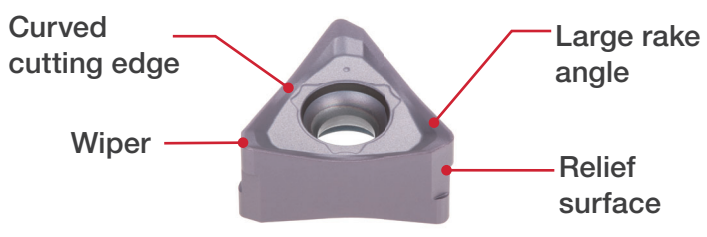




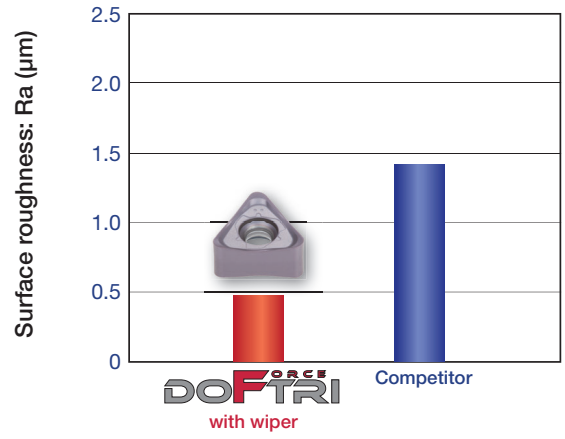
High precision shoulder mill series with economical double-sided triangular inserts

Innovative insert

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



Comparison of surface roughness

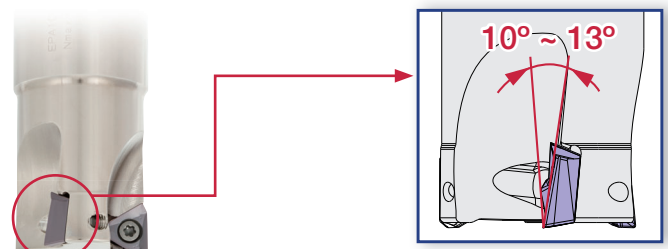
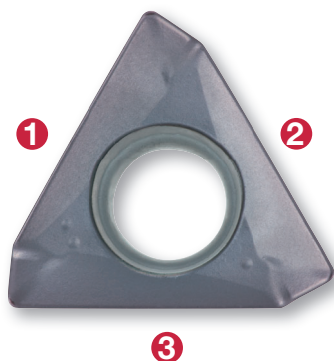


Reference pages: [H122](#) - [H124](#)



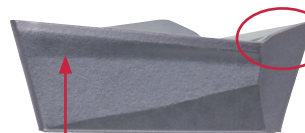
Excellent cutting performance with improved profitability

■ Economical 3 cutting-edge inserts ■ Drastically reduced cutting force



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

Large rake angle



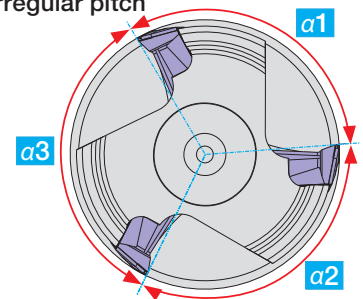
Uniquely designed flank face with built-in "margin" that prevents chattering and chipping.

Good surface finish due to positive inclination on wiper edge

■ Applicable for a wide range of cutting conditions

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

Irregular pitch



$a1 \neq a2 \neq a3$

■ Cutting performance

ap (mm)	10					
	9	OK				
8						
7						
6						
5						
4						
3						
2						
1						
Applicable area	0.05					
TUNG-TRI						

ap (mm)	10					
	9	OK				
8						
7						
6						
5						
4						
3						
2						
1						
Applicable area	0.05					
Competitor						

○ OK △ Chatter × Strong chatter

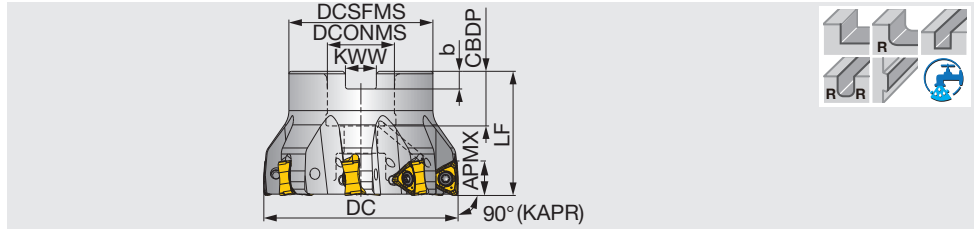
Cutter : EPA10R032M32.0-03N (DC = 32 mm, CICT = 3)
 Insert : TOMT100404PDER-MJ
 Grade : AH3135
 Workpiece : S55C (200 HB)
 Cutting speed : $V_c = 150$ m/min
 Width of cut : $a_e = 32$ mm
 Machine : Vertical M/C, BT50



DOFTRICE TPTN12

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

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



Designation	APMX	DC	CICT	DCSFMS	LF	DCONMS	CDBP	KWW	b	WT(kg)	Air hole	Shell locking bolt	Insert
TPTN12M050B22.0R04	11	50	4	47	40	22	20	10.4	6.3	0.4	With	CM10X30H	TN*U12...
TPTN12M050B22.0R05	11	50	5	47	40	22	20	10.4	6.3	0.4	With	CM10X30H	TN*U12...
TPTN12M063B22.0R05	11	63	5	47	40	22	20	10.4	6.3	0.6	With	CM10X30H	TN*U12...
TPTN12M063B22.0R06	11	63	6	47	40	22	20	10.4	6.3	0.6	With	CM10X30H	TN*U12...
TPTN12J080B25.4R06	11	80	6	58	50	25.4	26	9.5	6	1.1	With	CM12X30H	TN*U12...
TPTN12J080B25.4R08	11	80	8	58	50	25.4	26	9.5	6	1.1	With	CM12X30H	TN*U12...
TPTN12M080B27.0R06	11	80	6	58	50	27	22	12.4	7	1.1	With	CM12X30H	TN*U12...
TPTN12M080B27.0R08	11	80	8	58	50	27	22	12.4	7	1.1	With	CM12X30H	TN*U12...
TPTN12J100B31.7R07	11	100	7	67	50	31.75	32	12.7	8	1.4	With	TMBA-M16H	TN*U12...
TPTN12J100B31.7R10	11	100	10	67	50	31.75	32	12.7	8	1.4	With	TMBA-M16H	TN*U12...
TPTN12M100B32.0R07	11	100	7	67	50	32	28.5	14.4	8	1.4	With	TMBA-M16H	TN*U12...
TPTN12M100B32.0R10	11	100	10	67	50	32	28.5	14.4	8	1.4	With	TMBA-M16H	TN*U12...
TPTN12J125B38.1R08	11	125	8	71	63	38.1	38	15.9	10	2.4	With	TMBA-M20H	TN*U12...
TPTN12J125B38.1R12	11	125	12	71	63	38.1	38	15.9	10	2.5	With	TMBA-M20H	TN*U12...
TPTN12M125B40.0R08	11	125	8	71	63	40	32	16.4	9	2.3	With	TMBA-M20H	TN*U12...
TPTN12M125B40.0R12	11	125	12	71	63	40	32	16.4	9	2.4	With	TMBA-M20H	TN*U12...

SPARE PARTS

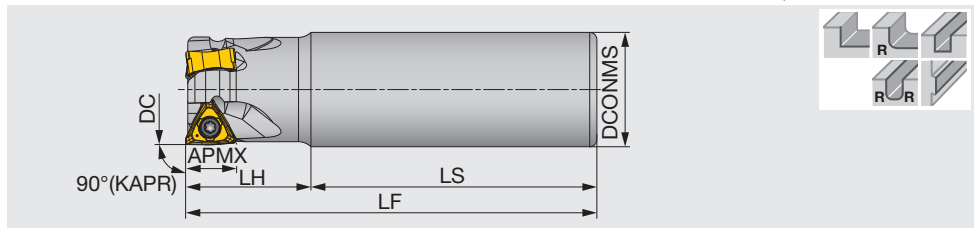
Designation	Clamping screw	Grip	Torx bit	Lubricant	Shell locking bolt 1	Shell locking bolt 2
TPTN12M050, 063B...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000	-	CM10X30H
TPTN12*080B...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000	-	CM12X30H
TPTN12*100B...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000	TMBA-M16H	-
TPTN12*125B...	CSPB-3.5	H-TB2W	BLDIP15/S7	M-1000	TMBA-M20H	-

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

DOFTRICE EPTN12

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

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



Designation	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPTN12M032C32.0R02N	11	32	2	32	80	35	115	0.7	Without	TN*U12...
EPTN12M032C32.0R03N	11	32	3	32	80	35	115	0.7	Without	TN*U12...
EPTN12M040C32.0R03N	11	40	3	32	80	35	115	0.8	Without	TN*U12...
EPTN12M040C32.0R04N	11	40	4	32	80	35	115	0.8	Without	TN*U12...

SPARE PARTS

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

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

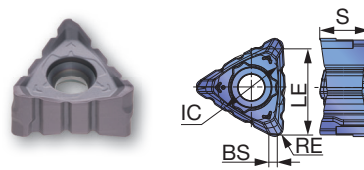
Reference pages: Inserts → [H123](#), Standard cutting conditions → [H124](#)

INSERT

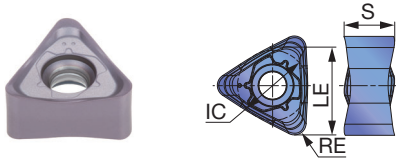
TNGU-MJ/TNMU-MJ



TNMU-NMJ



TNMU-R-MJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated				LE	IC	S	BS
			AH120	AH3135	T1215	T3225				
TNGU120708PER-MJ	0.8	11	●	●	●		12	9.525	7.04	1.16
TNMU120708PER-MJ	0.8	11	●	●	●	●	12	9.525	7.1	1.16
TNMU120708PER-NMJ	0.8	11	●	●			12	9.525	7.1	1.16
TNMU1207R16PER-MJ	1.6	11	●	●			12	9.525	6.88	-

● : Line up

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



STANDARD CUTTING CONDITIONS



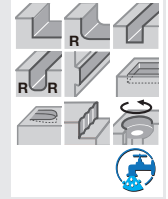
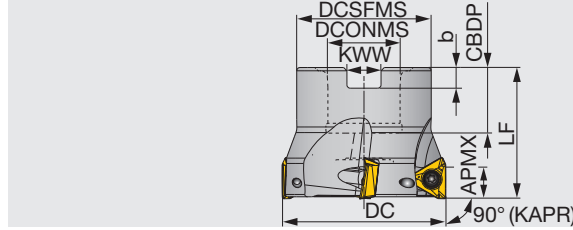
ISO	Workpiece materials	Hardness	Priority	Grades	Chip-breaker	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Low carbon steel S15C, SS400, etc. C15E4, E275A, etc.	- 300 HB	First choice	AH3135	MJ	100 - 250	0.08 - 0.3
		- 300 HB	Wear resistance	T3225	MJ	100 - 300	0.08 - 0.3
		- 300 HB	Low cutting force	AH3135	NMJ	100 - 250	0.08 - 0.14
	Carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	- 300 HB	First choice	AH3135	MJ	100 - 230	0.08 - 0.3
		- 300 HB	Wear resistance	T3225	MJ	100 - 280	0.08 - 0.3
		- 300 HB	Low cutting force	AH3135	NMJ	100 - 230	0.08 - 0.14
	Prehardened steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3135	MJ	100 - 180	0.08 - 0.25
		30 - 40 HRC	Wear resistance	T3225	MJ	100 - 200	0.08 - 0.25
		30 - 40 HRC	Low cutting force	AH3135	NMJ	100 - 180	0.08 - 0.14
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc.	-	First choice	AH3135	MJ	90 - 200	0.08 - 0.25
		-	Wear resistance	T3225	MJ	90 - 250	0.08 - 0.25
		-	Low cutting force	AH3135	NMJ	90 - 200	0.08 - 0.14
K	Grey cast iron FC250, 250, etc. FC300, 300, etc.	150 - 250 HB	First choice	AH120	MJ	140 - 250	0.08 - 0.3
		150 - 250 HB	Wear resistance	T1215	MJ	140 - 300	0.08 - 0.3
		150 - 250 HB	Low cutting force	AH120	NMJ	140 - 250	0.08 - 0.14
	Ductile cast iron FCD400, FCD600, etc. 400-15S, 600-3, etc.	150 - 250 HB	First choice	AH120	MJ	110 - 200	0.08 - 0.25
		150 - 250 HB	Wear resistance	T1215	MJ	110 - 250	0.08 - 0.25
		150 - 250 HB	Low cutting force	AH120	NMJ	110 - 200	0.08 - 0.14
S	Titanium alloys Ti-6Al-4V, etc.	-	First choice	AH120	MJ	20 - 60	0.08 - 0.2
		-	Low cutting force	AH120	NMJ	20 - 60	0.08 - 0.14
	Heat-resistant alloys Inconel718, etc.	-	First choice	AH120	MJ	20 - 40	0.07 - 0.18
		-	Low cutting force	AH120	NMJ	20 - 40	0.07 - 0.14

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

Designation	Chip thickness (mm)
TNMU120708PER-NMJ	< 0.2

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

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



Designation	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TPA06R032M16.0E05	6	32	5	30	16	18	40	5.6	8.4	0.14	With	TOMT06...
TPA06R040M16.0E06	6	40	6	35	16	18	40	5.6	8.4	0.22	With	TOMT06...
TPA06R050M22.0E08	6	50	8	41	22	20	40	6.3	10.4	0.31	With	TOMT06...

SPARE PARTS

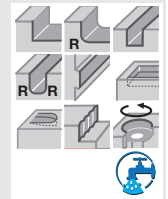
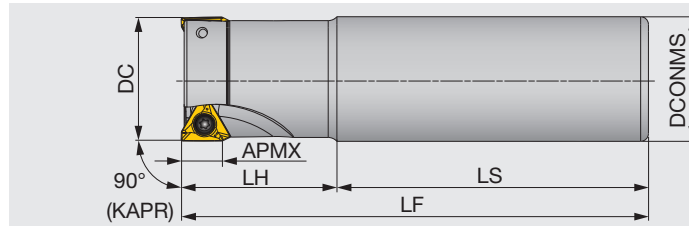


Designation	Clamping screw	Lubricant	Shell locking bolt	Wrench
TPA06R032M16.0E05	CSTB-2.5	M-1000	FSHM8-30H	T-8D
TPA06R040M16.0E06	CSTB-2.5	M-1000	CM8X30H	T-8D
TPA06R050M22.0E08	CSTB-2.5	M-1000	CM10X30H	T-8D

*Recommended clamping torque (N·m): CSTB-2.5=1.3

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

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



Designation	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPA06R012M16.0-01N	6	12	1	16	50	18	68	0.09	Without	TOMT06...
EPA06R016M16.0-02N	6	16	2	16	60	24	84	0.12	Without	TOMT06...
EPA06R016M16.0-02L	6	16	2	16	105	40	145	0.2	With	TOMT06...
EPA06R018M16.0-02N	6	18	2	16	60	24	84	0.13	Without	TOMT06...
EPA06R018M16.0-02L	6	18	2	16	115	30	145	0.21	With	TOMT06...
EPA06R020M16.0-02N	6	20	2	16	60	30	90	0.14	Without	TOMT06...
EPA06R020M20.0-02N	6	20	2	20	70	30	100	0.23	Without	TOMT06...
EPA06R020M20.0-03N	6	20	3	20	70	30	100	0.22	Without	TOMT06...
EPA06R020M20.0-02L	6	20	2	20	135	50	185	0.41	With	TOMT06...
EPA06R022M20.0-02N	6	22	2	20	70	30	100	0.23	Without	TOMT06...
EPA06R022M20.0-03N	6	22	3	20	70	30	100	0.23	Without	TOMT06...
EPA06R022M20.0-02L	6	22	2	20	145	40	185	0.42	With	TOMT06...
EPA06R025M25.0-03N	6	25	3	25	80	35	115	0.41	Without	TOMT06...
EPA06R025M25.0-04N	6	25	4	25	80	35	115	0.41	Without	TOMT06...
EPA06R025M25.0-02L	6	25	2	25	150	70	220	0.78	With	TOMT06...
EPA06R028M25.0-03N	6	28	3	25	80	35	115	0.42	Without	TOMT06...
EPA06R028M25.0-04N	6	28	4	25	80	35	115	0.42	Without	TOMT06...
EPA06R028M25.0-02L	6	28	2	25	180	40	220	0.8	With	TOMT06...

SPARE PARTS



Designation	Clamping screw	Lubricant	Wrench
EPA06R012 - 018M...	CSTB-2.5S	M-1000	T-8D
EPA06R020 - 028M...	CSTB-2.5	M-1000	T-8D

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

Reference pages: Inserts → [H131 - H132](#), Standard cutting conditions → [H133](#)

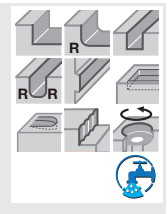
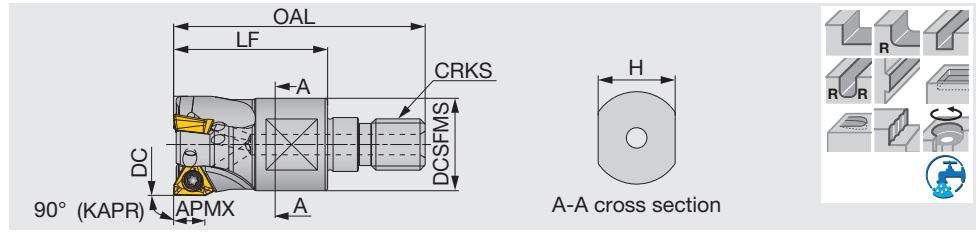
- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

TUNG-TRI

HPA06-M

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

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



Designation	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPA06R016MM08-02	6	16	2	42	25	10	13	M8	0.03	With	TOMT06...
HPA06R020MM10-03	6	20	3	49	30	15	18	M10	0.06	With	TOMT06...
HPA06R025MM12-04	6	25	4	57	35	17	21	M12	0.1	With	TOMT06...
HPA06R032MM16-05	6	32	5	63	40	22	29	M16	0.20	With	TOMT06...

Please see the page **H210** for TungFlex modular shank.

SPARE PARTS

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

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

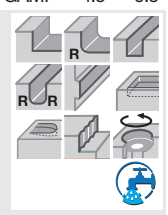
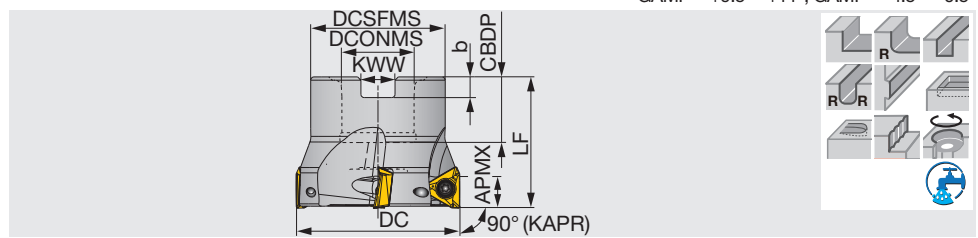
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

TUNG-TRI

TPA10

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

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



Designation	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TPA10R040M16.0E04	10	40	4	35	16	18	40	5.6	8.4	0.2	With	TO*T10...
TPA10R050M22.0E04	10	50	4	41	22	20	40	6.3	10.4	0.31	With	TO*T10...
TPA10R063M22.0E06	10	63	6	41	22	20	40	6.3	10.4	0.51	With	TO*T10...
TPA10R080M25.4-07	10	80	7	58	25.4	26	50	6	9.5	1.04	With	TO*T10...
TPA10R080M27.0E07	10	80	7	58	27	22	50	7	12.4	1.04	With	TO*T10...
TPA10R100M31.7-08	10	100	8	70	31.75	32	63	8	12.7	2.02	With	TO*T10...
TPA10R100M32.0E08	10	100	8	60	32	28.5	50	8	14.4	2.02	With	TO*T10...

