		
	TXN06R080M27.0E08	●	8	80	67.6	76	27	22	63	7	12.4	15°	1.6		CM12X30H		

EXN (Fig. B: Shank type)

type	Cat. No.	Stock	No. of Inserts	Dimensions (mm) øDc	øDc1	øDs	L	Lf	ℓ s	κ	Weight (kg)	Air hole	Insert
Standard	EXN03R016M16.0-02	●	2	16	9.6	16	100	30	70	17°	0.2	with	LNMU03...
	EXN03R018M16.0-02	●	2	18	11.5	16	100	30	70	17°	0.2		
	EXN03R020M20.0-04	●	4	20	13.5	20	130	50	80	17°	0.3		
	EXN03R022M20.0-04	●	4	22	15.5	20	130	50	80	17°	0.3		
	EXN03R025M25.0-05	●	5	25	18.5	25	140	60	80	17°	0.5		
	EXN03R028M25.0-05	●	5	28	21.5	25	140	60	80	17°	0.5		
	EXN03R030M32.0-05	●	5	30	23.5	32	150	70	80	17°	0.8		
	EXN03R032M32.0-06	●	6	32	25.5	32	150	70	80	17°	0.9		
	New EXN03R035M32.0-06	●	6	35	28.5	32	150	35	115	17°	0.9		
	EXN06R032M32.0-02	●	2	32	19.7	32	150	70	80	15°	0.8	with	LNMU06...
	EXN06R035M32.0-02	●	2	35	22.7	32	150	45	105	15°	0.9		
	EXN06R040M32.0-03	●	3	40	27.7	32	150	45	105	15°	0.9		
Long	EXN03R016M16.0-02L	●	2	16	9.6	16	150	50	100	17°	0.2	with	LNMU03...
	EXN03R018M16.0-02L	●	2	18	11.5	16	150	25	125	17°	0.2		
	EXN03R020M20.0-03L	●	3	20	13.5	20	160	80	80	17°	0.3		
	EXN03R022M20.0-03L	●	3	22	15.5	20	160	30	130	17°	0.4		
	EXN03R025M25.0-04L	●	4	25	18.5	25	180	100	80	17°	0.6		
	EXN03R028M25.0-04L	●	4	28	21.5	25	180	35	145	17°	0.7		
	EXN03R030M32.0-04L	●	4	30	23.5	32	200	120	80	17°	0.9		
	EXN03R032M32.0-05L	●	5	32	25.5	32	200	120	80	17°	1.1		
	New EXN03R035M32.0-05L	●	5	35	28.5	32	200	35	165	17°	1.2		
	EXN06R032M32.0-02L	●	2	32	19.7	32	200	120	80	15°	1.1	with	LNMU06...
	EXN06R035M32.0-02L	●	2	35	22.7	32	200	45	155	15°	1.2		
	EXN06R040M32.0-03L	●	3	40	27.7	32	220	45	175	15°	1.3		

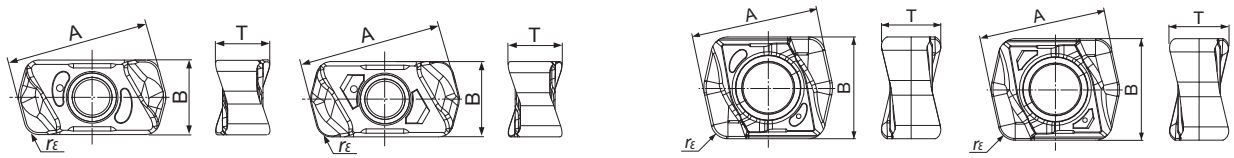
● : Stocked items
★ : Available from 2013

Relating pages
Technical Reference (15–1)

Replacement parts

Descriptions		Parts Cat. No.		
Applicable cutter		TXN06R...	T/EXN03R...	EXN06R...
Clamping screw		CSPB-5	CSPB-2.5	CSPB-5
Wrench	Bit	BLD IP20/S7	IP-8D	IP-20D
	Handle	H-TBS		

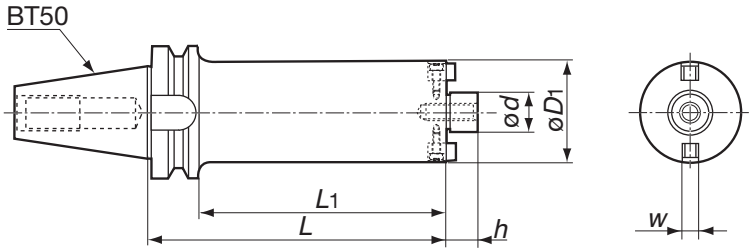
Inserts



MJ (for general purpose) ML (for low cutting force) MJ (for general purpose) ML (for low cutting force)

Cat. No.	Accuracy	Honing	Grades				Dimensions (mm)			
			AH725	AH120	AH130	New AH3035	A	B	T	rε
LNMU0303ZER-MJ	M	with	●		●	●	11.59	6.0	4.29	1.2
LNMU0303ZER-ML	M	with	●		●	●				
LNMU06X5ZER-MJ	M	with	●	●	●	●	15	12	7	2
LNMU06X5ZER-ML	M	with	●	●	●	●				

Arbors



※No through air hole.

Cat. No.	Stock	Dimensions (mm)						Weight (kg)	Applicable TAC mills
		L	L1	øD1	ød	h	w		
BT50-FMC22-138-47	●	138	100	47	22	18	10	5.2	TXN06R050M22.0E05 TXN03R050M22.0E08
BT50-FMC22-188-47	●	188	150					5.9	
BT50-FMC22-243-47	●	243	205					6.5	
BT50-FMC22-293-47	●	293	255					7.2	
BT50-FMC22-178-59	●	178	140	59				6.8	TXN06R063M22.0E06
BT50-FMC22-238-59	●	238	200					8	
BT50-FMC22-308-59	●	308	270					9.5	
BT50-FMC22-373-59	●	373	335					10.9	
BT50-FMA31.75-215-76	●	215	177	76	31.75	30	12.7	10	TXN06R080M31.7-08
BT50-FMA31.75-295-76	●	295	257					12.9	
BT50-FMA31.75-375-76	●	375	337					15.8	

● : Stocked items

Standard cutting conditions

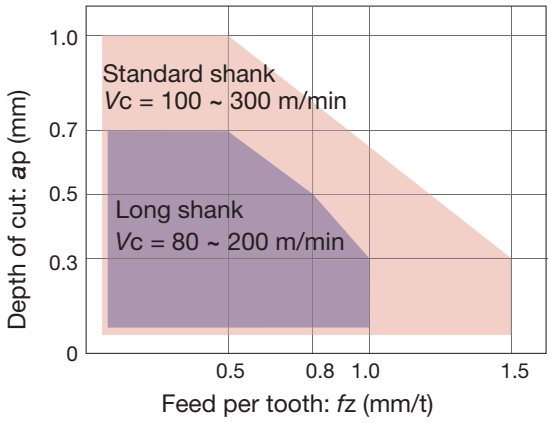
Work material		Hardness	Priority	Grades	Chip-breaker	Cutting speed Vc (m/min)	Feed per tooth: fz (mm/t) Tool dia: øDc (mm) ø16~ ø22	ø25 ~ ø50	Plunging
Carbon steels C45, C55 etc.		~ 300HB	First choice	AH725	MJ	100 - 300	0.5 -1.2	0.5 - 1.5	0.1
			for low cutting force	AH725	ML		0.5 - 0.7	0.5 - 1.0	
			for impact resistance	AH3035	MJ		0.5 -1.2	0.5 - 1.5	
Alloy steels 42CrMo4, 17Cr3 etc.		~ 300HB	First choice	AH725	MJ	100 - 200	0.5 -1.2	0.5 - 1.5	0.1
			for low cutting force	AH725	ML		0.5 - 0.7	0.5 - 1.0	
			for impact resistance	AH3035	MJ		0.5 -1.2	0.5 - 1.5	
Prehardened steels NAK80, PX5 etc.		30 ~ 40HRC	-	AH3035	ML	100 - 200	0.5 - 0.7	0.5 - 1.0	0.1
Stainless steels X5CrNi18-10, X5CrNiMo17-12-2 etc.		~ 200HB	First choice	AH130	ML	100 - 150	0.3 - 0.5	0.3 - 0.7	0.08
			for impact resistance	AH130	MJ		0.3 - 0.8	0.3 - 0.8	
Grey cast irons GG25, GGG30 etc.		150 ~ 250HB	-	AH725	MJ	100 - 300	0.5 - 1.2	0.5 - 1.5	0.1
Ductile cast irons GGG40 etc.		150 ~ 250HB	-	AH725	MJ	80 - 200	0.5 - 1.2	0.5 - 1.5	0.1
Titanium alloy Ti-6Al-4V etc.		~ 40HRC	-	AH725	ML	30 - 60	0.3 - 0.5	0.3 - 0.7	0.08
Hardened steels	X40CrMoV5-1 etc.	40 ~ 50HRC	-	AH3035	MJ	80 - 130	0.1 - 0.2	0.1 - 0.3	0.05
	X153CrMoV12 etc.	50 ~ 60HRC				50 - 70	0.03 - 0.05	0.03 - 0.07	0.03

- 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

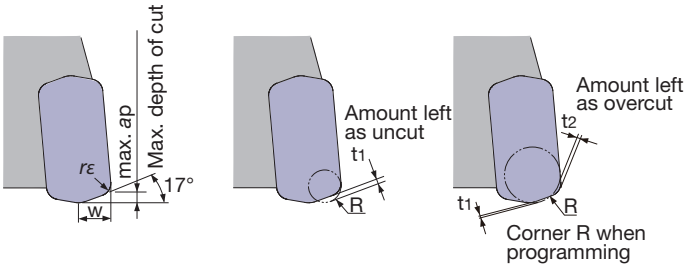
When using a long shank, please lower the cutting conditions (*Vc*, *fz*, *ap*) to 70% of the maximum conditions for the standard shank.



Tool dia.: ø*Dc* = ø16 ~ 35 mm
Work material: C55 (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 cutters. Usually, the corner radius should be set as R = 1.5 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left as uncut (t_1) and overcut (t_2).



Max. depth of cut max ap (mm)	Corner radius rε (mm)	W (mm)	Corner R when programming	Amount left as uncut t1 (mm)	Amount left as overcut t2 (mm)
1.0	1.2	3.0	1.0	0.6	-
			1.5	0.5	-
			2.0	0.25	0.08
			2.5	0.14	0.26

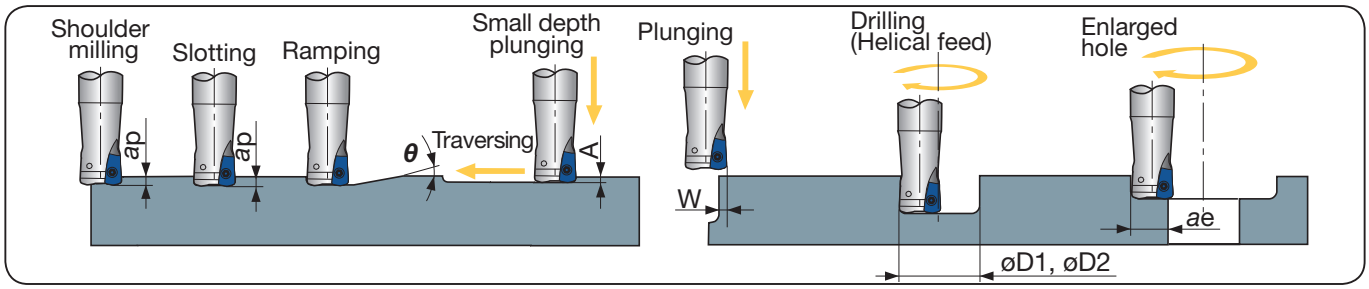
Each value in table is calculated theoretically at the maximum condition.

Tool dia.: øDc (mm), Number of revolutions: *n* (min^{-1}), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 1.0 mm																					
ø16, z = 2		ø18, z = 2		ø20, z = 4		ø22, z = 4		ø25, z = 5		ø28, z = 5		ø30, z = 5		ø32, z = 6		ø35, z = 6		ø40, z = 6		ø50, z = 8	
n	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*
3,980	6,370	3,540	5,660	3,180	10,180	2,890	9,250	2,550	12,750	2,270	11,350	2,120	10,600	1,990	11,940	1,820	10,920	1,590	9,540	1,270	10,160
Vc = 200 m/min, *fz* = 0.8 mm/t								*Vc* = 200 m/min, *fz* = 1.0 mm/t													
3,980	4,780	3,540	4,250	3,180	7,630	2,890	6,940	2,550	10,200	2,270	9,080	2,120	8,480	1,990	9,550	1,820	8,740	1,590	7,630	1,270	8,130
Vc = 200 m/min, *fz* = 0.6 mm/t								*Vc* = 200 m/min, *fz* = 0.8 mm/t													
3,980	6,370	3,540	5,660	3,180	10,180	2,890	9,250	2,550	12,750	2,270	11,350	2,120	10,600	1,990	11,940	1,820	10,920	1,590	9,540	1,270	10,160
Vc = 200 m/min, *fz* = 0.8 mm/t								*Vc* = 200 m/min, *fz* = 1.0 mm/t													
2,980	4,770	2,650	4,240	2,390	7,650	2,170	6,940	1,910	9,550	1,710	8,550	1,590	7,950	1,490	8,940	1,360	8,160	1,190	7,140	950	5,700
Vc = 150 m/min, *fz* = 0.8 mm/t								*Vc* = 150 m/min, *fz* = 1.0 mm/t													
2,980	3,580	2,650	3,180	2,390	5,740	2,170	5,210	1,910	7,640	1,710	6,840	1,590	6,360	1,490	7,150	1,360	6,530	1,190	5,710	950	4,560
Vc = 150 m/min, *fz* = 0.6 mm/t								*Vc* = 150 m/min, *fz* = 0.8 mm/t													
2,980	4,770	2,650	4,240	2,390	7,650	2,170	6,940	1,910	9,550	1,710	8,550	1,590	7,950	1,490	8,940	1,360	8,160	1,190	7,140	950	5,700
Vc = 150 m/min, *fz* = 0.8 mm/t								*Vc* = 150 m/min, *fz* = 1.0 mm/t													
2,980	3,580	2,650	3,180	2,390	5,740	2,170	5,210	1,910	7,640	1,710	6,840	1,590	6,360	1,490	7,150	1,360	6,530	1,190	5,710	950	4,560
Vc = 150 m/min, *fz* = 0.6 mm/t								*Vc* = 150 m/min, *fz* = 0.8 mm/t													
2,390	1,910	2,120	1,700	1,910	3,060	1,740	2,780	1,530	3,830	1,360	3,400	1,270	3,180	1,190	3,570	1,090	3,270	950	2,850	760	3,040
Vc = 120 m/min, *fz* = 0.4 mm/t								*Vc* = 120 m/min, *fz* = 0.5 mm/t													
2,390	2,390	2,120	2,120	1,910	3,820	1,740	3,480	1,530	4,590	1,360	4,080	1,270	3,810	1,190	4,280	1,090	3,920	950	3,420	760	3,650
Vc = 120 m/min, *fz* = 0.5 mm/t								*Vc* = 120 m/min, *fz* = 0.6 mm/t													
3,980	6,370	3,540	5,660	3,180	10,180	2,890	9,250	2,550	12,750	2,270	11,350	2,120	10,600	1,990	11,940	1,820	10,920	1,590	9,540	1,270	10,160
Vc = 200 m/min, *fz* = 0.8 mm/t								*Vc* = 200 m/min, *fz* = 1.0 mm/t													
2,980	4,770	2,650	4,240	2,390	7,650	2,170	6,940	1,910	9,550	1,710	8,550	1,590	7,950	1,490	8,940	1,360	8,160	1,190	7,140	950	5,700
Vc = 150 m/min, *fz* = 0.8 mm/t								*Vc* = 150 m/min, *fz* = 1.0 mm/t													
800	640	710	570	640	1,020	580	930	510	1,280	450	1,130	420	1,050	400	1,200	360	1,080	320	960	250	1,000
Vc = 40 m/min, *fz* = 0.4 mm/t								*Vc* = 40 m/min, *fz* = 0.5 mm/t													
1,990	600	1,770	530	1,590	950	1,450	870	1,270	1,270	1,140	1,140	1,060	1,060	990	1,190	910	1,090	800	960	640	1,020
Vc = 100 m/min, *fz* = 0.15 mm/t								*Vc* = 100 m/min, *fz* = 0.2 mm/t													
1,190	100	1,060	80	950	150	870	140	760	190	680	170	640	160	600	180	550	170	480	140	380	150
Vc = 60 m/min, *fz* = 0.04 mm/t								*Vc* = 60 m/min, *fz* = 0.05 mm/t													

■ 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.

Machining capability



Cat. No.	Tool dia. øDc (mm)	Max. depth of cut ap (mm)	Max. ramping angle θ	Max. plunging depth A (mm)	Max. cutting width in plunging W (mm)	Min. machinable hole dia. øD1 (mm)	Max. machinable hole dia. øD2 (mm)	Max. cutting width in enlarged hole ae (mm)
EXN03R016M16.0-□□□	ø16	1	2.1°	0.3	3.5	22	30	12.5
EXN03R018M16.0-□□□	ø18	1	1.7°	0.3	3.5	26	34	14.5
EXN03R020M20.0-□□□	ø20	1	1.4°	0.3	3.5	30	38	16.5
EXN03R022M20.0-□□□	ø22	1	1.2°	0.3	3.5	34	42	18.5
EXN03R025M25.0-□□□	ø25	1	1.0°	0.3	3.5	40	48	21.5
EXN03R028M25.0-□□□	ø28	1	0.8°	0.3	3.5	46	54	24.5
EXN03R030M32.0-□□□	ø30	1	0.7°	0.3	3.5	50	58	26.5
EXN03R032M32.0-□□□	ø32	1	0.7°	0.3	3.5	54	62	28.5

· For *øDc* up to 33 mm, slot milling, ramping or contouring is not recommended as chips may be re-cut

Standard cutting conditions

Work material		Hardness	Priority	Grades	Chip-breaker	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t) Tool dia: ø*Dc* (mm) ø32 ~ ø80	Feed when plunging *fz* (mm/t)
Carbon steels C45, C55 etc.		~ 300HB	first choice	**AH725**	**MJ**	100 - 300	0.5 - 1.5	0.15
			for wear resistance	**AH120**	**MJ**			
			for impact resistance	**AH3035**	**MJ**			
Alloy steels 42CrMo4, 17Cr3 etc.		~ 300HB	first choice	**AH725**	**MJ**	100 - 200	0.5 - 1.5	0.15
			for wear resistance	**AH120**	**MJ**			
			for impact resistance	**AH3035**	**MJ**			
Prehardened steels NAK80, PX5 etc.		30 ~ 40HRC	-	**AH3035**	**ML**	100 - 200	0.5 - 1.0	0.15
Stainless steels X5CrNi18-10, X5CrNiMo17-12-2 etc.		~ 200HB	first choice	**AH130**	**ML**	100 - 150	0.3 - 0.7	0.1
			for impact resistance	**AH130**	**MJ**		0.3 - 0.8	
Grey cast irons GG25, GGG30 etc.		150 ~ 250HB	first choice	**AH120**	**MJ**	100 - 300	0.5 - 1.5	0.15
			for low cutting force	**AH120**	**ML**		0.5 - 1.0	
Ductile cast irons GGG40 etc.		150 ~ 250HB	first choice	**AH120**	**MJ**	80 - 200	0.5 - 1.5	0.15
			for low cutting force	**AH120**	**ML**		0.5 - 1.0	
Titanium alloy Ti-6Al-4V etc.		~ 40HRC	-	**AH725**	**ML**	30 - 60	0.3 - 0.7	0.08
Hardened steels	X40CrMoV5-1 etc.	40 ~ 50HRC	-	**AH3035**	**MJ**	80 - 130	0.1 - 0.3	0.05
	X153CrMoV12 etc.	50 ~ 60HRC		**AH3035**	**MJ**	50 - 70	0.03 - 0.07	0.03

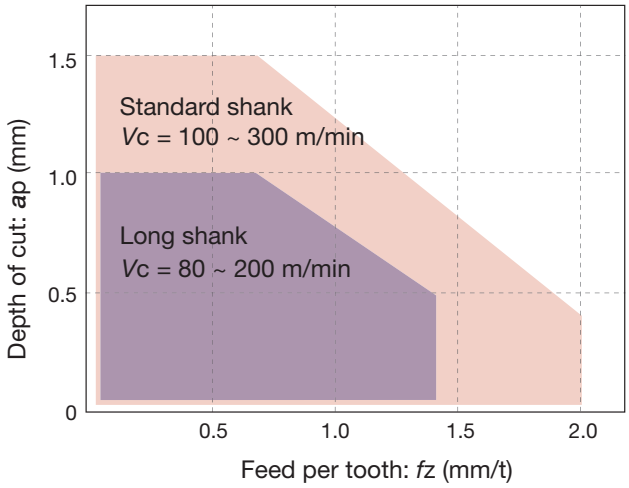
■ When chips stay in the cutting zone during slotting or pocketing, use an air blast to remove chips from the work area.

■ 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 for use

The usage of a standard & long shank

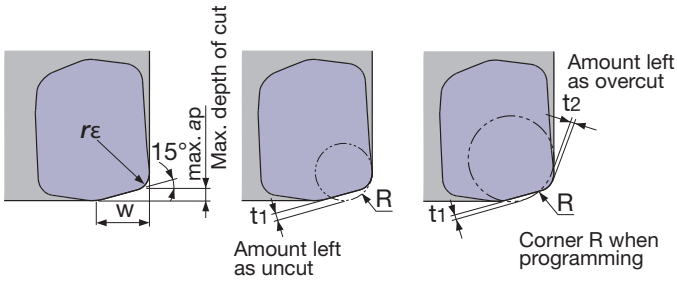
When using a long shank, please lower the cutting conditions (*Vc*, *fz*, *ap*) to 70% of the maximum conditions for the standard shank.



Tool dia.: ø*Dc* = ø32 ~ 40 mm
Work material: C55 (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 cutters. Usually, the corner radius should be set as R = 3.0 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left as uncut (t_1) and overcut (t_2).



Max. depth of cut max ap (mm)	Corner radius r_ε (mm)	W (mm)	Corner R when programming	Amount left as uncut t_1 (mm)	Amount left as overcut t_2 (mm)
1.5	2.0	6.0	2.0	0.1	-
			3.0	0.77	-
			4.0	0.54	0.26

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

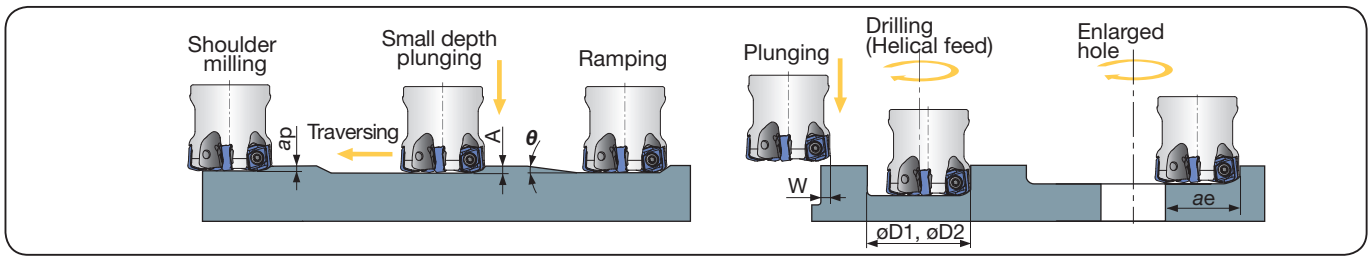
TXN06 / EXN06 DOFEED

Tool dia.: øDc (mm), Number of revolutions: *n* (min^{-1}), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 1.5 mm															
ø32, z = 2		ø35, z = 2		ø40, z = 3		ø50			ø63			ø80			
							Vf			*Vf*			*Vf*		
n	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	Standard (z = 4)	Close (z = 5)	*n*	Standard (z = 4)	Close (z = 6)	*n*	Standard (z = 5)	Close (z = 8)	
1,990	3,980	1,820	3,640	1,590	4,770	1,270	5,080	6,350	1,010	4,040	6,060	800	4,000	6,400	
Vc = 200 m/min, *fz* = 1.0 mm/t															
1,490	2,980	1,360	2,720	1,190	3,570	950	3,800	4,750	760	3,040	4,560	600	3,000	4,800	
Vc = 150 m/min, *fz* = 1.0 mm/t															
1,490	2,380	1,360	2,180	1,190	2,860	950	3,040	3,800	760	2,430	3,650	600	2,400	3,840	
Vc = 150 m/min, *fz* = 0.8 mm/t															
1,190	1,190	1,090	1,090	950	1,430	760	1,520	1,900	610	1,220	1,830	480	1,200	1,920	
Vc = 120 m/min, *fz* = 0.5 mm/t															
1,190	1,430	1,090	1,310	950	1,710	760	1,820	2,280	610	1,470	2,200	480	1,440	2,300	
Vc = 120 m/min, *fz* = 0.6 mm/t															
1,990	2,390	1,820	2,180	1,590	2,860	1,270	3,050	3,810	1,010	2,430	3,640	800	2,400	3,840	
Vc = 200 m/min, *fz* = 0.6 mm/t															
1,990	3,180	1,820	2,910	1,590	3,820	1,270	4,060	5,080	1,010	3,230	4,850	800	3,200	5,120	
Vc = 200 m/min, *fz* = 0.8 mm/t															
1,490	2,980	1,360	2,720	1,190	3,570	950	3,800	4,750	760	3,040	4,560	600	3,000	4,800	
Vc = 150 m/min, *fz* = 1.0 mm/t															
1,490	2,380	1,360	2,180	1,190	2,860	950	3,040	3,800	760	2,430	3,650	600	2,400	3,840	
Vc = 150 m/min, *fz* = 0.8 mm/t															
400	400	360	360	320	480	250	500	630	200	400	600	160	400	640	
Vc = 40 m/min, *fz* = 0.5 mm/t															
990	400	910	360	800	480	640	510	640	510	410	610	400	400	640	
Vc = 100 m/min, *fz* = 0.2 mm/t															
600	60	550	60	480	70	380	80	100	300	60	90	240	60	100	
Vc = 60 m/min, *fz* = 0.05 mm/t															

■ 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.

Machining capability



Cat. No.	Tool dia. øDc (mm)	Max. depth of cut ap (mm)	Max. ramping angle θ	Max. plunging depth A (mm)	Max. cutting width in plunging W (mm)	Min. machinable hole dia. øD1 (mm)	Max. machinable hole dia. øD2 (mm)	Max. cutting width in enlarged hole ae (mm)
EXN06R032M32.0-□□□	ø32	1.5	2.0°	0.5	6.0	47	59	25
EXN06R035M32.0-□□□	ø35	1.5	1.7°	0.5	6.0	53	65	28
EXN06R040M32.0-□□□	ø40	1.5	1.3°	0.5	6.0	63	75	33
TXN06R050M...	ø50	1.5	0.9°	0.5	6.0	83	95	43
TXN06R052M...	ø52	1.5	0.8°	0.5	6.0	85	97	45
TXN06R063M...	ø63	1.5	0.6°	0.5	6.0	109	121	56
TXN06R066M...	ø66	1.5	0.5°	0.5	6.0	112	124	59
TXN06R080M...	ø80	1.5	0.5°	0.5	6.0	143	155	73

DOFEEDQUAD

Diameter ø50~125 mm

13° 2 mm

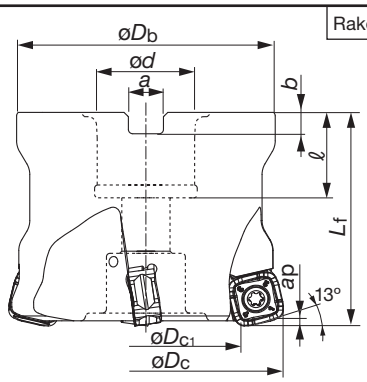
P Steel M Stainless K Cast Iron

Face Milling

For high speed milling of steels, stainless, catiron and superalloys

TXQ12

Rake angle: A.R. +7° R.R. -8° ~ -4.5°



Max. ap: 2.0 mm

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øDc1	øDb	ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Center bolt	Insert	Mounting details
TXQ12R050M22.0E04	●	3	50	33.8	47	22	20	50	6.3	10.4	0.4	with	FSHM10-40H	SQMU1206 ZER-MJ	9-138Ⓐ
TXQ12R052M22.0E04	●	3	52	35.8	49	22	20	50	6.3	10.4	0.5		FSHM10-40H		
TXQ12R063M22.0E04	●	4	63	46.8	59	22	20	50	6.3	10.4	0.8		CM10X30H		
TXQ12R066M27.0E04	●	4	66	49.8	63	27	22	50	7	12.4	0.9		CM10X30H		
TXQ12R080M27.0E05	●	5	80	63.8	76	27	22	63	7	12.4	1.6		CM12X30H		
TXQ12R100M32.0E06	●	6	100	83.8	96	32	25	63	8	14.4	3.0		CM16X40H		
TXQ12R125M40.0E07	●	7	125	108.8	98	40	32	63	9	16.4	3.2		TMBA-M20H		

● : Stocked items.

Standard cutting conditions

Work material	Hardness	Priority	Grades	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
High carbon steels (C45 etc.)	~ 300HB	First choice	**AH725**	100 - 300	0.5 - 2.0
		For wear resistance	**T3130**		
		For impact resistance	**AH130**		
Alloyed steels (42CrMo4 etc.)	~ 300HB	First choice	**AH725**	100 - 200	0.5 - 1.5
		For wear resistance	**T3130**		
		For impact resistance	**AH130**		
Prehardened steels(NAK80 etc.)	30 ~ 40HRC	-	**AH725**	100 - 200	0.5 - 1.0
Stainless steel (X5CrNi18-9 etc.)	~ 200HB	-	**AH130**	100 - 150	0.3 - 0.8
Grey cast iron (GG25 etc.)	-	-	**AH120**	100 - 300	0.5 - 2.0
Ductile cast irons (GGG40 etc.)	-	-	**AH120**	80 - 200	0.5 - 2.0
Titanium alloy (Ti-6Al-4V etc.)	~ 40HRC	-	**AH725**	30 - 60	0.3 - 0.7
Hardened steels (X40CrMoV5-1 etc.)	40 ~ 50HRC	-	**AH725**	80 - 130	0.1 - 0.3
	50 ~ 60HRC			50 - 70	0.03 - 0.07

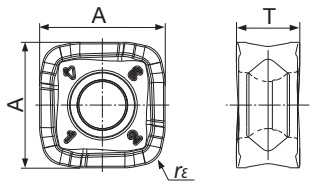
· Slot or pocket milling is not recommended, since the chip re-cutting easily occurs.
· Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.
· Cutting conditions are generally limited by the rigidity and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

Relating pages
Technical Reference (15–1)

Replacement parts

Description		Parts Cat. No.
Clamping screw		**CSPB-4**
Wrench	Bit	**BLD IP15/S7**
	Handle	**H-TBS**

Inserts



Cat. No.	Accuracy	Honing	Grades PREMIUMTEC				Dimensions (mm)		
			AH725	AH130	AH120	T3130	A	T	rε
SQMU1206ZSR-MJ	M	with	●	●	●	●	11.7	6	2

■ Grade selection

Grades	P Steel	M Stainless	K Cast Iron	S Superalloys	H Hard Materials
AH725	◎		○	◎	◎
AH130	○ For impact resistance	◎			
AH120			◎		
T3130	◎ For wear resistance				

◎: First choice
○: Applicable

Tool dia.: ø*Dc* (mm), Number of revolutions: *n* (min^{-1}), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 2 mm									
ø50		ø63		ø80		ø100		ø125	
n	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*
1,270	4,570	1,010	4,850	790	4,740	630	4,540	500	4,200
Vc = 200 m/min, *fz* = 1.2 mm/t									
950	2,850	750	3,000	590	2,950	470	2,820	380	2,660
Vc = 150 m/min, *fz* = 1.0 mm/t									
950	2,280	750	2,400	590	2,360	470	2,260	380	2,130
Vc = 150 m/min, *fz* = 0.8 mm/t									
760	1,140	600	1,200	470	1,180	380	1,140	300	1,050
Vc = 120 m/min, *fz* = 0.5 mm/t									
1,270	4,570	1,010	4,850	790	4,740	630	4,540	500	4,200
Vc = 200 m/min, *fz* = 1.2 mm/t									
950	3,420	750	3,600	590	3,540	470	3,380	380	3,190
Vc = 150 m/min, *fz* = 1.2 mm/t									
250	370	200	400	150	380	120	360	100	350
Vc = 40 m/min, *fz* = 0.5 mm/t									
630	380	500	400	390	390	310	370	250	350
Vc = 100 m/min, *fz* = 0.2 mm/t									
380	60	300	60	235	60	190	60	150	50
Vc = 60 m/min, *fz* = 0.05 mm/t									

EXH

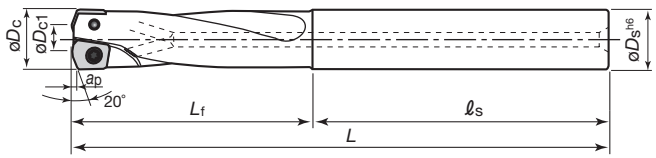
HYBRIDTACMILL

Diameter ø10 ~ 16 mm | 20° | 0.6, 0.8 mm | Air Hole | P Steel | M Stainless | K Cast Iron | N Non-ferrous

Face Milling | Slotting | Pocketing | Ramping | Plunging | Enlarging Hole | Drilling

For high feed milling of steels and aluminium alloys

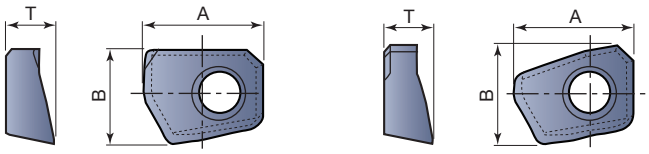
Rake angle: A.R. +20° R.R. +12°



Right hand (R) shown.

Cat. No.	Stock	No. of inserts	Dimensions (mm) Tool dia. øDc	Shank dia. øDs	Effective diameter øDc1	Effective edge length ap	Overall length L	Neck length Lf	Shank length ℓs	Clamping screw (Std. fastening torque)	Wrench	Applicable inserts
EXH06R010M10.0-02	●	2	10	10	5	0.6	90	40	50	CSPD-1.8S (0.7 N·m)	IP-6F	XXGT06H205□□-□□
EXH07R012M12.0-02	●	2	12	12	7	0.6	98	48	50	CSPB-2H (0.7 N·m)	IP-6F	XXGT07X305□□-□□
EXH09R016M16.0-02	●	2	16	16	10	0.8	124	64	60	CSPB-2.5S (1.3 N·m)	IP-8D	XXGT09X408□□-□□

Inserts

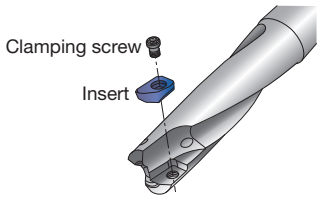


Center edge inserts | Peripheral edge inserts

	Cat. No.	Grade AH730	Dimensions (mm) A	B	T	Application	Applicable cutter
Center edge	XXGT06H205EC-MJ	●	6.2	4.9	2.5	P Steel, M Stainless, K Cast Iron	EXH06R010M10.0-02
Center edge	XXGT07X305EC-MJ	●	7	5.9	3		EXH07R012M12.0-02
Center edge	XXGT09X408EC-MJ	●	8.9	7.9	4		EXH09R016M16.0-02
Peripheral edge	XXGT06H205EP-MJ	●	6.2	5.1	2.5		EXH06R010M10.0-02
Peripheral edge	XXGT07X305EP-MJ	●	7	6.3	3		EXH07R012M12.0-02
Peripheral edge	XXGT09X408EP-MJ	●	8.9	8.0	4		EXH09R016M16.0-02

	Cat. No.	Grade DS1200	Dimensions (mm) A	B	T	Application	Applicable cutter
Center edge	XXGT06H205FC-AJ	●	6.2	4.9	2.5	N Non-ferrous	EXH06R010M10.0-02
Center edge	XXGT07X305FC-AJ	●	7	5.9	3		EXH07R012M12.0-02
Center edge	XXGT09X408FC-AJ	●	8.9	7.9	4		EXH09R016M16.0-02
Peripheral edge	XXGT06H205FP-AJ	●	6.2	5.1	2.5		EXH06R010M10.0-02
Peripheral edge	XXGT07X305FP-AJ	●	7	6.3	3		EXH07R012M12.0-02
Peripheral edge	XXGT09X408FP-AJ	●	8.9	8.0	4		EXH09R016M16.0-02

Replacement parts



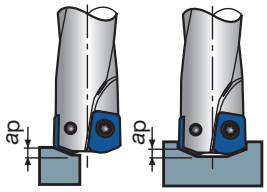
Cat. No.	Clamping screw	Wrench
EXH06R010**	CSPD-1.8S	IP-6F
EXH07R012**	CSPB-2H	IP-6F
EXH09R016**	CSPB-2.5S	IP-8D

● : Stocked items.

Relating pages | Technical Reference (15–1)

Standard cutting conditions

●Shoulder milling, Slotting

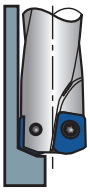


Side cutting Slotting

ap: Axial depth of cut

Work material		Carbon steels and alloy steels		Alloy steels and prehardened steelst		Stainless steels		Cast irons		Aluminium alloys (Si < 13%)		Aluminium alloys (Si ≥ 13%)	
Hardness		< 30HRC		30 ~ 40HRC		< 250HB		–		–		–	
Cutting speed		Vc = 100 ~ 300 m/min		Vc = 100 ~ 250 m/min		Vc = 100 ~ 300 m/min		Vc = 100 ~ 300 m/min		Vc = 100 ~ 500 m/min		Vc = 100 ~ 300 m/min	
Conditions		No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min
Tool dia. (mm)	ø10	4770	1430	3820	760	4770	1430	6360	2540	9550	5730	6360	3180
	ø12	3980	1190	3180	630	3980	1190	5300	2120	7950	4770	5300	2650
	ø16	2980	890	2380	470	2980	890	3970	1580	5960	3570	3970	1980
Depth of cut	ø10	ap < 0.6		ap < 0.5		ap < 0.6		ap < 0.6		ap < 0.6		ap < 0.6	
	ø12	ae < 0.6		ae < 0.5		ae < 0.6		ae < 0.6		ae < 0.6		ae < 0.6	
	ø16	ap < 0.8		ap < 0.6		ap < 0.8		ap < 0.8		ap < 0.8		ap < 0.8	

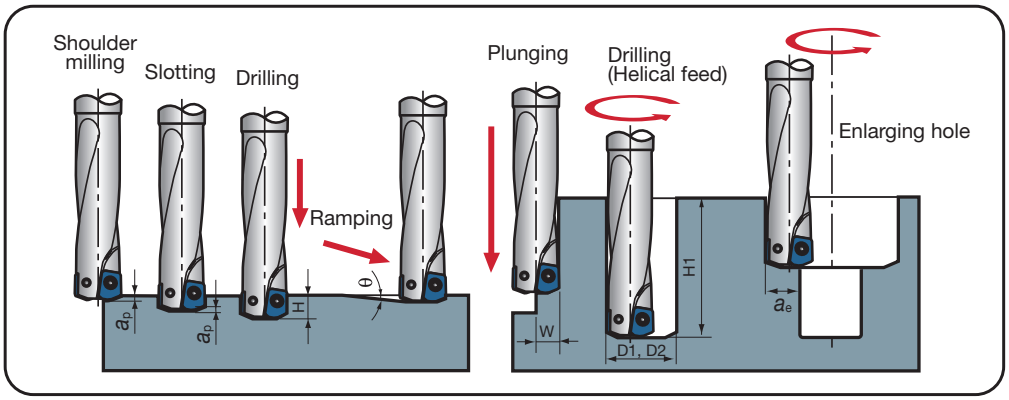
●Plunging



Work material		Carbon steels and alloy steels		Alloy steels and prehardened steelst		Stainless steels		Cast irons		Aluminium alloys (Si < 13%)		Aluminium alloys (Si ≥ 13%)	
Hardness		< 30HRC		30 ~ 40HRC		< 250HB		–		–		–	
Cutting speed		Vc = 100 ~ 300 m/min		Vc = 100 ~ 250 m/min		Vc = 100 ~ 300 m/min		Vc = 100 ~ 300 m/min		Vc = 100 ~ 500 m/min		Vc = 100 ~ 300 m/min	
Conditions		No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min	No. of rev. n min⁻¹	Feed speed Vf mm/min
Tool dia. (mm)	ø10	4770	240	3820	150	4770	240	6360	440	9550	760	6360	440
	ø12	3980	200	3180	130	3980	200	5300	370	7950	640	5300	370
	ø16	2980	150	2380	95	2980	150	3970	280	5960	480	3970	280

Note:
- In slotting or pocketing where chips tend to stay in the cutting zone, use an air blast to remove chips for preventing chip recutting.
- When chips tend to weld excessively on the cutting edge such as in machining aluminium alloys, use a water soluble cutting fluid.
- In the case of cutting a casting skin or a heavily interrupted work surface, decrease the feed per tooth and the maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- 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 whilst making sure that the machine is running normally.

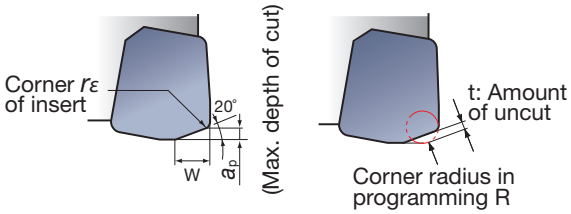
Machining modes



Cat. No.	Tool dia.	Effective edge length ap (mm)	Max.depth of drilling H (mm)	Max. cutting width in plunging W (mm)	Max. ramping angle θ	Min. machinable hole dia. D1 (mm)	Max. machinable hole dia. D2 (mm)	Max. cutting width in enlarging hole ae (mm)	Max.depth of boring H1 (mm)
EXH06R010M10.0-02	ø10	0.6	5	5	5°	12	19	7	30
EXH07R012M12.0-02	ø12	0.6	6	6	5°	14	23	9	36
EXH09R016M16.0-02	ø16	0.8	8	8	5°	18	31	12.5	48

Notes for programming

When using CAD/CAM, please program it as for radius cutter.
The following table shows actual cutting edge geometry and amount of unfinished work cut.



Cat. No.	Tool dia. (mm)	Max. depth of cut ap (mm)	Corner of insert rε	Wide of tooth W (mm)	Amount of uncut t (mm)	Corner radius in programming R
EXH06R010M10.0-02	ø10	0.6	0.5	2.5	0.7	R0.5
					0.6	R1.0
EXH07R012M12.0-02	ø12	0.6	0.5	2.5	0.7	R0.5
					0.6	R1.0
EXH09R016M16.0-02	ø16	0.8	0.8	3.0	0.8	R0.5
					0.7	R1.0
					0.6	R1.5

MILLFEED

Diameter ø20 ~ 125 mm | 10°, 20° | 1.5, 3 mm | Air Hole | P Steel | M Stainless | K Cast Iron | H Hard Materials

Face Milling | Pocketing | Ramping | Enlarging Hole

For high feed milling of general steels, cast irons, stainless steels, and hard materials

TXP

EXP

The below figures show the mill with air hole.

Rake angle: A.R. +5° R.R. -4° ~ -6°

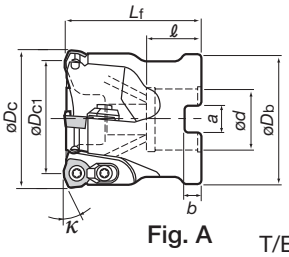


Fig. A

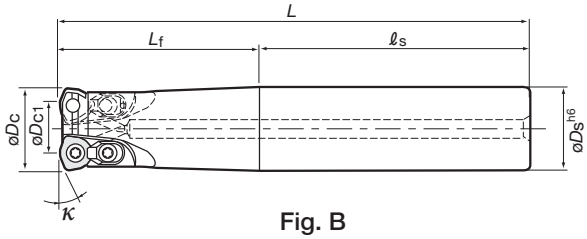


Fig. B

T/EXP 05, 06, 09: $\kappa = 20^\circ$
T/EXP 08: $\kappa = 10^\circ$

Centre bolts

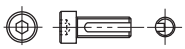


Fig. 1

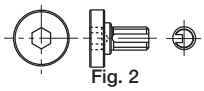


Fig. 2

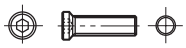


Fig. 3

Max. ap: 9-106

TXP (Fig. A: bore type)

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	Effective dia. øDc1	ℓ	Lf	b	a	ød	øDb	Weight (kg)	Air hole	Applicable inserts	Centre bolts Cat. No.	Fig.	Mounting details
TXP05063RB-E	●	6	63	55.4	20	50	6.3	10.4	22	59	0.8	With	WPM□05H315ZPR	CM10X30H	1	9-138Ⓐ
TXP05080RB-E	●	7	80	72.4	22	63	7	12.4	27	76	1.7	With		CM12X30H		
TXP06063RB-E	●	5	63	54.4	20	50	6.3	10.4	22	59	0.7	With	WPM□06X415ZPR	CM10X30H		
TXP06080RB-E	●	6	80	71.4	22	63	7	12.4	27	76	1.6	With		CM12X30H		9-138Ⓐ
TXP08050R-E	●	3	50	38.6	20	50	6.3	10.4	22	47	0.4	Without	WPMT080615Z□R	FSHM10-40	3	
TXP08052R-E	●		52	40.6						50	0.5	Without				
TXP08063R-E	●	4	63	51.6						59	0.7	Without		-	-	
TXP08066R-E	●		66	54.6	22		7.0	12.4	27	63	0.8	Without				
TXP08080R-E	●	5	80	68.6		63				76	1.5	Without				
TXP08100R-E	●	6	100	88.6	25		8	14.4	32	96	2.5	Without				
TXP08125R-E	●	7	125	113.6	32		9	16.4	40	98	3.1	With		TMBA-M20H	2	9-138Ⓑ
TXP09063R-E	●	3	63	49.4	20	50	6.3	10.4	22	59	0.6	Without	WPMT090725Z□R	-	-	9-138Ⓐ
TXP09080R-E	●	4	80	66.4	22	63	7	12.4	27	76	1.3	Without				
TXP09100R-E	●	5	100	86.4	25		8	14.4	32	96	2.4	Without				
TXP09125R-E	●	6	125	111.4	32		9	16.4	40	98	2.9	Without				9-138Ⓑ

● : Stocked items.

Relating pages | Technical Reference (15–1)

EXP (Fig. B: shank type)

type	Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	Effective dia. øDc1	L	Lf	ℓs	øDs	Applicable inserts
Standard	EXP05020RS	●	2	20	12.4	130	50	80	20	WPM□05H315ZPR(-□□□)
	EXP05021RS	●		21	13.4					
	EXP06025RS	●	2	25	16.4	140	60	80	25	WPM□06X415ZPR(-□□□)
	EXP06026RS	●		26	17.4					
	EXP06032RS	●		32	23.4	150	70		32	
	EXP06032RSB	●	3							
	EXP06033RS	●	2	33	24.4					
	EXP06033RSB	●	3							
	EXP06040RS	●		40	31.4		50	100		
	EXP08040RSA	●	2	40	28.6	150	50	100	32	WPMT080615Z□R(-□□□)
	EXP09050RS	●	2	50	36.4	150	50	100	42	WPMT090725Z□R(-□□□)
Long	EXP05020RL	●	2	20	12.4	180	100	80	20	WPM□05H315ZPR(-□□□)
	EXP05021RL	●		21	13.4					
	EXP06025RL	●	2	25	16.4	200	120	80	25	WPM□06X415ZPR(-□□□)
	EXP06026RL	●		26	17.4					
	EXP06032RL	●		32	23.4				32	
	EXP06032RLB	●	3							
	EXP06033RL	●	2	33	24.4					
	EXP06033RLB	●	3							
	EXP06040RL	●		40	31.4	250	50	200		
	EXP06040RLS42	●							42	
	EXP08040RLA	●	2	40	28.6	250	50	200	32	WPMT080615Z□R(-□□□)
	EXP09050RL	●	2	50	36.4	250	50	200	42	WPMT090725Z□R(-□□□)
Extra long	EXP05020RLL	●	2	20	12.4	250	130	120	20	WPM□05H315ZPR(-□□□)
	EXP05021RLL	●		21	13.4		50	200		
	EXP06025RLL	●	2	25	16.4	300	180	120	25	WPM□06X415ZPR(-□□□)
	EXP06026RLL	●		26	17.4		60	240		
	EXP06032RLL	●		32	23.4		180	120	32	
	EXP06033RLL	●		33	24.4		70	230		
	EXP06040RLL	●	3	40	31.4		50	250		
	EXP08040RLL	●	2	40	28.6	300	50	250	32	WPMT080615Z□R(-□□)

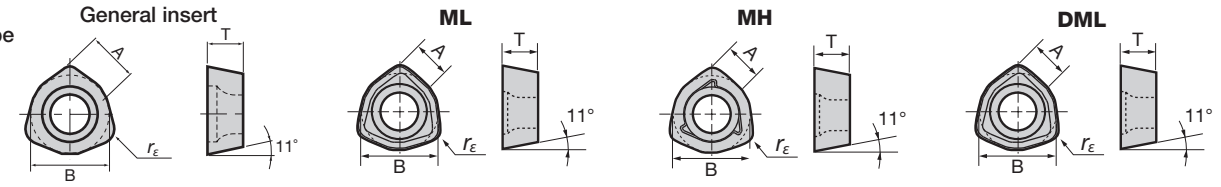
Replacement Parts

Cat. No.	Clamping screw	Clamp set	Wrench
EXP05 -	CSPB-3.5S	-	IP-15D
TXP06 -	CSPB-4S	CSY-15	IP-15D
EXP06 -			
TXP08 -	CSTB-5	CSX20	T-20T
EXP08 -			
TXP09 -	CSPB-5	CSY-20	IP-20T

● : Stocked items.

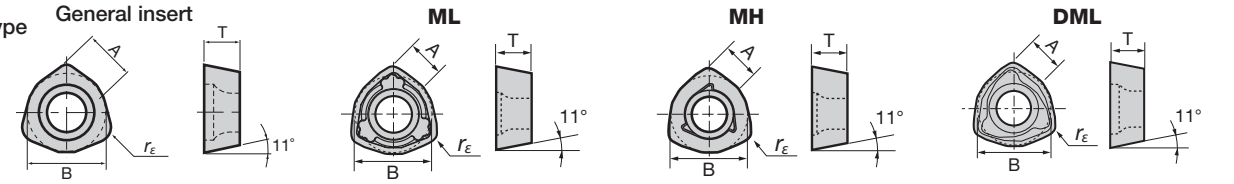
Inserts

05 type



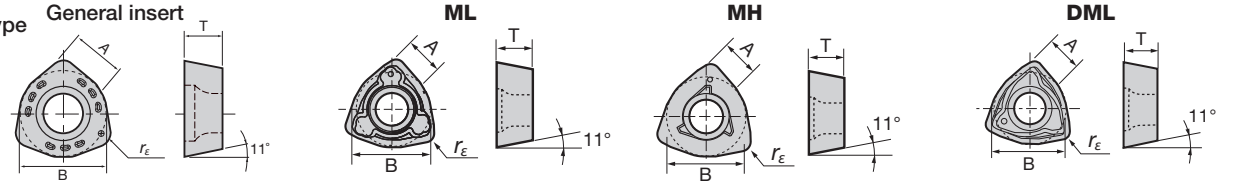
Cat. No.	Accuracy	Honing	Grades				Dimensions (mm)			
			AH120	AH140	T3130	AH730	A	B	T	r_ε
WPMW05H315ZPR	M	With	●	●	●		5	7.94	3.5	1.5
WPMT05H315ZPR-ML			●	●	●					
WPMT05H315ZPR-MH			●	●						
WPMT05H315ZPR-DML						●				

06 type



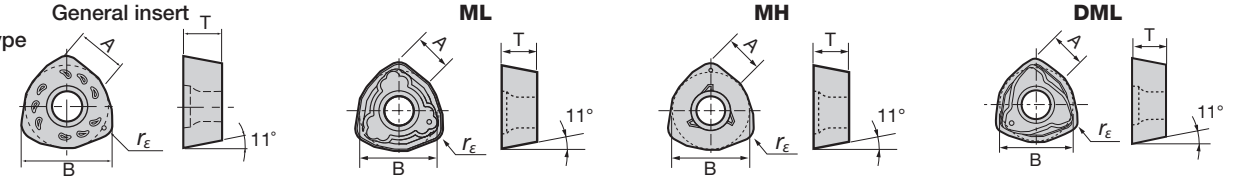
Cat. No.	Accuracy	Honing	Grades					Dimensions (mm)			
			AH120	AH130	AH140	T3130	AH730	A	B	T	r_ε
WPMW06X415ZPR	M	With	●		●	●		6	9.525	4.2	1.5
WPMT06X415ZPR-ML			●	●	●	●					
WPMT06X415ZPR-MH			●		●						
WPMT06X415ZPR-DML							●				

08 type



Cat. No.	Accuracy	Honing	Grades					Dimensions (mm)			
			AH120	AH130	AH140	T3130	AH730	A	B	T	r_ε
WPMT080615ZSR	M	With	●	●	●	●		8	12.87	6.35	1.5
WPMT080615ZPR-ML			●	●	●	●					
WPMT080615ZSR-MH			●		●						
WPMT080615ZPR-DML							●				

09 type



Cat. No.	Accuracy	Honing	Grades					Dimensions (mm)			
			AH120	AH130	AH140	T3130	AH730	A	B	T	r_ε
WPMT090725ZSR	M	With	●		●	●		9	15	7	2.5
WPMT090725ZPR-ML			●	●	●	●					
WPMT090725ZSR-MH			●	●	●						
WPMT090725ZPR-DML							●				

● : Stocked items.