SPARE PARTS

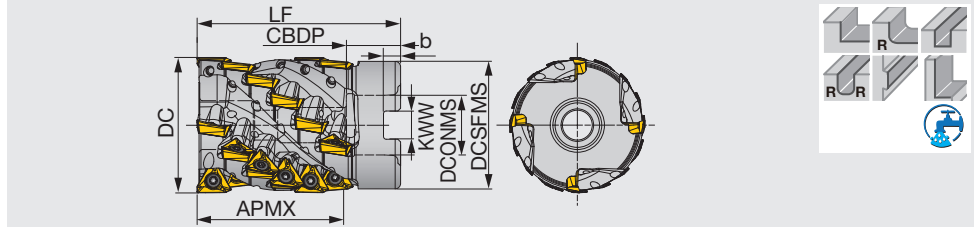
Designation	Clamping screw	Grip	Lubricant	Shell locking bolt	Torx bit
TPA10R040M16.0E04	SR14-562/S	SW6-SD	M-1000	CM8X30H	BLDT10/S7
TPA10R050, 063M...	SR14-562/S	SW6-SD	M-1000	CM10X30H	BLDT10/S7
TPA10R080M...	SR14-562/S	SW6-SD	M-1000	CM12X30H	BLDT10/S7
TPA10R100M...	SR14-562/S	SW6-SD	M-1000	CM16X40H	BLDT10/S7

*Recommended clamping torque (N·m): SR14-562/S=3.5

Reference pages: Inserts → **H131 - H132**, Standard cutting conditions → **H133**, TungFlex → **H210**

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

GAMP = +9.5°~+11°, GAMF = -4.5°~-0.5°



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

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

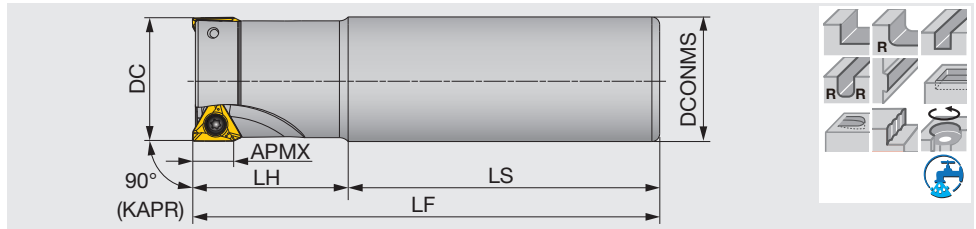
SPARE PARTS

Designation	Clamping screw	Lubricant	Shell locking bolt1	Shell locking bolt2	Wrench
TLA10R050L054M22.0E04	SR14-562	M-1000	CAP-CM10X1.5X55-H	-	T-10D
TLA10R063L...	SR14-562	M-1000	-	CAP-CM12X1.75X50	T-10D

*Recommended clamping torque (N·m): SR14-562=3.5

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

GAMP = +9.5°~+11°, GAMF = -4.5°~-0.5°



Designation	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPA10R025M25.0-02N	10	25	2	25	80	35	115	0.38	Without	TO*T10...
EPA10R025M25.0-02L	10	25	2	25	150	70	220	0.75	With	TO*T10...
EPA10R028M25.0-02N	10	28	2	25	80	35	115	0.39	Without	TO*T10...
EPA10R028M25.0-02L	10	28	2	25	185	35	220	0.78	With	TO*T10...
EPA10R032M32.0-02N	10	32	2	32	80	40	120	0.66	Without	TO*T10...
EPA10R032M32.0-03N	10	32	3	32	80	40	120	0.65	Without	TO*T10...
EPA10R032M32.0-02L	10	32	2	32	175	80	255	1.46	With	TO*T10...
EPA10R035M32.0-02N	10	35	2	32	80	40	120	0.7	Without	TO*T10...
EPA10R035M32.0-03N	10	35	3	32	80	40	120	0.68	Without	TO*T10...
EPA10R035M32.0-02L	10	35	2	32	215	40	255	1.52	With	TO*T10...
EPA10R040M32.0-03N	10	40	3	32	80	40	120	0.72	Without	TO*T10...
EPA10R040M32.0-04N	10	40	4	32	80	40	120	0.73	Without	TO*T10...
EPA10R040M32.0-02L	10	40	2	32	205	50	255	1.57	With	TO*T10...

SPARE PARTS

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

*Recommended clamping torque (N·m): SR14-562/S=3.5



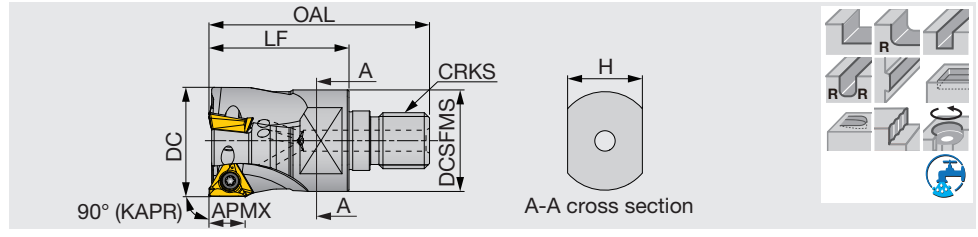
- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

TUNG-TRI

HPA10-M

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

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



Designation	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPA10R025MM12-02	10	25	2	57	35	17	21	M12	0.08	With	TO*T10...
HPA10R032MM16-03	10	32	3	63	40	22	29	M16	0.18	With	TO*T10...

Please see the page **H210** for TungFlex modular shank.

SPARE PARTS

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

*Recommended clamping torque (N·m): SR14-562/S=3.5

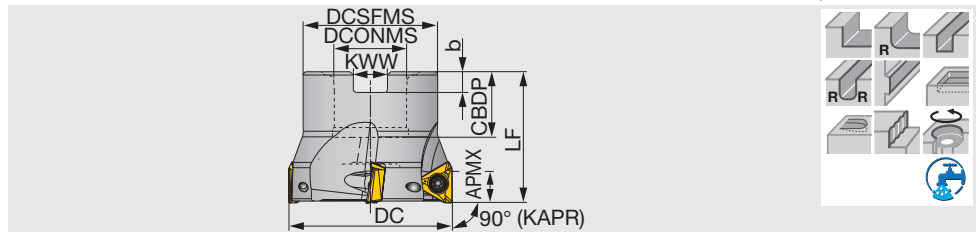
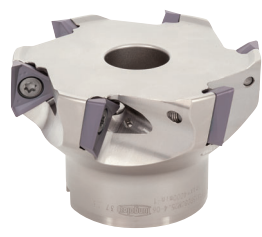
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

TUNG-TRI

TPA15

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

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



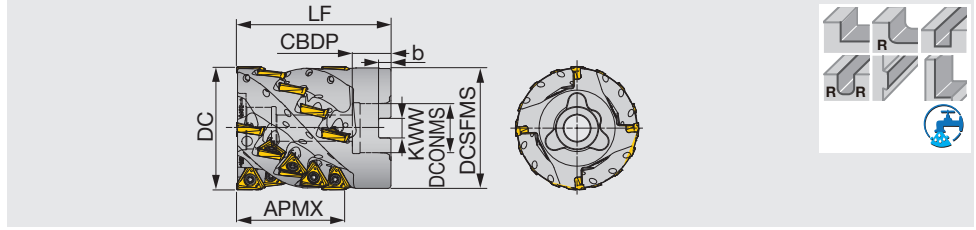
Designation	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TPA15R050M22.0E04	15	50	4	41	22	20	40	6.3	10.4	0.27	With	TOMT15...
TPA15R063M22.0E05	15	63	5	41	22	20	40	6.3	10.4	0.41	With	TOMT15...
TPA15R080M25.4-06	15	80	6	46	25.4	26	50	6	9.5	0.83	With	TOMT15...
TPA15R080M27.0E06	15	80	6	50	27	22	50	7	12.4	0.86	With	TOMT15...
TPA15R100M31.7-07	15	100	7	60	31.75	32	50	8	12.7	1.3	With	TOMT15...
TPA15R100M32.0E07	15	100	7	60	32	28.5	50	8	14.4	1.27	With	TOMT15...
TPA15R125M38.1-08	15	125	8	80	38.1	38	63	10	15.9	2.7	With	TOMT15...
TPA15R125M40.0E08	15	125	8	71	40	32	63	9	16.4	2.47	With	TOMT15...
TPA15R160M40.0E10N	15	160	10	100	40	32	63	9	16.4	4.77	Without	TOMT15...
TPA15R160M50.8-10N	15	160	10	100	50.8	46	63	11	19	4.4	Without	TOMT15...

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TPA15R050M22.0E04	TS45120I	H-TB2W	M-1000	-	FSHM10-40H	BT20S
TPA15R063M22.0E05	TS45120I	H-TB2W	M-1000	-	CM10X30H	BT20S
TPA15R080M...	TS45120I	H-TB2W	M-1000	-	CM12X30H	BT20S
TPA15R100M...	TS45120I	H-TB2W	M-1000	TMBA-M16H	-	BT20S
TPA15R125M...	TS45120I	H-TB2W	M-1000	TMBA-M20H	-	BT20M
TPA15R160M...	TS45120I	H-TB2W	M-1000	-	-	BT20M

*Recommended clamping torque (N·m): TS45120I=5

Reference pages: Inserts → **H131 - H132**, Standard cutting conditions → **H133**, TungFlex → **H210**



Designation	APMX	DC	ZEFP	CICT	DCSFMS	DCONMS	CBDP	LF	b	KWW	WT(kg)	Air hole	Insert
TLA15R080L070M31.7-04M	70	80	4	20	78	31.75	32	100	8	12.7	2.29	With	TOMT15...
TLA15R080L070M32.0E04M	70	80	4	20	78	32	25	100	8	14.4	2.38	With	TOMT15...
TLA15R100L083M38.1-05M	83	100	5	30	98	38.1	38	110	10	15.9	4.24	With	TOMT15...
TLA15R100L083M40.0E05M	83	100	5	30	98	40	32	110	9	16.4	4.26	With	TOMT15...

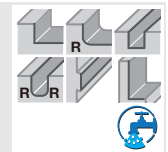
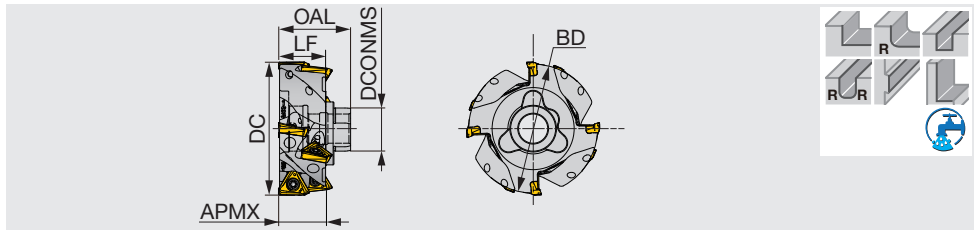
Note: Coolant needs to be supplied from the end of the arbor inlay. Coolant cannot be supplied from the set bolt.

SPARE PARTS



Designation	Clamping screw	Grip	Torx bit	Lubricant	Shell locking bolt
TLA15R080...	TS45120I	H-TB2W	BT20S	M-1000	CM16X75
TLA15R100...	TS45120I	H-TB2W	BT20S	M-1000	CM20X80

*Recommended clamping torque (N·m): TS45120I=5



Designation	APMX	DC	ZEFP	CICT	BD	DCONMS	OAL	LF	WT(kg)	Air hole	Insert
TLA15R080L028-04S	28	80	4	8	77.6	27	43	28.2	0.65	With	TOMT15...
TLA15R100L028-05S	28	100	5	10	97.2	33	46	28	1.05	With	TOMT15...

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

SPARE PARTS



Designation	Clamping screw	Grip	Lubricant	Torx bit
TLA15...	TS45120I	H-TB2W	M-1000	BT20S

*Recommended clamping torque (N·m): TS45120I=5

CENTER BOLT

(Optional parts)



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

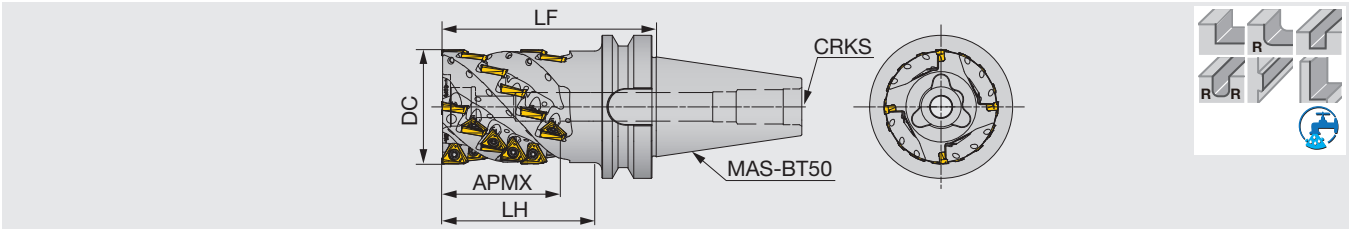


TUNG-TRI

TLA15-BT

Square shoulder mill for roughing, with BT tapered shank, for triangular inserts

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



Designation	APMX	DC	ZEFP	CICT	LF	LH	WT(kg)	Air hole	CRKS	Insert
TLA15R080L083BT50-04M	83	80	4	24	150	107	6.29	With	M24	TOMT15...
TLA15R100L097BT50-05M	97	100	5	35	165	126.5	8.92	With	M24	TOMT15...

SPARE PARTS

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

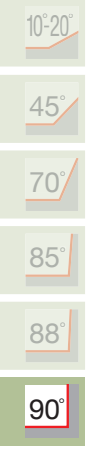
*Recommended clamping torque (N·m): TS45120I=5

CENTER BOLT

(Optional parts)

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

Approach angle

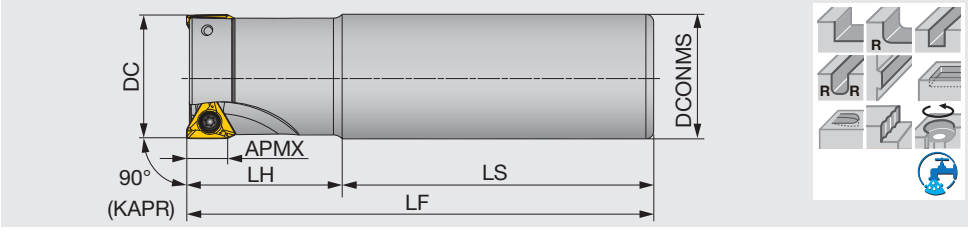


TUNG-TRI

EPA15

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

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



Designation	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPA15R040M32.0-03N	15	40	3	32	80	40	120	0.73	Without	TOMT15...
EPA15R040M32.0-02L	15	40	2	32	205	50	255	1.56	With	TOMT15...
EPA15R050M32.0-04N	15	50	4	32	80	40	120	0.83	Without	TOMT15...
EPA15R050M42.0-02L	15	50	2	42	310	50	360	3.84	With	TOMT15...

SPARE PARTS

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

*Recommended clamping torque (N·m): TS45120I=5

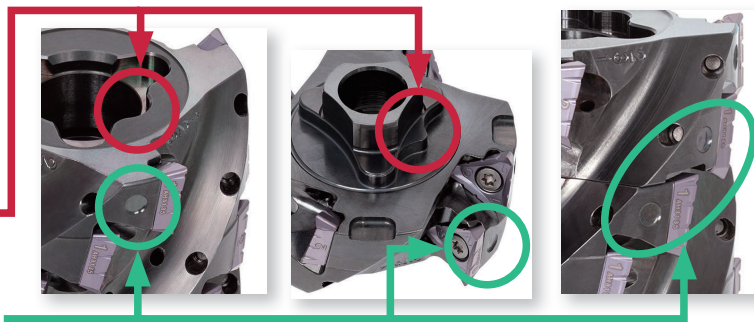
Reference pages: Inserts → [H131 - H132](#), Standard cutting conditions → [H133](#)

How to set a sub-unit

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

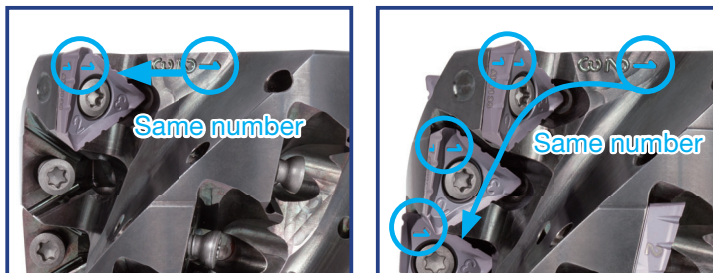
Projection for error-proofing (Poka-yoke)

Marking



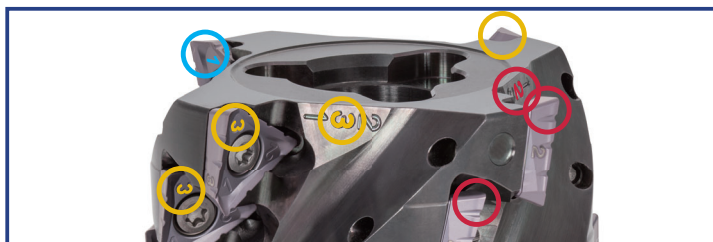
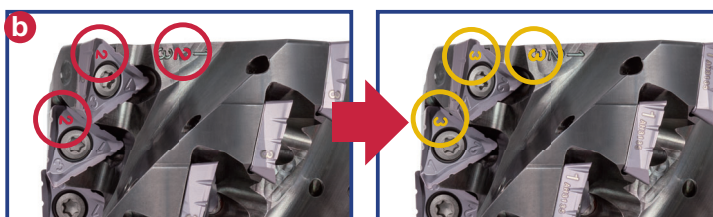
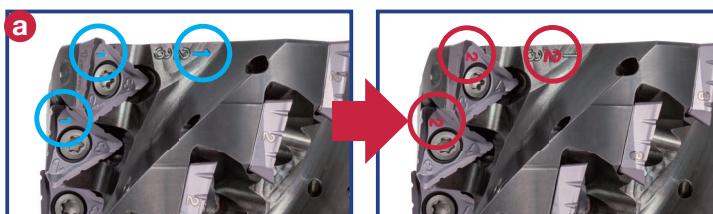
Directions for setting NMJ inserts on roughing type bodies

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



Directions for changing corners for inserts on roughing type bodies

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



STANDARD CUTTING CONDITIONS

TPA/EPA/HPA

	Workpiece materials	Hardness HB	Grades	Cutting speed Vc (m/min)			Feed per tooth: fz (mm/t)				
				T/E/HPA06 T/E/HPA10 T/EPA15			MJ		NMJ		AJ
				T/E/HPA06	T/E/HPA10	T/EPA15	T/E/HPA06	T/E/HPA10	T/EPA15	T/EPA15	T/E/HPA10
P	Low carbon steel (SS400, S15C, etc. E275A, C15E4, etc.	- 200	AH3135	100 - 220	100 - 250	100 - 250	0.05 - 0.15	0.08 - 0.2	0.08 - 0.25	0.08 - 0.15	-
	High carbon steel S45C, etc. C45, etc.	200 - 300	AH3135	100 - 170	100 - 200	100 - 230	0.05 - 0.12	0.08 - 0.15	0.08 - 0.2	0.08 - 0.15	-
	Alloy steel SCM440, etc. 42CrMo4, etc.	150 - 300	AH3135	100 - 170	100 - 200	100 - 230	0.05 - 0.12	0.08 - 0.15	0.08 - 0.2	0.08 - 0.15	-
	Tool steel SKD61, etc. X40CrMoV5-1, etc.	30 - 40 HRC	AH3135	100 - 120	100 - 150	100 - 180	0.05 - 0.12	0.08 - 0.15	0.08 - 0.2	0.08 - 0.15	-
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	AH3135	80 - 150	80 - 200	90 - 200	0.05 - 0.15	0.08 - 0.2	0.08 - 0.2	0.08 - 0.15	-
K	Grey cast iron FC250, etc. 250, etc.	150 - 250	AH120	100 - 200	100 - 250	140 - 250	0.05 - 0.15	0.08 - 0.2	0.08 - 0.25	0.08 - 0.15	-
			T1215	150 - 250	150 - 300	200 - 300	0.05 - 0.12	0.08 - 0.15	0.08 - 0.18	-	-
	Ductile cast iron FCD450, etc. 450-10S, etc.	150 - 250	AH120	80 - 150	80 - 200	110 - 200	0.05 - 0.15	0.08 - 0.2	0.08 - 0.25	0.08 - 0.15	-
			T1215	100 - 200	130 - 250	150 - 250	0.05 - 0.12	0.08 - 0.15	0.08 - 0.18	-	-
N	Aluminium Si < 13%	-	KS05F	-	300 - 1000	-	-	-	-	-	0.08 - 0.22
	Aluminium Si ≥ 13%	-	KS05F	-	100 - 200	-	-	-	-	-	0.08 - 0.22
S	Titanium alloys Ti-6Al-4V, etc.	-	AH120	20 - 50	20 - 60	20 - 60	0.05 - 0.1	0.08 - 0.15	0.08 - 0.18	0.08 - 0.15	-
	Heat-resistant alloys Inconel 718, etc.	-	AH120	20 - 35	20 - 40	20 - 40	0.03 - 0.08	0.05 - 0.13	0.07 - 0.15	0.07 - 0.15	-

- When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.
- Remove excessive chip accumulation with an air blast.
- For the operation with depth of cut which varies (ex.casting skin) and machining of workpiece materials with interrupted surface, the feed per tooth (fz) should be set to the lower recommended value shown in the above table.

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

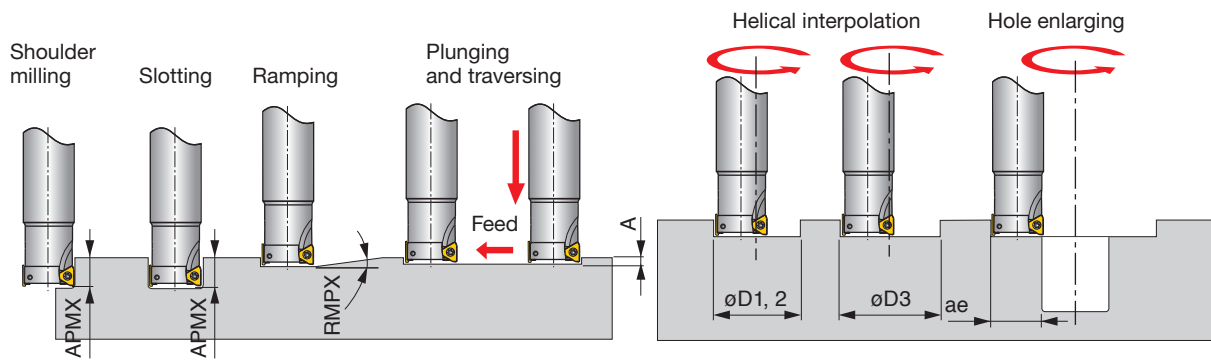
TLA (Roughing type)

ISO	Workpiece materials	Hardness HB	Grades	Cutting speed Vc (m/min)		Feed per tooth: fz (mm/t)				
				TLA10 TLA15		MJ		NMJ		AJ
				TLA10	TLA15	TLA10	TLA15	TLA15	TLA10	
P	Low carbon steel SS400, S15C, etc. E275A, C15E4, etc.	- 200	AH3135	100 - 250	100 - 250	0.08 - 0.18	0.08 - 0.22	0.08 - 0.15	-	
	High carbon steel S45C, etc. C45, etc.	200 - 300	AH3135	100 - 200	100 - 270	0.08 - 0.14	0.08 - 0.18	0.08 - 0.15	-	
	Alloy steel SCM440, etc. 42CrMo4, etc.	30 - 40 HRC	AH3135	100 - 150	100 - 180	0.08 - 0.14	0.08 - 0.18	0.08 - 0.15	-	
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	AH3135	80 - 200	90 - 200	0.08 - 0.15	0.08 - 0.18	0.08 - 0.15	-	
K	Grey cast iron FC250, etc. 250, etc.	150 - 250	AH120	100 - 250	140 - 250	0.08 - 0.18	0.08 - 0.25	0.08 - 0.15	-	
			T1215	150 - 250	150 - 250	0.08 - 0.15	0.08 - 0.18	-	-	
	Ductile cast iron FCD450, etc. 450-10S, etc.	150 - 250	AH120	80 - 200	110 - 200	0.08 - 0.18	0.08 - 0.25	0.08 - 0.15	-	
			T1215	150 - 250	150 - 250	0.08 - 0.15	0.08 - 0.18	-	-	
N	Aluminium Si < 13%	-	KS05F	300 - 1000	-	-	-	-	0.08 - 0.22	
	Aluminium Si ≥ 13%	-	KS05F	100 - 200	-	-	-	-	0.08 - 0.22	
S	Titanium alloys Ti-6Al-4V, etc.	-	AH120	20 - 60	20 - 60	0.08 - 0.15	0.08 - 0.18	0.08 - 0.15	-	
	Heat-resistant alloys Inconel 718, etc.	-	AH120	20 - 40	20 - 40	0.05 - 0.13	0.07 - 0.15	0.07 - 0.15	-	

- When using NMJ chipbreaker, please set up the feed not to exceed 0.15 mm/t.



APPLICATION RANGE



Designation	DC	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Min. machining depth $\phi D1$	Max. machining diameter $\phi D2$ $\phi D3^*$		Max. cutting width in enlarging ae
EPA06R012...	12	6	5°	0.6	18	23.6	21	11.5
E/HPA06R016...	16	6	4.3°	0.6	25	31.6	29	15.5
EPA06R018...	18	6	3.5°	0.6	29.5	35.6	33	17.5
E/HPA06R020...	20	6	2.8°	0.6	33.5	39.6	37	19.5
EPA06R022...	22	6	2.5°	0.6	37.5	43.6	41	21.5
E/HPA06R025...	25	6	2°	0.6	43.5	49.6	47	24.5
E/HPA10R025...	25	10	2°	0.6	42.1	49.6	47	24.5
EPA06R028...	28	6	1.8°	0.6	49.5	55.6	53	27.5
EPA10R028...	28	10	2°	0.6	48.1	55.6	53	27.5
H/TPA06R032...	32	6	1.5°	0.6	57.5	63.6	61	31.5
E/HPA10R032...	32	10	2°	0.6	56.1	63.6	61	31.5
EPA10R035...	35	10	1.7°	0.6	62.1	69.6	67	34.5
TPA06R040...	40	6	1°	0.6	73.5	79.6	77	39.5
E/TPA10R040...	40	10	1.4°	0.6	72.1	79.6	77	39.5
EPA15R040...	40	15	2.3°	0.8	68.5	79.2	75.5	39
TPA06R050...	50	6	0.7°	0.6	94	99.6	97	49.5
TPA10R050...	50	10	0.9°	0.6	92.1	99.6	97	49.5
E/TPA15R050...	50	15	1.7°	0.8	88.5	99.2	95.5	49
TPA10R063...	63	10	0.8°	0.6	118.1	125.6	123	62.5
TPA15R063...	63	15	1.4°	0.8	114.5	125.2	121.5	62
TPA10R080...	80	10	0.6°	0.6	152.1	159.6	157	79.5
TPA15R080...	80	15	1°	0.8	148.5	159.2	155.5	79
TPA10R100...	100	10	0.5°	0.6	192.1	199.6	197	99.5
TPA15R100...	100	15	0.8°	0.8	188.5	199.2	195.5	99
TPA15R125...	125	15	0.6°	0.8	238.5	249.2	245.5	124
TPA15R160...	160	15	0.5°	0.8	308.5	319.2	315.5	159

* Flat bottom hole

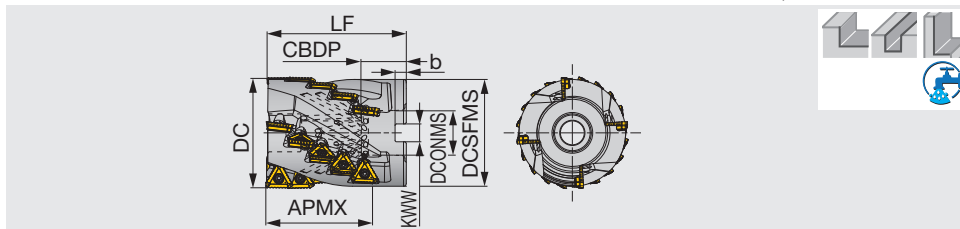
Note: Corner RE for dimensions of $\phi D1$, $\phi D2$ and $\phi D3$: RE = 0.4 for E/TPA06, E/TPA10 and RE = 0.8 for E/TPA15.

TUNG^{RI}SHRED

LPTC16

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

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



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

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

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt	Torx bit
LPTC16*063B...	TS 40B100I	H-TB2W	M-1000	CAP-CM12X1.75X50	BT15S
LPTC16*080B...	TS 40B100I	H-TB2W	M-1000	CM16X75	BT15S

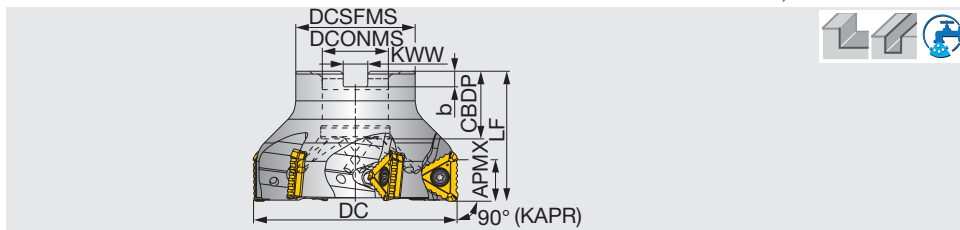
*Recommended clamping torque (N·m): TS 40B100I=3.5

TUNG^{RI}SHRED

TPTC16

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

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



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

SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt1	Shell locking bolt2	Torx bit
TPTC16M050B22.0R04	TS 40B100I	H-TB2W	M-1000	-	FSHM10-40H	BT15S
TPTC16M063B22.0R05	TS 40B100I	H-TB2W	M-1000	-	CM10X30H	BT15S
TPTC16*080B...	TS 40B100I	H-TB2W	M-1000	-	CM12X30H	BT15S
TPTC16*100B...	TS 40B100I	H-TB2W	M-1000	TMBA-M16H	-	BT15S

*Recommended clamping torque (N·m): TS 40B100I=3.5

Reference pages: Inserts → [H136](#), Standard cutting conditions → [H137](#)



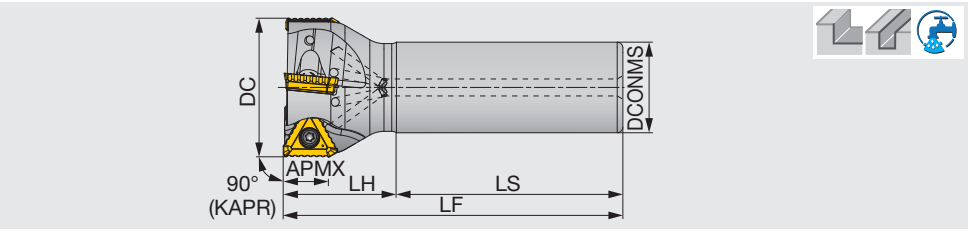
- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

TUNGSHRED

EPTC16

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

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



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

SPARE PARTS

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

*Recommended clamping torque (N·m): TS 40B100I=3.5

INSERT

TCGT-MJ

TCMT-NMJ

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



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated				LE	IC	S	BS
			AH120	AH3135	T1215	T3225				
TCGT160608PDER-MJ	0.8	16	●	●			16	13.7	5.8	1
TCMT160620PDER-NMJ	2	16	●	●	●	●	16	13.3	5.8	2

● : Line up

Reference pages: Standard cutting conditions → [H137](#)

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Low carbon steel S15C, S20S, etc. C15, C20, etc.	- 300 HB	First choice	AH3135	NMJ*	100 - 250	0.08 - 0.15
		- 300 HB	Wear resistance	T3225	NMJ*	100 - 300	0.08 - 0.15
		- 300 HB	For finishing	AH3135	MJ	100 - 250	0.08 - 0.20
	Carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	- 300 HB	First choice	AH3135	NMJ*	100 - 230	0.08 - 0.15
		- 300 HB	Wear resistance	T3225	NMJ*	100 - 280	0.08 - 0.15
		- 300 HB	For finishing	AH3135	MJ	100 - 230	0.08 - 0.20
	Prehardened steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3135	NMJ*	100 - 180	0.08 - 0.15
		30 - 40 HRC	Wear resistance	T3225	NMJ*	100 - 200	0.08 - 0.15
		30 - 40 HRC	For finishing	AH3135	MJ	100 - 180	0.08 - 0.20
M	Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc.	-	First choice	AH3135	NMJ*	90 - 200	0.08 - 0.15
		-	Wear resistance	T3225	NMJ*	90 - 250	0.08 - 0.15
		-	For finishing	AH3135	MJ	90 - 200	0.08 - 0.20
K	Grey cast iron FC250, FC300, etc. 250, 300, etc.	150 - 250 HB	First choice	AH120	NMJ*	140 - 250	0.08 - 0.15
		150 - 250 HB	Wear resistance	T1215	NMJ*	150 - 300	0.08 - 0.15
		150 - 250 HB	For finishing	AH120	MJ	140 - 250	0.08 - 0.25
	Ductile cast iron FCD400, FCD600, etc. 400-15S, 600-3, etc.	150 - 250 HB	First choice	AH120	NMJ*	140 - 250	0.08 - 0.15
		150 - 250 HB	Wear resistance	T1215	NMJ*	150 - 300	0.08 - 0.15
		150 - 250 HB	For finishing	AH120	MJ	140 - 250	0.08 - 0.25
S	Titanium alloys Ti-6Al-4V, etc.	-	First choice	AH120	NMJ*	20 - 60	0.08 - 0.15
		-	For finishing	AH120	MJ	20 - 60	0.08 - 0.18
	Heat-resistant alloys Inconel718, etc.	-	First choice	AH120	NMJ*	20 - 40	0.08 - 0.13
		-	For finishing	AH120	MJ	20 - 40	0.08 - 0.15

* When using the -NMJ chipbreaker, do not feed higher than 0.15 mm/t.

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



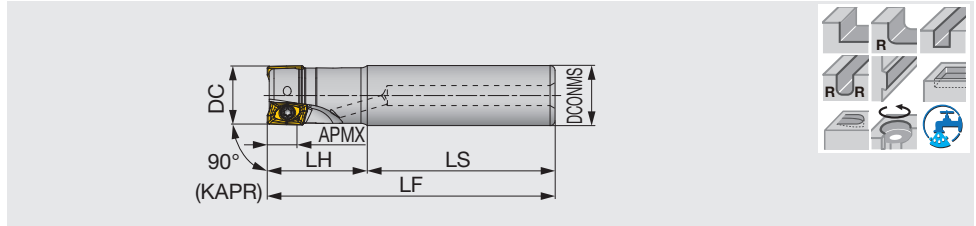
- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling
- Approach angle
- Others

TUNG F^{ORCE} REC

EPAV06

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

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



Designation	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPAV06M008C10.0R01	6	8	1	10	60	20	80	0.04	With	AVGT06...
EPAV06M010C10.0R02	6	10	2	10	60	20	80	0.04	With	AVGT06...
EPAV06M010C10.0R02L	6	10	2	10	65	35	100	0.06	With	AVGT06...
EPAV06M010C08.0R02L	6	10	2	8	80	20	100	0.04	With	AVGT06...
EPAV06M012C12.0R02	6	12	2	12	60	20	80	0.06	With	AVGT06...
EPAV06M012C12.0R03	6	12	3	12	60	20	80	0.06	With	AVGT06...
EPAV06M012C12.0R02L	6	12	2	12	85	35	120	0.09	With	AVGT06...
EPAV06M012C10.0R02L	6	12	2	10	100	20	120	0.07	With	AVGT06...
EPAV06M012C10.0R03	6	12	3	10	60	20	80	0.04	With	AVGT06...
EPAV06M014C12.0R03	6	14	3	12	60	20	80	0.07	With	AVGT06...
EPAV06M014C12.0R03L	6	14	3	12	120	20	140	0.11	With	AVGT06...
EPAV06M016C16.0R03	6	16	3	16	70	20	90	0.12	With	AVGT06...
EPAV06M016C16.0R04	6	16	4	16	70	20	90	0.12	With	AVGT06...
EPAV06M016C16.0R03L	6	16	3	16	105	35	140	0.20	With	AVGT06...
EPAV06M018C16.0R04	6	18	4	16	70	20	90	0.13	With	AVGT06...
EPAV06M018C16.0R03	6	18	3	16	70	20	90	0.13	With	AVGT06...
EPAV06M018C16.0R03L	6	18	3	16	160	20	180	0.26	With	AVGT06...
EPAV06M020C20.0R05	6	20	5	20	70	30	100	0.21	With	AVGT06...
EPAV06M020C20.0R04	6	20	4	20	70	30	100	0.23	With	AVGT06...
EPAV06M020C20.0R04L	6	20	4	20	165	35	200	0.45	With	AVGT06...
EPAV06M020C16.0R04	6	20	4	16	80	30	110	0.17	With	AVGT06...
EPAV06M025C25.0R06	6	25	6	25	80	35	115	0.4	With	AVGT06...
EPAV06M025C25.0R05	6	25	5	25	80	35	115	0.4	With	AVGT06...
EPAV06M025C25.0R04L	6	25	4	25	160	40	200	0.72	With	AVGT06...
EPAV06M025C20.0R06	6	25	6	20	80	35	115	0.27	With	AVGT06...
EPAV06M032C32.0R08	6	32	8	32	80	40	120	0.7	With	AVGT06...
EPAV06M032C32.0R06L	6	32	6	32	155	45	200	1.2	With	AVGT06...

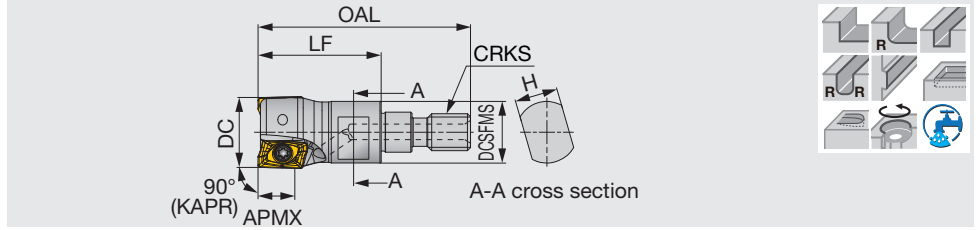
SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
EPAV06M...	CSPB-2H	M-1000	IP-6DB

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

Reference pages: Inserts, Standard cutting conditions → [H141](#)

Mini square shoulder endmill, modular type (TungFlex)



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

Designation	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPAV06M010M06R02	6	10	2	34.5	20	7	9.5	M6	0.01	With	AVGT06...
HPAV06M012M06R02	6	12	2	34.5	20	7	10	M6	0.01	With	AVGT06...
HPAV06M012M06R03	6	12	3	34.5	20	7	10	M6	0.01	With	AVGT06...
HPAV06M016M08R03	6	16	3	42	25	10	13	M8	0.03	With	AVGT06...
HPAV06M016M08R04	6	16	4	42	25	10	13	M8	0.03	With	AVGT06...