Standard cutting conditions

05·06 type

Work material	Insert grades	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)	ø20, 21 (z = 2)	ø25, 26 (z = 2)	ø32, 33 (z = 2, 3)	ø40 (z = 3)	ø50 (z = 4)
Carbon Steels (C50 etc.) < 300HB	**AH120 (T3130)**	100 - 250	0.5 - 2.0	*Vc* = 150 m/min, *fz* = 0.8 mm/t *ap* =1.0 mm, *ae* = 1.0D mm	*Vc* = 150 m/min, *fz* = 1.0 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm			
				When plunging in small depth: *fz* = 0.2 mm/t				
Alloy steels (42CrMo4 etc.) < 300 HB	**AH120 (T3130)**	100 - 200	0.5 - 2.0	*Vc* = 130 m/min, *fz* = 0.8 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm	*Vc* = 130 m/min, *fz* = 1.0 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm			
				When plunging in small depth: *fz* = 0.2 mm/t				
Prehardened steels (X96CrMoV12 etc.) 30 - 40HRC	**AH120 (T3130)**	80 - 150	0.5 - 1.0	*Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm	*Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm			
				When plunging in small depth: *fz* = 0.1 mm/t				
Stainless steels (X5CrNi18 9 etc.)	**AH130 AH140**	100 - 200	0.5 - 2.0	*Vc* = 130 m/min, *fz* = 0.8 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm	*Vc* = 130 m/min, *fz* = 1.0 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm			
				When plunging in small depth: *fz* = 0.2 mm/t				
Cast irons (GG25 etc.)	**AH120**	100 - 250	0.8 - 2.5	*Vc* = 150 m/min, *fz* = 1.0 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm	*Vc* = 180 m/min, *fz* = 1.5 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm			
				When plunging in small depth: *fz* = 0.2 mm/t				
Hard materials (SDK, DH31 etc.) 40 - 50HRC	**AH730**	50 - 80	0.5 - 1.0	*Vc* = 70 m/min, *fz* = 0.7 mm/t *ap* = 0.7 mm, *ae* = 1.0D mm	*Vc* = 70 m/min, *fz* = 0.7 mm/t *ap* = 0.7 mm, *ae* = 1.0D mm			
				When plunging in small depth: *fz* = 0.1 mm/t				

08 type

Work material	Insert grades	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)	ø20, 21 (z = 2)	ø50 (z = 3)	ø63 (z = 4)	ø80 (z = 5)	ø100 (z = 6)	ø125 (z = 7)	ø160 (z = 8)
Carbon Steels (C50 etc.) < 300HB	**AH120 (T3130)**	100 - 250	0.5 - 2.0	*Vc* = 180 m/min, *fz* = 1.0 mm/t *ap* = 1.0 mm, *ae* = 40 mm	*Vc* = 200 m/min, *fz* = 1.5 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.2 mm/t						
Alloy steels (42CrMo4 etc.) < 300 HB	**AH120 (T3130)**	100 - 200	0.5 - 2.0	*Vc* = 130 m/min, *fz* = 1.0 mm/t *ap* = 1.0 mm, *ae* = 40 mm	*Vc* = 150 m/min, *fz* = 1.5 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.2 mm/t						
Prehardened steels (X96CrMoV12 etc.) 30 - 40HRC	**AH120 (T3130)**	80 - 150	0.5 - 1.0	*Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1.0 mm, *ae* = 40 mm	*Vc* = 120 m/min, *fz* = 0.8 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.1 mm/t						
Stainless steels (X5CrNi18 9 etc.)	**AH130 AH140**	100 - 200	0.5 - 2.0	*Vc* = 130 m/min, *fz* = 1.0 mm/t *ap* = 1.0 mm, *ae* = 40 mm	*Vc* = 150 m/min, *fz* = 1.5 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.2 mm/t						
Cast irons (GG25 etc.)	**AH120**	150 - 250	0.8 - 2.5	*Vc* = 180 m/min, *fz* = 1.5 mm/t *ap* = 1.0 mm, *ae* = 40 mm	*Vc* = 200 m/min, *fz* = 2.0 mm/t *ap* = 1.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.2 mm/t						
Hard materials (SDK, DH31 etc.) 40 - 50HRC	**AH730**	50 - 80	0.5 - 1.0	*Vc* = 70 m/min, *fz* = 0.7 mm/t, *ap* = 0.7 mm, *ae* = 1.0D mm						
				When plunging in small depth: *fz* = 0.1 mm/t						

Note: • 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.

09 type

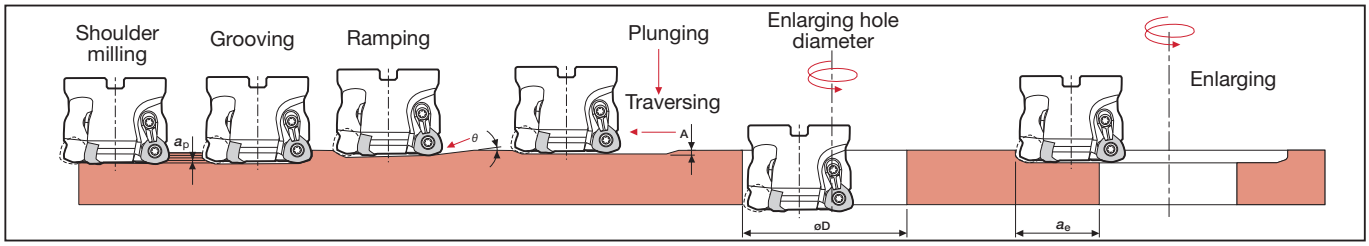
Work material	Insert grades	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)	ø50 (z = 2)	ø63 (z = 3)	ø80 (z = 4)	ø100 (z = 5)	ø125 (z = 6)	ø160 (z = 7)
Carbon Steels (C50 etc.) < 300HB	**AH120 (T3130)**	100 - 250	0.5 - 2.0	*Vc* = 200 m/min, *fz* = 1.5 mm/t, *ap* = 2.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.2 mm/t					
Alloy steels (42CrMo4 etc.) < 300 HB	**AH120 (T3130)**	100 - 200	0.5 - 2.0	*Vc* = 150 m/min, *fz* = 1.5 mm/t, *ap* = 2.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.2 mm/t					
Prehardened steels (X96CrMoV12 etc.) 30 - 40HRC	**AH120 (T3130)**	80 - 150	0.5 - 1.0	*Vc* = 120 m/min, *fz* = 0.8 mm/t, *ap* = 2.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.1 mm/t					
Stainless steels (X5CrNi18 9 etc.)	**AH130 AH140**	100 - 200	0.5 - 2.0	*Vc* = 150 m/min, *fz* = 1.5 mm/t, *ap* = 2.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.2 mm/t					
Cast irons (GG25 etc.)	**AH120**	150 - 250	0.8 - 2.5	*Vc* = 200 m/min, *fz* = 2.0 mm/t, *ap* = 2.0 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.2 mm/t					
Hard materials (SDK, DH31 etc.) 40 - 50HRC	**AH730**	60 - 100	0.5 - 1.0	*Vc* = 70 m/min, *fz* = 0.7 mm/t, *ap* = 0.7 mm, *ae* = 1.0D mm					
				When plunging in small depth: *fz* = 0.1 mm/t					

Notes : 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.

MILLFEED

Diameter ø20 ~ 160 mm | 10°, 20° | 1.5, 3 mm | P Steel | M Stainless | K Cast Iron | H Hard Materials

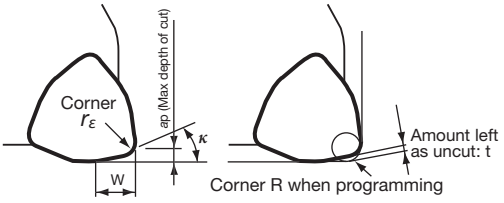
Machining capability



Cat. No.	Cutter dia. ø	Max. depth of cut ap (mm)	Max. ramping angle θ	Max. ramping angle A (mm)	Min. machining hole dia. øD (mm)	Max. machining hole dia. øD (mm)	Max. cutting width in enlarging hole ae (mm)
TXP05063RB-E	63	1.5	1°	0.5	116	123	59
TXP05080RB-E	80		0°30'		150	157	76
TXP06063RB-E	63		1°	1.0	109	123	58
TXP06080RB-E	80		0°30'		143	157	75
TXP08050R-E	50		4°		72	97	44
TXP08052R-E	52				76	101	46
TXP08063R-E	63		2°30'		98	123	57
TXP08066R-E	66				104	129	60
TXP08080R-E	80		1°30'		132	157	74
TXP08100R-E	100		1°		172	197	94
TXP08125R-E	125		0°45'		222	247	119
TXP09063R-E	63	3.0	2°	1.5	98	123	56
TXP09080R-E	80		1°30'		132	157	73
TXP09100R-E	100		1°		172	197	93
TXP09125R-E	125		0°45'		222	247	118
EXP05020...	20	1.5	3°	0.5	30	37	16
EXP05021...	21		2°30'		32	39	17
EXP06025...	25		5°	1.0	33	47	20
EXP06026...	26		4°30'		35	49	21
EXP06032...	32		3°30'		47	61	27
EXP06033...	33		3°		49	63	28
EXP06040...	40		2°		63	77	35
EXP08040...			6°		53		34

Tool geometry on programming

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



TXP / EXP	Max. depth of cut ap	Corner of insert rε	Cutting edge angle κ	W	t	Corner R when programming
05	1.5	1.5	20°	3.8	0.5	R2
06	1.5	1.5	20°	4.3	0.7	R2.5
08	1.5	1.5	10°	5.7	0.7	R2
09	3.0	2.5	20°	6.8	1.4	R3
					1.2	R4

● : Stocked items

TRC / ERC type

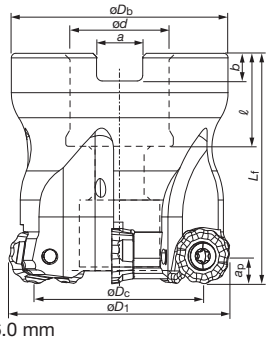
ROUNDSPLIT

Diameter ø32 ~ 125 mm | R 6, 8 mm | Air Hole | P Steel | M Stainless | K Cast Iron | N Non-ferrous | S Superalloys

Face Milling | Radius Milling | Slotting | Pocketing | Ramping | Profiling | Enlarging Hole

Die engraving of various work materials

Fig. A



Max. ap:
T/ERC12 = 6.0 mm
T/ERC16 = 8.0 mm

Rake angle: A.R. +0° R.R. −1°~ -5°

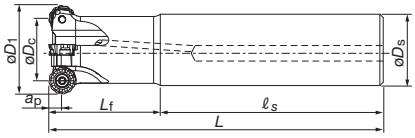


Fig. B

TRC12, 16 (Fig. A: bore type)

Cat. No.	Stock	No. of Inserts	Dimensions (mm) øD1	øDc	øDb	ød	ℓ	Lf	b	a	Weight (kg)	Air hole	Centre bolt	Inserts	Mounting details
TRC12R040M16.0E04	●	4	40	28	35	16	19	40	5.6	8.4	0.2	With	FSHM8-30H	RCMT1204*N-***	9-138Ⓐ
TRC12R050M22.0E05	●	5	50	38	47	22	20	50	6.3	10.4	0.4	With	CM10X30H		
TRC12R052M22.0E05	●	5	52	40	49	22	20	50	6.3	10.4	0.4	With	CM10X30H		
TRC12R063M22.0E06	●	6	63	51	59	22	20	50	6.3	10.4	0.7	With	CM10X30H		
TRC12R066M22.0E06	●	6	66	54	62	22	20	50	6.3	10.4	0.7	With	CM10X30H		
TRC12R080M27.0E07	●	7	80	68	76	27	22	50	7	12.4	1.1	With	CM12X30H		
TRC16R050M22.0E04	●	4	50	34	47	22	20	50	6.3	10.4	0.3	With	FSHM10-40H	RCMT1606*N-***	9-138Ⓐ
TRC16R052M22.0E04	●	4	52	36	49	22	20	50	6.3	10.4	0.4	With	FSHM10-40H		
TRC16R063M22.0E05	●	5	63	47	59	22	20	50	6.3	10.4	0.6	With	CM10X30H		
TRC16R066M22.0E05	●	5	66	50	62	22	20	50	6.3	10.4	0.7	With	CM10X30H		
TRC16R080M27.0E06	●	6	80	64	76	27	22	50	7	12.4	1.0	With	CM12X30H		
TRC16R100M32.0E07	●	7	100	84	96	32	25	63	8	14.4	2.4	With	CM16X40H		
TRC16R125M40.0E08	●	8	125	109	98	40	32	63	9	16.4	3.0	With	TMBA-M20H		9-138Ⓑ

ERC12, 16 (Fig. B: shank type)

type	Cat. No.	Stock	No. of Inserts	Dimensions (mm) øD1	øDc	øDs	ℓs	Lf	L	Weight (kg)	Air hole	Inserts
Standard	ERC12R032M32.0-03	●	3	32	20	32	80	70	150	0.8	With	RCMT1204*N-***
	ERC12R033M32.0-03	●	3	33	21	32	80	70	150	0.8	With	
	ERC12R040M32.0-04	●	4	40	28	32	100	50	150	0.8	With	
	ERC12R050M42.0-05	●	5	50	38	42	100	50	150	1.5	With	
	ERC16R040M32.0-02	●	2	40	24	32	100	50	150	0.8	With	RCMT1606*N-***
	ERC16R050M42.0-03	●	3	50	34	42	100	50	150	1.4	With	
Long	ERC12R032M32.0-03L	●	3	32	20	32	100	150	250	1.3	With	RCMT1204*N-***
	ERC12R033M32.0-03L	●	3	33	21	32	100	150	250	1.4	With	
	ERC12R040M32.0-04L	●	4	40	28	32	200	50	250	1.5	With	
	ERC12R050M42.0-05L	●	5	50	38	42	200	50	250	2.6	With	
	ERC16R040M32.0-02L	●	2	40	24	32	200	50	250	1.4	With	RCMT1606*N-***
	ERC16R050M42.0-03L	●	3	50	34	42	200	50	250	2.4	With	
Extra long	ERC12R032M32.0-03LL	●	3	32	20	32	120	180	300	1.6	With	RCMT1204*N-***
	ERC12R033M32.0-03LL	●	3	33	21	32	230	70	300	1.7	With	
	ERC12R040M32.0-04LL	●	4	40	28	32	250	50	300	1.8	With	
	ERC12R050M42.0-05LL	●	5	50	38	42	250	50	300	3.0	With	
	ERC16R040M32.0-02LL	●	2	40	24	32	250	50	300	1.7	With	RCMT1606*N-***
	ERC16R050M42.0-03LL	●	3	50	34	42	250	50	300	3.0	With	

● : Stocked items.

Relating pages | Technical Reference (15−1)

ROUNDSPLIT

Inserts

For general machining
with serrated cutting edge

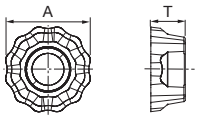


Fig. 1 **NMJ**

For general machining
Round insert

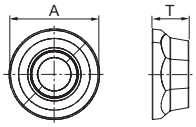


Fig. 2 **MJ**

For aluminium machining
with serrated cutting edge

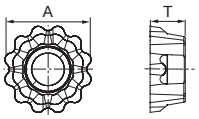
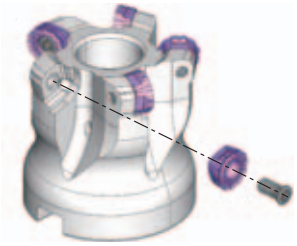


Fig. 3 **NAJ**

● : Stocked items.

Cat. No.	Accuracy	Honing	Stock				Dimensions (mm)		Shape	Cutter
			Coated grades			Carbide				
			AH725	AH120	AH140	KS15F	A	T		
RCMT1204EN-NMJ	M	with	●	●	●		12	4.8	Fig. 1	E/TRC12
RCMT1204EN-MJ	M	with	●	●	●		12	4.8	Fig. 2	
RCMT1204FN-NAJ	M	without				●	12	4.8	Fig. 3	
RCMT1606EN-NMJ	M	with	●	●	●		16	6.5	Fig. 1	E/TRC16
RCMT1606EN-MJ	M	with	●	●	●		16	6.5	Fig. 2	
RCMT1606FN-NAJ	M	without				●	16	6.5	Fig. 3	

Replacement Parts



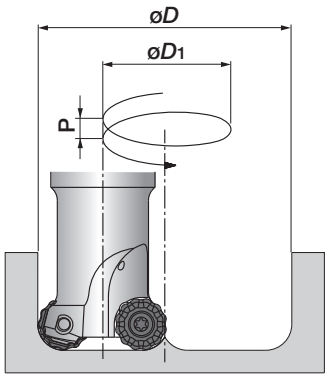
Descriptions		Replacement parts Cat. No.		
Applicable cutter		TRC12R...	TRC16R050~100...	TRC16R125...
Clamping screw		**CSTB-4L090**	**CSTB-5L120**	**CSTB-5L120**
Wrench	Torx Bit	**BT15S**	**BT20S**	**BT20M**
	Grip	**H-TBS**	**H-TB**	**H-TB**
Mono block type wrench (substitution)		**T-15D**	**T-20D**	**T-20D**
Descriptions		**Replacement parts Cat. No.**		
Applicable cutter		ERC12R...	ERC16R...	ERC16R040M32.0-02
Clamping screw		**CSTB-4L090**	**CSTB-5L120**	**CSTB-5L105**
Wrench (substitution)		**T-15DB (T-15D)**	**T-20DB (T-20D)**	**T-20DB (T-20D)**

Standard cutting conditions

Work material	Brinell hardness HB	Grades	Cutting Speed *Vc* (m/min)	Feed per tooth *fz* (mm/t) each chipbreaker		
				NMJ	MJ	NAJ
Low carbon steels (C15E etc.)	≤ 200	AH725	100 - 220	0.17 - 0.3	0.2 - 0.7	-
High carbon steels (C45, C55 etc.)	200 - 300		100 - 200	0.17 - 0.25		
Alloyed steels (42CrMo4, 17Cr3 etc.)	150 - 300					
Tool steels (X155CrVMo121 etc.)	≤ 300		100 - 180			
Stainless steels (300 Series, X5CrNi189 etc.)	-	AH140	90 - 180	0.15 - 0.25	0.2 - 0.6	-
Grey cast irons	150 - 250	AH120	140 - 250	0.17 - 0.3	0.2 - 0.7	-
Ductile cast irons	150 - 250	AH120	100 - 200	0.17 - 0.3	0.2 - 0.7	-
Aluminium alloys (Si < 13%)	-	KS15F	500 - 1200	-	-	0.1 - 0.3
Aluminium alloys (Si ≥ 13%)	-		100 - 300			
Heat-resisting alloy (Ti-6Al-4V, Inconel718 etc.)	-	AH725	20 - 50	0.15 - 0.25	0.2 - 0.6	-

· To remove excessive chip accumulation use an air blast.
· When chips stick to the cutting edges (aluminium 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.

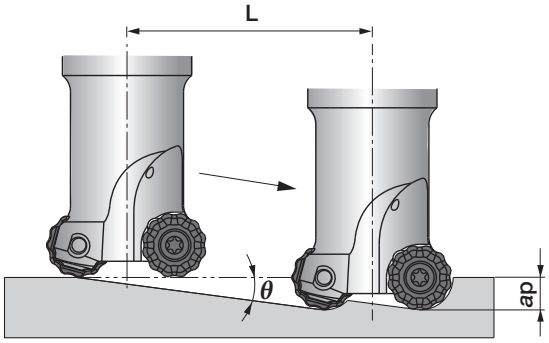
Holemaking with helical feed



Cat. No.	Tool ø øDc (mm)	Min. machining diameter (mm)		Max. machining diameter (mm)		Pitch P (mm)
		øD	øD1	øD	øD1	
ERC12R032...	ø32	52	20	62	30	< 6
ERC12R033...	ø33	54	21	64	31	< 6
T/ERC12R040...	ø40	68	28	78	38	< 6
T/ERC12R050...	ø50	88	38	98	48	< 6
TRC12R063...	ø63	114	51	124	61	< 6
TRC12R080...	ø80	148	68	158	78	< 6
ERC16R040...	ø40	64	24	78	38	< 8
T/ERC16R050...	ø50	84	34	98	48	< 8
TRC16R063...	ø63	110	47	124	61	< 8
TRC16R080...	ø80	144	64	158	78	< 8
TRC16R100...	ø100	184	84	198	98	< 8
TRC16R125...	ø125	234	109	248	123	< 8

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

Ramping



Cat. No.	Tool ø øDc (mm)	Max. ramping angle θ	L (mm): tool pass length when ramping angle is 2 degrees				
			ap (mm)				
			2	3	4	6	8
ERC12R032...	ø32	10°	57	85	114	171	–
ERC12R033...	ø33	9°					
T/ERC12R040...	ø40	6°					
T/ERC12R050...	ø50	4°					
TRC12R063...	ø63	3°					
TRC12R080...	ø80	2.3°					
ERC16R040...	ø40	12°					229
T/ERC16R050...	ø50	7.4°					
TRC16R063...	ø63	6°					
TRC16R080...	ø80	4.3°					
TRC16R100...	ø100	3°					
TRC16R125...	ø125	2.4°					

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

TAC Flash radius mills

TRD12·16

Diameter ø50 ~ 100 mm

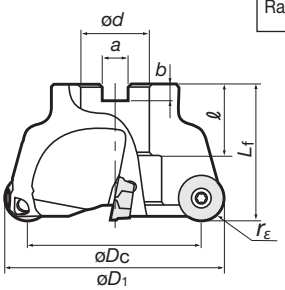
R 6, 8 mm

P Steel | M Stainless | K Cast Iron | H Hard Materials

Face Milling | Radius Milling | Slotting | Pocketing | Ramping | Profiling | Enlarging Hole

For multi-functional milling of steels, cast irons and hard materials

Rake angle:			
	TRD	A.R. + 10°	R.R. – 6° ~ 0°
	ERD	A.R. + 8° ~ 10°	R.R. – 6° ~ – 2°



Max. ap: RDMT/W12 type = 6.0 mm
RDMT/W16 type = 8.0 mm

TRD12·16 (Fig. A: bore type)

Cat. No.	Stock	Applicable insert	No. of inserts	Dimensions (mm) r_ε	$øD_1$	$øD_c$	L_f	ℓ	ød	b	a	Weight (kg)	Mounting details
TRD12050R-E	●	RDMT1204ZDPN-MJ RDMW1204ZDSN	4	6	50	38	40	20	22	6.3	10.4	0.3	9-138Ⓐ
TRD12052R-E	●		4		52	40							
TRD12063R-E	●		5		63	51						0.4	
TRD12066R-E	●		5		66	54		22		7	12.4	0.5	
TRD12080R-E	●		6		80	68	50		27			0.8	9-138Ⓑ
TRD12100R-E	●		6		100	88		26	32	8	14.4	1.4	
TRD16063R-E	●	RDMT1606ZDPN-MJ RDMW1606ZDSN	4	8	63	47	40	20	22	6.3	10.4	0.4	9-138Ⓐ
TRD16066R-E	●		4		66	50	50	22	27	7	12.4	0.5	
TRD16080R-E	●		5		80	64						0.7	
TRD16100R-E	●		6		100	84		26	32	8	14.4	1.1	9-138Ⓑ

Inserts

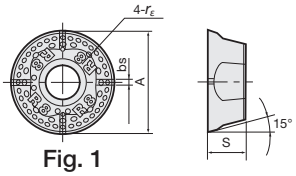


Fig. 1

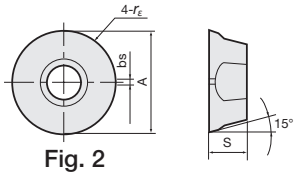


Fig. 2

Cat No.	Accuracy	Honing	Figure	Grades: Coated T3130	AH120	AH130	AH140	AH330	Uncoated UX30	Dimensions (mm) A	S	bs	r_ε
RDMT1204ZDPN-MJ	M	With	Fig. 1	●	●		●	●	●	12.8	4.76	0.8	6
RDMW1204ZDSN			Fig. 2	●	●		●						
RDMT1606ZDPN-MJ			Fig. 1	●	●	●	●	●	●	16.8	6.35		8
RDMW1606ZDSN			Fig. 2	●	●		●						

Replacement parts

Parts	Part Cat. No. T/ERD12	T/ERD16
Clamping screw	CSTB-3.5	CSTB-5
Wrench	T-15D	T-20D

● : Stocked items.

Relating pages | Technical Reference (15–1)

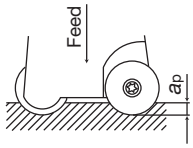
Standard cutting conditions

Work materials	Grades	Cutting speed *Vc* (m/min)	Feed per tooth *f* (mm/t)	
			T/ERD12	T/ERD16
Carbon steels (C50 etc.) < 300 HB	**AH120**	120 - 220	0.3 - 0.5	0.3 - 0.6
	AH330	140 - 240	0.2 - 0.4	0.2 - 0.5
	UX30	80 - 120		
Alloy steels (42CrMo4, 17Cr3 etc.) < 300 HB	**AH120**	100 - 200	0.2 - 0.45	0.2 - 0.5
	AH330	120 - 220	0.15 - 0.35	0.15 - 0.4
	UX30	60 - 120		
Die steels (X96CrMoV12 etc.) < 300 HB	**AH120**	80 - 180	0.2 - 0.35	0.25 - 0.45
	AH330	100 - 200	0.1 - 0.3	0.1 - 0.4
Stainless steels (X5CrNi18 9 etc.)	**AH130•AH140**	100 - 200	0.2 - 0.3	0.2 - 0.4
Grey Cast irons (GG25 etc.)	**AH120**	120 - 240	0.3 - 0.5	0.3 - 0.6
	AH330	150 - 250	0.2 - 0.4	0.2 - 0.5
Hard materials < 45 HRC	**AH120**	60 - 140	0.08 - 0.25	0.1 - 0.3

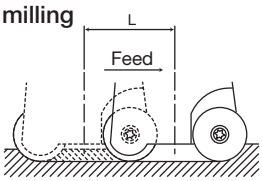
Note: When the depth of cut is smaller than 2 mm, use the higher limit of feed values shown above. When larger than 3 mm, use the lower limit of the feed values.