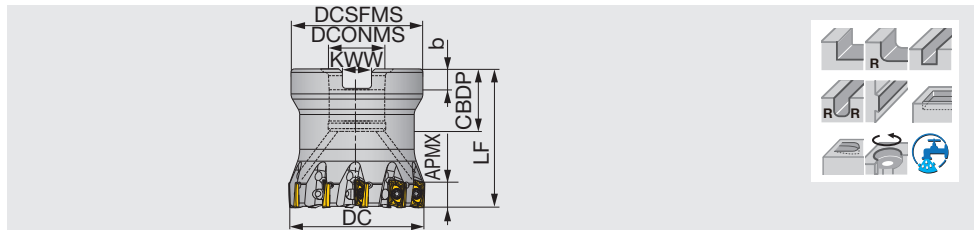
Please see the page **H210** for TungFlex modular shank.

SPARE PARTS

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

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

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



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

Designation	APMX	DC	CICT	DCSFMS	DCONMS	CBDP	LF	KWW	b	WT(kg)	Air hole	Insert
TPAV06M040B16.0R10	6	40	10	38	16	18	40	8.4	5.6	0.24	With	AVGT06...

SPARE PARTS

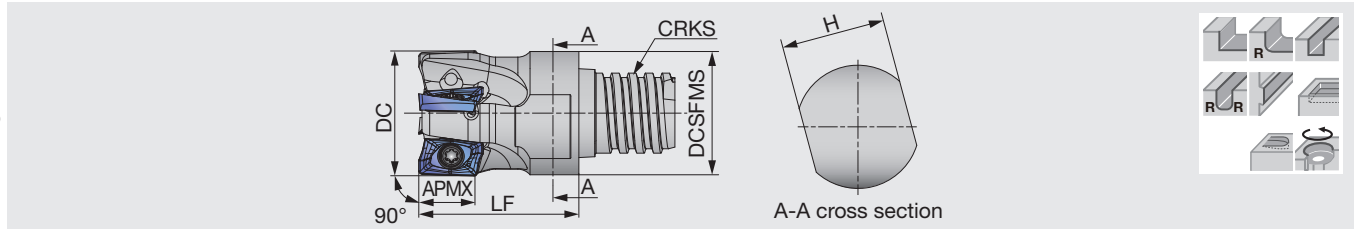
Designation	Clamping screw	Lubricant	Wrench	Shell locking bolt
TPAV06M040B16.0R10	CSPB-2H	M-1000	IP-6DB	CM8X30H

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



- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

Mini square shoulder endmill, modular type (TungMeister)



Designation	APMX	DC	CICT	LF	H	DCSFMS	CRKS	WT (kg)	Air hole	Insert
HPAV06M010S05R02	6	10	2	10	8	8	S05	0.01	Without	AVGT06...
HPAV06M010S06R02	6	10	2	16	8	9.8	S06	0.01	Without	AVGT06...
HPAV06M012S08R02	6	12	2	18	10	11.7	S08	0.02	Without	AVGT06...
HPAV06M012S08R03	6	12	3	18	10	11.7	S08	0.02	Without	AVGT06...
HPAV06M016S10R03	6	16	3	20	13	15.4	S10	0.03	Without	AVGT06...
HPAV06M016S10R04	6	16	4	20	13	15.4	S10	0.03	Without	AVGT06...

- Applicable shank: VSSD, VTSD, VSC, VSTD, VER
 Please see the page **I086 - I089** for the types and the selection of TungMeister shank.
 Please use VAD-M adapter to connect TungMeister with a metric thread shank.

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

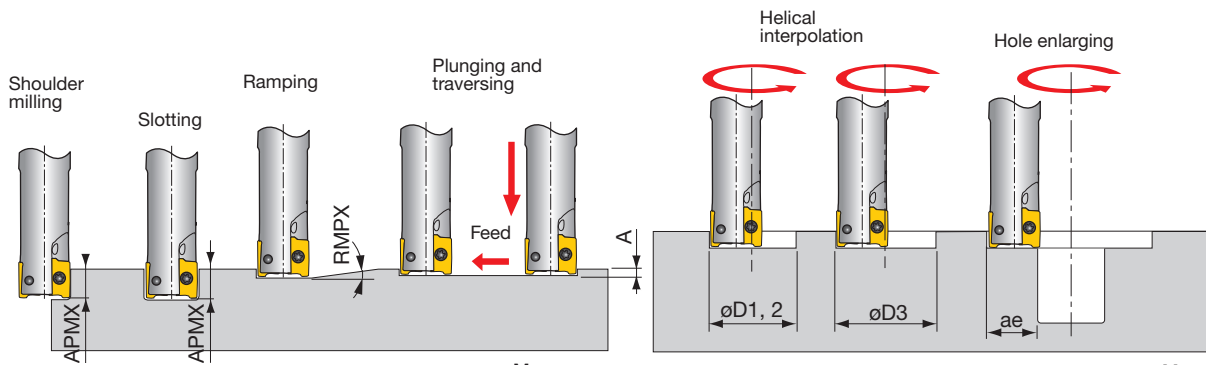
*sold separately

SPARE PARTS

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

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

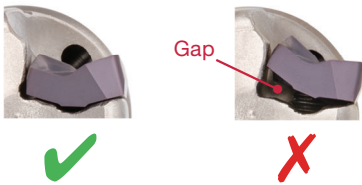
MACHINING APPLICATIONS



Designation	DC	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging A	Min. machining øD1	Max. machining øD2	Max. machining øD3*	Max. cutting width in enlarging ae
EPAV06_008...	8	6	-	-	-	-	-	-
EPAV/HPAV06_010...	10	6	3°	0.3	15	19	18	9.5
EPAV/HPAV06_012...	12	6	3°	0.3	18	23	22	11.5
EPAV/HPAV06_014...	14	6	2.3°	0.3	22	27	26	13.5
EPAV/HPAV06_016...	16	6	2°	0.3	28	31	30	15.5
EPAV/HPAV06_018...	18	6	1.6°	0.3	30	35	34	17.5
EPAV/HPAV06_020...	20	6	1.4°	0.3	34	39	38	19.5
EPAV/HPAV06_025...	25	6	1.1°	0.3	44	49	48	24.5
EPAV/HPAV06_032...	32	6	0.8°	0.3	58	63	62	31.5
TPAV06_040...	40	6	0.6°	0.3	74	79	78	39.5

*Flat bottom hole

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

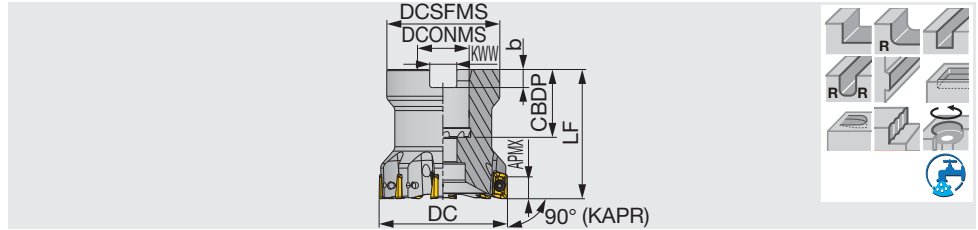


90°

Others

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

GAMP = +7°, GAMF = +13° ~ +18°



Designation	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TPO07R032M16.0E08	32	8	30	40	16	21	8.4	5.6	0.1	With	AO*T0702...
TPO07R040M16.0E10	40	10	35	40	16	21	8.4	5.6	0.2	With	AO*T0702...
TPO07R050M22.0E12	50	12	41	40	22	22	10.4	6.3	0.3	With	AO*T0702...

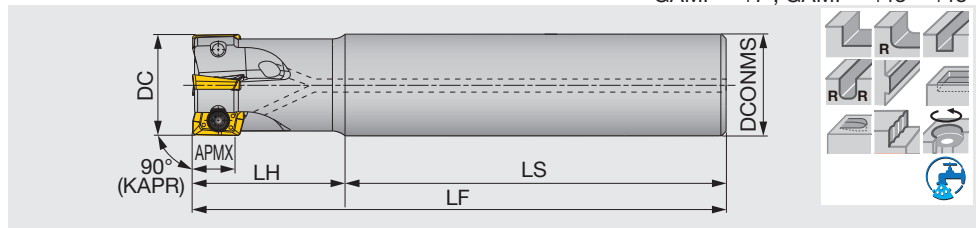
SPARE PARTS

Designation	Clamping screw	Shell locking bolt	Wrench
TPO07R032, 040...	CSTB-2.5L046	CM8X30H	T-7DB
TPO07R050M22.0E12	CSTB-2.5L046	CM10X30H	T-7DB

*Recommended clamping torque (N·m): CSTB-2.5L046=0.9

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

GAMP = +7°, GAMF = +13° ~ +18°



Designation	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPO07R012M12.0-02	12	2	12	50	18	68	0.1	With	AO*T0702...
EPO07R012M12.0-02L	12	2	12	95	30	125	0.1	With	AO*T0702...
EPO07R016M12.0-02	16	2	12	50	20	70	0.1	With	AO*T0702...
EPO07R016M16.0-02L	16	2	16	105	40	145	0.2	With	AO*T0702...
EPO07R016M16.0-04	16	4	16	60	24	84	0.1	With	AO*T0702...
EPO07R018M16.0-02L	18	2	16	105	40	145	0.2	With	AO*T0702...
EPO07R018M16.0-04	18	4	16	60	24	84	0.1	With	AO*T0702...
EPO07R020M16.0-03	20	3	16	60	30	90	0.1	With	AO*T0702...
EPO07R020M20.0-03L	20	3	20	135	50	185	0.4	With	AO*T0702...
EPO07R020M20.0-05	20	5	20	70	30	100	0.2	With	AO*T0702...
EPO07R022M20.0-03L	22	3	20	135	50	185	0.4	With	AO*T0702...
EPO07R022M20.0-05	22	5	20	70	30	100	0.2	With	AO*T0702...
EPO07R025M20.0-03	25	3	20	60	35	95	0.3	With	AO*T0702...
EPO07R025M25.0-03L	25	3	25	150	70	220	0.7	With	AO*T0702...
EPO07R025M25.0-07	25	7	25	80	35	115	0.4	With	AO*T0702...
EPO07R028M25.0-03L	28	3	25	150	70	220	0.7	With	AO*T0702...
EPO07R028M25.0-07	28	7	25	80	35	115	0.4	With	AO*T0702...

*The DC above is the diameter when using MJ or AJ chipbreaker.

With HJ chipbreaker, the tool diameter is (DC above + 0.6 mm).

**The LF and L above are the lengths when using MJ chipbreaker.

With AJ chipbreaker, the length is (LF, L + 0.1 mm). With HJ chipbreaker, the length is (LF, L + 0.5 mm).

SPARE PARTS

Designation	Clamping screw	Wrench
EPO07R012...	SR-10503833-S	T-7DB
EPO07R016 - 028...	CSTB-2.5L046	T-7DB

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

Reference pages: Inserts → [H144](#), Standard cutting conditions → [H145](#)



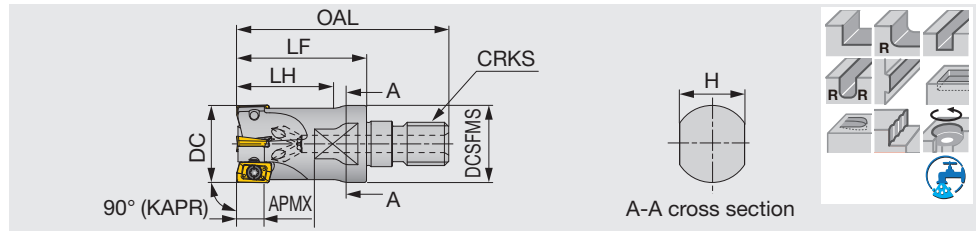
- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

TUNGREC

HPO07-M

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

GAMP = +7°, GAMF = +13°~ +18°

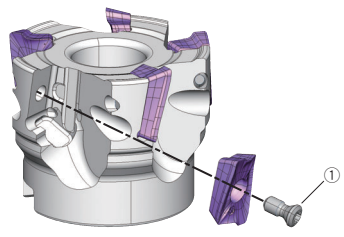


Designation	DC	CICT	OAL	LF	LH	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPO07R012MM06-02	12	2	39.5	25	-	7	9.8	M6	0.01	With	AO*T0702...
HPO07R012MM08-02	12	2	42	25	20	10	12.8	M8	0.02	With	AO*T0702...
HPO07R016MM08-04	16	4	42	25	-	10	12.8	M8	0.03	With	AO*T0702...
HPO07R016MM10-04	16	4	49	30	20	15	17.8	M10	0.05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

SPARE PARTS

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

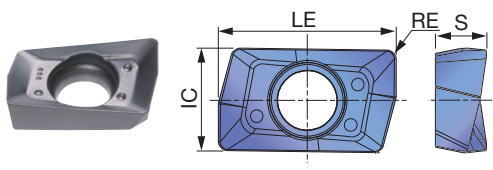
*Recommended clamping torque (N·m): SR-10503833-S=0.9 , CSTB-2.5L046=0.9



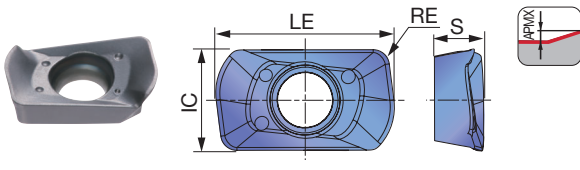
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

INSERT

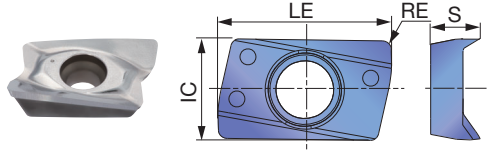
AOMT07-MJ



AOMT07-HJ



AOGT07-AJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated			Uncoated			LE	IC	S
			AH140	AH725	KS15F						
AOMT070202PDPR-MJ	0.2	7	●	●					8	4.7	2.3
AOMT070204PDPR-MJ	0.4	7	●	●					8	4.7	2.3
AOMT070208PDPR-MJ	0.8	7	●	●					8	4.7	2.3
AOMT070216PDPR-MJ	1.6	7	●	●					8	4.7	2.3
AOMT070208PDPR-HJ	0.8	0.8	●	●					8.8	4.9	2.4
AOGT070204PDFR-AJ	0.4	6.4			●				8.1	4.7	2.3

● : Line up

Reference pages: Standard cutting conditions → H145, TungFlex → H210

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness HB	Grades	Cutting speed Vc (m/min)	Feed per tooth: fz (mm/t)		
					MJ	HJ	AJ
P	Low carbon steel S15C, etc. C15E4, etc.	< 200	AH725	90 - 200	0.05 - 0.1	0.4 - 0.9	-
	High carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	200 - 300	AH725	90 - 150	0.05 - 0.1	0.4 - 0.9	-
	Tool steel SKD11, etc. X153CrMoV12, etc.	150 - 300	AH725	80 - 120	0.05 - 0.1	0.4 - 0.9	-
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	AH140	90 - 150	0.05 - 0.1	0.4 - 0.9	-
K	Grey cast irons FC250, etc. 250, etc.	150 - 250	AH725	100 - 180	0.05 - 0.1	0.4 - 0.9	-
	Ductile cast irons FCD450, etc. 450-10S, etc.	150 - 250	AH725	80 - 150	0.05 - 0.1	0.4 - 0.9	-
N	Aluminium alloys Si < 13%	-	KS15F	300 - 1000	-	-	0.08 - 0.2
	Aluminium alloys Si ≥ 13%	-	KS15F	100 - 200	-	-	0.08 - 0.2
S	Titanium alloys Ti-6Al-4V, etc.	-	AH725	20 - 50	0.05 - 0.1	0.4 - 0.9	-
	Superalloys Inconel 718, etc.	-	AH725	20 - 35	0.05 - 0.08	0.2 - 0.6	-

- To remove excessive chip accumulation use an air blast.
- To avoid build up edge on 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, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

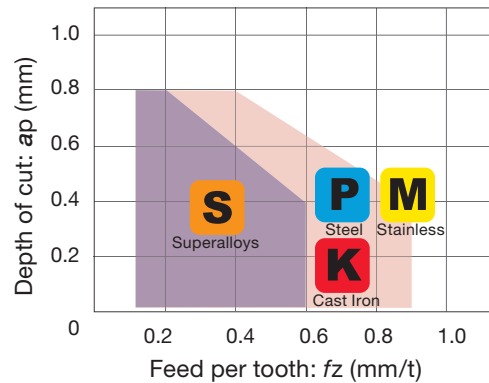
CAUTIONARY POINTS WHEN USING HJ INSERTS

HJ type inserts are designed for high feed machining.

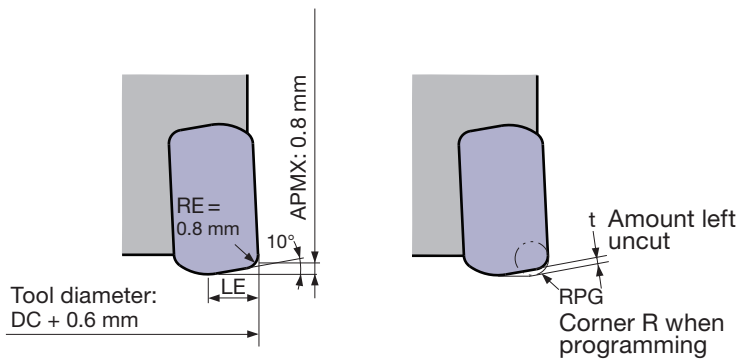
Please note the following when using HJ inserts:

1. The shape of HJ insert differs from that of other inserts (MJ, AJ). However the same insert pocket can be used.
2. When using HJ inserts, all the inserts on the cutter body must be HJ type. Do not use other types of inserts (MJ and AJ types) with HJ inserts on the same cutter body.
3. When using CAD/CAM, please program it as a radius cutter. The table below shows the corner R when programming and the uncut area (t).
4. With HJ inserts, the tool diameter increases by 0.6 mm over the diameter DC shown in the table.

TungRec 07 type HJ inserts Standard conditions



Max. depth of cut APMX (mm)	Main cutting edge length LE (mm)	Corner R when programming	Amount left uncut t (mm)
0.8	3	R 0.5	0.4
		R 1	0.3



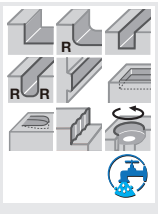
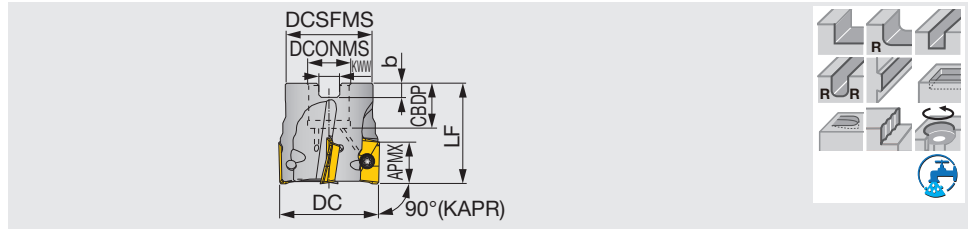
- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

TUNGREC

TPO11

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

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



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

SPARE PARTS



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

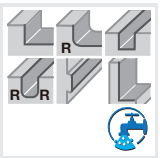
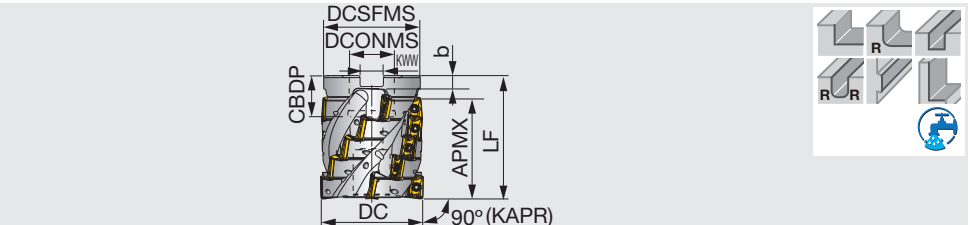
*Recommended clamping torque (N · m) : CSPB-2.5=1.3

TUNGREC

TLS11

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

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



Designation	APMX	DC	ZEFP	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TLS11R050M22.0E04	48.8	50	4	20	47	60	22	20	10.4	6.3	0.5	With	AS*T11T3...

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

SPARE PARTS



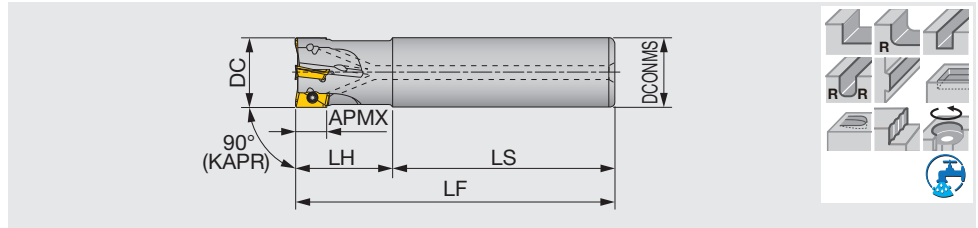
Designation	Clamping screw	Lubricant	Shell locking bolt	Wrench
TLS11R050M22.0E04	CSPB-2.5	M-1000	CM10X40H	IP-8D

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

Reference pages: Inserts → [H149](#), Standard cutting conditions → [H150 - H151](#)

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

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



Designation	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPO11R012M16.0-01	10.6	12	1	16	60	25	85	0.11	With	AS*T11T3...
EPO11R012M16.0-01L	10.6	12	1	16	95	30	125	0.16	With	AS*T11T3...
EPO11R016M16.0-02	10.6	16	2	16	60	25	85	0.12	With	AS*T11T3...
EPO11R016M16.0-02L	10.6	16	2	16	105	40	145	0.2	With	AS*T11T3...
EPO11R018M16.0-02	10.6	18	2	16	60	25	85	0.12	With	AS*T11T3...
EPO11R018M16.0-02L	10.6	18	2	16	105	40	145	0.21	With	AS*T11T3...
EPO11R020M20.0-02	10.6	20	2	20	70	30	100	0.22	With	AS*T11T3...
EPO11R020M20.0-02L	10.6	20	2	20	135	50	185	0.41	With	AS*T11T3...
EPO11R020M20.0-03	10.6	20	3	20	70	30	100	0.21	With	AS*T11T3...
EPO11R022M20.0-02	10.6	22	2	20	70	30	100	0.22	With	AS*T11T3...
EPO11R022M20.0-02L	10.6	22	2	20	155	30	185	0.42	With	AS*T11T3...
EPO11R022M20.0-03	10.6	22	3	20	70	30	100	0.22	With	AS*T11T3...
EPO11R025M25.0-02L	10.6	25	2	25	150	70	220	0.76	With	AS*T11T3...
EPO11R025M25.0-03	10.6	25	3	25	80	35	115	0.39	With	AS*T11T3...
EPO11R025M25.0-04	10.6	25	4	25	80	35	115	0.38	With	AS*T11T3...
EPO11R028M25.0-02L	10.6	28	2	25	185	35	220	0.8	With	AS*T11T3...
EPO11R028M25.0-03	10.6	28	3	25	80	35	115	0.4	With	AS*T11T3...
EPO11R028M25.0-04	10.6	28	4	25	80	35	115	0.39	With	AS*T11T3...
EPO11R030M25.0-02L	10.6	30	2	25	180	40	220	0.8	With	AS*T11T3...
EPO11R030M25.0-03	10.6	30	3	25	80	40	120	0.43	With	AS*T11T3...
EPO11R030M25.0-04	10.6	30	4	25	80	40	120	0.42	With	AS*T11T3...
EPO11R032M32.0-02L	10.6	32	2	32	175	80	255	1.48	With	AS*T11T3...
EPO11R032M32.0-03	10.6	32	3	32	80	40	120	0.68	With	AS*T11T3...
EPO11R032M32.0-05	10.6	32	5	32	80	40	120	0.67	With	AS*T11T3...
EPO11R035M32.0-02L	10.6	35	2	32	215	40	255	1.49	With	AS*T11T3...
EPO11R035M32.0-03	10.6	35	3	32	80	40	120	0.69	With	AS*T11T3...
EPO11R035M32.0-05	10.6	35	5	32	80	40	120	0.67	With	AS*T11T3...
EPO11R040M32.0-02L	10.6	40	2	32	205	50	255	1.53	With	AS*T11T3...
EPO11R040M32.0-04	10.6	40	4	32	80	40	120	0.72	With	AS*T11T3...
EPO11R040M32.0-06	10.6	40	6	32	80	40	120	0.71	With	AS*T11T3...
EPO11R050M32.0-05	10.6	50	5	32	80	40	120	0.83	With	AS*T11T3...
EPO11R050M32.0-07	10.6	50	7	32	80	40	120	0.82	With	AS*T11T3...
EPO11R050M42.0-03L	10.6	50	3	42	310	50	360	3.78	With	AS*T11T3...

SPARE PARTS



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

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



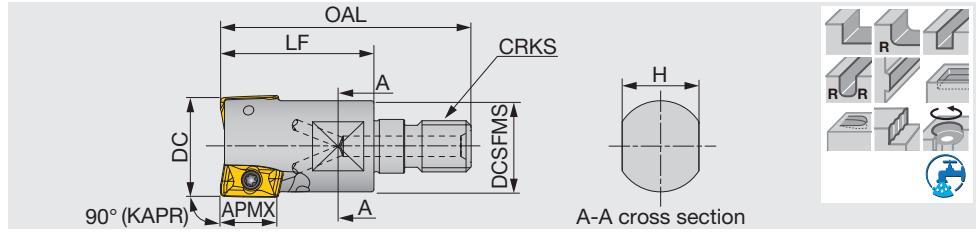


TUNGREC

HPO11-M

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

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

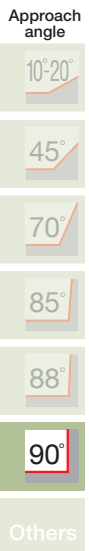


Designation1	APMX	DC	CICT	OAL	LF	H	DCSFMS	CRKS	WT(kg)	Air hole	Insert
HPO11R020MM10-02	10.6	20	2	49	30	15	17.8	M10	0.06	With	AS*T11T3...
HPO11R025MM12-03	10.6	25	3	57	35	17	20.8	M12	0.1	With	AS*T11T3...
HPO11R032MM16-03	10.6	32	3	63	40	22	28.8	M16	0.2	With	AS*T11T3...

SPARE PARTS

Designation	Clamping screw	Lubricant	Wrench
HPO11R020MM10-02	CSPB-2.5S	M-1000	IP-8D
HPO11R025, 032...	CSPB-2.5	M-1000	IP-8D

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

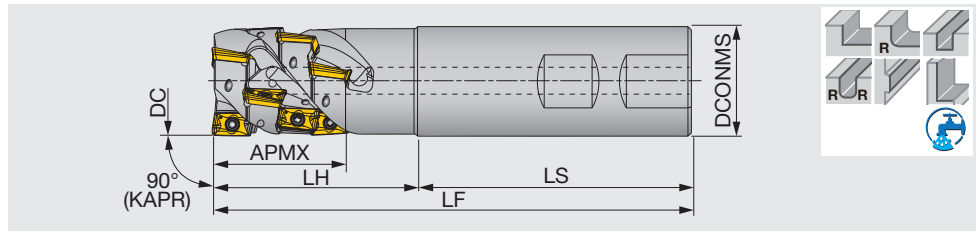


TUNGREC

ELS11

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

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



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

SPARE PARTS

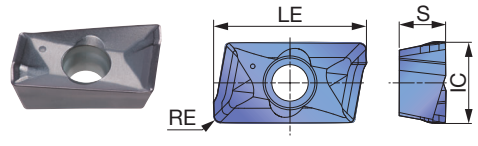
Designation	Clamping screw	Lubricant	Wrench
ELS11...	CSPB-2.5	M-1000	IP-8D

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

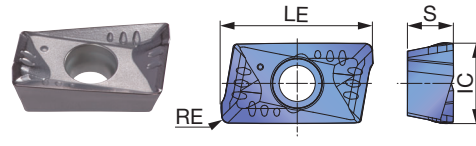
Reference pages: Inserts → [H149](#), Standard cutting conditions → [H150 - H151](#), Tung Flex → [H210](#)

INSERT

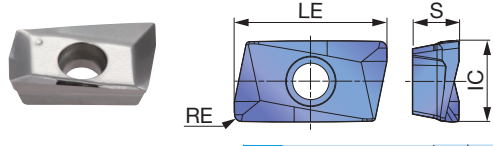
ASMT11-MJ



ASMT11-MS



ASGT11-AJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated								Cermet	Uncoated	LE	IC	S				
			AH120	AH130	AH140	AH725	T1115	T1215	T3130	DS1100	NS740	KS05F							
ASMT11T304PDPR-MJ	0.4	10.6	●	●		●	●									12.3	6.7	3.7	
ASMT11T308PDPR-MJ	0.8	10.6	●	●		●	●	●									12.3	6.7	3.7
ASMT11T312PDPR-MJ	1.2	10.6	●			●											12.3	6.7	3.7
ASMT11T316PDPR-MJ	1.6	10.6	●			●											12.3	6.7	3.7
ASMT11T320PDPR-MJ	2	10.6	●														12.3	6.7	3.7
ASMT11T330PDPR-MJ	3	10.6	●	●													12.3	6.7	3.7
ASMT11T304PDPR-MS	0.4	10.6		●	●												12.3	6.7	3.7
ASGT11T304PDRF-AJ	0.4	10.6									●		●				12.3	6.7	3.7
ASGT11T308PDRF-AJ	0.8	10.6									●		●				12.3	6.7	3.7

● : Line up

STANDARD CUTTING CONDITIONS

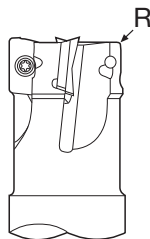
TPO11/EPO11/HPO11 type

ISO	Workpiece material	Brinell hardness HB	Priority	Grade	Cutting speed: Vc (m/min)	Feed per tooth: fz (mm/t)			
						MJ	MS	AJ	
P	Low carbon steel S15C, etc. C15E4, etc.	~ 200	First choice	AH725	100 - 250	0.1 - 0.2	-	-	
		~ 200	Wear resistance	T3130	100 - 250	0.1 - 0.2	-	-	
		~ 200	Surface quality	NS740	100 - 250	0.05 - 0.15	-	-	
	High carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	200 ~ 300	First choice	AH725	100 - 200	0.1 - 0.15	-	-	
		200 ~ 300	Wear resistance	T3130	100 - 200	0.1 - 0.15	-	-	
		200 ~ 300	Surface quality	NS740	100 - 200	0.05 - 0.12	-	-	
	Tool steel SKD11, etc. X153CrMoV12, etc.	150 ~ 300	First choice	AH725	100 - 150	0.1 - 0.15	-	-	
		150 ~ 300	Wear resistance	T3130	100 - 150	0.1 - 0.15	-	-	
	M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	-	AH130	80 - 200	-	0.08 - 0.2	-
	K	Grey cast irons FC250, etc. 250, etc.	150 ~ 250	First choice	AH120	100 - 250	0.12 - 0.2	-	-
150 ~ 250			Wear resistance	T1215 T1115	100 - 250	0.12 - 0.2	-	-	
Ductile cast irons FCD450, etc. 450-10S, etc.		150 ~ 250	First choice	AH120	80 - 200	0.12 - 0.2	-	-	
		150 ~ 250	Wear resistance	T1215 T1115	80 - 200	0.12 - 0.2	-	-	
N	Aluminium alloys Si < 13%	-	-	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	
S	Titanium alloys Ti-6Al-4V, etc.	-	-	AH130	20 - 60	-	0.08 - 0.15	-	
	Superalloys Inconel 718, etc.	-	-	AH725	20 - 40	0.08 - 0.13	-	-	

CAUTIONARY POINT IN MODIFYING CUTTER BODIES

When using inserts with corner radius
 $RE \geq 2.0$ mm, standard cutter bodies have to be modified "R". (Only for TPO11, EPO11, TLS11, ELS11, HPO11)

About roughing type TLS11, ELS11
 From 2nd row onwards, please use insert with $RE = 0.4$ or 0.8 mm



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

STANDARD CUTTING CONDITIONS

Roughing type TLS11 / ELS11

ISO	Workpiece material	Brinell hardness HB	Priority	Grade	Cutting speed: Vc (m/min)	Feed per tooth: fz (mm/t)		
						MJ	MS	AJ
P	Low carbon steel S15C, etc. C15E4, etc.	~ 200	First choice	AH725	100 - 250	0.10 - 0.18	-	-
		~ 200	Wear resistance	T3130	100 - 250	0.10 - 0.18	-	-
	High carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	200 ~ 300	First choice	AH725	100 - 200	0.08 - 0.14	-	-
		200 ~ 300	Wear resistance	T3130	100 - 200	0.08 - 0.14	-	-
	Tool steel SKD11, etc. X153CrMoV12, etc.	150 ~ 300	First choice	AH725	100 - 200	0.08 - 0.14	-	-
		150 ~ 300	Wear resistance	T3130	100 - 200	0.08 - 0.14	-	-
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	-	AH130	100 - 150	-	0.08 - 0.15	-
K	Grey cast irons FC250, etc. 250, etc.	150 ~ 250	First choice	AH120	100 - 250	0.10 - 0.18	-	-
		150 ~ 250	Wear resistance	T1215 T1115	100 - 250	0.10 - 0.18	-	-
	Ductile cast irons FCD450, etc. 450-10S, etc.	150 ~ 250	First choice	AH120	80 - 200	0.10 - 0.18	-	-
		150 ~ 250	Wear resistance	T1215 T1115	80 - 200	0.10 - 0.18	-	-
N	Aluminium alloys Si < 13%	-	-	DS1100	200 - 500	-	-	0.05 - 0.18
	Aluminium alloys Si ≥ 13%	-	-	DS1100	100 - 200	-	-	0.05 - 0.18
S	Titanium alloys Ti-6Al-4V, etc.	-	-	AH130	20 - 60	-	0.08 - 0.14	-
	Superalloys Inconel718, etc.	-	-	AH725	20 - 40	0.06 - 0.12	-	-

- To remove excessive chip accumulation use an air blast.
- To avoid build up edge on 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, 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.

Grade

Insert

Ext. Toolholder

Int. Toolholder

Threading

Grooving

Miniature tool

Milling cutter

Endmill

Drilling tool

Tooling System

User's Guide

Index



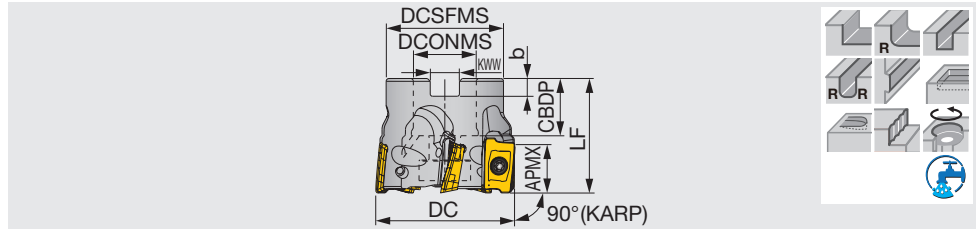
- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

TUNGREC

TPO18

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

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



Designation	APMX	DC	CICT	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert
TPO18R040M16.0-04	16.7	40	4	35	40	16	18	8.2	5.6	0.2	With	AO*T1805...
TPO18R040M16.0E04	16.7	40	4	35	40	16	18	8.4	5.6	0.2	With	AO*T1805...
TPO18R050M22.0-05	16.7	50	5	41	40	22	20	10	6	0.2	With	AO*T1805...
TPO18R050M22.0E05	16.7	50	5	41	40	22	20	10.4	6.3	0.3	With	AO*T1805...
TPO18R063M22.0-06	16.7	63	6	41	40	22	20	10	6	0.4	With	AO*T1805...
TPO18R063M22.0E06	16.7	63	6	41	40	22	20	10.4	6.3	0.5	With	AO*T1805...
TPO18R080M25.4-07	16.7	80	7	46	50	25.4	26	9.5	6	0.8	With	AO*T1805...
TPO18R080M27.0E07	16.7	80	7	50	50	27	22	12.4	7	1.0	With	AO*T1805...
TPO18R100M31.7-08	16.7	100	8	60	50	31.75	32	12.7	8	1.2	With	AO*T1805...
TPO18R100M32.0E08	16.7	100	8	60	50	32	28.5	14.4	8	1.4	With	AO*T1805...
TPO18R125M38.1-09	16.7	125	9	80	63	38.1	38	15.9	10	2.8	With	AO*T1805...
TPO18R125M40.0E09	16.7	125	9	71	63	40	32	16.4	9	2.8	With	AO*T1805...
TPO18R160M40.0E10	16.7	160	10	100	63	40	29	16.4	9	4.9	Without	AO*T1805...
TPO18R160M50.8-10	16.7	160	10	100	63	50.8	46	19	11	4.9	Without	AO*T1805...