Plunging + traverse feed milling

Plunging



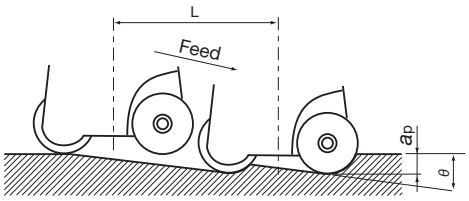
Traverse feed milling



Cat. No.	Max. plunging depth *ap* (mm)	Min. traverse length to flatten the bottom surface: L (mm)
TRD12050R-E	4	Tool diameter $øD_1$ - 11
TRD12052R-E		
TRD12063R-E		
TRD12066R-E		
TRD12080R-E		
TRD12100R-E		
TRD16063R-E	5.5	Tool diameter $øD_1$ - 15
TRD16066R-E		
TRD16080R-E		
TRD16100R-E		

Notes:
- In plunging, the maximum plunging depth is limited as shown in the above table.
- In plunging, set the Z-axis feed in a range of 0.05 to 0.1 mm/t.
- When plunging, use peck-feed every 1 mm (or smaller than 1 mm) to break chips.

Ramping

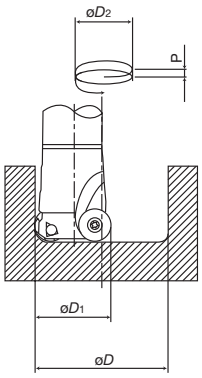


Cat. No.	Max. ramping angle θ
TRD12050R-E	6°
TRD12052R-E	5.5°
TRD12063R-E	4°
TRD12066R-E	4°
TRD12080R-E	2.5°
TRD12100R-E	1.5°
TRD16063R-E	6°
TRD16066R-E	6°
TRD16080R-E	4°
TRD16100R-E	3°

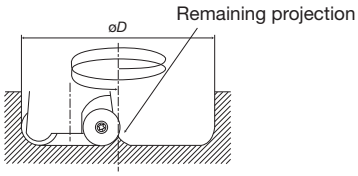
Notes:
- tanθ = depth of cut: *ap* / length of tool pass: L
- In ramping, the ramping angle should be set within the maximum ramping angle.

Helical feed drilling

Unit: mm



Cat. No.	Min. machining diameter		Mix. machining diameter		P
	øD	*øD2*	*øD*	*øD2*	
TRD12050R-E	88	38	98	48	< 6
TRD12052R-E	92	40	102	50	
TRD12063R-E	114	51	124	61	
TRD12066R-E	120	54	130	64	
TRD16080R-E	148	68	158	78	
TRD16100R-E	188	88	198	98	
TRD16063R-E	110	47	124	61	< 8
TRD16066R-E	120	50	130	64	
TRD16080R-E	144	64	158	78	
TRD16100R-E	184	84	198	98	



$øD_1$: Tool diameter
øD : Drilling diameter
$øD_2$: Tool pass diameter
P : Z-axis feed per one round of tool pass (Pitch of helical cycle)

- In helical feed hole machining, the machinable hole diameters are limited by the tool diameter as shown in the above tables.
- When machining between the minimum and maximum machining diameters, a projection remains in the center of the bottom surface of the hole as shown in the Figure at right. Remove it by traverse feed milling.

TAC radius mills

T/ERF6000

Diameter ø50 ~ 160 mm

R 10 mm

M Stainless S Superalloys H Hard Materials

Face Milling Radius Milling

For face milling of hard materials and other difficult-to-cut materials

TRF6000 I

ERF6000

Rake angle: A.R. +19° R.R. +3°

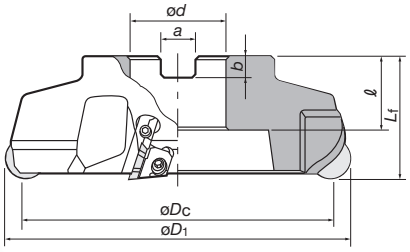


Fig. A

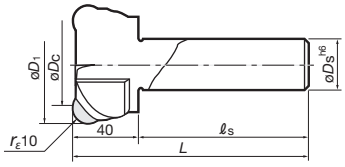


Fig. B

Max. *ap*: 3 mm (RFEN2004ZF□N), 10 mm (RFEN2004M0□N)

TRF6000RIE (Fig. A: Irregular pitch for vibration-free milling)

Cat. No.	Stock	No. of inserts	Dimensions (mm)							Weight (kg)	Mounting details
			øDc	øD1	ød	ℓ	Lf	b	a		
TRF6003RIE	●	4	80	100	27	26	50	7	12.4	1.4	9-138Ⓑ
TRF6004RIE	●	5	100	120	32	32	63	8	14.4	2.5	
TRF6005RIE	●	6	125	145	40			9	16.4	3.9	
TRF6006RIE	●	8	160	180		29				5.8	9-138Ⓒ

ERF6000 (Fig. B: shank type)

Cat. No.	Stock	No. of inserts	Dimensions (mm)				
			øDc	øD1	øDs	L	ℓs
ERF6050RE	●	3	50	70	32	120	80
ERF6063RE	●	4	63	83			

Note: The above TAC Endmills are not irregular pitch spec.

9

TAC Mills

Inserts

RFEN2004ZF□N

(With partially flattened flanks)

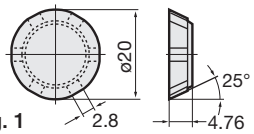


Fig. 1

RFEN2004M0□N

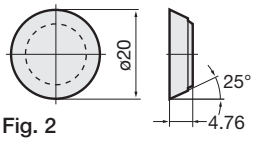


Fig. 2

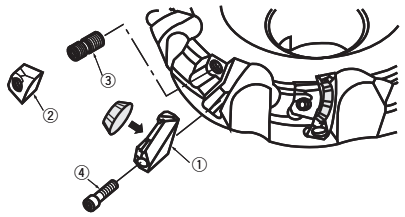
Cat. No.	Accuracy	Honing	Grades				Shape
			Coated		Uncoated		
			GH330	AH120	KS20	UX30	
RFEN2004ZFTN	E	With	●	●	●	●	Fig. 1
RFEN2004M0TN		With	●		●	●	Fig. 2

Notes : • RFEN2004M0TN type inserts should not be used for finishing requiring surface finish better than 12S.
• RFEN2004ZF□N type Inserts can be used for both finishing and roughing at depth of cut up to 3 mm.
• RFEN2004M0TN does not have flattened flanks.

● : Stocked items.

Relating pages Technical Reference (15–1)

Replacement parts



No.	Descriptions	Cat. No.	
		TRF6003RIE~ TRF6006RIE	ERF6050R ERF6063R
①	Locator	LF602R	LF602R
②	Insert locking wedge	WF603R	WF602R
③	Wedge fixing screw	FDS-8S	FDS-6Z
④	Locator fixing screw	CM4X0.7X20	CM4X0.7X20
⑤	T-handle wrench	TP-4	TP-3A

Standard cutting conditions

Work materials		Grades	Depth of cut = 1 ~ 3 mm		Depth of cut = 0.4 ~ 1 mm		Cutting fluid
			Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)	Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)	
Stainless steels	Austenitic, Ferritic X5CrNi18-9, X6Cr17 (< 300HB)	**AH120•GH330**	150 - 250	0.20 - 0.35	180 - 250	0.2 - 0.5	Dry cutting
		UX30	150 - 230				
	Precipitatio hardening X5CrNiCuNb 16-4 (< 35HRC)	**AH120•GH330**	150 - 200	0.15 - 0.3	180 - 250	0.2 - 0.4	Dry cutting
		UX30	130 - 180		150 - 200		
Superalloys Inconel, Hastelloy etc.		**KS20**	20 - 30	0.10 - 0.15	20 - 50	0.2 - 0.4	Water insoluble type
Titanium alloys Ti-6Al-4V etc.		**KS20**	40 - 50	0.15 - 0.35	40 - 60	0.2 - 0.5	Water soluble type or dry cutting
Hard materials (40 - 50HRC)		**KS20**	20 - 50	0.05 - 0.1	20 - 50	0.05 - 0.2	Water insoluble type

Note: Cutting width should be within 60 to 70 % of effective cutter diameter.

- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

TAC Flash endmills with center cutting edge

EVX

Diameter ø16 ~ 32 mm | 90° ~ 15 mm | Air Hole

P Steel | K Stainless | M Cast Iron

Shoulder Milling | Slotting | Side Milling | Pocketing | Ramping | Plunging | Enlarging Hole | Drilling

For multi-functional milling of steels, cast irons and stainless steels

Rake angle:		
Standard type	A.R. +2° ~ +5° R.R. −10° ~ − 3.5°	
Long type	A.R. +5°	R.R. −4° ~ − 2°

Fig. A

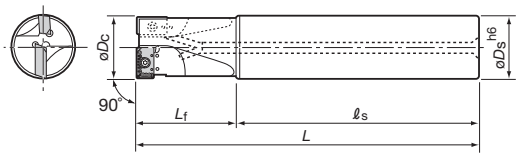
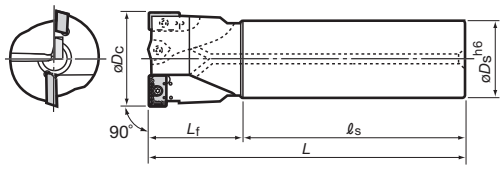


Fig. B



Max. ap: 9-115

EVX : ø16 ~ 32 mm

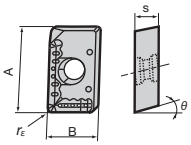
Type	Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øDs	ℓs	Lf	L	Air hole	Applicable insert	Fig.
Standard	EVX08016RSA-E	●	2	16	16	55	30	85	With	XXMU08T204PR-MJ	Fig. C
Long	EVX08016RLA-E	●					50	105	With		
Extra-long	EVX08016RLA	●				135	40	175	With		Fig. A
Standard	EVX10020RSA-E	●	2	20	20	60	30	90	With	XXMU10H308PR-MJ	Fig. C
Long	EVX10020RLA-E	●					60	120	With		
Extra-long	EVX10020RLA	●				135	50	185	With		Fig.A
Standard	EVX12025RSA-E	●	2	25	25	60	40	100	With	XXMU12X408PR-MJ	Fig. C
Long	EVX12025RLA-E	●					75	135	With		
Extra-long	EVX12025RLA	●				150	70	220	With		Fig. A
Standard	EVX16032RSA-E	●	2	32	25	60	50	110	With	XXMU16X508PR-MJ	Fig. C
Long	EVX16032RLA-E	●					95	155	With		
Extra-long	EVX16032RLA	●			32	175	80	255	With		Fig. A

Replacement parts for ISO

Cat. No.	Clamping screw	Wrench
EVX08016	CSPB-2.2	IP-7D
EVX10020	CSPB-2.5	IP-8D
EVX12025	CSPD-3	IP-10D
EVX16032	CSPB-3.5	IP-15D

Inserts

Fig. 1
Used for both peripheral and center edges



Cat. No.	Accuracy	Honing	Grades Coated AH120	AH140	Dimensions (mm) A	B	s	rε	θ	C	Figure
XXMU08T204PR-MJ	M	With	●	●	8.2	5.6	2.78	0.4	10°	–	Fig. 1
XXMU10H308PR-MJ			●	●	10.6	6.8	3.5	0.8	11°		
XXMU12X408PR-MJ			●	●	13.2	7.9	4.2				
XXMU16X508PR-MJ			●	●	16.8	11.1	5.0				

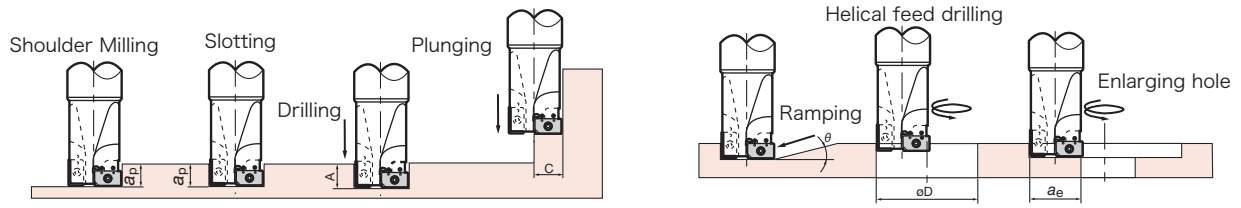
● : Stocked items.

Relating pages | Technical Reference (15–1)

Standard cutting conditions

Work material	Grades	øD: ø16 ~ ø20 mm			øD: ø25 ~ ø63 mm		
		Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)		Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)	
			Shouldering·Grooving	Drilling		Shouldering·Grooving	Drilling
Carbon steels (Ck50 etc.) < 300 HB	**AH120**	100 - 180	0.05 - 0.20	0.03 - 0.08	120 - 200	0.08 - 0.25	0.05 - 0.10
Alloy steels (42CrMo4 etc.) < 300 HB	**AH120**	80 - 160	0.05 - 0.15	0.03 - 0.08	100 - 180	0.08 - 0.20	0.05 - 0.10
Die steels (X96CrMoV12 etc.) < 300 HB	**AH120**	60 - 120	0.05 - 0.13	0.03 - 0.06	80 - 150	0.08 - 0.15	0.03 - 0.08
Stainless steels (X5CrNi18 9 etc.)	**AH140**	70 - 140	0.05 - 0.15	0.03 - 0.08	90 - 160	0.08 - 0.20	0.03 - 0.08
Cast irons (GG25 etc.)	**AH120**	100 - 180	0.05 - 0.25	0.03 - 0.10	120 - 200	0.08 - 0.25	0.05 - 0.10

Machining capability



	Cat. No.	Tool diameter øDc	Effective cutting edge length (*ap*)	Max. drilling depth (A)	Max. cutting width in plunging (C)	Max. ramping angle (D)	Min. machining hole dia. (øDmin)	Max. machining hole dia. (øDmax)	Max. cutting width in enlarging hole (*ae*)
Standard type / Long type	**EVX08016R...**	16	7	8	8	3°	19.2	30	14
	EVX10020R...	20	9	10	10	3°	24	38	18
	EVX12025R...	25	11.5	12.5	12.5	3°	30	48	23
	EVX16032R...	32	15	16	16	3°	38.4	62	30

ESD10

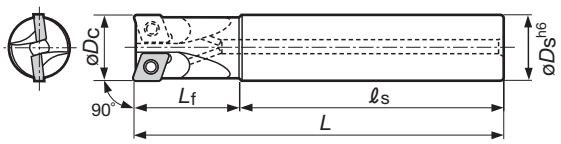
Diameter ø20 ~ 32 mm | 90° 9, 15 mm | Air Hole

P Steel | M Stainless | K Cast Iron | N Non-ferrous

Shoulder Milling | Slotting | Side Milling | Pocketing | Ramping | Plunging | Enlarging Hole

For multi-functional milling of general steels, stainless steels, cast irons and non-ferrous metals

Rake angle:	ESD10	A.R. +8.5° ~ +10° R.R. – 10° ~ – 5°



Max. ap: 9-117

TSD10 (Fig. A: bore type)

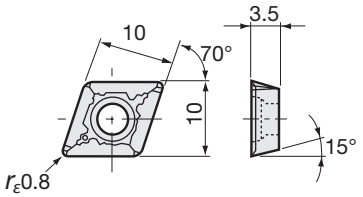
Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	L	Lf	ℓs	øDs	Applicable inserts	Clamping screw	Wrench
ESD10020RS-E	●	1	20	80	30	50	20	GDMT10H3PDPR-MJ GDGT10H3PDFR-AJ	CSTB-3.5H	T-15D
ESD10025RS-E	●	2	25	96	40	56	25			
ESD10032RS-E	●		32	110	50	60	32			

Replacement parts

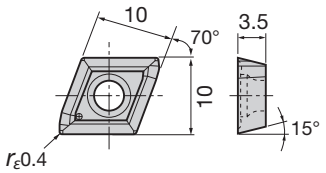
Cat. No.	Clamping screw	Wrench
T/ESD10	CSTB-3.5H	T-15D

Inserts

GDMT10H3PDPR-MJ



GDGT10H3PDFR-AJ



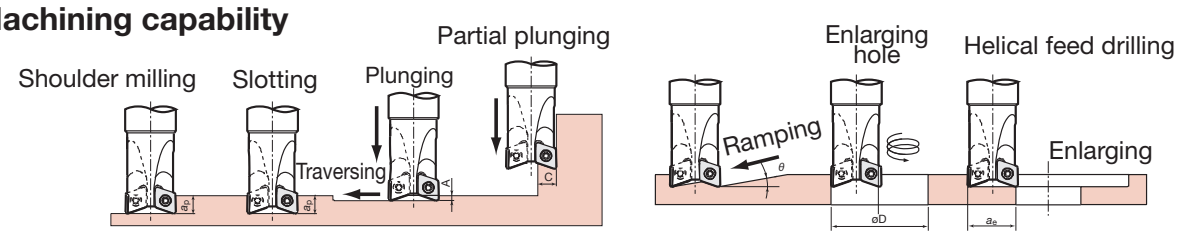
Cat. No.	Accuracy	Honing	Coated AH120	AH140	AH330	T3130	DLC coated DS1100	Uncoated UX30	TH10
GDMT10H3PDPR-MJ	M	With	●	●	●	●		●	
GDGT10H3PDFR-AJ	G	Without					●		●

● : Stocked items.

Standard cutting conditions

Work material	Grades	ESD (ø20 ~ 32 mm)		
		Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)	
			Shouldering, grooving, Z-feed milling	Partial plunging
Carbon steels (C50 etc.) < 300 HB	**AH120**	100 - 180	0.05 - 0.2	0.03 - 0.1
	AH330	120 - 230	0.05 - 0.15	0.03 - 0.08
	UX30	80 - 130		
	T3130	100 - 180	0.05 - 0.2	0.03 - 0.1
Alloy steels (42CrMo4 etc.) < 300 HB	**AH120**	80 - 160	0.05 - 0.15	0.03 - 0.08
	AH330	100 - 200	0.05 - 0.13	0.03 - 0.06
	UX30	80 - 120		
	T3130	80 - 160	0.05 - 0.15	0.03 - 0.08
Die steels (X96CrMoV12 etc.) < 300 HB	**AH120**	60 - 120	0.05 - 0.13	0.03 - 0.06
	AH330	80 - 160	0.05 - 0.1	0.03 - 0.05
	UX30	60 - 100		
	T3130	60 - 120	0.05 - 0.13	0.03 - 0.06
Stainless steels (X5CrNi18 9 etc.)	**AH140**	80 - 160	0.05 - 0.15	0.03 - 0.08
Cast irons (GG25 etc.)	**AH120**	100 - 180	0.05 - 0.25	0.03 - 0.1
	AH330	120 - 230	0.05 - 0.2	0.03 - 0.08
	UX30	80 - 130		
Aluminium alloys	**DS1100**	200 - 1000	0.05 - 0.25	0.05 - 0.15
Copper alloys	**TH10**	200 - 400	0.05 - 0.25	0.05 - 0.15

Machining capability



Cat. No.	Cutter dia. ø*Dc* (mm)	*ap* (mm)	A (mm)	C (mm)	*θ*	Min. øD (mm)	Max. øD (mm)	*ae* (mm)
ESD10020R...	20	9	2.5	8	10°	24	38	18
ESD10025R...	25	9	2.5	9	10°	32	48	23
ESD10032R...	32	9	2.5	9	6°30'	46	62	30

ap = Effective cutting edge length A = Max. plunging depth
C = Max. cutting width in plunging
θ = Max. ramping angle øD = Machining hole dia.
ae = Max. cutting width in enlarging hole (E)

● : Stocked items.

TAC Flash ball endmills

EBP

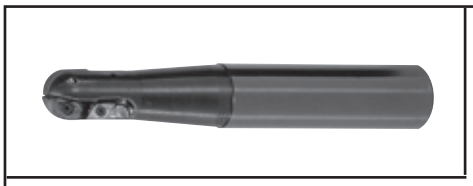
Diameter ø20 ~ 32 mm

R ~ 15 mm

P Steel | K Cast Iron | H Hard Materials

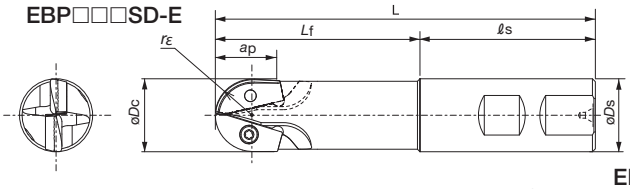
Radius Milling | Pocketing | Ramping | Profiling

For medium to finish engraving of steel and cast iron dies

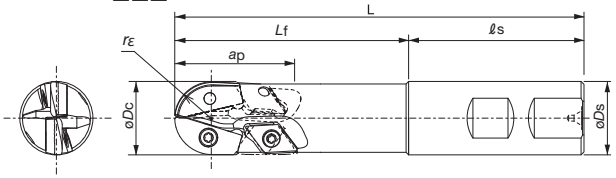


Tolerance on R ±0.08

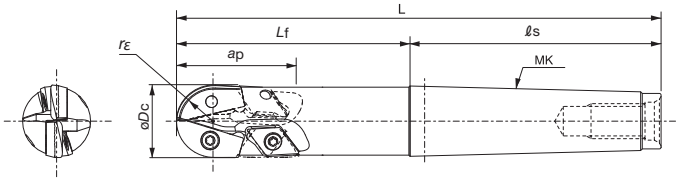
EBP□□□SD-E



EBP□□□MDE-E



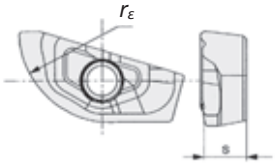
EBP□□□MME-E



Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	L	Lf	ℓs	øDs	ap	rε	MK	Applicable inserts		for ZPET Clamping screw	for ZPET Wrench	for DCMW Clamping screw	for DCMW Wrench
EBP020SD-E	●	2	20	116	60	56	20	16	10	-	ZPET2004-MJ	-	CSTD-3T	T-10D	-	-
EBP020MDE-E	●	2+2		126	70			29.5				DCMW070204TN			CSTB-2.5S	T-8D
EBP020MME-E	●	2+2		139		69	-			MK2						
EBP025SD-E	●	2	25	130	80	60	25	21	12.5	-	ZPET2505-MJ	-	CSTB-4S	T-15D	-	-
EBP025MDE-E	●	2+2		140				41				DCMW11T304TN			CSTB-4S	T-15D
EBP025MME-E	●	2+2		166		86	-			MK3						
EBP032SD-E	●	2	32	140	100	60	32	25	16	-	ZPET3206-MJ	-	CSTB-5	T-20D	-	-
EBP032MDE-E	●	2+2		160				46				DCMW11T304TN			CSTB-4S	T-15D
EBP032MME-E	●	2+2		209		109	-			MK4						

Inserts

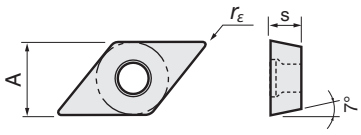
For R-edge



Cat. No.	Accuracy	Honing	Stocked grade Coated AH120	AH330	Dimensions (mm) s	rε
ZPET2004-MJ	E	With	●	●	4.5	10
ZPET2505-MJ			●	●	4.625	12.5
ZPET3206-MJ			●	●	6.75	16

"ZPET3006-MJ" : Packing Quantity=1 pcs.

For peripheral edge



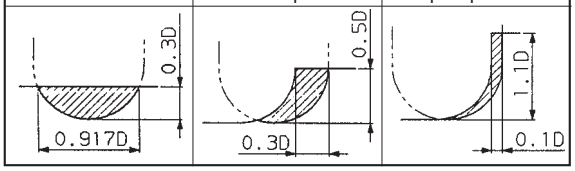
Cat. No.	Accuracy	Honing	Stocked grade Coated AH120	AH330	Dimensions (mm) A	s	rε
DCMW070204TN	M	With	●	●	6.35	2.38	0.4
DCMW11T304TN			●	●	9.525	3.97	

Standard cutting conditions

Work material	Grade	Machining type	Cutting speed Vc (m/min)	Table feed vf (mm/min) Tool dia. : ø20	Tool dia. : ø25	Tool dia. : ø32
Carbon steels (C55 etc.) < 300 HB	AH120	(1)	170 - 230	610 - 910	460 - 760	360 - 660
		(2)	200 - 260	900 - 1300	680 - 1080	530 - 930
		(3)	150 - 200	420 - 350	310 - 610	230 - 530
Alloy steels (42CrMo4 etc.) < 300 HB	AH120	(1)	150 - 210	530 - 830	400 - 700	300 - 600
		(2)	180 - 240	800 - 1200	600 - 400	470 - 870
		(3)	130 - 180	360 - 660	250 - 550	190 - 490
Die steels (X96CrMoV12 etc.) < 300 HB	AH330	(1)	120 - 180	420 - 720	310 - 610	230 - 530
		(2)	150 - 210	660 - 1060	490 - 890	370 - 770
		(3)	100 - 150	260 - 560	180 - 480	130 - 430
Cast irons (GG25 etc.)	AH120	(1)	170 - 230	800 - 1100	610 - 910	490 - 790
		(2)	200 - 260	900 - 1400	700 - 1200	530 - 1030
		(3)	150 - 200	420 - 720	310 - 610	230 - 530
Hardened steels Prehardened steels < 45 HRC	AH120	(1)	60 - 100	150 - 350	100 - 300	100 - 260
		(2)	70 - 130	160 - 460	100 - 400	100 - 360
		(3)	40 - 80	140 - 240	100 - 200	80 - 180

Machining types

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



Notes:
- Cutting speeds shown in the left 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 (MSE), set the cutting speed and feed to 60 to 80 % of values shown in the table.
- When using long shank types (LSE), set the cutting speed and feed to 20 to 50 % of values shown in the table, bearing in mind the overhang length.

● : Stocked items.

Relating pages | Technical Reference (15–1)

TAC Flash ball endmills (Large diameter type)

EBD

Diameter ø40 ~ 50 mm

R ~ 25 mm

P Steel | K Cast Iron | H Hard Materials

Radius Milling | Pocketing | Ramping | Profiling

For medium to rough engraving of steel and cast iron dies

Tolerance on R ±0.2

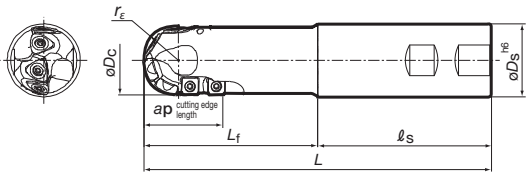


Fig. A

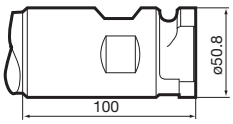
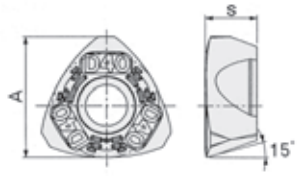


Fig. B
Combination shank

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	L	Lf	ℓs	ap	rε	øDs	Applicable inserts	Clamping screw	Wrench
EBD040SDE-E	●	4+3	40	170	100	70	45	20	40	ZDMT4005-MJ SCMT09T308-23	CSTB-4M	T-15T
EBD040MME-E	●	4+3	40	170	120	109	45	20	MK4			
EBD050SDE-E	●	4+3	50	229	100	70	59	25	40	ZDMT5006-MJ SCMT120408-23	CSTB-5	T-20T
EBD050MME-E	●	4+3	50	256	120	136	59	25	MK5			

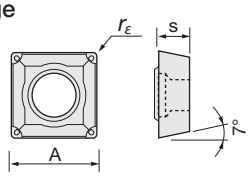
Standard cutting

For R-edge



* The figure shows ZDMT4005-MJ.

For peripheral edge



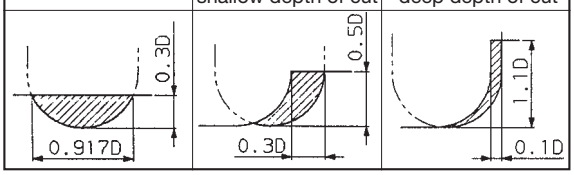
	Cat. No.	Accuracy	Honing	Grade Coated AH120	Dimensions (mm) A	s	r_ε
R-edge	ZDMT4005-MJ	M	With	●	13	5.5	–
R-edge	ZDMT5006-MJ			●	16.2	6.5	–
Peripheral edge	SCMT09T308-23			●	9.525	3.97	0.8
Peripheral edge	SCMT120408-23			●	12.7	4.76	0.8

Standard cutting conditions

Work material	Grade	Machining type	Cutting speed Vc (m/min)	Table feed vf (mm/min) Tool dia. : ø40	Tool dia. : ø50
Carbon steels (C55 etc.) < 300 HB	AH120	(1)	150 - 210	610 - 910	460 - 760
		(2)	170 - 230	900 - 1300	680 - 1080
		(3)	130 - 190	420 - 720	310 - 610
Alloy steels (42CrMo4 etc.) < 300 HB	AH120	(1)	130 - 190	530 - 830	400 - 700
		(2)	150 - 210	800 - 1200	800 - 1000
		(3)	110 - 170	360 - 660	250 - 550
Die steels (X96CrMoV12 etc.) < 300 HB	AH120	(1)	110 - 170	420 - 720	310 - 610
		(2)	130 - 190	660 - 1060	490 - 890
		(3)	90 - 150	260 - 560	180 - 480
Cast irons (GG25 etc.)	AH120	(1)	170 - 230	800 - 1000	610 - 910
		(2)	190 - 250	900 - 1400	700 - 1200
		(3)	150 - 210	420 - 720	310 - 610
Hardened steels Prehardened steels < 45 HRC	AH120	(1)	70 - 110	150 - 350	100 - 300
		(2)	80 - 120	160 - 460	100 - 400
		(3)	50 - 90	140 - 240	100 - 200

Machining types

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



Notes:
- Cutting speeds shown in the left 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.

● : Stocked items.

TAC ball Endmills

TBN1000

Diameter ø10 ~ 30 mm

R ~ 15 mm

K Cast Iron P Steel

Pocketing Ramping Profiling

For medium to finish engraving of steel and cast iron dies

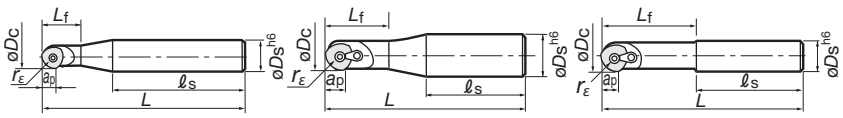


Fig. A Fig. B Fig. C

Cat. No.	Stock	Applicable insert	Dimensions (mm) øDc	rε	L	ap	Lf	ℓs	øDs	Fig.	Clamping screw	Clamp	Clamp screw	Wrench
TBN1100SE	●	ZNCA1002FN2	10	5	90	5	15	60	16	A	CSTB-2.5B	–	–	T-8D
TBN1120SE	●	ZNCA1203FN	12	6	110	6	20	70			CSTB-3S			T-9D
TBN1160SE	●	ZNCA1603FN	16	8	130	8	25	85	20		CSTB-4S			T-15D
TBN1200SE	●	ZNCA2004FN ZNMM2004EN	20	10	160	10	35	100	25		CSTA-5S			T-15D
TBN1250SE	●	ZNCA2505FN ZNMM2505EN	25	12.5	175	12.5	45	100	32	B	CSTA-5S	CP536	DS-6T	T-15D
TBN1300SE	●	ZNCA3005FN ZNMM3005EN	30	15	190	15	90	100	32	C				

Inserts

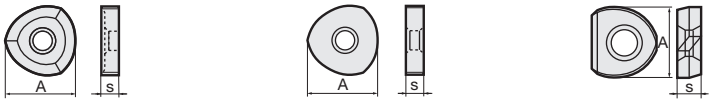


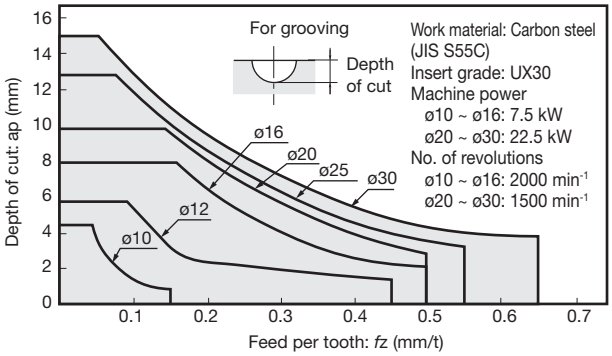
Fig. 1 Fig. 2 Fig. 3

Note : Type B inserts, used for cutter smaller than ø16 mm, are single-sided type.

Cat. No.	Accuracy	Grades Uncoated TH10	UX30	Dimensions (mm) A	s	No. of cutting edges per insert	Type	Application
ZNCA1002FN2	C	●	●	7.958	2.5	2	Fig. 3	UX30 grade for steels TX10 grade for cast irons and light alloys
ZNCA1203FN		●	●	9.735	3	3	Fig. 2	
ZNCA1603FN		●	●	12.772	3.5			
ZNCA2004FN		●	●	15.862	4	6		
ZNCA2505FN		●	●	19.826	5			
ZNCA3005FN		●	●	23.618	5.5			
ZNMM2004EN	M		●	15.862	4	3	Fig. 1	
ZNMM2505EN			●	19.826	5			
ZNMM3005EN			●	23.618	5.5			

Note : M-class inserts are mainly used for medium finishing and C-class inserts are most suitable for finishing.

Guidelines for selecting depth of cut and feed



- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

Standard cutting conditions for finishing

Work materials: Cast iron, carbon steels and alloy steels

Cat. No.	Grades	No. of rev. n (min^{-1})	Pick feed p_f (mm)	Table feed v_f (mm/min)
TBN1100SE	UX30 TH10	3200	0.3	480
TBN1120SE		2700		540
TBN1160SE		2000	0.5	650
TBN1200SE		1600		700
TBN1250SE		1300		580
TBN1300SE		1100		550

Note: For die steels, reduce the spindle speed to 80% and the feed to 75-85% respectively of the values shown above.

● : Stocked items.

Relating pages Technical Reference (15–1)

TAC roughing Endmills

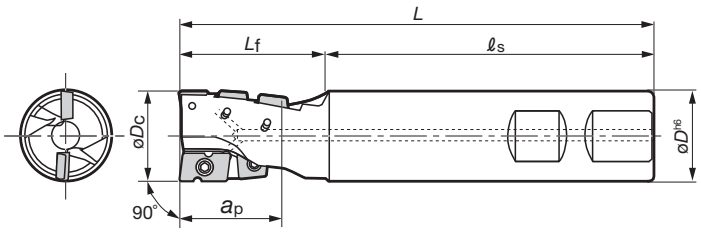
ELP-A

Diameter ø25 ~ 40 mm | 90° ~ 44 mm | Air Hole

P Steel | M Stainless | K Cast Iron

Deep Shoulder Milling | Slotting | Side Milling

For roughing, large-depth shouldering, and slotting of steels and cast irons



Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	L	Lf	ℓs	ap	øDs	Applicable inserts	Clamping screw	Wrench
ELP13025RA	●	2 (5)	25	130	40	90	28	25	APMT070308PN-MJ ADMT130308PR-MJ	CSPB-2.5 CSPD-3	IP-8D IP-10D
ELP17032RA	●		32	140	50		35	32	APMT09T308PN-MJ ADMT17T308PR-MJ	CSPD-3 CSPB-4S	IP-10D IP-15D
ELP21040RAS40	●		40	150	60		44	40	APMT120408PN-MJ ADMT210408PR-MJ	CSPB-4 CSTB-5	IP-15D T-20D

Inserts

Fig. A
(Used for end cutting edge)

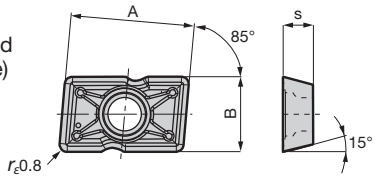
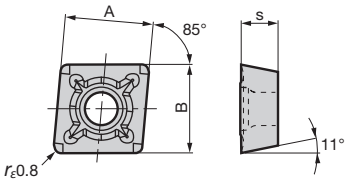


Fig. B
(Used for both end and peripheral edges)



Cat. No.	Accuracy	Honing	Grades AH120	AH140	T3130	GH330	Dimensions (mm) A	B	s	Figure
ADMT130308PR-MJ	M	With	●	●	●		13.1	7.94	3.18	Fig. A
ADMT17T308PR-MJ			●	●	●		16.6	9.525	3.97	
ADMT210408PR-MJ			●	●	●		20.6	12.7	4.76	
APMT070308PN-MJ			●	●	●	●	7.94	7.94	3.18	Fig. B
APMT09T308PN-MJ			●	●	●	●	9.525	9.525	3.97	
APMT120408PN-MJ			●	●	●	●	12.7	12.7	4.76	

● : Stocked items.

Standard cutting conditions

Work materials	Grades	Cutter diameter (mm) ø25 Vc (m/min)	ø25 fz (mm/t)	ø32 Vc (m/min)	ø32 fz (mm/t)	ø40 Vc (m/min)	ø40 fz (mm/t)
Mild steels, Low carbon steels St37 etc.	T3130 (AH120)	60 - 150	0.08 - 0.2	60 - 150	0.1 - 0.3	60 - 150	0.1 - 0.3
High carbon steels, Alloy steels C45, C55 etc.		60 - 120		60 - 120		60 - 120	
Die steels X96CrMoV12 etc.		60 - 100		60 - 100		60 - 100	
Stainless steels X5CrNi18 9 etc.	AH140	70 - 120	0.08 - 0.2	70 - 120	0.1 - 0.3	70 - 120	0.1 - 0.3
Cast irons GG25, GGG50 etc.	AH120	60 - 150	0.08 - 0.2	60 - 150	0.1 - 0.3	60 - 150	0.1 - 0.3

• *Vc*: Cutting speed
• *fz*: Feed per tooth (Feed per revolution is *fz* × 2 as effective number of teeth is equal to two)

Notes : • To get the best of the tool's performance, use of a high-accuracy, side-lock type toolholder or milling chuck which has a high gripping force is recommended.
• Excessive tool overhang from the toolholder should be avoided to prevent chatter.

TAC Flash Mills for plunging

TZP12

Diameter ø50 ~ 80 mm

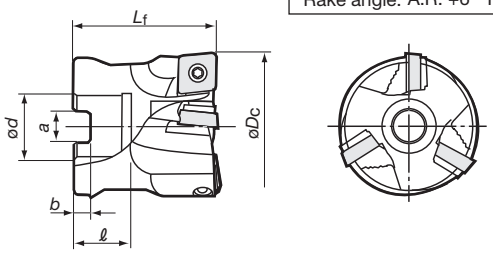
90°

P Steel K Cast Iron

Plunging Face Milling

For Z-feed milling of steels and cast irons

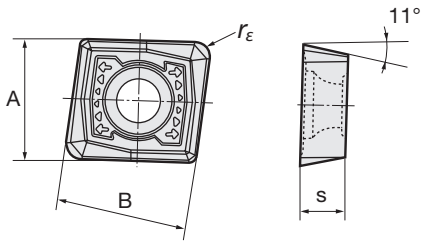
Rake angle: A.R. +6° R.R. –2°



Max. ap: 9-123

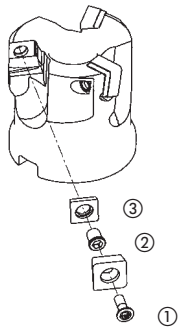
Pitch	Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
Standard	TZP12050R-E	●	3	50	22	20	50	6.3	10.4	0.38	9-138Ⓐ
	TZP12063R-E	●		63						0.72	
	TZP12080R-E	●	4	80	27	26	63	7	12.4	1.51	9-138Ⓐ

Inserts



Cat. No.	Accuracy	Honing	Grades AH120	T3130	Dimensions (mm) A	B	s	rε	Eff. cutting edge length (mm)
APMT120416PR-MJ	M	With	●	●	12.7	13.5	4.76	1.6	10

Replacement parts



No.	Descriptions	Cat. No.
①	Clamping screw	CSTB-3.5T
②	Shim screw	DTS5-3.5S
③	Shim	ZSA1102
–	Wrench	P-3.5
–	Wrench	T-20D

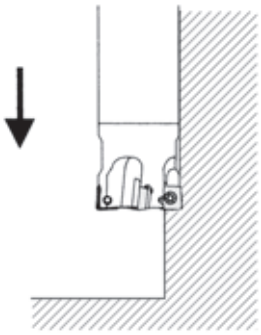
● : Stocked items.

Relating pages Technical Reference (15–1)

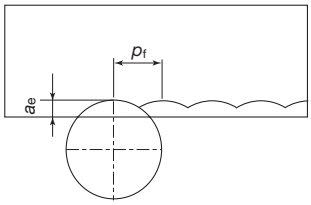
Standard cutting conditions

Work materials	Grades	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Carbon steels, Alloy steels	**AH120**	100 - 200	0.1 - 0.3
	T3130	150 - 250	0.1 - 0.25
Die steels (X96CrMoV12) < 300 HB	**AH120**	100 - 200	0.1 - 0.3
	T3130	150 - 250	0.1 - 0.25
Prehardened steels < 45 HRC	**AH120**	60 - 120	0.1 - 0.2
Cast irons (GG···, GGG···)	**AH120**	100 - 200	0.1 - 0.3

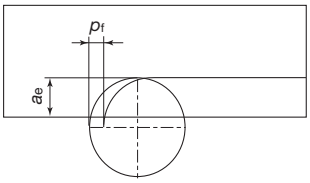
Z-feed miling



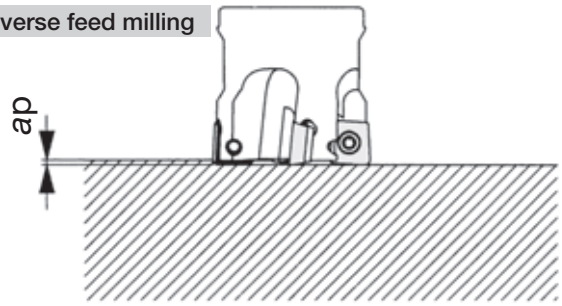
Machining method (1)



Machining method (2)



Traverse feed milling



Machining method	Z-feed milling		Traverse feed milling
	Pick feed p_f (mm)	Radial depth of cut *ae* (mm)	Depth of cut *ap* (mm)
(1)	Tool dia. øD/2	Within effective cutting edge length	≤ 0.5
(2)	Within effective cutting edge length	Tool dia. øD/2	

Note: In Z-feed milling, select either of the machining method (1) or (2) and decide the depth of cut according to the application.

● : Stocked items.

TAC Flash Mills for plunging

TZF11

Diameter ø50 ~ 80 mm

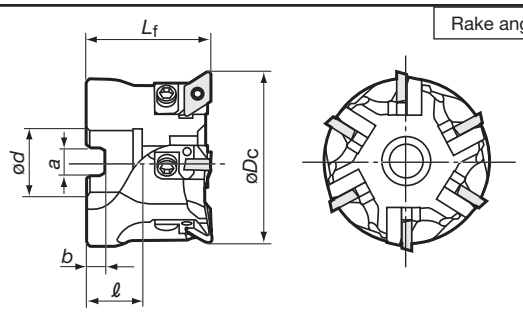
90°

P Steel | K Cast Iron | H Hard Materials

Plunging | Face Milling

For Z-feed finish milling of steels and cast irons

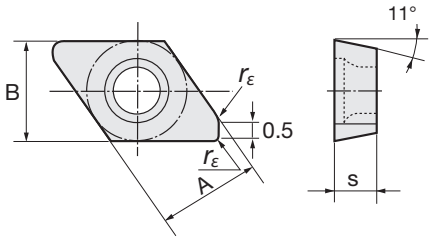
Rake angle: A.R. 0° R.R. –6°~0°



Max. ap: 9-125

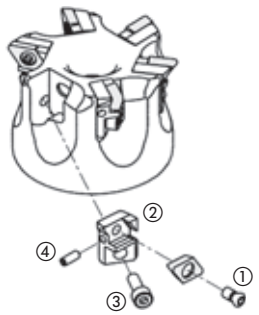
Cat. No.	Stock	No. of inserts	Dimensions (mm)						Weight (kg)	Mounting details
			øDc	ød	ℓ	Lf	b	a		
TZF11050R-E	●	4	50	22	20	45	6.3	10.4	0.38	9-138Ⓐ
TZF11063R-E	●	6	63						0.72	
TZF11080R-E	●	7	80	27	26	63	7	12.4	1.51	

Inserts



Cat. No.	Accuracy	Honing	Grades			Dimensions (mm)			
			Coated		Cermet	A	B	s	rε
DPCW11T3ZFR	C	Without	AH120	AH740	NS530	9.525	9.525	3.97	1.0
			●	●	●				

Replacement parts



No.	Descriptions	Cat. No.
①	Clamping screw	CSTB-4S
②	Cartridge	SDUPR09CZ-11
③	Cartridge fixing screw	CM4X0.7X12
④	Cartridge adjusting screw	SSHM3-10
-	Wrench	T-15D
-	Hex. wrench	P-1.5, P-3

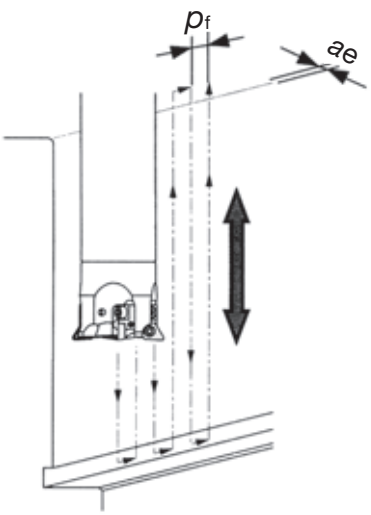
● : Stocked items.

Relating pages | Technical Reference (15–1)

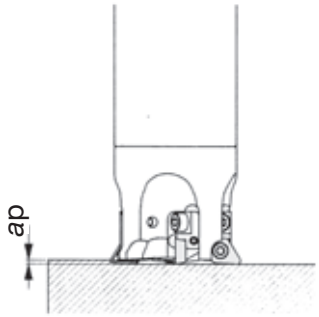
Standard cutting conditions

Work materials	Grades	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Carbon steels, Alloy steels (< 300 HB)	**NS530**	150 - 400	0.05 - 0.20
	AH740	150 - 350	
Cast irons (GG25 etc.)	**AH740**	200 - 500	0.05 - 0.20
Ductile cast irons (GGG25 etc.)	**AH740**	150 - 350	
Prehardened steels, Hard materials (40-55 HRC)	**AH740**	100 - 200	0.05 - 0.15

Z-feed miling



Traverse feed milling



Z-feed milling		Traverse feed milling
Pick feed *pf* (mm)	Radial depth of cut *ae* (mm)	Depth of cut *ap* (mm)
0.5 - 1.0	< 0.5	≤ 0.5

- Dry cutting (or air blow) at a depth of cut up *ae* to 0.3 mm (allowable max. 0.5 mm) and a pick feed *pf* from 0.5 to 1.0 mm is recommended.
- TZF11 type cutters are not designed to adjust dynamic balance. Therefore, when the tool's overhang ratio (cutter diameter-to-length) exceeds 6:1, special care should be taken with the revolution speed. (At first, start the machining at 50 % of the speed shown in the table of the standard cutting conditions, and then gradually increase the speed whilst confirming safety.)
- To produce highly accurate surface finish, use the cutter on a machine with sufficient rigidity.

●Cautionary points in use

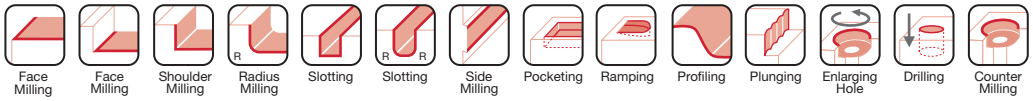
- Use the cutter for finish milling of vertical wall surfaces requiring long tool-overhang of L/D > 6.
- Radial cutting edge run-out should be adjusted within 0.01 mm.
- In addition to Z-feed milling, TZF11 type cutters can be also used for traverse feed milling. (*ap* ≤ 0.5 mm)

● : Stocked items.

TMS

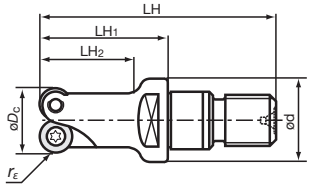
Diameter
ø10 ~ 25 mm

P Steel | K Cast Iron | M Stainless | N Non-ferrous | H Hard Materials



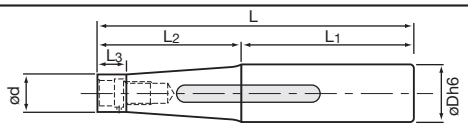
HWD-type cutting heads + T-BAR modular system

ap: HWD05: 2.5 mm
HWD07: 3.5 mm
HWD10: 5.0 mm



Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	LH1	LH2	LH	ød	Applicable insert	Radius of inserts rε	Screw	Wrench	Thread	Extensions
HWD05010R		2	10	20	15	37	13	RDMW0501M0	2.5	CSTD-1.8	T-6D	M8 x 1	HD01520L110T
HWD05012R	●	3	12	20	15	37	13						
HWD05015R	●	4	15	20	–	37	13						
HWD05020R	●	5	20	20	–	38	18					M12 X1.5	HD02025L150T
HWD05025R		6	25	25	–	45	23					M14 X1.5	HD02532L170T
HWD07015R		3	15	20	–	37	13	RDMW0702M0	3.5	CSTB-2.5S	T-8D	M8 X 1	HD01520L110T
HWD07020R	●	4	20	20	–	38	18					M12 X1.5	HD02025L150T
HWD07025R	●	5	25	25	–	45	23					M14 X1.5	HD02532L170T
HWD10020R	●	2	20	20	–	38	18	RDMW1003M0	5	CSTB-3.5H	T-15D	M12 X1.5	HD02025L150T
HWD10025R	●	3	25	25	–	45	23					M14 X1.5	HD02532L170T

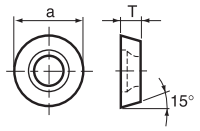
Specifications of straight-shank "Tsuppari-Ichiban" (T-BAR)



Shank Cat. No.	Stock	Cutter head Cat. No.	Tool dia. (mm)	Dimensions (mm) ød	L	L1	L2	L3	øD
HD01520L110T	●	HWD05	ø10 - 15	13	110	50	60	10	20
HD02025L150T	●	HWD...20	ø20	18	150	70	80	20	25
HD02532L170T	●	HWD...25	ø25	23	170	90	80	20	32

* The products shown in above are made to order.

Inserts



Cat. No.	Grade AH120	Dimensions (mm) a	T
RDMW0501M0	●	5.0	1.40
RDMW0702M0	●	7.0	2.38
RDMW1003M0	●	10.0	3.18

Standard cutting conditions

Work materials	Grades	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)	Cutting depth: ap (mm) ø10, 12	ø15, 20	ø25
Carbon steels < 300 HB	AH120	200 - 500	0.15 - 0.45	≤ 0.5	≤ 0.7	≤ 1.0
Alloy steels < 300 HB		120 - 350	0.15 - 0.35			
Die steels < 300 HB		100 - 300	0.10 - 0.30			
Cast irons		200 - 500	0.20 - 0.50			
Hardened steels < 40 HRC		70 - 200	0.10 - 0.25			

- No. of revolutions n (min^{-1}) = Cutting speed V_c (m/min) x 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Feed speed V_f (mm/min) = n (min^{-1}) x Feed per tooth f_z (mm/t) x z (No. of inserts)

● : Stocked items

Relating pages
Technical Reference (15–1)

TAC Flash chamfering mills

ECC31

Chamfering of hole ø5mm ~

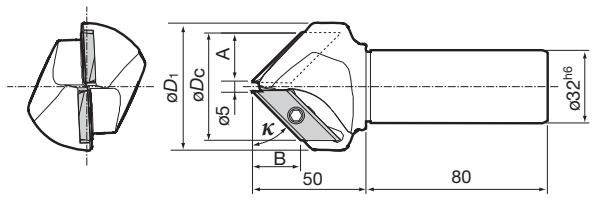
60° Chamfering | 45° Chamfering | 30° Chamfering

P Steel | M Stainless | K Cast Iron

Chamfering | Chamfering

For chamfering of general steels, stainless steels and cast irons

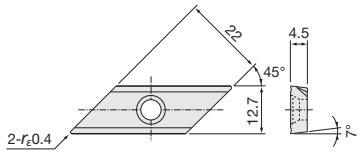
Rake angle: A.R. −5°~ −3° R.R. −15° ~ −10°



The accuracy of κ : ±1°

Cat. No.	Stock	No. of inserts	Dimensions (mm) κ	A	B	øD1	øDc	Applicable insert	Clamping screw	Wrench
ECC31005R-30	●	1	60°	14.5	25.5	40	34	XCET 310404ER	CSTB-5S	T-20D
ECC31005R-45	●	2	45°	20.5	20.5	56	46			
ECC31005R-60	●		30°	25.5	14.5	72	55			

Inserts



Cat. No.	Accuracy	Honing	Stock: Coated AH330	Cermet NS740	Cermet NS530	Uncoated UX30
XCET310404ER	E	With	●	●	●	●

Packing Quantity = 5 pcs.