SPARE PARTS



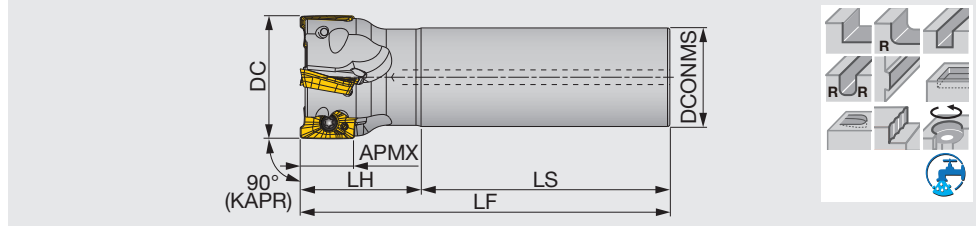
Designation	Clamping screw	Grip	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TPO18R040M...	CSTB-4L093	H-TBS	-	FSHM8-30H	BT15M
TPO18R050M...	CSTB-4L093	H-TBS	-	CM10X30H	BT15M
TPO18R063M...	CSTB-4L093	H-TBS	-	CM10X30H	BT15M
TPO18R080M...	CSTB-4L120	H-TBS	-	CM12X30H	BT15M
TPO18R100M...	CSTB-4L120	H-TBS	TMBA-M16H	-	BT15M
TPO18R125M...	CSTB-4L120	H-TBS	TMBA-M20H	-	BT15M
TPO18R160M...	CSTB-4L120	H-TBS	-	-	BT15M

*Recommended clamping torque (N·m) : CSTB-4L093=3.5, CSTB-4L120=3.5

Reference pages: Inserts, Standard cutting conditions → [H154](#)

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

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



Designation	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPO18R025M25.0-02	16.7	25	2	25	80	35	115	0.4	With	AO*T1805...
EPO18R025M25.0-02L	16.7	25	2	25	150	70	220	0.8	With	AO*T1805...
EPO18R028M25.0-02	16.7	28	2	25	80	35	115	0.4	With	AO*T1805...
EPO18R028M25.0-02L	16.7	28	2	25	150	70	220	0.8	With	AO*T1805...
EPO18R030M32.0-02	16.7	30	2	32	80	40	120	0.6	With	AO*T1805...
EPO18R030M32.0-02L	16.7	30	2	32	175	80	255	1.4	With	AO*T1805...
EPO18R030M32.0-03	16.7	30	3	32	80	40	120	0.6	With	AO*T1805...
EPO18R032M32.0-02	16.7	32	2	32	80	40	120	0.7	With	AO*T1805...
EPO18R032M32.0-02L	16.7	32	2	32	175	80	255	1.5	With	AO*T1805...
EPO18R032M32.0-03	16.7	32	3	32	80	40	120	0.6	With	AO*T1805...
EPO18R035M32.0-02	16.7	35	2	32	80	40	120	0.7	With	AO*T1805...
EPO18R035M32.0-02L	16.7	35	2	32	175	80	255	1.5	With	AO*T1805...
EPO18R035M32.0-03	16.7	35	3	32	80	40	120	0.7	With	AO*T1805...
EPO18R040M32.0-02L	16.7	40	2	32	205	50	255	1.6	With	AO*T1805...
EPO18R040M32.0-03	16.7	40	3	32	80	40	120	0.7	With	AO*T1805...
EPO18R040M32.0-04	16.7	40	4	32	80	40	120	0.7	With	AO*T1805...
EPO18R040M42.0-02L	16.7	40	2	42	210	100	310	3	With	AO*T1805...
EPO18R050M32.0-03	16.7	50	3	32	80	40	120	0.8	With	AO*T1805...
EPO18R050M32.0-05	16.7	50	5	32	80	40	120	0.8	With	AO*T1805...
EPO18R050M42.0-03L	16.7	50	3	42	310	50	360	3.8	With	AO*T1805...
EPO18R063M32.0-04	16.7	63	4	32	80	45	125	1	With	AO*T1805...
EPO18R063M32.0-06	16.7	63	6	32	80	45	125	1.1	With	AO*T1805...
EPO18R063M42.0-03L	16.7	63	3	42	310	50	360	4	With	AO*T1805...

*The DC above is the diameter when using MJ chipbreaker. With AJ chipbreaker, the tool diameter is (DC above + 0.2 mm).

SPARE PARTS



Designation	Clamping screw	Wrench
EPO18R025 - 030...	CSTB-4L085	T-15DB
EPO18R032 - 050...	CSTB-4L093	T-15DB
EPO18R063M...	CSTB-4L120	T-15DB

*Recommended clamping torque N·m) : CSTB-4L085=3.5, CSTB-4L093=3.5, CSTB-4L120=3.5

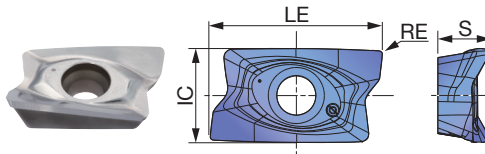
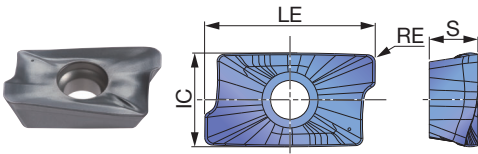




INSERT

AOMT18-MJ

AOGT18-AJ



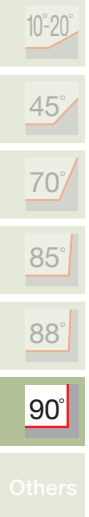
P	Steel	★							
M	Stainless	★	☆						
K	Cast iron	★							
N	Non-ferrous			★					
S	Superalloys	★							
H	Hard materials								

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated		Uncoated	LE	IC	S
			AH140	AH725	KS15F			
AOMT180508PDPR-MJ	0.8	16.7	●	●		19.5	10.7	5.6
AOMT180516PDPR-MJ	1.6	16.7	●	●		19.5	10.7	5.6
AOMT180524PDPR-MJ	2.4	16.7	●	●		19.5	10.7	5.6
AOMT180532PDPR-MJ	3.2	16.7	●	●		19.5	10.7	5.6
AOGT180504PDFR-AJ	0.4	16.7			●	19.8	10.8	6.1
AOGT180508PDFR-AJ	0.8	16.7			●	19.8	10.8	6.1

● : Line up

Approach angle



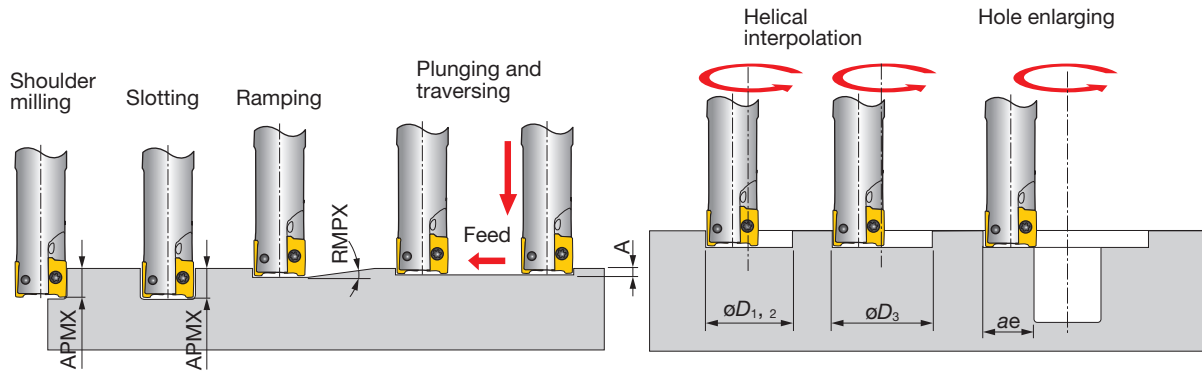
STANDARD CUTTING CONDITIONS

TPO18/EPO18 type

ISO	Workpiece material	Brinell hardness HB	Priority	Cutting speed: Vc (m/min)	Feed per tooth: fz (mm/t)	
					MJ	AJ
P	Low carbon steel S15C, etc. C15E4, etc.	~ 200	AH725	100 - 250	0.08 - 0.25	-
	High carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	200 ~ 300	AH725	100 - 230	0.08 - 0.2	-
	Tool steel SKD11, etc. X153CrMoV12, etc.	150 ~ 300	AH725	100 - 180	0.08 - 0.2	-
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	AH140	90 - 200	0.08 - 0.2	-
K	Grey cast irons FC250, etc. 250, etc.	150 ~ 250	AH725	140 - 250	0.08 - 0.25	-
	Ductile cast irons FCD450, etc. 450-10S, etc.	150 ~ 250	AH725	110 - 200	0.08 - 0.25	-
N	Aluminium alloys Si < 13%	-	KS15F	300 - 1000	-	0.05 - 0.25
	Aluminium alloys Si ≥ 13%	-	KS15F	100 - 200	-	0.05 - 0.25
S	Titanium alloys Ti-6Al-4V, etc.	-	AH725	20 - 60	0.08 - 0.18	-
	Superalloys Inconel718, etc.	-	AH725	20 - 40	0.08 - 0.15	-

- To remove excessive chip accumulation use an air blast.
- To avoid build up edge on 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, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

APPLICATION RANGE



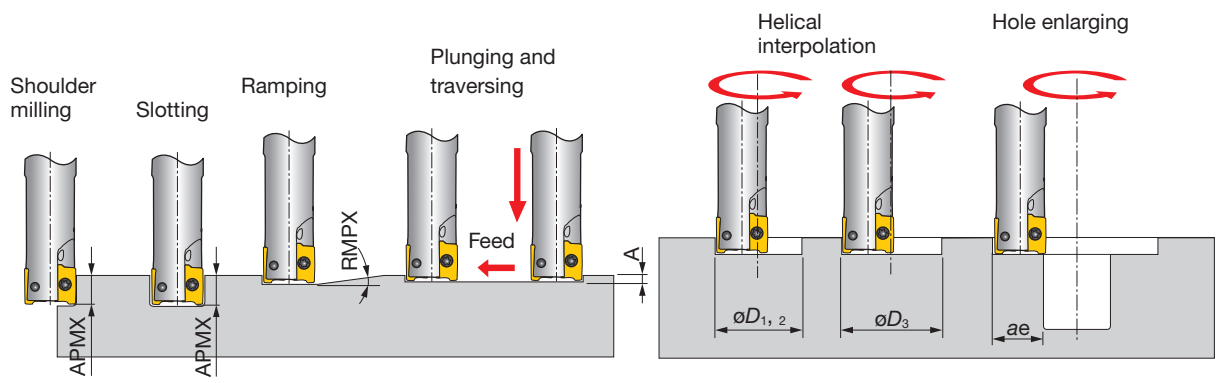
Designation	Tool dia.	Chipbreaker	Max. depth of cut	Max. ramping angle	Max. plunging depth	Min. machining	Max. machining		Max. cutting width in enlarging
	DC		APMX	RMPX	A	øD1	øD2	øD3*	ae
E/HPO07R012...	12	MJ	7	8°	0.5	16	23	20.5	11.5
E/HPO07R016...	16	MJ	7	5°	0.5	24	31	28.5	15.5
EPO07R018...	18	MJ	7	4°	0.5	28	35	32.5	17.5
E/HPO07R020...	20	MJ	7	3.5°	0.5	32	39	36.5	19.5
EPO07R022...	22	MJ	7	3°	0.5	36	43	40.5	21.5
E/HPO07R025...	25	MJ	7	2.5°	0.5	42	49	46.5	24.5
EPO07R028...	28	MJ	7	2°	0.5	48	55	52.5	27.5
TPO07R032...	32	MJ	7	1.8°	0.5	56	63	60.5	31.5
TPO07R040	40	MJ	7	1.2°	0.5	72	79	76.5	39.5
TPO07R050...	50	MJ	7	0.9°	0.5	92	99	96.5	49.5
E/HPO07R012...	12	AJ	6.4	8°	0.5	16	23	20.5	11.5
E/HPO07R016...	16	AJ	6.4	5°	0.5	24	31	28.5	15.5
EPO07R018...	18	AJ	6.4	4°	0.5	28	35	32.5	17.5
E/HPO07R020...	20	AJ	6.4	3.5°	0.5	32	39	36.5	19.5
EPO07R022...	22	AJ	6.4	3°	0.5	36	43	40.5	21.5
E/HPO07R025...	25	AJ	6.4	2.5°	0.5	42	49	46.5	24.5
EPO07R028...	28	AJ	6.4	2°	0.5	48	55	52.5	27.5
TPO07R032...	32	AJ	6.4	1.8°	0.5	56	63	60.5	31.5
TPO07R040	40	AJ	6.4	1.2°	0.5	72	79	76.5	39.5
TPO07R050...	50	AJ	6.4	0.9°	0.5	92	99	96.5	49.5
E/HPO07R012...	12.6	HJ	0.8	5°	0.5	17	24	-	9.6
E/HPO07R016...	16.6	HJ	0.8	3°	0.5	25	32	-	13.6
EPO07R018...	18.6	HJ	0.8	2.5°	0.5	29	36	-	15.6
E/HPO07R020...	20.6	HJ	0.8	2.1°	0.5	33	40	-	17.6
EPO07R022...	22.6	HJ	0.8	1.9°	0.5	37	44	-	19.6
E/HPO07R025...	25.6	HJ	0.8	1.6°	0.5	43	50	-	22.6
EPO07R028...	28.6	HJ	0.8	1.3°	0.5	49	56	-	25.6
TPO07R032...	32.6	HJ	0.8	1.1°	0.5	57	64	-	29.6
TPO07R040	40.6	HJ	0.8	0.8°	0.5	73	80	-	37.6
TPO07R050...	50.6	HJ	0.8	0.6°	0.5	93	100	-	47.6
EPO11R012...	12	MJ, MS, AJ	10.6	6°	0.5	15	23	21	11.5
EPO11R016...	16	MJ, MS, AJ	10.6	5°	0.5	20	31	29	15.5
EPO11R018...	18	MJ, MS, AJ	10.6	4°	0.5	26	35	33	17.5
E/HPO11R020...	20	MJ, MS, AJ	10.6	3°	0.5	28	39	37	19.5
EPO11R022...	22	MJ, MS, AJ	10.6	2.5°	0.5	31	43	41	21.5

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





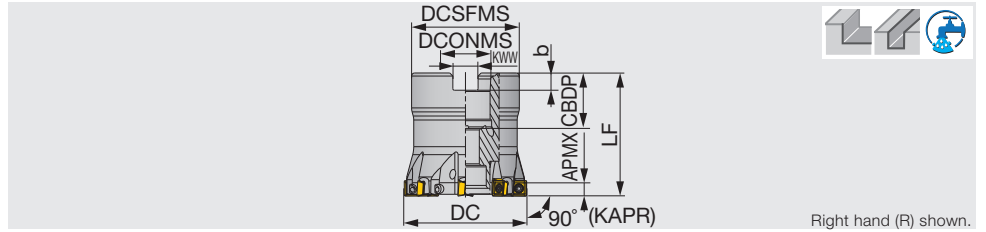
APPLICATION RANGE



Designation	Tool dia. DC	Chipbreaker	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Min. machining øD1	Max. machining øD2	Max. machining øD3*	Max. cutting width in enlarging ae
E/HPO11R025...	25	MJ, MS, AJ	10.6	2°	0.5	38	49	47	24.5
EPO11R028...	28	MJ, MS, AJ	10.6	1.5°	0.5	42	53	51	27.5
EPO11R030...	30	MJ, MS, AJ	10.6	1.5°	0.5	48	55	53	29.5
E/HPO11R032...	32	MJ, MS, AJ	10.6	1.5°	0.5	52	59	57	31.5
EPO11R035...	35	MJ, MS, AJ	10.6	1°	0.5	56	67	65	34.5
E/TPO11R040...	40	MJ, MS, AJ	10.6	1°	0.5	68	79	77	39.5
TPO11R050...	50	MJ, MS, AJ	10.6	0.7°	0.5	68	99	97	49.5
TPO11R063...	63	MJ, MS, AJ	10.6	0.5°	0.5	114	125	123	62.5
TPO11R080...	80	MJ, MS, AJ	10.6	0.4°	0.5	148	159	157	79.5
TPO11R100...	100	MJ, MS, AJ	10.6	0.3°	0.5	188	199	197	99.5
EPO18R025...	25	MJ, AJ	16.7	6°	1	32	48	44	24
EPO18R028...	28	MJ, AJ	16.7	4.5°	1	38	54	50	27
EPO18R030...	30	MJ, AJ	16.7	4°	1	42	58	54	29
EPO18R032...	32	MJ, AJ	16.7	3.5°	1	46	62	58	31
EPO18R035...	35	MJ, AJ	16.7	3°	1	52	68	64	34
E/TPO18R040...	40	MJ, AJ	16.7	2.5°	1	62	78	74	39
E/TPO18R050...	50	MJ, AJ	16.7	1.9°	1	82	98	94	49
E/TPO18R063	63	MJ, AJ	16.7	1.4°	1	108	124	120	62
TPO18R080...	80	MJ, AJ	16.7	1°	1	142	158	154	79
TPO18R100...	100	MJ, AJ	16.7	0.8°	1	182	198	194	99
TPO18R125...	125	MJ, AJ	16.7	0.6°	1	232	248	244	124
TPO18R160...	160	MJ, AJ	16.7	0.4°	1	302	318	314	159

*Flat bottom hole
Note: Corner RE for dimensions of øD1, øD2, and øD3: RE = 0.4 for EPO07 / EPO11 and RE = 0.8 for EPO18.

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



GAMP = +5°, GAMF = -7° ~ +12°

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

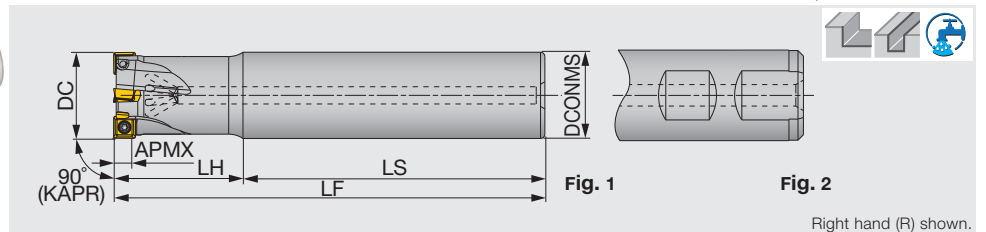
SPARE PARTS



Designation	Clamping screw	Shell locking bolt	Wrench
TPD05R032M16.0E06	CSPB-2L043	CM8X30H	IP-6DB
TPD05R040M22.0E08	CSPB-2L043	CM10X30H	IP-6DB

*Recommended clamping torque (N-m) : CSPB-2L043=0.7

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



GAMP = +5°, GAMF = -7° ~ +12°

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

SPARE PARTS



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

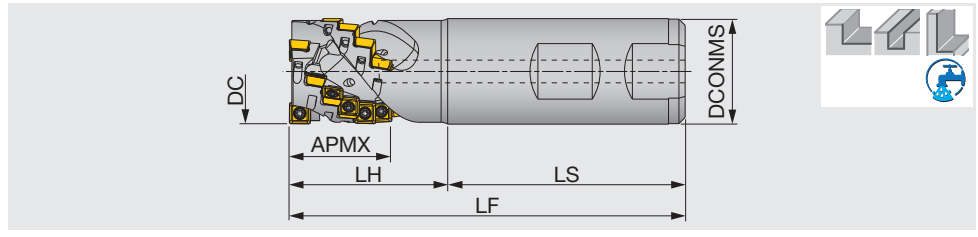
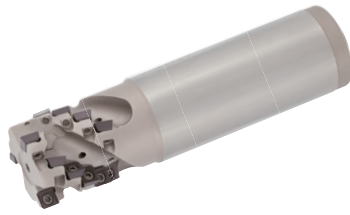
*Recommended clamping torque (N-m) : CSPB-2L043=0.7

- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

TUNGQUAD

ELD05

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



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

SPARE PARTS

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

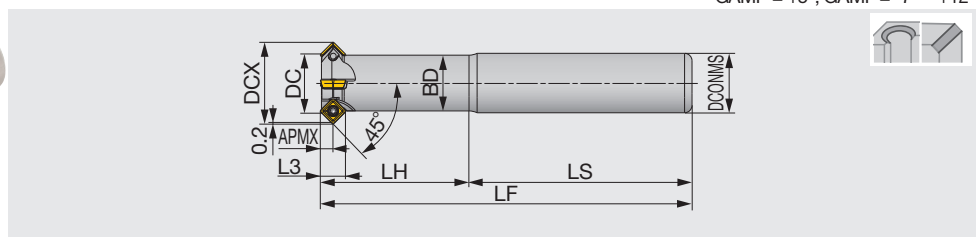
*Recommended clamping torque (N-m) : CSPB-2L043=0.7

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

TUNGQUAD

EASD05

Chamfering endmill, for SDMT/SDHT05 inserts



Designation	DCX	CICT	DC*	BD	APMX	DCONMS	LH	L3	LS	LF	Air hole	Insert
EASD05M006C12.0R01	12	1	5.7	7.5	3	12	40	6.8	60	100	Without	SD*T0502...
EASD05M008C12.0R02	14	2	7.8	9.1	3	12	40	6.8	60	100	Without	SD*T0502...
EASD05M016C16.0R04	22	4	15.7	15	3	16	40	6.8	60	100	Without	SD*T0502...

The minimum chamfering diameter (DC) measures up to the point where the insert's nose radius ends. This will offset the total tool length by shortening 0.3 mm.