Standard cutting conditions

Work materials	Grades	No. of revolutions: *n* (min⁻¹)	Feed per tooth: *fz* (mm/t)
Carbon steels (C55 etc.)	NS740•NS530	1000 - 7000	0.1 - 0.25
Alloy steels (42CrMo4 etc.) < 300 HB	UX30	700 - 4900	
Die steels (X40CrMoV5-1 etc.) < 300 HB	AH330	1000 - 7000	0.1 - 0.2
Stainless steels (X5CrNi18-10 etc.) < 250 HB	AH330	1000 - 7000	0.1 - 0.25
Cast irons (GG25 etc.)	AH330	1000 - 7000	0.1 - 0.25

Notes:
- 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 ø10 mm) in a plunge-milling mode, peck-feeding should not be used.
- When the hole diameter to be chamfered is smaller than ø10 mm or the cutting edges near the tool's front end are used, the feed should be set within 0.15 mm/t.

● : Stocked items.

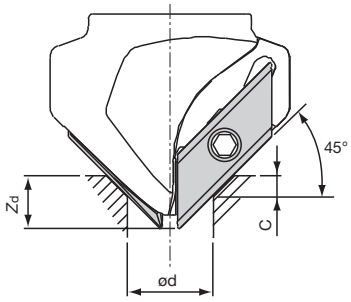
Relating pages | Technical Reference (15−1)

ECC31

Guidelines for programming

Z-axis plunging depth Z_d (mm) in 45° chamfering of hole

Hole dia. ød (mm)	Size of chamfering C (mm)						
	0.5	1	1.5	2	3	4	5
5	0.7	1.2	1.7	2.2	3.2		
6	1.2	1.7	2.2	2.7	3.7		
6.8	1.6	2.1	2.6	3.1	4.1		
8	2.2	2.7	3.2	3.7	4.7		
8.5	2.4	2.9	3.4	3.9	4.9		
10	3.2	3.7	4.2	4.7	5.7	6.7	7.7
10.2	3.3	3.8	4.3	4.8	5.8	6.8	7.8
12	4.2	4.7	5.2	5.7	6.7	7.7	8.7
14	5.2	5.7	6.2	6.7	7.7	8.7	9.7
16	6.2	6.7	7.2	7.7	8.7	9.7	10.7
17.5	6.9	7.4	7.9	8.4	9.4	10.4	11.4
20	8.2	8.7	9.2	9.7	10.7	11.7	12.7
21	8.7	9.2	9.7	10.2	11.2	12.2	13.2
24	10.2	10.7	11.2	11.7	12.7	13.7	14.7
30	13.2	13.7	14.2	14.7	15.7	16.7	17.7
33	14.7	15.2	15.7	16.2	17.2	18.2	19.2
36	16.2	16.7	17.2	17.7	18.7	19.7	
42	19.2	19.7	20.2				

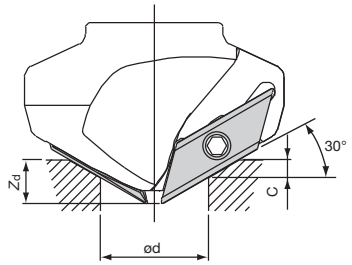


Tool: ECC31005R-45

Note: 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 Z_d (mm) in 30° chamfering of hole

Hole dia. ød (mm)	Size of chamfering C (mm)						
	0.5	1	1.5	2	2.5	3	3.5
5	0.6	1.1	1.6	2.1			
6	0.9	1.4	1.9	2.4			
6.8	1.1	1.6	2.1	2.6			
8	1.4	1.9	2.4	2.9			
8.5	1.6	2.1	2.6	3.1			
10	2.0	2.5	3.0	3.5	4.0	4.5	5.0
10.2	2.1	2.6	3.1	3.6	4.1	4.6	5.1
12	2.6	3.1	3.6	4.1	4.6	5.1	5.6
16	3.7	4.2	4.7	5.2	5.7	6.2	6.7
17.5	4.2	4.7	5.2	5.7	6.2	6.7	7.2
20	4.9	5.4	5.9	6.4	6.9	7.4	7.9
21	5.2	5.7	6.2	6.7	7.2	7.7	8.2
24	6.1	6.6	7.1	7.6	8.1	8.6	9.1
30	7.8	8.3	8.8	9.3	9.8	10.3	10.8
33	8.7	9.2	9.7	10.2	10.7	11.2	11.7
36	9.5	10.0	10.5	11.0	11.5	12.0	12.5
38	10.1	10.6	11.1	11.6	12.1	12.6	13.1
42	11.2	11.7	12.2	12.7	13.2	13.7	14.2
46	12.4	12.9	13.4	13.9	14.4		
48	13	13.5	14	14.5			
52	14.1						

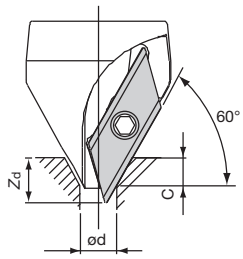


Tool: ECC31005R-60

Note: 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 Z_d (mm) in 60° chamfering of hole

Hole dia. ød (mm)	Size of chamfering C (mm)							
	0.5	1	1.5	2	2.5	3	3.5	4
5	0.8	1.3	1.8	2.3	2.8			
6	1.7	2.2	2.7	3.2	3.7			
6.8	2.4	2.9	3.4	3.9	4.4			
8	3.4	3.9	4.4	4.9	5.4			
8.5	3.8	4.3	4.8	5.3	5.8			
10	5.1	5.6	6.1	6.6	7.1	7.6	8.1	8.6
10.2	5.3	5.8	6.3	6.8	7.3	7.8	8.3	8.8
12	6.9	7.4	7.9	8.4	8.9	9.4	9.9	10.4
16	10.3	10.8	11.3	11.8	12.3	12.8	13.3	13.8
17.5	11.6	12.1	12.6	13.1	13.6	14.1	14.6	15.1
20	13.7	14.2	14.7	15.2	15.7	16.2	16.7	17.2
21	14.6	15.1	15.6	16.1	16.6	17.1	17.6	18.1
24	17.2	17.7	18.2	18.7	19.2	19.7	20.2	20.7
30	22.4	22.9	23.4	23.9	24.4	24.9	25.4	
33	24.9	25.4						



Tool: ECC31005R-30

Note: 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.

TAC countering mills

TCB

Diameter ø14 ~ 39 mm

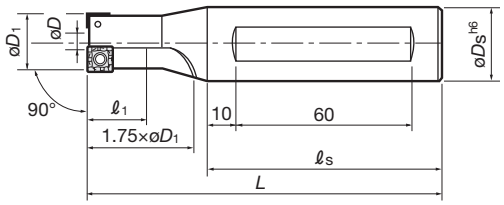
90°

P Steel | M Stainless | K Cast Iron

Counter Milling

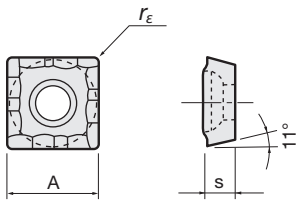
For counter milling of general steels, cast irons and stainless steels

Rake angle: A.R. Pozitive R.R. Negative



Cat. No.	Stock	No. of inserts	Dimensions (mm) øD1	øDs	øD	ℓ1	ℓs	L	Applicable screw size	Applicable inserts	Clamping screw	Wrench
TCB-140	●	1	14	25	4.0	18	80	117	M8	SPMP831DS	CSTB-2.2S	T-7D
TCB-175	●	2	17.5		7.1	22		115	M10		CSTB-2.2	
TCB-200	●		20		8.2	25		120	M12	SPMP042ERD	CSTA-NO3	T-9D
TCB-230	●		23		11.0	29		126	M14			
TCB-260	●		26	32	14.0	33		132	M16			
TCB-290	●		29			30		138	M18	SPMM322ERD	CSTA-NO5	
TCB-320	●		32		16.9	–		144	M20			
TCB-350	●		35		14.0	–		150	M22	SPMM432ERD	CSTA-4	T-15D
TCB-390	●		39		17.9	–		158	M24			

Inserts



Cat. No.	Accuracy	Coated T313W	Dimensions (mm) A	s	rε	Application
SPMP831DS	M	●	6.35	2.38	0.4	Steel · Cast irons
SPMP042ERD		●	7.938	3.18	0.8	
SPMM322ERD		●	9.525			
SPMM432ERD		●	12.7	4.76		

Note: No dimples on SPMP831DS.

Standard cutting conditions (for TCB-200)

Work materials	Grade	Cutting speed v_c (m/min)	Feed f (mm/rev)	Cutting fluid
Carbon steels	T313W	80 - 150	0.12 - 0.24	Water soluble type
Stainless steels, Mild steels	T313W	150 - 200	0.05 - 0.12	Water soluble type
Cast irons	T313W	70 - 130	0.20 - 0.40	Water soluble type or dry cutting

Notes : • For cutters under 20 mm diameter, be sure to use a cutting fluid and select lower cutting speeds than shown above.
• For TCB-140 type, reduce the feeds to 1/2 of the values shown in the table.

● : Stocked items.

TAC Mills for super finishing

SFP4000

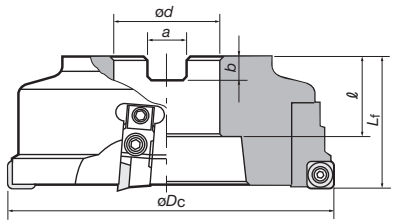
Diameter ø100 ~ 160 mm | 0.1 mm

P Steel | M Stainless | K Cast Iron | N Non-ferrous

Face Milling | Face Milling

For precision finishing of general steels, cast irons and stainless steels

Rake angle: A.R. +5° R.R. −20°



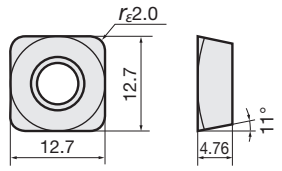
Max. ap: 0.1 mm

Right hand (R) shown.

SFP4000 (Bore type)

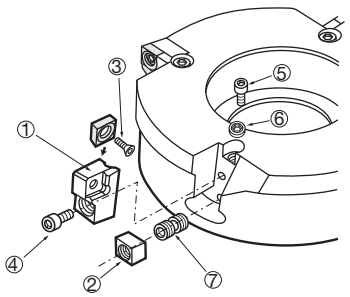
Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
SFP4004RE	●	2	100	32	32	40	8	14.4	2.3	9-138Ⓐ
SFP4005RE	●		125	40			9	16.4	3.5	9-138Ⓑ
SFP4006RE	●	4	160		29	50			5.8	9-138Ⓒ

Inserts



Cat. No. (Inch)	ISO Cat. No. (Metric)	Accuracy	Honing	Cermet N308	Uncoated TH10
SPHA435FNW	SPHB120420FN-W	H	Without	●	●

Replacement parts



No.	Descriptions	Part Cat. No.
①	Locator	LW400R
②	Locator adjusting wedge	FW-305
③	Insert fixing screw	CSTA-5S
④	Locator fixing screw	CM5X0.8X16
⑤	Hex. socket-head screw	CM5X0.8X8
⑥	Washer	(JIS) L5
⑦	Wedge-locking screw	FDS-8S
–	Spring washer	(JIS) 5S
–	T-handle wrench	P-4
–	Wrench	T-15D

Standard cutting conditions

Work materials	Grade	Cutting speed v_c (m/min)	Feed: f (mm/rev) SFP	EFP	Depth of cut a_p (mm)
Mild steels	N308	180 ~ 250	≤ 6	≤ 4	≤ 0.1
Carbon steels		150 ~ 200			
Alloy steels					
Stainless steels	N308	160 ~ 200	≤ 4	≤ 3	≤ 0.1
Cast irons	TH10	100 ~ 150	≤ 5	≤ 3	≤ 0.2
Non-ferrous metals	TH10	200 ~ 500	≤ 6	≤ 4	≤ 0.1

Note: Under above conditions, attainable surface roughness is 3 to 4 µm Rz_{JIS} for steels and 6 to 12 µm Rz_{JIS} for cast irons.

- No. of revolutions n (min^{-1}) = Cutting speed V_C (m/min) x 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Feed speed V_f (mm/min) = n (min^{-1}) x Feed per tooth f_z (mm/t) x z (No. of inserts)

● : Stocked items

Relating pages | Technical Reference (15–1)

MS

Diameter ø100 ~ 300 mm

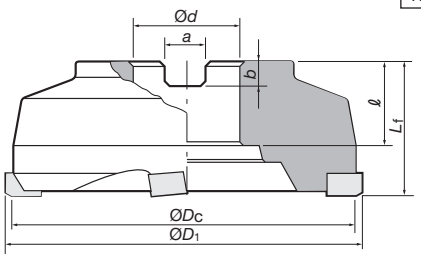
0.1 mm

P Steel | K Cast Iron | H Hard Materials

Face Milling

For precision finishing of steels and cast irons

Rake angle: A.R. –5° R.R. –30°



Max. ap: 0.1 mm

Right hand (R) shown.

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øD1	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
MS04RE		2	100	105	32	32	55	8	14.4	3	9-138Ⓑ
MS05RE			125	130	40		60	9	16.4	4	
MS06RE		4	160	165		29				5	9-138Ⓒ
MS08RE			200	205	60	38		14	25.7	8.5	
MS10RE			250	255						14	9-138Ⓓ
MS12RE			300	305						23	

Inserts

Fig. 1
SNAC1509PNTR

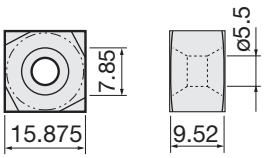
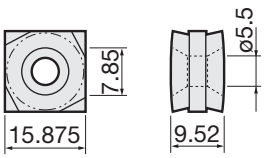


Fig. 2
SNAJ1509PNTR



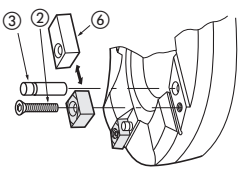
Right hand (R) shown.

Cat. No. (Inch)	ISO Cat. No. (Metric)	Accuracy	Cutting edge length (mm)	Grades Cermet X407	Cermet	Uncoated	Figure
SNAA56FTR	SNAC1509PNTR	A	7.80	●			Fig. 1
SNAG56FTR	SNAJ1509PNTR						Fig. 2

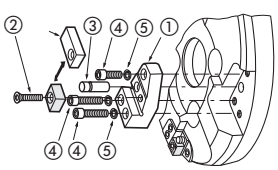
Packing Quantity = 4 pcs.

Replacement parts

MS04R/L ~ MS06R/L



MS08R/L ~ MS12R/L
(Locator type)



No.	Parts	Part Cat. No. MS04R/L	MS05R/L, MS06R/L	MS08R/L~MS12R/L
①	Locator	–	–	LMS56R
②	Clamping screw	CST-5	CST-5	CST-5
③	Pin	SP-8	SP-8	SP-8
④	Locator fixing screw	–	–	CM6X25, CM6X16
⑤	Washer			VA6
⑥	Protector	PMS4R/L	PMS5R/L	PMS5R
–	Wrench	T-25D	T-25D	T-25D

Standard cutting conditions

Work materials	Grade	Cutting speed v_c (m/min)	Feed per tooth f_z (mm/t)	Depth of cut a_p (mm)
Mild steels	X407	260 - 300	≤ 6	≤ 0.1
Carbon steels		120 - 180		
Alloy steels				
Die steels				
Cast irons	X407	100 - 150	≤ 6	≤ 0.1
Carbon steels (> 40HRC)	X407	150 - 200	≤ 3	≤ 0.05

- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

● : Stocked items.

QPP15

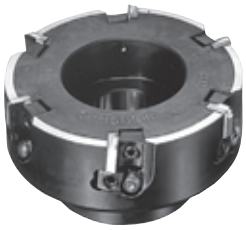
Diameter ø80 ~ 400 mm

60° 1 mm

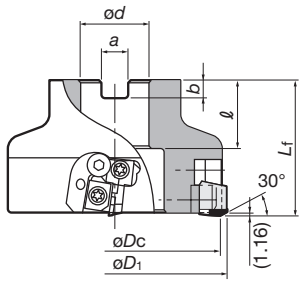
Cast Iron

Face Milling

For high speed finishing of cast irons



Rake angle: A.R. +5.5° R.R. −3°



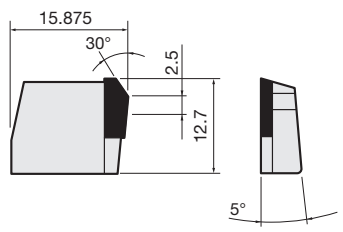
Max. ap: 1 mm

Right hand (R) shown.

Cat. No.	Stock	No. of inserts	Dimensions (mm) øDc	øD1	ød	ℓ	Lf	b	a	Weight (kg)	Mounting details
QPP15080R-E		4	80	84	27	26	50	7	12.4	1.1	9-138Ⓐ
QPP15100R-E		6	100	104	32	28.5	63	8	14.4	2.1	
QPP15125R-E		6	125	129	40	32		9	16.4	3.7	9-138Ⓑ
QPP15160R-E		8	160	164		29				5.3	
QPP15200R-E		10	200	204	60	38		14	25.7	8.3	9-138Ⓒ
QPP15250R-E		12	250	254						13.5	
QPP15315R-E		14	315	319						22.6	9-138Ⓓ
QPP15355R-E		16	355	359			80			33.4	
QPP15400R-E		18	400	404						43.3	

Note: QPP15 type TAC mills can be made to have quick-change mounting specification shown on page 9-153.

Inserts

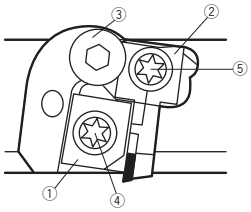


Right hand (R) shown.

Cat. No.	Grade T-CBN	Stock
YPEN1505PPTR -Q	BX950	●

Packing Quantity = 1 pcs.

Replacement parts



Right hand (R) shown.

No.	Descriptions	Part Cat. No.
①	Insert locking wedge	FW304R-D
②	Locator adjusting wedge	FW325R-D
③	Screw for preventing wedge from flying out	BHM615-GT
④	Wedge fixing screw (øD = 80)	FDS-8ST-18
	Wedge fixing screw (for øD > 80)	FDS-8ST
⑤	Adjusting wedge fixing screw	FDS-8ST-18
–	Wrench	T-27T

Standard cutting conditions

Work materials	Grade	Cutting speed v_c (m/min)	Feed per tooth. f_z (mm/t)	Depth of cut a_p (mm)
Grey cast irons (GG25 ~ GGG35)	BX950	350 - 2000	0.1 - 0.25	0.1 - 1.0

Note : Dry cutting is recommended.

Features of QPP15

1 Highly efficient and accurate machining capability

Performs well in high-speed machining and produces a fine surface finish on machining centers and special purpose machines.
Attainable accuracies: $Rz_{JIS} \leq 3.0$ µm, Rz ($Rmax$) ≤ 6.0 µm

2 Provided with adjusting mechanism for all the inserts

The axial run out of the cutter is micro adjustable with the adjusting wedge provided for each insert.
Attainable axial run out: < 5 µm

3 Superior resistance to centrifugal force

The inserts are firmly fixed even when using at speeds as high as v_c 2000 m/min and do not exhibit any looseness.

- No. of revolutions (min^{-1}) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

● : Stocked items.

Relating pages Technical Reference (15–1)

MEMO

TECSLOT

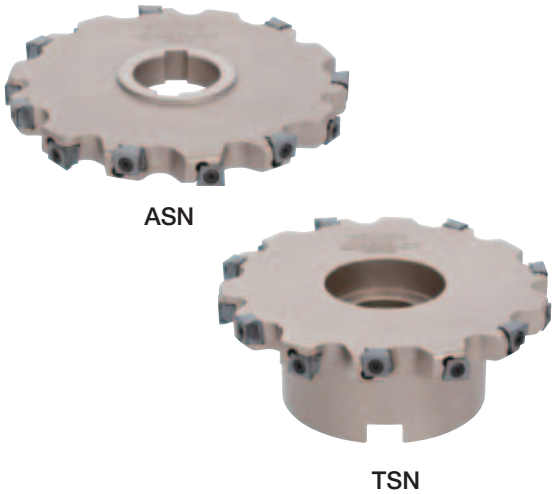
Diameter ø100 ~ 250 mm

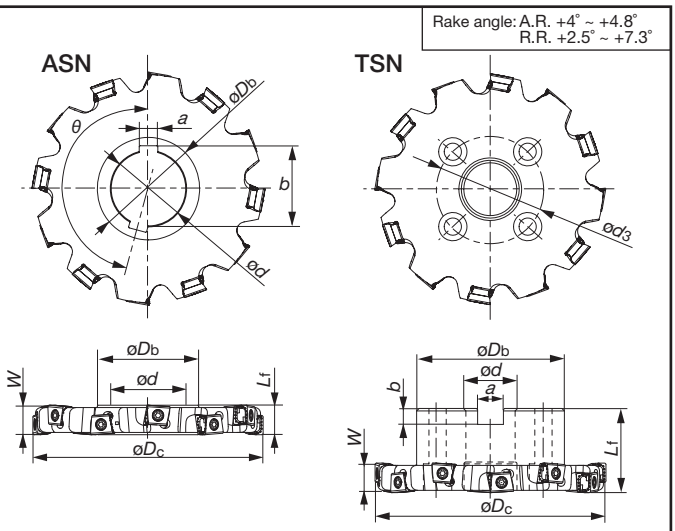
90°

P Steel | M Stainless | K Cast Iron | S Superalloys

Slotting

For slotting of general steels, cast irons, and stainless steels





Axial drive: ASN

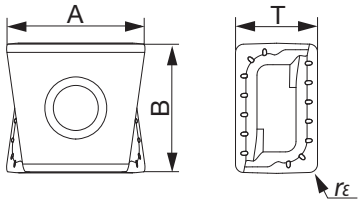
Edge width W (mm)	Cat. No.	Stock	No. of edge lines / No. of inserts	Dimensions (mm) øDc	øDb	ød	Lf	b	a	θ	Insert
16	ASN10R100M32.0E16-05	●	5/10	100	47	32	16	34.8	8	162°	LMEU1008** ZNEN-MJ
	ASN10R125M40.0E16-06	●	6/12	125	55	40	16	43.5	10	165°	
	ASN10R160M40.0E16-07	●	7/14	160	55	40	16	43.5	10	167.14°	
	ASN10R200M50.0E16-08	●	8/16	200	69	50	16	53.6	12	168.75°	
19	ASN12R100M32.0E19-05	●	5/10	100	47	32	19	34.8	8	162°	LMEU1208** ZNEN-MJ
	ASN12R125M40.0E19-06	●	6/12	125	55	40	19	43.5	10	165°	
	ASN12R160M40.0E19-07	●	7/14	160	55	40	19	43.5	10	167.14°	
	ASN12R200M50.0E19-08	●	8/16	200	69	50	19	53.6	12	168.75°	
	ASN12R250M50.0E19-09	●	9/18	250	84	50	19	53.6	12	170°	
25	ASN15R125M40.0E25-05	●	5/10	125	55	40	25	43.5	10	165°	LMEU1509** ZNEN-MJ
	ASN15R160M40.0E25-06	●	6/12	160	55	40	25	43.5	10	167.14°	
	ASN15R200M50.0E25-07	●	7/14	200	69	50	25	53.6	12	168.75°	
	ASN15R250M50.0E25-08	●	8/16	250	84	50	25	53.6	12	170°	

Radial drive: TSN

Edge width W (mm)	Cat. No.	Stock	No. of edge lines / No. of inserts	Dimensions (mm) øDc	øDb	ød	Lf	b	a	P.C.D. ød3	Insert
16	TSN10R100M27.0E16-05	●	5/10	100	58	27	50	7	12.4	-	LMEU1008** ZNEN-MJ
	TSN10R125M32.0E16-06	●	6/12	125	66	32	50	8	14.4	-	
	TSN10R160M40.0E16-07	●	7/14	160	82	40	63	9	16.4	-	
	TSN10R200M40.0E16-08	●	8/16	200	88	40	63	9	16.4	66.7	
19	TSN12R100M27.0E19-05	●	5/10	100	58	27	50	7	12.4	-	LMEU1208** ZNEN-MJ
	TSN12R125M32.0E19-06	●	6/12	125	66	32	50	8	14.4	-	
	TSN12R160M40.0E19-07	●	7/14	160	82	40	63	9	16.4	-	
	TSN12R200M40.0E19-08	●	8/16	200	88	40	63	9	16.4	66.7	
	TSN12R250M60.0E19-09	●	9/18	250	128	60	63	14	25.7	101.6	
25	TSN15R125M32.0E25-05	●	5/10	125	66	32	50	8	14.4	-	LMEU1509** ZNEN-MJ
	TSN15R160M40.0E25-06	●	6/12	160	82	40	63	9	16.4	-	
	TSN15R200M40.0E25-07	●	7/14	200	88	40	63	9	16.4	66.7	
	TSN15R250M60.0E25-08	●	8/16	250	128	60	63	14	25.7	101.6	

● : Stocked items.

Inserts



Cat. No.	Accuracy	Honing	Grades			Dimensions (mm)			
			AH725	AH140	AH120	A	B	T	r_ε
LMEU100808ZNEN-MJ	E	with	●	●	●	12.7	10.5	8	0.8
LMEU100816ZNEN-MJ			●	●	●	12.5			1.6
LMEU100824ZNEN-MJ			●	●	●	12.4			2.4
LMEU100832ZNEN-MJ			●	●	●	12.2			3.2
LMEU120808ZNEN-MJ	E	with	●	●	●	13.6	12.7	8	0.8
LMEU120816ZNEN-MJ			●	●	●	13.4			1.6
LMEU120824ZNEN-MJ			●	●	●	13.2			2.4
LMEU120832ZNEN-MJ			●	●	●	13.1			3.2
LMEU150908ZNEN-MJ	E	with	●	●	●	15.6	15	9.5	0.8
LMEU150916ZNEN-MJ			●	●	●	15.4			1.6
LMEU150924ZNEN-MJ			●	●	●	15.3			2.4
LMEU150932ZNEN-MJ			●	●	●	15.1			3.2

Replacement parts

Descriptions		Parts Cat. No.	
Applicable cutter		ASN10R... ASN12R... TSN10R... TSN12R...	ASN15R... TSN15R...
Clamping screw		SM40-143-H0	CSTB-5L159
Wrench	Bit	BT15S	BT20S
	Grip	H-TB	H-TB

● : Stocked items.

Replacement parts

Work materials	Hardness (HB)	Priority	Grades	Cutting speed *Vc* (m/min)	Chip thickness t (mm)
Low carbon steels C10E etc.	< 200	First choice	**AH725**	90 - 180	0.13 - 0.25
		Priority for impact resistance	**AH140**		
High carbon steels C45 etc.	200 - 300	First choice	**AH725**	90 - 180	0.13 - 0.25
		Priority for impact resistance	**AH140**		
Alloy steels 42CrMo4 etc.	150 - 300	First choice	**AH725**	90 - 180	0.13 - 0.25
		Priority for impact resistance	**AH140**		
Tool steels X40CrMoV5-1 etc.	< 300	First choice	**AH725**	90 - 180	0.13 - 0.25
		Priority for impact resistance	**AH140**		
Stainless steel X5CrNi-18-9 etc.	-	-	**AH140**	90 - 200	0.13 - 0.25
Grey cast irons GG25 etc.	150 - 250	-	**AH120**	120 - 230	0.13 - 0.3
Ductile cast irons GGG45 etc.		-	**AH120**	90 - 150	0.13 - 0.2
Titanium alloys Ti-6Al-4V etc.	-	-	**AH725**	30 - 40	0.07 - 0.13
Nickel-based alloys Inconel718 etc.	-	-	**AH725**	20 - 35	0.07 - 0.13

Chip thickness "t"

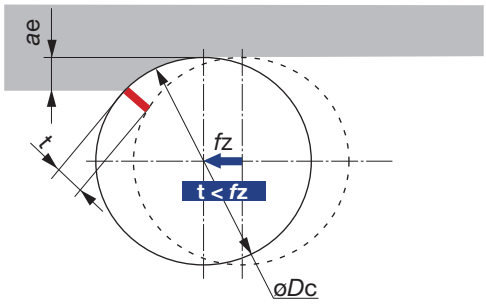
- Chip thickness "t" is one of the most important factors for chip evacuation in slot milling.
- Hence, setup feed per edge line (*fz*) should be calculated according to chip thickness (t).

Slotting with a slot milling cutter

$$t \fallingdotseq 2 \times fz \times \sqrt{(ae / øDc) \times (1 - (ae / øDc)}$$

$$fz \fallingdotseq t / 2 / \sqrt{(ae / øDc) \times (1 - (ae / øDc)}$$

øDc : Tool diameter (mm)
fz : Feed per edge line (mm/t)
ae : Depth of slot (mm)



TAC side milling cutters

SVN4000

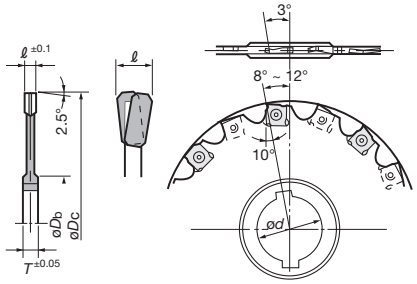
Diameter ø100 ~ 200 mm

90°

P Steel | K Cast Iron | N Non-ferrous

Slotting

For slotting of steels, cast irons and aluminium alloys



Unit: mm

Cat. No.	Stock M	Stock W	Cutter dia. øDc	Tool width ℓ	No. of staggered lines	Mounting hole dia. ød M (Metric)	Mounting hole dia. ød W (Inch)	Hub dia. øDb	Hub thick. T	Insert	No. of inserts	Parts Screw	Parts Wrench
SVN4100-5M/W	●		100	5	2	32	31.75	48	8	SNEN12T2ZT/FN	10	CST-3.5S	T-9D
SVN4100-6M/W	●			6					10	SNEN1233ZT/FN		CST-3.5S	
SVN4100-8M/W	●			8	4				12		8	CST-3.5	
SVN4125-5M/W	●		125	5	2				8	SNEN12T2ZT/FN	12	CST-3.5S	
SVN4125-6M/W	●			6					10	SNEN1233ZT/FN		CST-3.5	
SVN4125-8M/W	●			8	4				12				
SVN4160-5M/W	●		160	5	2	40	38.1	58	8	SNEN12T2ZT/FN	16	CST-3.5S	
SVN4160-6M/W	●			6					10	SNEN1233ZT/FN		CST-3.5	
SVN4160-8M/W	●			8	4				12				
SVN4200-5M/W	●		200	5	2			68	8	SNEN12T2ZT/FN	20	CST-3.5S	
SVN4200-6M/W	●			6					10	SNEN1233ZT/FN		CST-3.5	
SVN4200-8M/W	●			8	4				12				

● Notes on specifications of specials made to order

① The cutter widths (ℓ) are available in a range from 5 mm to 12 mm.

② The maximum cutter diameter available is ø960 mm.

③ Special mounting specifications are also available on request.

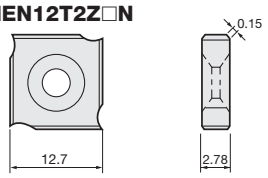
● Nomenclature

SVN4□□□–□ M/W

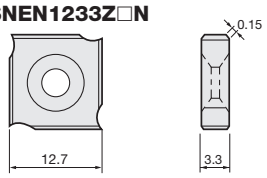
Cutter diameter | Tool width | Mounting hole spec.

Inserts

SNEN12T2Z□N



SNEN1233Z□N



Cat. No.	Accuracy	Honing	Grades Uncoated UX30	Grades Uncoated TH10
SNEN12T2ZTN	E	With	●	
SNEN12T2ZFN		Without		●
SNEN1233ZTN		With	●	
SNEN1233ZFN		Without		●

Standard cutting conditions

Work materials	Grades	Cutting speed v_c (m/min)
Carbon steels (< 300 HB)	**UX30**	80 - 120
Die steels (< 300 HB)	**UX30**	60 - 80
Cast irons	**TH10**	80 - 100
Aluminium alloys	**TH10**	600 - 1000

Note: SVN4000 type TAC mills should be used only for roughing. Attainable accuracy of groove width is ±0.1 mm.

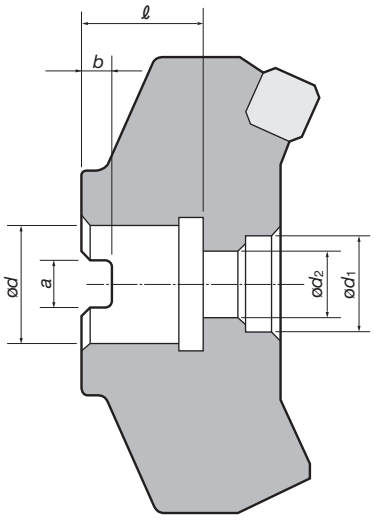
- No. of revolutions n (min^{-1}) = Cutting speed V_c (m/min) x 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Feed speed V_f (mm/min) = n (min^{-1}) x Feed per tooth f_z (mm/t) x z (No. of inserts)

● : Stocked items.

Mounting Details for TAC Mills

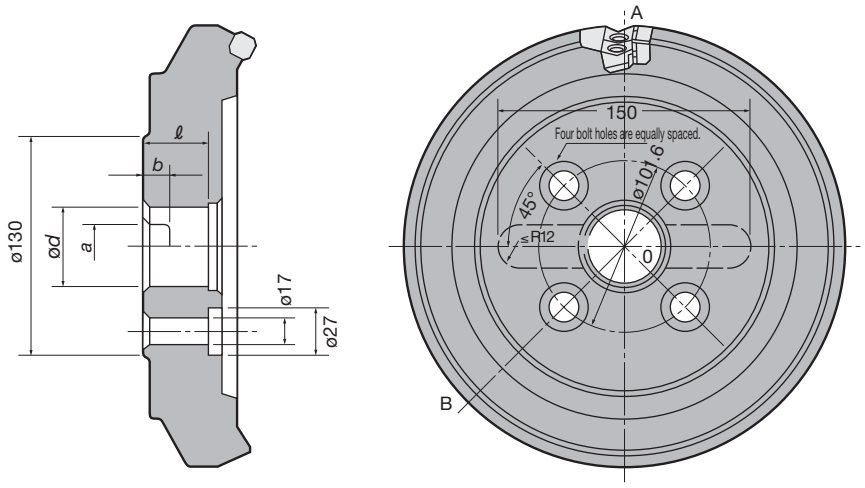
Cutter diameter (mm)	Figure	Dimensions (mm)					
		$\varnothing d_1$	$\varnothing d_2$	$\varnothing d$	b	a	ℓ
ø50, ø52, ø63, ø66	Ⓐ	18	10	22	6.3	10.4	20
ø80	Ⓐ	20	13.5	27	7	12.4	22
	Ⓑ	38	–				26
ø100	Ⓐ	27	17.5	32	8	14.4	25
	Ⓑ	45	–				32
ø125	Ⓑ	56	–	40	9	16.4	
ø160 (ø150)	Ⓒ	–	–				29
ø200	Ⓒ	–	–	60	14	25.7	38
ø250	Ⓒ	–	–				
ø315 (ø300)	Ⓓ	–	–				

Ⓐ



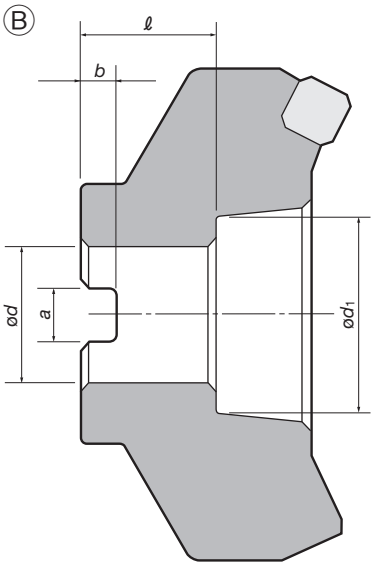
Note: Can be mounted with a commercially available hex. socket head screw.

Ⓒ

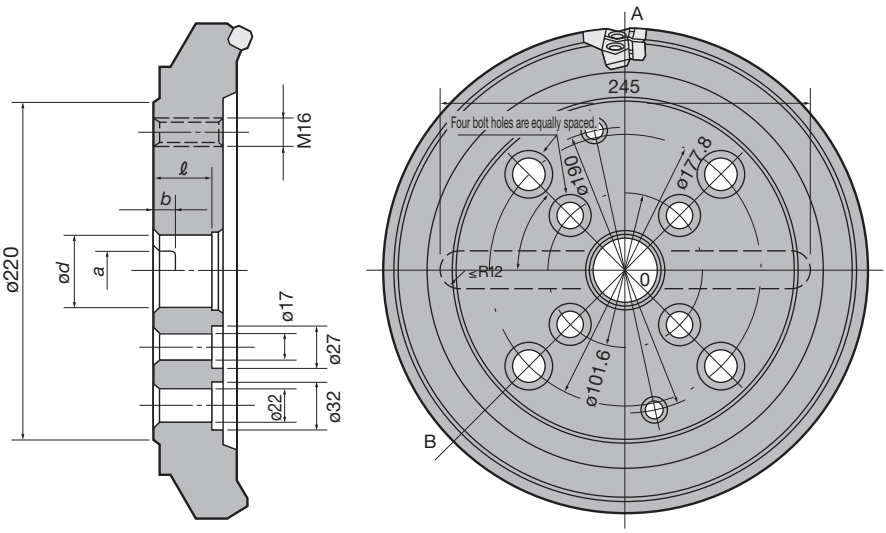


Notes: • Keyway slot of ø200 mm cutter is opened through.
• Some of ø200 TAC mills are not provided with ø27 counter sink.

Ⓑ

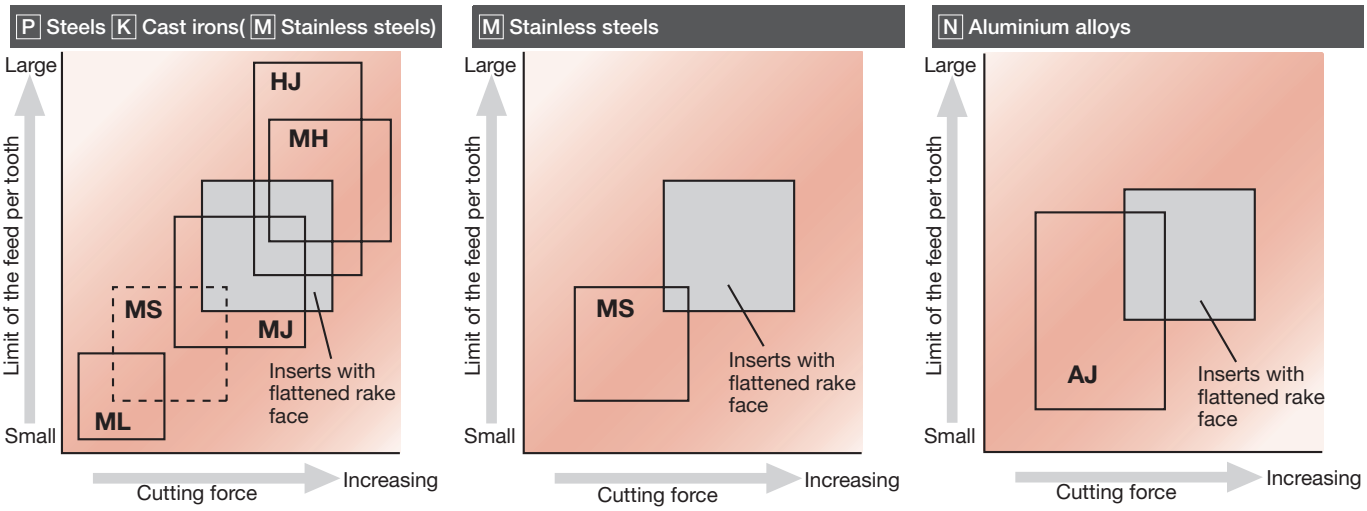


Ⓓ

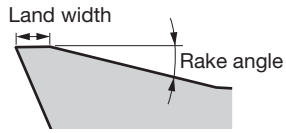
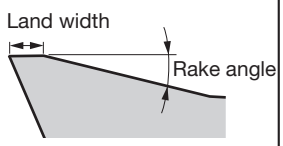
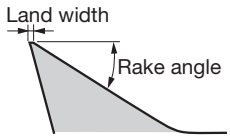
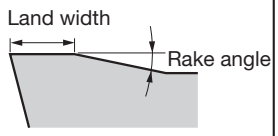
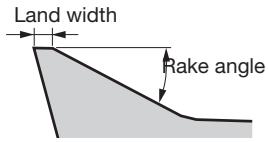
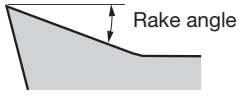


TAC Milling Inserts

Guideline for Selection of Inserts for Milling



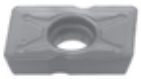
Features of Inserts for Milling

Type	Features	Work materials	Cross sections of the cutting edge (Outline figure)
MJ	• The inserts have functional curvatures at cutting edges and relief faces. • General inserts with both impact resistance and the function of cutting force reduction.	P Steels K Cast irons Ductile cast irons (M Stainless steels)	
HJ	• Allows super high feeds as high as 1.5 to 2 times those of general purpose inserts. • Even under high machining load at high feeds, ensures superior impact resistance and low cutting forces. (Maximum depth of cut: 2 mm)		
ML	• Lowered cutting force compared with MJ type • Applicable when chattering occurs in using MJ type.		
MH	• Suitable for high feed milling. • Available when chipping occurs in using MJ type. • Toughness priority.		
MS	• Low cutting force compared with MJ type • For stainless steels (and mild steels) • Applicable for burr reduction.	M Stainless steels (Mild steels)	
AJ	• For non-ferrous metals such as aluminium alloys etc. • Inserts have sharp edges and mirror like rake faces. • Applicable for burr reduction.	N Aluminium alloys (Non-ferrous metals)	

TAC Milling Inserts

Inserts

●ADMT□□□□08PR-MJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated											Applicable TAC mills (Page)
				AH120	AH140	T3130									
	ADMT130308PR-MJ	M	With	●	●	●									ELP-A (Used for end cutting edge) 9-121
	ADMT17T308PR-MJ			●	●	●									
	ADMT210408PR-MJ			●	●	●									

●AECW□□□□PES/FR, AEMW□□□□PES/T/FR

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated				Cermet		Uncoated					Applicable TAC mills (Page)
				AH120	GH330			NS740		TH10	UX30				
	AECW1403PESR	C	With	●	●			●			●				EPE4000 (Former products)
	AECW16T3PESR		With	●	●			●			●				EPE5000 (Former products)
	AECW1804PESR		With	●	●			●			●				EPE6000 (Former products)
	AECW1804PEFR		Without					●		●					
	AEMW1403PETR	M	With		●			●			●				EPE4000 (Former products)
	AEMW16T3PETR		With		●			●			●				EPE5000 (Former products)
	AEMW1804PETR		With		●			●			●				EPE6000 (Former products)
	AEMW1804PEFR		Without							●					

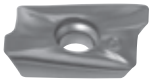
●AO□T0702□□PD□R-MJ/HJ/AJ

TUNGREC TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated				Uncoated							Applicable TAC mills (Page)
				AH725	AH140			KS15F							
-MJ	AOMT070202PDPR-MJ	M	With	●	●										EPO07R TPO07R 9-58
	AOMT070204PDPR-MJ			●	●										
	AOMT070208PDPR-MJ			●	●										
	AOMT070216PDPR-MJ			●	●										
	AOMT070208PDPR-HJ			●	●										
	AOGT070204PDFR-AJ	G	Without					●							

● : Stocked items.

●AO□T1805□□PD□R-MJ/AJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated				Uncoated							Applicable TAC mills (Page)
				AH725	AH140			KS15F							
 -MJ	AOMT180508PDPR-MJ	M	With	●	●										EPO18R TPO18R 9-64
	AOMT180516PDPR-MJ			●	●										
	AOMT180524PDPR-MJ			●	●										
	AOMT180532PDPR-MJ			●	●										
-AJ	AOGT180504PDFR-AJ	G	Without					●							
	AOGT180508PDFR-AJ							●							

●APMT120416PR-MJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated											Applicable TAC mills (Page)
				AH120	T3130										
	APMT120416PR-MJ	M	With	●	●										TZP12 9-122

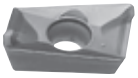
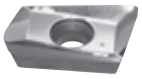
●APMT□□□□08PN-MJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated											Applicable TAC mills (Page)
				AH120	AH140	GH330	T3130								
	APMT070308PN-MJ	M	With	●	●	●	●								ELP-A 9-121 (Used for both end and peripheral edges)
	APMT09T308PN-MJ			●	●	●	●								
	APMT120408PN-MJ			●	●	●	●								

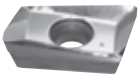
● : Stocked items.

TAC Milling Inserts

●AS□T11T3□□PD□R-MJ/MS/AJ

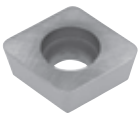
Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH725	AH120	AH130	AH140	T3130	T1115		DLC coated: DS1100	Cermet: NS740	Uncoated: KS05F	Applicable TAC mills (Page)
 -MJ	ASMT11T304PDPR-MJ	M	With	●	●			●	●			●		EPS11 TPS11 ELS11 TLS11 9-62
	ASMT11T308PDPR-MJ			●	●			●	●			●		
	ASMT11T312PDPR-MJ			●	●			●						
	ASMT11T316PDPR-MJ			●	●			●				●		
-MS	ASMT11T320PDPR-MJ				●									
	ASMT11T330PDPR-MJ				●									
	ASMT11T304PDPR-MS					●	●							
 -AJ	ASGT11T304PDFR-AJ	G	Without								●		●	
	ASGT11T308PDFR-AJ										●		●	

●AS□T1705□□PD□R-MJ/MS/AJ

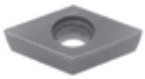
Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH725	AH120	AH130	AH140	T3130	T1115		DLC coated: DS1100	Cermet: NS740	Uncoated: KS05F	Applicable TAC mills (Page)
-MJ	ASMT170504PDPR-MJ	M	With		●			●	●			●		EPS17 TPS17 9-89
	ASMT170508PDPR-MJ				●			●	●			●		
	ASMT170512PDPR-MJ				●			●						
	ASMT170516PDPR-MJ				●			●				●		
-MS	ASMT170520PDPR-MJ				●									
	ASMT170530PDPR-MJ				●									
	ASMT170532PDPR-MJ				●			●				●		
	ASMT170508PDPR-MS					●	●							
 -AJ	ASGT170504PDFR-AJ	G	Without								●		●	
	ASGT170508PDFR-AJ										●		●	

● : Stocked items.

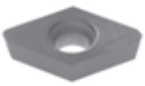
●CPMW/T□□□□08EN

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated				Uncoated							Applicable TAC mills (Page)
				GH330				UX30							
	CPMW050208EN	M	With	●				●							EVP1000 (Former products)
	CPMW06T208EN			●				●							
	CPMT080308EN			●				●							

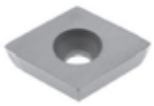
●DCMW□□□□04TN

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated											Applicable TAC mills (Page)
				AH120	AH330										
	DCMW070204TN	M	With	●	●										EBP 9-118
	DCMW11T304TN			●	●										

●DPCW11T3ZFR

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated				Cermet							Applicable TAC mills (Page)
				AH740				NS530							
	DPCW11T3ZFR	C	Without	●				●							TZF11 9-124

●EDKW53ZT/FR

Shape	Cat. No.		Accuracy	Honing	Stocked grades: Coated				Uncoated					Applicable TAC mills (Page)
					GH330				UX30					
	EDKW53ZTR	EDKW1504EDTR	K	With	●				●					ESD5000 (Former products)

●GD□T□□□□PD□R-MJ/AJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated						DLC coated		Uncoated			Applicable TAC mills (Page)
				AH120	AH140	AH330	T3130			DS1100		UX30	TH10		
-MJ	GDMT10H3PDPR-MJ	M	With	●	●	●	●					●			ESD10 9-116
	GDGT10H3PDFR-AJ	G	Without							●			●		
-AJ															

● : Stocked items.

TAC Milling Inserts

●LMEU□□□□□□□ZNEN-MJ

TECSLOT TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades									Applicable TAC mills (Page)
				Coated									
				AH725	AH120	AH140							
-MJ	LMEU100808ZNEN-MJ	E	With	●	●	●							ASN10R TSN10R 9-135
	LMEU100816ZNEN-MJ			●	●	●							
	LMEU100824ZNEN-MJ			●	●	●							
	LMEU100832ZNEN-MJ			●	●	●							
	LMEU120808ZNEN-MJ	E	With	●	●	●							ASN12R TSN12R 9-135
	LMEU120816ZNEN-MJ			●	●	●							
	LMEU120824ZNEN-MJ			●	●	●							
	LMEU120832ZNEN-MJ			●	●	●							
	LMEU150908ZNEN-MJ	E	With	●	●	●							ASN15R TSN15R 9-135
	LMEU150916ZNEN-MJ			●	●	●							
	LMEU150924ZNEN-MJ			●	●	●							
	LMEU150932ZNEN-MJ			●	●	●							

●LMMU□□□□□□□PNER-MJ

TECMILL TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades									Applicable TAC mills (Page)
				Coated									
				AH725	AH120	AH140	T3130	T1115					
-MJ	LMMU110708PNER-MJ	M	With	●	●	●	●	●					EPM11 TPM11 TLM11 9-68
	LMMU110716PNER-MJ			●	●	●	●	●					
	LMMU110724PNER-MJ			●	●	●	●	●					
	LMMU110732PNER-MJ			●	●	●	●	●					
	LMMU160908PNER-MJ			●	●	●	●	●					TPM16 9-68
	LMMU160916PNER-MJ			●	●	●	●	●					
	LMMU160924PNER-MJ			●	●	●		●					
	LMMU160932PNER-MJ			●	●	●		●					

● : Stocked items.

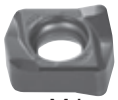
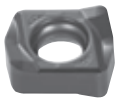
●LNMU0303ZER-MJ/ML

DOFEEDMINI TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH725	AH130	AH3035 (NEW)	Applicable TAC mills (Page)
-MJ	LNMU0303ZER-MJ	M	With	●	●	●	EXN03 9-93
-ML	LNMU0303ZER-ML			●	●	●	

●LNMU06X5ZER-MJ/ML

DOFEED TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH725	AH120	AH130	AH3035 (NEW)	Applicable TAC mills (Page)
 -MJ	LNMU06X5ZER-MJ	M	With	●	●	●	●	EXN06 9-93
 -ML	LNMU06X5ZER-ML			●	●	●	●	

●LQMU□□□□□□PNER-MJ

DOREC TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH725	AH120	AH140	Applicable TAC mills (Page)
-MJ	LQMU110704PNER-MJ	M	With	●	●	●	E/TPQ11 9-57
	LQMU110708PNER-MJ			●	●	●	
	LQMU110716PNER-MJ			●	●	●	
	LQMU180804PNER-MJ			●	●	●	E/TPQ18 9-57
	LQMU180808PNER-MJ			●	●	●	
	LQMU180816PNER-MJ			●	●	●	
	LQMU180824PNER-MJ			●	●	●	

● : Stocked items.