SPARE PARTS

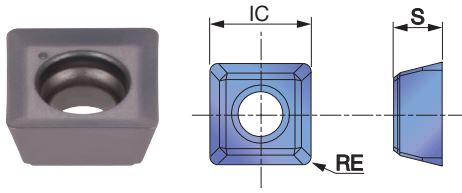
Designation	Clamping screw	Wrench
EASD05...	CSPB-2L043	IP-6DB

*Recommended clamping torque (N-m) : CSPB-2L043=0.7

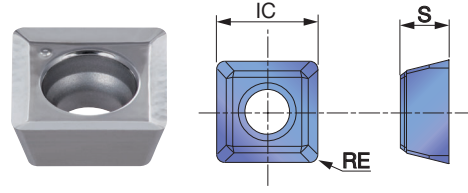
Reference pages: Inserts → **H159**, Standard cutting conditions → **H160 - H161**

INSERT

SDMT05-MJ



SDHT05-AJ



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

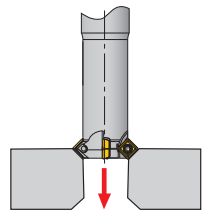
★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated			Uncoated					S	IC	
			AH140	AH725	TH10								
SDMT050204PN-MJ	0.4	4	●	●								2.38	5.09
SDHT050204FN-AJ	0.4	4			●							2.39	5.09

● : Line up

CUTTING PERFORMANCE

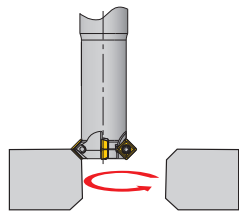
Chamfering & countersinking



■ C2.5 (45° x 2.5 mm)
Workpiece material: S55C / C55

Designation	Cutting speed Vc (m/min)	Feed rate fz (mm/z)
EASD05M006C12.0R01	80 - 120	0.03 - 0.08
EASD05M008C12.0R02	80 - 120	0.03 - 0.08
EASD05M016C16.0R04 (*z=2)	80 - 120	0.03 - 0.08

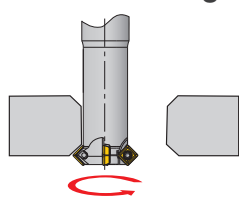
Interpolated chamfering



■ C2.5 (45° x 2.5 mm)
Workpiece material: S55C / C55

Designation	Cutting speed Vc (m/min)	Feed rate fz (mm/z)
EASD05M006C12.0R01	80 - 120	0.08 - 0.12
EASD05M008C12.0R02	80 - 120	0.08 - 0.12
EASD05M016C16.0R04	80 - 120	0.08 - 0.12

Back chamfering



■ C1.0 (45° x 1.0 mm)
Workpiece material: S55C / C55

Designation	Cutting speed Vc (m/min)	Feed rate fz (mm/z)
EASD05M006C12.0R01	80 - 120	0.08 - 0.12
EASD05M008C12.0R02	80 - 120	0.08 - 0.12
EASD05M016C16.0R04	80 - 120	0.08 - 0.12

STANDARD CUTTING CONDITIONS

■ Bore, shank type TPD05/EPD05

	ISO	Workpiece material	Brinell hardness HB	Grade	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
High Feed Milling	P	Low carbon steels S15C, etc. C15E4, etc.	~ 200	AH725	230 - 320	0.04 - 0.1
		High carbon steels S45C, etc. C45, etc.	200 ~ 300	AH725	150 - 230	0.04 - 0.1
		Alloyed steels SCM440, etc. 42CrMo4, etc.	150 ~ 300	AH725	150 - 230	0.04 - 0.1
		Tool steels SKD11, etc. X153CrMoV12, etc.	~ 300	AH725	110 - 130	0.03 - 0.09
Face Milling	M	Stainless steels SUS304, etc. X5CrNi18-9, etc.	-	AH140	100 - 200	0.03 - 0.09
Shoulder Milling	K	Grey cast irons FC250, etc. 250, etc.	150 ~ 250	AH725	200 - 300	0.05 - 0.12
		Ductile cast irons FCD450, etc. 450-10S, etc.	150 ~ 250	AH725	160 - 240	0.05 - 0.12
Slot Milling	N	Aluminium alloys Si < 13%	-	TH10	350 - 500	0.05 - 0.15
		Aluminium alloys Si ≥ 13%	-	TH10	100 - 200	0.05 - 0.15
Profile Milling						

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

■ Roughing type ELD05

	ISO	Workpiece material	Brinell hardness HB	Grade	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
10°-20°	P	Low carbon steels S15C, etc. C15E4, etc.	~ 200	AH725	100 - 250	0.04 - 0.1
		High carbon steels S45C, etc. C45, etc.	200 ~ 300	AH725	100 - 200	0.04 - 0.1
		Alloyed steels SCM440, etc. 42CrMo4, etc.	150 ~ 300	AH725	100 - 200	0.04 - 0.1
		Tool steels SKD11, etc. X153CrMoV12, etc.	~ 300	AH725	100 - 130	0.03 - 0.09
45°	M	Stainless steels SUS304, etc. X5CrNi18-9, etc.	-	AH140	100 - 150	0.03 - 0.09
70°	K	Grey cast irons FC250, etc. 250, etc.	150 ~ 250	AH725	100 - 250	0.05 - 0.12
		Ductile cast irons FCD450, etc. 450-10S, etc.	150 ~ 250	AH725	80 - 200	0.05 - 0.12
85°	N	Aluminium alloys Si < 13%	-	TH10	200 - 500	0.05 - 0.15
		Aluminium alloys Si ≥ 13%	-	TH10	100 - 200	0.05 - 0.15
88°						
90°						
Others						

Interpolated or back chamfering type

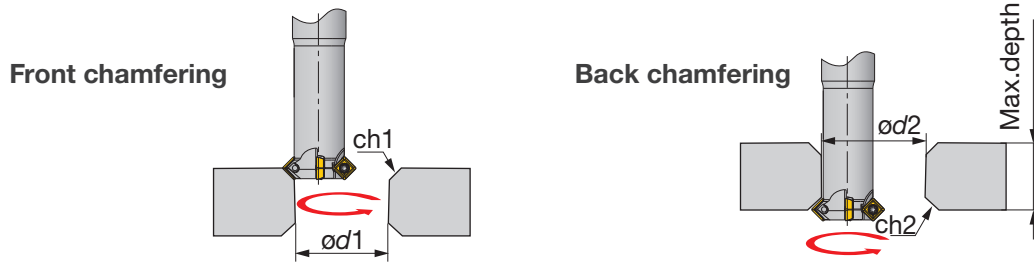
ISO	Workpiece material	Grade	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Low carbon steels S15C, etc. C15E4, etc.	AH725	230 ~ 320	0.04 ~ 0.1
	High carbon steels S45C, etc. C45, etc.	AH725	150 ~ 230	0.04 ~ 0.1
	Alloyed steels SCM440, etc. 42CrMo4, etc.	AH725	150 ~ 230	0.04 ~ 0.1
	Tool steels SKD11, etc. X153CrMoV12, etc.	AH725	110 ~ 130	0.03 ~ 0.09
M	Stainless steels SUS304, etc. X5CrNi18-9, etc.	AH140	100 ~ 200	0.03 ~ 0.09
K	Grey cast irons FC250, etc. 250, etc.	AH725	150 ~ 250	0.05 ~ 0.12
	Ductile cast irons FCD450, etc. 450-10S, etc.	AH725	100 ~ 180	0.05 ~ 0.12
N	Aluminium alloys Si < 13%	TH10	350 ~ 500	0.05 ~ 0.15
	Copper alloys	TH10	100 ~ 200	0.05 ~ 0.15

Front chamfering type

ISO	Workpiece material	Grade	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Low carbon steels S15C, etc. C15E4, etc.	AH725	160 ~ 220	0.04 ~ 0.1
	High carbon steels S45C, etc. C45, etc.	AH725	110 ~ 160	0.04 ~ 0.1
	Alloyed steels SCM440, etc. 42CrMo4, etc.	AH725	110 ~ 160	0.04 ~ 0.1
	Tool steels SKD11, etc. X153CrMoV12, etc.	AH725	80 ~ 90	0.03 ~ 0.09
M	Stainless steels SUS304, etc. X5CrNi18-9, etc.	AH140	70 ~ 140	0.03 ~ 0.09
K	Grey cast irons FC250, etc. 250, etc.	AH725	110 ~ 180	0.05 ~ 0.12
	Ductile cast irons FCD450, etc. 450-10S, etc.	AH725	70 ~ 130	0.05 ~ 0.12
N	Aluminium alloys Si < 13%	TH10	250 ~ 350	0.05 ~ 0.15
	Copper alloys	TH10	70 ~ 140	0.05 ~ 0.15

* When chamfering over C1.0 (45° x 1.0 mm), decrease the cutting parameters to 70% of the above parameters.

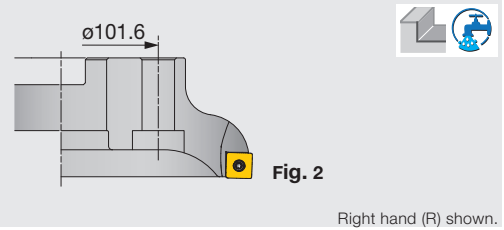
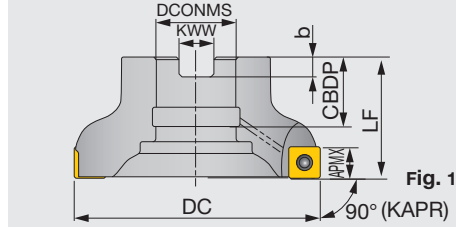
APPLICATION RANGE



Designation	Minimum hole diameter to be chamfered (mm)		Maximum chamfer dimension (at 45°) (mm)		Maximum reachable hole distance when back chamfering (mm)
	Front-chamfer $\phi d1$	Back-chamfer $\phi d2$	Front ch1	Back ch2	
EASD05M006C12.0R01	5.7	12.5	2.9 x 2.9	2 x 2	18.2
EASD05M008C12.0R02	7.8	14.5	2.9 x 2.9	1.5 x 1.5	33.2
EASD05M016C16.0R04	15.8	22.5	2.9 x 2.9	2.8 x 2.8	43.2

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

GAMP = +11.5°, GAMF = -13° ~ -10.5°



- Shoulder Milling
- Face Milling
- High Feed Milling
- Slot Milling
- Profile Milling

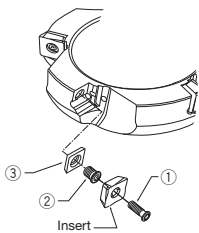
Designation	APMX	DC	CICT	LF	DCONMS	CBDDP	KWW	b	WT(kg)	Air hole	Insert	Fig.
TPW13R050M22.0-03	10	50	3	40	22	20	10	6	0.3	With	SW*T1304...	1
TPW13R050M22.0-04	10	50	4	40	22	20	10	6	0.3	With	SW*T1304...	1
TPW13R050M22.0E04	10	50	4	40	22	20	10.4	6.3	0.3	With	SW*T1304...	1
TPW13R050M22.0E05	10	50	5	40	22	20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

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

SPARE PARTS

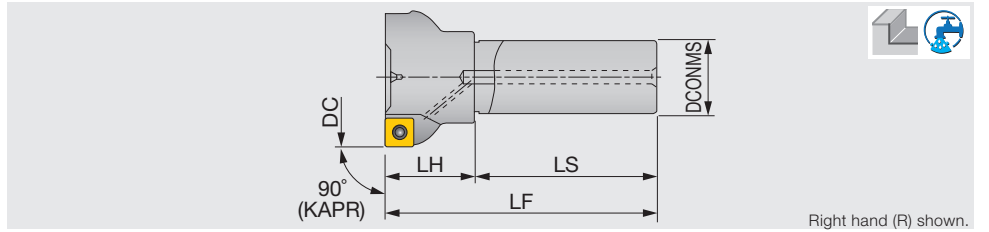
Designation	① Clamping screw	Lubricant	② Shim screw	Shell locking bolt 1	Shell locking bolt 2	③ Shim	Wrench for ①	Wrench for ②
TPW13R050, 063...	CSPB-3.5	M-1000	DTS5-3.5SS	-	CM10X30H	FSSP1102	IP-15D	P-3.5
TPW13R080M...	CSPB-3.5	M-1000	DTS5-3.5SS	-	CM12X30H	FSSP1102	IP-15D	P-3.5
TPW13R100M...	CSPB-3.5	M-1000	DTS5-3.5SS	TMBA-M16H	-	FSSP1102	IP-15D	P-3.5
TPW13R125M...	CSPB-3.5	M-1000	DTS5-3.5SS	TMBA-M20H	-	FSSP1102	IP-15D	P-3.5
TPW13R160, 200...	CSPB-3.5	M-1000	DTS5-3.5SS	-	-	FSSP1102	IP-15D	P-3.5

*Recommended clamping torque (N-m) : CSPB-3.5=3.5



Reference pages: Inserts → **H164**, Standard cutting conditions → **H165**

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

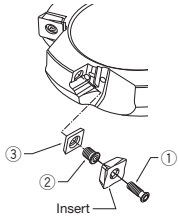


Designation	APMX	DC	CICT	DCONMS	LS	LH	LF	WT(kg)	Air hole	Insert
EPW13R032M32.0-02	10	32	2	32	80	35	115	0.6	With	SW*T1304...
EPW13R040M32.0-03	10	40	3	32	80	35	115	0.7	With	SW*T1304...
EPW13R050M32.0-03	10	50	3	32	80	40	120	0.9	With	SW*T1304...
EPW13R050M32.0-04	10	50	4	32	80	40	120	0.9	With	SW*T1304...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

SPARE PARTS

Designation	① Clamping screw	Lubricant	② Shim screw	③ Shim	Wrench for ①	Wrench for ②
EPW13R032, 040...	CSPB-3.5	M-1000	-	-	IP-15D	-
EPW13R050 - 080...	CSPB-3.5	M-1000	DTS5-3.5SS	FSSP1102	IP-15D	P-3.5

*Recommended clamping torque (N-m) : CSPB-3.5=3.5





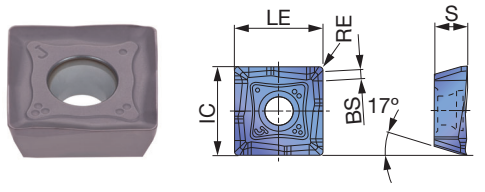
High Feed Milling

INSERT

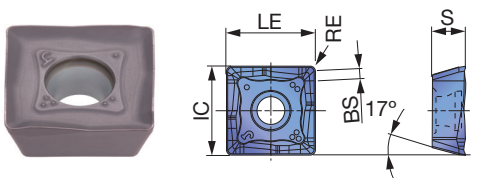


Face Milling

SWG T1304-MJ

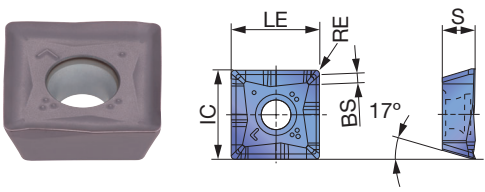


SWMT1304-MJ

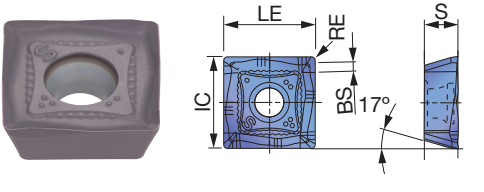


Shoulder Milling

SWMT1304-ML



SWMT1304-MS

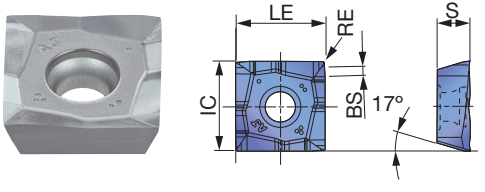


Slot Milling

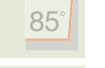
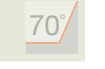


Profile Milling

SWG T1304-AJ



Approach angle



Others

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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated							Cermet	Uncoated	LE	IC	S	BS					
			AH120	AH130	AH140	AH3135	T1115	T1215	T3130	T3225	DS1100					NS740	KS05F			
SWG T1304PDPR-MJ	0.8	10	●								●					13.6	13.6	5	1.4	
SWMT1304PDPR-MJ	0.8	10	●	●	●	●	●	●	●	●	●						13.6	13.6	5	1.4
SWMT1304PDER-ML	0.8	10	●			●											13.6	13.6	5	1.4
SWMT1304PDPR-MS	0.8	10		●	●												13.6	13.6	5	1.4
SWG T1304PDFR-AJ	0	10								●		●					13.6	13.6	5	1.6

● : Line up

STANDARD CUTTING CONDITIONS TPW / EPW13 type

ISO	Workpiece material	Grade	Cutting speed Vc (m/min)	Roughing (Depth of cut: APMX ≥ 1.0 mm)				Light cutting to finishing (Depth of cut: APMX ≥ 1.0 mm)				
				Feed per tooth: fz (mm/t)				Feed per tooth: fz (mm/t)				
				MJ	ML	MS	AJ	MJ	ML	MS	AJ	
P	Mild steels Low carbon steels < 180HB	AH3135 (First choice)	100 - 270	0.05 - 0.25	0.05 - 0.2	-	-	0.05 - 0.2	0.05 - 0.18	-	-	
		T3225 (Wear resistance)	150 - 300	0.05 - 0.25	-	-	-	0.05 - 0.2	-	-	-	
		AH130 (Fracture resistance)	80 - 180	0.05 - 0.25	-	0.05 - 0.2	-	0.05 - 0.2	-	0.05 - 0.18	-	
		NS740 (Surface finish)	100 - 300	0.05 - 0.15	-	-	-	0.05 - 0.12	-	-	-	
	Carbon steels Alloy steels < 300HB	AH3135 (First choice)	100 - 230	0.05 - 0.2	0.05 - 0.15	-	-	0.05 - 0.18	0.05 - 0.12	-	-	
		T3225 (Wear resistance)	150 - 280	0.05 - 0.2	-	-	-	0.05 - 0.18	-	-	-	
		AH130 (Fracture resistance)	80 - 150	0.05 - 0.2	-	-	-	0.05 - 0.18	-	-	-	
		NS740 (Surface finish)	100 - 230	0.05 - 0.15	-	-	-	0.05 - 0.12	-	-	-	
	Die steels < 30HRC	AH3135 (First choice)	100 - 180	0.05 - 0.15	0.05 - 0.12	-	-	0.05 - 0.12	0.05 - 0.1	-	-	
		T3225 (Wear resistance)	100 - 180	0.05 - 0.15	-	-	-	0.05 - 0.12	-	-	-	
	M	Stainless steels < 50HB	AH130 / AH3135 (First choice)	80 - 200	0.05 - 0.2	-	0.05 - 0.18	-	0.05 - 0.18	-	0.05 - 0.15	-
			AH120 (Wear resistance)	150 - 250	0.05 - 0.2	0.05 - 0.15	-	-	0.05 - 0.18	0.05 - 0.12	-	-
K	Grey cast irons Ductile cast irons	T1215 (First choice)	100 - 250	0.05 - 0.2	-	-	-	0.05 - 0.18	-	-	-	
		AH120 (Fracture resistance)	100 - 250	0.05 - 0.2	0.05 - 0.15	-	-	0.05 - 0.18	0.05 - 0.12	-	-	
N	Aluminium alloys Si < 13 %	DS1100 / KS05F (First choice)	300 - 1000	-	-	-	0.05 - 0.2	-	-	-	0.05 - 0.2	
	Aluminium alloys Si ≥ 13 %	DS1100 / KS05F (First choice)	80 - 300	-	-	-	0.05 - 0.2	-	-	-	0.05 - 0.2	
	Copper alloys	DS1100 / KS05F (First choice)	200 - 500	-	-	-	0.05 - 0.2	-	-	-	0.05 - 0.2	

Notes:

- When machining at large depth of cut or large cutting width, Vc and fz should be reduced.
- As a rule, dry machining (including air blow) is recommended. But, for excessive chip welding, such as when machining stainless steels, use a water soluble cutting fluid. In this case, use AH140 and set the cutting speed to Vc ≤ 100 m/min.
- When machining mild steel, carbon steel or alloy steel in wet conditions the T3130 is recommended. In this case, Vc and fz should be reduced.
- TPW13 type can not be used for ramping, plunging and drilling.