TAC Milling Inserts

●ON□U□□□□AN□□-ML/MJ/W

DOOCTO TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH725	AH120	AH140	T1115 (NEW)	Applicable TAC mills (Page)
-ML	ONHU0705ANPN-MJ	H	With	●		●		TAN07 9-43
	ONHU0705ANTN-ML			●	●	●	★	
	ONHU0705ANPR-W				●			
-MJ	ONMU0705ANPN-MJ	M		●		●		
	ONMU0705ANPN-ML				●		★	
-W								

●PNCU0905GN□R-MJ/W/AJ

DOPENT TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH725	AH120	AH140	T3130 (NEW)	T1115 (NEW)	Cermet: NS740 (NEW)	Uncoated: TH10	Applicable TAC mills (Page)
-MJ	PNCU0905GNER-MJ	C	With	●	●	●	●	●	●		E/TEN09 9-40
	PNCU0905GNER-W			●							
	PNCU0905GNFR-AJ		Without							●	
-W											
-AJ											

●RCMT□□□□EN-NMJ/MJ, RCMT□□□□FN-NAJ

ROUNDSPLIT TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH725	AH120	AH140	Uncoated: KS15F	Applicable TAC mills (Page)
-NMJ	RCMT1204EN-NMJ	M	With	●	●	●		E/TRC12, 16 9-108
	RCMT1606EN-NMJ			●	●	●		
	RCMT1204EN-MJ			●	●	●		
	RCMT1606EN-MJ			●	●	●		
-MJ	RCMT1204FN-NAJ		Without				●	
	RCMT1606FN-NAJ						●	
-NAJ								

● : Stocked items
★ : Available from 2013

●RDMW05/07/10□□M0

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	Applicable TAC mills (Page)
	RDMW0501M0	M	With	●	HWD05 9-126
	RDMW0702M0			●	HWD07 9-126
	RDMW1003M0			●	HWD10 9-126

●RDCM1203T/FN, RDMA1203T/FN

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Uncoated: UX30	Applicable TAC mills (Page)
	RDCM1203TN	RDCM1203M0TN	C	With	●	ERD4000 (Former products)
	RDCM1203FN	RDCM1203M0FN		Without		
	RDMA1203TN	RDMA1203M0TN	M	With	●	
	RDMA1203FN	RDMA1203M0FN		Without		

●RDM□1204ZD□N(-MJ), RDM□1606ZD□N(-MJ)

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	AH130	AH140	AH330	T3130	Uncoated: UX30	Applicable TAC mills (Page)
- MJ	RDMT1204ZDPN-MJ	M	With	●		●	●	●	●	TRD12 9-110
	RDMT1606ZDPN-MJ			●	●	●	●	●	●	TRD16 9-110
	RDMW1204ZDSN			●		●		●		TRD12 9-110
	RDMW1606ZDSN			●		●		●		TRD16 9-110

●RFEN2004□□T/FN

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	GH330	Uncoated: KS20	UX30	Applicable TAC mills (Page)
	RFEN2004M0TN	E	With		●	●	●	TRF6000 ERF6000 9-112
	RFEN2004M0FN		Without					
	RFEN2004ZFTN		With	●	●	●	●	
	RFEN2004ZFFN		Without					

● : Stocked items.

TAC Milling Inserts

●SCMT□□□□08-23

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120											Applicable TAC mills (Page)
	SCMT09T308-23	M	With	●											EBD 9-119
	SCMT120408-23			●											

●SD□N1203AETN, SDCN1203AEFN-D, SD□R1203AETN-MJ, SDKR1203AE□□-M□

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	AH130	AH140	AH330	GH330	T3130	T1115		Cermet: NS740	N308	Uncoated: TH10	UX30	T-DIA: DX140			Applicable TAC mills (Page)
	SDKN42ZTN	SDKN1203AETN-12	K	With	●	●	●	●	●		●		●	●		●				TMD440I TGD4400-A TFD4400-A EMD4403 RI-S32 EGD4400 (Former products)
	SDKN42ZFN	SDKN1203AEFN-12		Without											●					
	SDKN42ZTNCR	SDKN1203AETN-CR		With									●							
	SDKN42ZTN16	SDKN1203AETN-16								●										
	SDCN42ZFN-DIA	SDCN1203AEFN-D	C	Without													●			
	SDMR1203AETN-MJ		M	With									●							
- MJ	SDKR42ZPN-MS	SDKR1203AEPN-MS	K				●													
	SDKR42ZSR-MJ	SDKR1203AESR-MJ			●			●	●	●										

"DX140" : Packing quantity=1 pcs

●SD□N53Z□N□, SDKR53ZSR-MJ

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	AH130	AH140	GH330	T3130		Cermet: NS740	N308	Uncoated: TH10	UX30			Applicable TAC mills (Page)
	SDCN53ZTN	SDCN1504AETN	C	With							●	●					TMD5400RIE 9-50
	SDCN53ZFN	SDCN1504AEFN		Without													
	SDEN53ZTN	SDEN1504AETN	E	With				●			●	▲		●			
	SDEN53ZFN	SDEN1504AEFN		Without									●				
	SDKN53ZTN	SDKN1504AETN	K	With	●	●	●	●			●	●		●			
	SDKN53ZFN	SDKN1504AEFN		Without									●				
	SDEN53ZTN20	SDEN1504AETN-20	E	With					●								
	SDKN53ZTN16	SDKN1504AETN-16	K						●								
- MJ	SDEN53ZTNCR	SDEN1504AETNCR	E								●						
	SDKN53ZTNCR	SDKN1504AETNCR	K								●						
	SDKR53ZSR-MJ	SDKR1504AESR-MJ	K					●	●								

● : Stocked items.
▲ : Shortly unavailable

●SDMT050204PN-MJ, SDHT050204FN-AJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated			Uncoated										Applicable TAC mills (Page)
				AH725	AH140		TH10										
-MJ -AJ	SDMT050204PN-MJ	M	With	●	●												TPD05 EPD05 ELD05 9-70
	SDHT050204FN-AJ	H	Without				●										

●SD□T1204AF□N-□□

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated						Cermet			Uncoated			Applicable TAC mills (Page)
				AH120	AH140	AH330	GH330	T3130		NS740	NS530		TH10			
-MJ -AJ	SDMT1204AFPN-MJ	M	With	●	●	●	●	●								TAD12 (Former products)
	SDMT1204AFTN-MJ									●	●					
	SDMT1204AFPN-ML			●		●										
	SDMT1204AFPN-MS				●											
	SDGT1204AFTN-MJ	G		●		●				●	●					
	SDGT1204AFFN-AJ		Without										●			

●SD□T1204PD□R-□□

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated						Cermet			Uncoated			Applicable TAC mills (Page)
				AH120	AH140	AH330	GH330	T3130		NS740	NS530		TH10			
-MJ -AJ	SDMT1204PDSR-MJ	M	With	●	●	●	●	●								TPD12 (Former products)
	SDMT1204PDTR-MJ									●	●					
	SDMT1204PDPR-ML			●		●										
	SDMT1204PDPR-MS				●											
	SDGT1204PDTR-MJ	G		●		●				●	●					
	SDGT1204PDFR-AJ		Without										●			

● : Stocked items.

TAC Milling Inserts

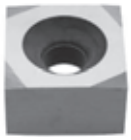
●SE□N1203AG□□, SEKR1203AGSR-MJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated								Cermet	Uncoated		Applicable TAC mills (Page)
				AH120	AH130	AH140	AH330	GH330	T3130	T1115		NS740	TH10	UX30	
	SECN1203AGTN	C	With												TME4400I TME4400B 9-49
	SECN1203AGFN		Without										●		
	SEEN1203AGTN	E	With	●	●	●		●		●		●		●	
	SEEN1203AGFN		Without										●		
	SEEN1203AGTNCR		With	●	●	●	●		●						
	SEEN1203AGTNCR-14											●			
	SEKN1203AGTN	K		●	●	●	●	●	●			●		●	
	SEKN1203AGFN		Without												
-MJ	SEKN1203AGTNCR		With									●			
	SEEN1203AGTN-T	E							●			●		●	
	SEEN1203AGFN-T		Without												
	SEKN1203AGTN-T	K	With					●	●	●		●		●	
	SEKN1203AGFN-T		Without										●		
-MS	SEKR1203AGSR-MJ		With	●			●	●	●						
	SEKR1203AGPN-MS				●	●									

●SN□N43ZT/FN, SNKF43ZT/FN

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Coated			Cermet			Uncoated				Ceramics		Applicable TAC mills (Page)
					T3130	T1115		NS740	N308		TH10	UX30			FX105	CX710	
	SNCN43ZTN	SNCN1204ZNTN	C	With				●	●			●					TGN4200-A 9-53
	SNCN43ZFN	SNCN1204ZNFN		Without							●						
	SNKN43ZTN	SNKN1204ZNTN	K	With	●	●		●				●			●		
	SNKN43ZFN	SNKN1204ZNFN		Without													
	SNKF43ZTN	SNKF1204ZNTN		With		●						●					
	SNKF43ZFN	SNKF1204ZNFN		Without							●						

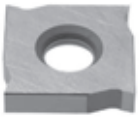
●SNA□56FTR/L, SNC□56FTR/L

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Cermet										Applicable TAC mills (Page)
					X407										
	SNAA56FTR	SNAC1509PNTR	A	With	●										MS cutter (Former products)
	SNAG56FTR	SNAJ1509PNTR													

Packing Quantity=4 pcs.

● : Stocked items.

●SNEN12T2Z□N, SNEN1233Z□N

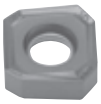
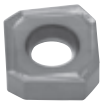
Shape	Cat. No.	Accuracy	Honing	Stocked grades												Applicable TAC mills (Page)
				Uncoated												
				UX30	TH10											
	SNEN12T2ZTN	E	With	●												SVN4000 9-137
	SNEN12T2ZFN		Without		●											
	SNEN1233ZTN		With	●												
	SNEN1233ZFN		Without		●											

●SNMN□□□□

Shape	Cat. No.	Accuracy	Honing	Stocked grades													Applicable TAC mills (Page)
				Coated			Uncoated				Caramics						
				AH120	T3130	T1115	UX30				FX105	CX710					
	SNMN120408TN	M	With								●						TGN4200-A 9-53
	SNMN120412TN			●	●	●	●				●						
	SNMN120416TN										●						
	SNMN120420TN										●						
	SNMN120424TN										●						
	SNMN190412TN										▲						
	SNMN190416TN										●						

●SNMU1706AN□R-ML/MJ, SNHU1706AN□□-MJ/W

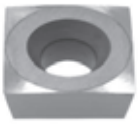
DOQUAD TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades													Applicable TAC mills (Page)
				Coated													
				AH725	AH120	AH140	NEW T1115										
 -ML	SNHU1708ANPR-MJ	H	With	●		●											TAN07 9-43
	SNHU1708ANTR-ML				●		★										
	SNHU1708ANFN-W		Without		●												
 -MJ	SNMU1708ANPR-MJ	M	With	●		●											
	SNMU1708ANTR-ML				●		★										

● : Stocked items
▲ : Shortly unavailable
★ : Available from 2013

TAC Milling Inserts

●SPHA431FNW, SPHA435FNW

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Cermet N308		Uncoated TH10								Applicable TAC mills (Page)
	SPHA435FNW	SPHB120420FN-W	H	Without	●		●								TFD4400-A (Former products) TFP4000IA (Former products) SFP4000 9-130

●SPMP831DS, SPMP/M□□2ERD

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Coated T313W										Applicable TAC mills (Page)
	SPMP831DS	SPMT060204-DS	M	With	●										TCB 9-129
	SPMP042ERD	SPMP080308ER-D			●										
	SPMM322ERD	SPMT090308ER-D			●										
	SPMM432ERD	SPMT120408ER-D			●										

●SPMR1605PP□R-M□

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated GH330	T3130	T1115			Uncoated UX30							Applicable TAC mills (Page)
-MJ	SPMR1605PPTR-MJ	M	With	●	●	●			●							TPP16RIE 9-82
	SPMR1605PPTR-MH			●	●				●							
	SPMR1605PPPR-ML			●												
-ML																

● : Stocked items.

●SP□□1203

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Coated						Cermet		Uncoated		Ceramics		Applicable TAC mills (Page)
					AH120	AH140	GH330	T3130	T1115		NS740	N308	TH10	UX30	FX105	CX710	
	SPEN423TN	SPEN120312TN	E	With				●			●			●			TGP 4100RBAE 9-51
	SPEN423FN	SPEN120312FN		Without									●				
	SPCN42STR	SPCN1203EDTR	C	With							●	●		●			
	SPCN42STL	SPCN1203EDTL															
	SPCN42SFR	SPCN1203EDFR		Without									●				
	SPCN42SFL	SPCN1203EDFL															
	SPEN42STR	SPEN1203EDTR	E	With							●						
	SPEN42STL	SPEN1203EDTL															
	SPKN42STR	SPKN1203EDTR	E		●	●	●	●	●		●	●		●	●		
	SPKN42STL	SPKN1203EDTL									●			●			
	SPKN42SFR	SPKN1203EDFR		Without									●				
	SPKN42SFL	SPKN1203EDFL											●				
	SPGN120312TN		G	With											●		
	SPKR42SSR-MJ	SPKR1203EDSR-MJ	K	With			●	●	●								

●SQMU1203ZSR-MJ

DOFEEDQUAD TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated												Applicable TAC mills (Page)
				AH725	AH120	AH130	T3130									
	SQMU1206ZSR-MJ	M	With	●	●	●	●									TXQ12 9-99

● : Stocked items.

TAC Milling Inserts

●SW□□13T3AF□R-□□

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	AH130	AH140	T3130	T1115		GH110	DLC coated: DS1100	Cermet: NS740	Uncoated: KS05F		Applicable TAC mills (Page)
-MJ	SWMT13T3AFPR-MJ	M	With	●	●	●	●	●				●			TAW13 9-45
	SWMT13T3AFER-ML			●											
-ML	SWMW13T3AFTR			●			●	●				●			
	SWMT13T3AFPR-HJ			●	●	●	●	●							
	SWMT13T3AFPR-MS				●	●									
-FL	SWGT13T3AFFR-AJ	G	Without								●		●		
	SWGT13T3AFPR-MJ		With	●								●			
-HJ															
-MS															
-AJ															
SWGT-MJ															

● : Stocked items.

●SW□□1304PD□R-□□

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated AH120	AH130	AH140	T3130	T1115			DLC coated DS1100	Cermet NS740	Uncoated KS05F		Applicable TAC mills (Page)
-MJ	SWMT1304PDPR-MJ	M	With	●	●	●	●	●				●			TPW13 9-72
	SWMT1304PDER-ML			●											
	SWMT1304PDPR-MS				●	●									
-ML	SWGT1304PDFR-AJ	G	Without								●		●		
	SWGT1304PDPR-MJ		With	●								●			
-MS															
-AJ															
SWGT-MJ															

●TECN32Z□□, TEEN32Z□□, TECN32ZFR-DIA, TEKR1603PEPR-MS

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Coated AH120	AH130	AH140	AH330	GH330	T3130	T1115		Cermet NS740	N308	Uncoated TH10	UX30		T-DIA DX140	Applicable TAC mills (Page)
-DIA	TECN32ZTR	TECN1603PETR	C	With									●	●		●			TSE 3000R(IA)E 9-84
	TECN32ZTL	TECN1603PETL																	
	TECN32ZFR	TECN1603PEFR		Without											●				
	TECN32ZFL	TECN1603PEFL																	
	TEEN32ZTR	TEEN1603PETR	E	With	●	●	●	●	●	●	●		●	●		●			
	TEEN32ZTL	TEEN1603PETL																	
	TEEN32ZFR	TEEN1603PEFR		Without											●				
	TEEN32ZFL	TEEN1603PEFL																	
	TECN32ZFR-DIA	TECN1603PEFR-D	C															●	
-MS	TEKR1603PEPR-MS		K	With			●												

"DX140": Packing Quantity=1 pcs.

● : Stocked items.

TAC Milling Inserts

●TE□N43Z□□, TECN43ZFR-DIA, TEKR2204PEPR-MS

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Coated								Cermet		Uncoated			T-DIA		Applicable TAC mills (Page)
					AH120	AH130	AH140	AH330	GH330	T3130	T1115		NS740	N308	TH10	UX30		DX140	DX160	
	TECN43ZTR	TECN2204PETR	C	With									●	●		●				TSE4000IA
	TECN43ZTL	TECN2204PETL																		
	TECN43ZFR	TECN2204PEFR		Without											●					
	TECN43ZFL	TECN2204PEFL																		
	TEEN43ZTR	TEEN2204PETR	E	With	●	●	●	●	●	●	●		●	●		●				9-86
	TEEN43ZTL	TEEN2204PETL																		
	TEEN43ZFR	TEEN2204PEFR		Without											●					
-DIA	TEEN43ZFL	TEEN2204PEFL																		
	TECN43ZFR-DIA	TECN2204PEFR-D	C	Without														●	▲	
	TEKR2204PEPR-MS		K	With			●													
-MS																				

"DX140": Packing Quantity=1 pcs.

●WDCN42ZFR-DIA

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: T-DIA									Applicable TAC mills (Page)
					DX140									
	WDCN42ZFR-DIA	SDCX1203AEFR-WD	C	Without	●									(Former products)
Wiper inserts														

"DX140" : Packing Quantity=1 pcs.

●SPAX1203EDFR-W

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Cermet			Uncoated						Applicable TAC mills (Page)
					N308			TH10						
	WPAN42SFR	SPAX1203EDFR-W	A	Without	●			●						TGP4100BAE 9-51
Wiper inserts (Two corner type)														

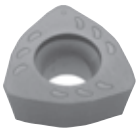
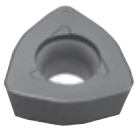
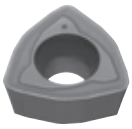
● : Stocked items.

●SPAX1203EDFR-WS

Shape	Cat. No.	ISO Metric Cat. No.	Accuracy	Honing	Stocked grades: Uncoated TH10									Applicable TAC mills (Page)
Wiper inserts (Two corner type)	WPAN42SFRS	SPAX1203EDFR-WS	A	Without	●									TGP4100BAE 9-51

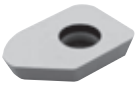
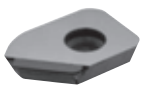
MILLFEED TUNGALOY

●WPMW/T□□□□□□Z□R-(M□)

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated AH120	AH130	AH140	T3130	AH730						Applicable TAC mills (Page)
	WPMW05H315ZPR	M	With	●		●	●							EXP05, 06, 08, 09 TXP06, 08, 09 9-104
	WPMW06X415ZPR			●		●	●							
	WPMT080615ZSR			●	●	●	●							
	WPMT090725ZSR			●		●	●							
-ML	WPMT05H315ZPR-ML	M	With	●		●	●							
	WPMT06X415ZPR-ML			●	●	●	●							
	WPMT080615ZPR-ML			●	●	●	●							
	WPMT090725ZPR-ML			●	●	●	●							
 -MH	WPMT05H315ZPR-MH	M	With	●		●								
	WPMT06X415ZPR-MH			●		●								
	WPMT080615ZSR-MH			●		●								
	WPMT090725ZSR-MH			●	●	●								
 -DML	WPMT05H315ZPR-DML	M	With					●						
	WPMT06X415ZPR-DML							●						
	WPMT080615ZPR-DML							●						
	WPMT090725ZPR-DML							●						

TUNGMILL TUNGALOY

●WWCW13T3AF□R-□□

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated GH110		DLC coated DS1100		Cermet NS740	Uncoated KS05F		T-DIA DX140		Applicable TAC mills (Page)
	WWCW13T3AFER-WS	C	With	●				●					TAW13 9-45
	WWCW13T3AFFR-WS		Without			●			●				
 -WD	WWCW13T3AFFR-WD										●		

"DX140" : Packing Quantity=1 pcs.

● : Stocked items.

TAC Milling Inserts

●XCET310404ER

Shape	Cat. No.	Accuracy	Honing	Stocked grades												Applicable TAC mills (Page)
				Coated			Cermet			Uncoated						
				AH330			NS740	NS530		UX30						
	XCET310404ER	E	With	●			●	●		●						ECC31 9-127

●XHGR□□□□□□ER-MJ

HYBRIDTACMILL TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades												Applicable TAC mills (Page)
				Coated												
				AH730												
-MJ	XHGR110202ER-MJ	G	With	●												EPH11, 13, 18 9-75
	XHGR110204ER-MJ			●												
	XHGR110205ER-MJ			●												
	XHGR110208ER-MJ			●												
	XHGR110210ER-MJ			●												
	XHGR110212ER-MJ			●												
	XHGR110215ER-MJ			●												
	XHGR110216ER-MJ			●												
	XHGR110220ER-MJ			●												
	XHGR130202ER-MJ			●												
	XHGR130204ER-MJ			●												
	XHGR130205ER-MJ			●												
	XHGR130208ER-MJ			●												
	XHGR130210ER-MJ			●												
	XHGR130212ER-MJ			●												
	XHGR130215ER-MJ			●												
	XHGR130216ER-MJ			●												
	XHGR130220ER-MJ			●												
	XHGR18T202ER-MJ			●												
	XHGR18T204ER-MJ			●												
	XHGR18T205ER-MJ			●												
	XHGR18T208ER-MJ			●												
	XHGR18T210ER-MJ			●												
	XHGR18T212ER-MJ			●												
	XHGR18T215ER-MJ			●												
	XHGR18T216ER-MJ			●												
	XHGR18T220ER-MJ			●												

● : Stocked items.

HYBRIDTACMILL TUNGALOY

●XHGR□□□□□□FR-AJ

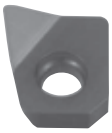
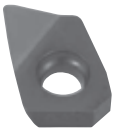
Shape	Cat. No.	Accuracy	Honing	Stocked grades												Applicable TAC mills (Page)
				DLC coated												
				DS1200												
-AJ	XHGR110200FR-AJ	G	Without	●												EPH11, 13, 18 9-75
	XHGR110202FR-AJ			●												
	XHGR110204FR-AJ			●												
	XHGR110205FR-AJ			●												
	XHGR110208FR-AJ			●												
	XHGR110210FR-AJ			●												
	XHGR110212FR-AJ			●												
	XHGR110215FR-AJ			●												
	XHGR110216FR-AJ			●												
	XHGR110220FR-AJ			●												
	XHGR130200FR-AJ			●												
	XHGR130202FR-AJ			●												
	XHGR130204FR-AJ			●												
	XHGR130205FR-AJ			●												
	XHGR130208FR-AJ			●												
	XHGR130210FR-AJ			●												
	XHGR130212FR-AJ			●												
	XHGR130215FR-AJ			●												
	XHGR130216FR-AJ			●												
	XHGR130220FR-AJ			●												
	XHGR18T200FR-AJ			●												
	XHGR18T202FR-AJ			●												
	XHGR18T204FR-AJ			●												
	XHGR18T205FR-AJ			●												
	XHGR18T208FR-AJ			●												
	XHGR18T210FR-AJ			●												
	XHGR18T212FR-AJ			●												
	XHGR18T215FR-AJ			●												
	XHGR18T216FR-AJ			●												
	XHGR18T220FR-AJ			●												

● : Stocked items.

TAC Milling Inserts

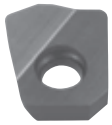
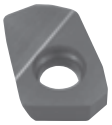
●XVGT□□□□□□□EC-MJ, XVGT□□□□□□□EP-MJ, XVGT□□□□□□□FC-AJ, XVGT□□□□□□□FP-AJ

HYBRIDTACMILL TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated			DLC coated									Applicable TAC mills (Page)
				AH730			DS1200									
 Center edge insert	XVGT06H205EC-MJ	G	With	●												EVH 9-78
	XVGT07X305EC-MJ			●												
	XVGT09X405EC-MJ			●												
	XVGT06H205EP-MJ			●												
	XVGT07X305EP-MJ			●												
	XVGT09X405EP-MJ			●												
 Peripheral edge insert	XVGT06H205FC-AJ		Without				●									
	XVGT07X305FC-AJ						●									
	XVGT09X405FC-AJ						●									
	XVGT06H205FP-AJ						●									
	XVGT07X305FP-AJ						●									
	XVGT09X405FP-AJ						●									

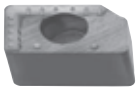
●XXGT□□□□□□□EC-MJ, XXGT□□□□□□□-MJ, XXGT□□□□□□□FC-AJ, XXGT□□□□□□□-AJ

HYBRIDTACMILL TUNGALOY

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated			DLC coated									Applicable TAC mills (Page)
				AH730			DS1200									
 Center edge insert	XXGT06H205EC-MJ	G	With	●												EXH 9-100
	XXGT07X305EC-MJ			●												
	XXGT09X408EC-MJ			●												
	XXGT06H205EP-MJ			●												
	XXGT07X305EP-MJ			●												
	XXGT09X408EP-MJ			●												
 Peripheral edge insert	XXGT06H205FC-AJ		Without				●									
	XXGT07X305FC-AJ						●									
	XXGT09X408FC-AJ						●									
	XXGT06H205FP-AJ						●									
	XXGT07X305FP-AJ						●									
	XXGT09X408FP-AJ						●									

● : Stocked items.

●XXMU□□□□□□PR-MJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	AH140	Applicable TAC mills (Page)
	XXMU08T204PR-MJ	M	With	●	●	EVX 9-114
	XXMU10H308PR-MJ			●	●	
	XXMU12X408PR-MJ			●	●	
	XXMU16X508PR-MJ			●	●	

●YDEN1505ADFR/L-D/WD

Shape	Cat. No.	Accuracy	Honing	Stocked grades: T-DIA: DX140	Applicable TAC mills (Page)
General inserts	YDEN1505ADFR-D	E	Without	●	DAD15 9-54
	YDEN1505ADFR-WD			●	
Wiper inserts					

"DX140": Packing Quantity = 1 pcs.

●YDEN1505PDFR/L-D/WD

Shape	Cat. No.	Accuracy	Honing	Stocked grades: T-DIA: DX140	Applicable TAC mills (Page)
General inserts	YDEN1505PDFR-D	E	Without	●	DPD15 9-80 EDPD15
	YDEN1505PDFR-WD			●	
Wiper inserts					

"DX140": Packing Quantity = 1 pcs.

●YPEN1505PPTR/L-Q

Shape	Cat. No.	Accuracy	Honing	Stocked grades: T-CBN: BX950	Applicable TAC mills (Page)
	YPEN1505PPTR-Q	E	With	●	QPP15 9-132

"BX950": Packing Quantity = 1 pcs.

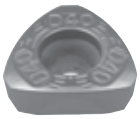
● : Stocked items.

TAC Milling Inserts

●ZD□A□□□□T/FN

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Uncoated: UX30	Applicable TAC mills (Page)
	ZDKA0704TN	K	With		TBF1000 (Former products)
	ZDKA1105TN			▲	
	ZDCA0804TN	C		●	
	ZDCA1105TN			●	

●ZDMT□□□□-MJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	Applicable TAC mills (Page)
	ZDMT4005-MJ	M	With	●	EBD040 9-119
	ZDMT5006-MJ			●	EBD050 9-119

●ZNCA□□□□FN, ZNMM□□□□EN

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Uncoated: TH10	UX30	Applicable TAC mills (Page)
	ZNCA1002FN2	C	Without	●	●	TBN1000 9-120
	ZNCA1203FN			●	●	
	ZNCA1603FN			●	●	
	ZNCA2004FN			●	●	
	ZNCA2505FN			●	●	
	ZNCA3005FN			●	●	
	ZNMM2004EN	M	With		●	
	ZNMM2505EN				●	
	ZNMM3005EN				●	

●ZPET□□□□-MJ

Shape	Cat. No.	Accuracy	Honing	Stocked grades: Coated: AH120	AH330	Applicable TAC mills (Page)
	ZPET2004-MJ	E	With	●	●	EBP020 9-118
	ZPET2505-MJ			●	●	EBP025 9-118
	ZPET3006-MJ			●	●	EBP030 9-118

"ZPET3006-MJ": Packing Quantity = 5 pcs.

● : Stocked items.
▲ : Shortly unavailable

MEMO