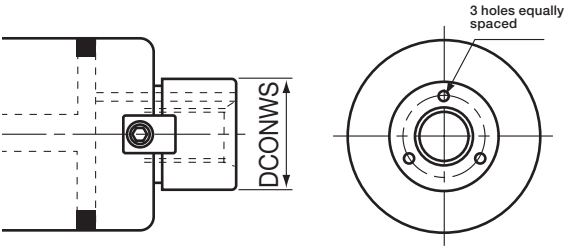
Grade
Insert
Ext. Toolholder
Int. Toolholder
Threading
Grooving
Miniature tool
Milling cutter
Endmill
Drilling tool
Tooling System
User's Guide
Index



High Feed Milling

Face mill arbors with center through-coolant hole

Face Milling



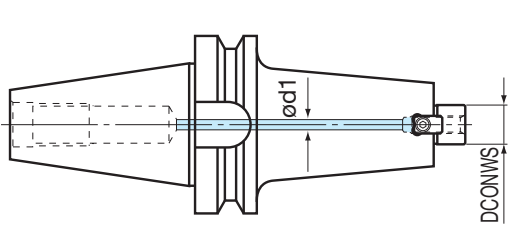
Cutter diameter DC (mm)	50/63	80	100	125	160
Nominal diameter DCONWS (mm)	22	25.4	31.75	38.1	50.8
Arbor type	FMH22	FMH25.4	FMH31.75	FMH38.1	FMH50.8

Shoulder Milling

Slot Milling

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

Profile Milling



Nominal diameter DCONWS (mm)	16	22	25.4	31.75	38.1	50.8
Applicable arbor types	SMA SM1	FMC SM1	FMA FMC	FMA SMB	FMA	FMA
Through hole diameter ød1 (mm)	4 ~ 6	5 ~ 8	6 ~ 9	10 ~ 13	10 ~ 15	10 ~ 15

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

Cautionary notes in use

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

Approach angle

10°-20°

45°

70°

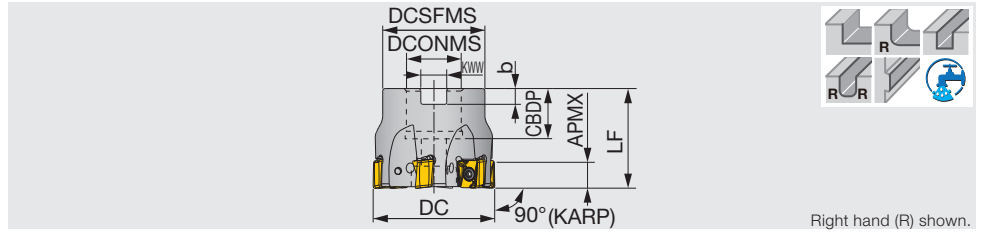
85°

88°

90°

Others

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



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

SPARE PARTS

Designation	Clamping screw	Grip 1	Grip 2	Torx bit	Shell locking bolt
TPQ11R040M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	CM8x30H
TPQ11R050M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	CM10x30H
TPQ11R063M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	CM10x30H
TPQ11R080M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	CM12x30H
TPQ11R100M...	CSTB-3.5L115	SW6-SD	-	BLDT10/S7	TMBA-M16H
TPQ18R050M...	SR14-591	-	H-TB	BT20M	CM10x30H
TPQ18R063M...	SR14-591	-	H-TB	BT20M	CM12x30H
TPQ18R080M...	SR14-591	-	H-TB	BT20M	CM12x30H
TPQ18R100M...	SR14-591	-	H-TB	BT20M	TMBA-M16H
TPQ18R125M...	SR14-591	-	H-TB	BT20M	TMBA-M20H
TPQ18R160M...	SR14-591	-	H-TB	BT20M	-

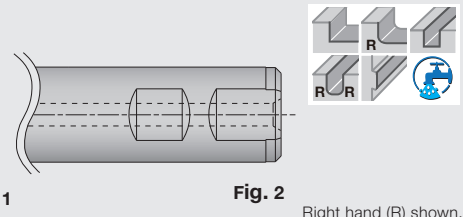
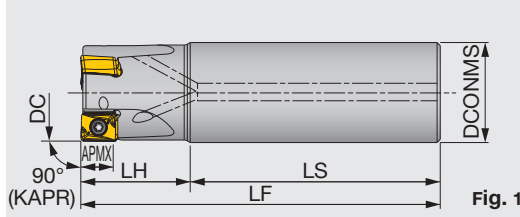
*Recommended clamping torque (N·m) : CSTB-3.5L115=2.5, SR14-591=5



- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

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

GAMP = +4° ~ +5°, GAMF = +13° ~ +15°



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

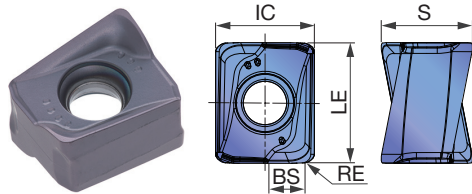
SPARE PARTS

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

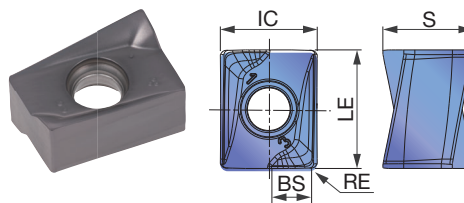
*Recommended clamping torque (N·m) : CSTB-3.5L115=2.5, SR14-591=5

INSERT

LQMU11-PXER-MJ



LQMU11/18-PNER-MJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated				LE	S	IC	BS
			AH120	AH140	AH725	AH3135				
LQMU110704PNER-MJ	0.4	9	●	●	●		11	8.3	9	1.5
LQMU110708PNER-MJ	0.8	9	●	●	●		11	8.3	9	1.1
LQMU110708PXER-MJ	0.8	9	●			●	11	8.3	9	1.1
LQMU110716PNER-MJ	1.6	9	●	●	●		11	8.3	9	0.3
LQMU110720PNER-MJ	2	9	●				11	8.3	9	-
LQMU180804PNER-MJ	0.4	16	●	●	●		17.5	10.9	11.5	2.0
LQMU180808PNER-MJ	0.8	16	●	●	●		17.5	10.9	11.5	1.6
LQMU180816PNER-MJ	1.6	16	●	●	●		17.5	10.9	11.5	0.8
LQMU180824PNER-MJ	2.4	16	●	●	●		17.5	10.9	11.5	-

● : Line up

Reference pages: Standard cutting conditions → **H169**

STANDARD CUTTING CONDITIONS

LQMU11-PXER-MJ

ISO	Workpiece material	Hardness	Grade	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Low carbon steel S15C, etc. C15E, etc.	- 200HB	AH3135	100 - 250	0.1 - 0.25*
	Alloy steel S55C, etc. C55, etc.	- 300HB	AH3135	100 - 230	0.1 - 0.2*
	Prehardened steel NAK80, PX5, etc.	30 - 40HRC	AH3135	100 - 230	0.1 - 0.2*
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	AH3135	90 - 180	0.1 - 0.25*
K	Grey cast iron FC250, etc. 250, etc.	150 - 250HB	AH120	140 - 250	0.1 - 0.25*
	Ductile cast iron FCD400, etc. 450-10S, etc.	150 - 250HB	AH120	110 - 200	0.1 - 0.25*
S	Titanium alloys Ti-6Al-4V, etc.	-	AH120	30 - 60	0.08 - 0.2*
	Superalloys Inconel 718, etc.	-	AH120	20 - 50	0.06 - 0.1*
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	AH120	45 - 70	0.08 - 0.15*
		SKD11, etc. X153CrMoV12, etc.	AH120	40 - 65	0.06 - 0.1*

LQMU11/18-PNER-MJ

ISO	Workpiece material	Hardness HB	Grade	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Low carbon steel S15C, etc. C15E, etc.	- 200	AH725	100 - 250	0.1 - 0.25*
	High carbon steel S45C, S55C, etc. C45, C55, etc.	200 - 300	AH725	100 - 230	0.1 - 0.2*
	Alloy steel SCM440, SCr415, etc. 42CrMo4, etc.	150 - 300	AH725	100 - 230	0.1 - 0.2*
	Tool steel D2, etc. X153CrMoV12, etc.	- 300	AH725	100 - 180	0.1 - 0.2*
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	AH140	90 - 180	0.1 - 0.25*
K	Grey cast iron FC250, etc. 250, etc.	150 - 250	AH120	140 - 250	0.1 - 0.25*
	Ductile cast iron FCD400, etc. 450-10S, etc.	150 - 250	AH120	110 - 200	0.1 - 0.25*
S	Superalloys Inconel 718, Ti-6Al-4V, etc.	-	AH725	20 - 50	0.08 - 0.2*

* When using LQMU11 inserts, see page **H170** for proper feed per tooth setting.

- For applications with poor chip evacuation, use air gun to remove chips from the machining area to avoid chip re-cutting and part damage.
- To machine cast surface with unstable cutting depths or interruptions, it is recommended to lower the feed rate (fz) to the lowest parameter in the recommended range.
- Rigidity of the machine and/or workpiece and the spindle power capability greatly influence the cutting conditions. For applications with large cutting width/depth and/or long tool overhang, start with a Vc and fz in the lower range of the recommended cutting parameters and monitor the machine stability.

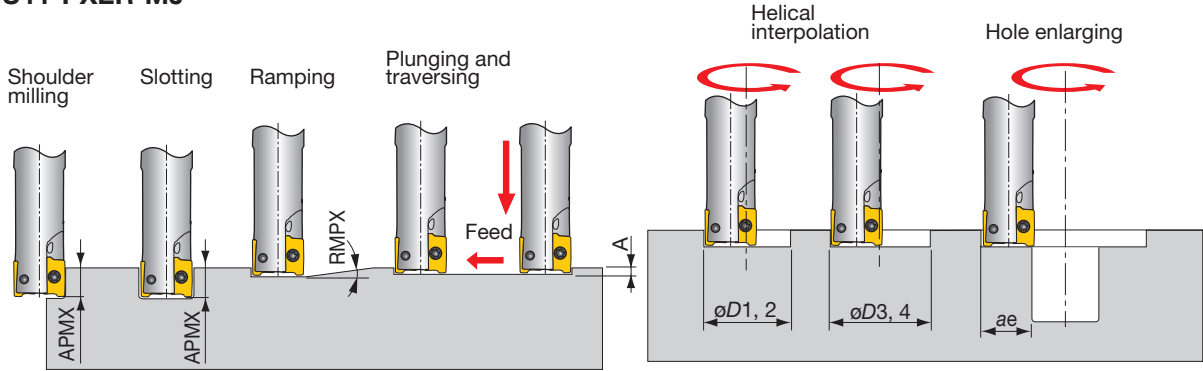
Grade
Insert
Ext. Toolholder
Int. Toolholder
Threading
Grooving
Miniature tool
Milling cutter
Endmill
Drilling tool
Tooling System
User's Guide
Index

A
B
C
D
E
F
G
H
I
J
K
L
M



APPLICATION RANGE

LQMU11-PXER-MJ



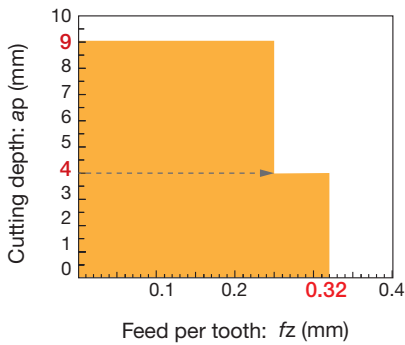
Designation	DC	Max. depth of cut		Max. plunging	Min. machining	Max. machining				Max. cutting width in enlarging
		APMX	RMPX			øD1	øD2*	øD3	øD4*	
EPQ11R025...	25	9	1.8°	0.6	35	46.8	49	48.5	0.8	24.1
EPQ11R032...	32	9	1.3°	0.6	48	60.8	63	62.5	0.8	31.1
TPQ11R040...	40	9	0.9°	0.6	64	76.8	79	78.5	0.8	39.1
TPQ11R050...	50	9	0.7°	0.6	84	96.8	99	98.5	0.8	49.1
TPQ11R063...	63	9	0.5°	0.6	110	122.8	125	124.5	0.8	62.1
TPQ11R080...	80	9	0.4°	0.6	144	156.8	159	158.5	0.8	79.1
TPQ11R100...	100	9	0.3°	0.6	184	196.8	199	198.5	0.8	99.1

*For a flat bottom

NOTE WHEN USING LQMU11 INSERTS

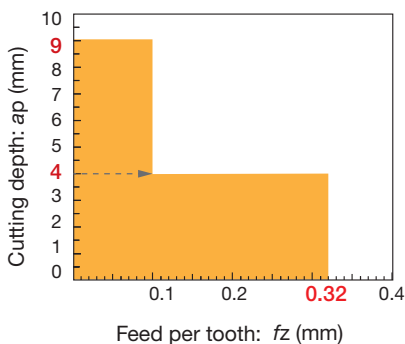
Maximum feed rate per tooth varies depending on the cutting depth and width.
 Use proper feed rate as described below.
 Use caution. Tool may damage if the parameters are not properly set.

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



Cutter : TPQ11R050M22.0-06 (DC = 50 mm, z = 6)
 Insert : LQMU110708PXER-MJ
 Grade : AH3135
 Workpiece material : S55C (200HB)
 Cutting Speed : $V_c = 200$ m/min
 Cutting width : $ae = 5$ mm
 Coolant : Dry
 Machine : Vertical M/C, 22 kW

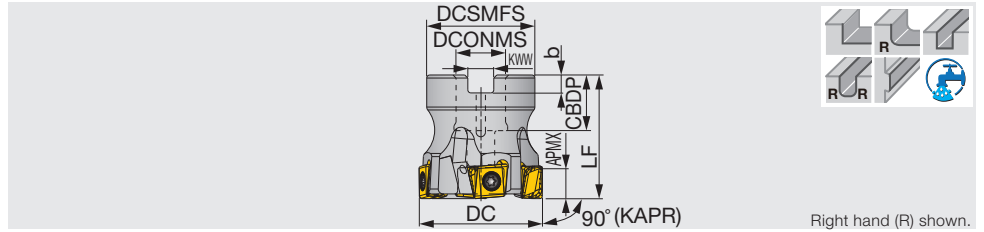
Applicable feed rate (for $ae > 10\%$ of tool diameter)



Cutter : TPQ11R050M22.0-06 (DC = 50 mm, z = 6)
 Insert : LQMU110708PXER-MJ
 Grade : AH3125
 Workpiece material : S55C (200HB)
 Cutting Speed : $V_c = 200$ m/min
 Cutting width : $ae = 42.5$ mm
 Coolant : Dry
 Machine : Vertical M/C, 22 kW

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

GAMP = +5° ~ +6°, GAMF = +9° ~ +13°



Right hand (R) shown.

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

SPARE PARTS

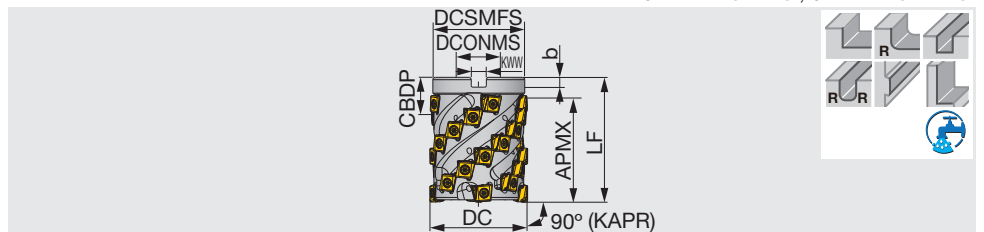


Designation	Clamping screw	Wrench	Shell locking bolt 1	Shell locking bolt 2	Torx bit
TPM11R050, 063...	SM35-114-H0	T-15DF	-	CM10X30H	-
TPM11R080M...	SM35-114-H0	T-15DF	-	CM12X30H	-
TPM11R100M...	SM35-114-H0	T-15DF	TMBA-M16H	-	-
TPM16R080M25.4-05, TPM16R080M27.0E05	CSTB-5L159	-	-	CM12X30H	BT20S
TPM16R100M31.7-06, TPM16R100M32.0E06	CSTB-5L159	-	TMBA-M16H	-	BT20S
TPM16R125M38.1-07, TPM16R125M40.0E07	CSTB-5L159	-	TMBA-M20H	-	BT20S

*Recommended clamping torque (N·m) : CSTB-3.5L110=3.5, CSTB-5L159=5, SM35-114-H0=3.5

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

GAMP = +5° ~ +6°, GAMF = +9° ~ +13°



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

SPARE PARTS



Designation	Clamping screw	Grip	Shell locking bolt
TLM11R050M22.0E03	SM35-114-H0	T-15DF	SD06-A3
TLM11R063M25.4-04, TLM11R063M27.0E04	SM35-114-H0	T-15DF	SD08-98

*Recommended clamping torque (N·m) : SM35-114-H0=3.5

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

Reference pages: Inserts → **H172**, Standard cutting conditions → **H173**

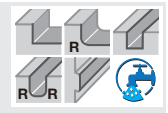
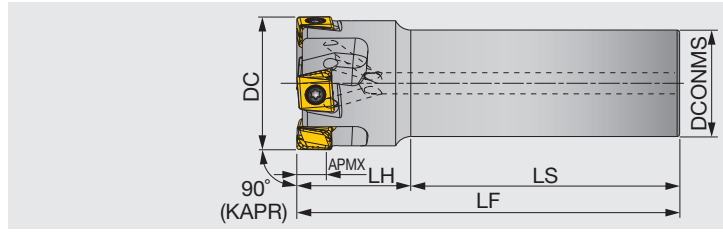


- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

TECMILL EPM11

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

GAMP = +5° ~ +6°, GAMF = +9° ~ +13°



Right hand (R) shown.

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

SPARE PARTS

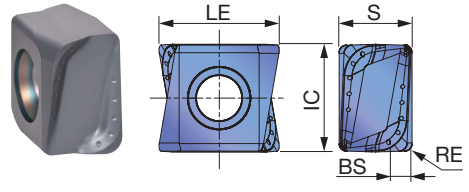
Designation	Clamping screw	Wrench
EPM11...	SM35-114-H0	T-15DF

*Recommended clamping torque (N·m) : SM35-114-H0=3.5

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

INSERT

LMMU11/16-MJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated						LE	IC	S	BS
			AH3135	AH725	AH120	AH140	T1215	T3225				
LMMU110708PNER-MJ	0.8	9.7	●	●	●	●	●	●	11.7	10.5	7.1	2
LMMU110716PNER-MJ	1.6	9.7	●	●	●	●	●	●	11.7	10.5	7.1	1.2
LMMU110724PNER-MJ	2.4	9.7		●	●	●			11.7	10.5	7.1	0.4
LMMU110732PNER-MJ	3.2	9.7		●	●	●			11.7	10.5	7.1	-
LMMU160908PNER-MJ	0.8	15.1	●	●	●	●	●	●	17.3	16	9.5	2.4
LMMU160916PNER-MJ	1.6	15.1	●	●	●	●			17.3	16	9.5	1.6
LMMU160924PNER-MJ	2.4	15.1		●	●	●			17.3	16	9.5	0.8
LMMU160932PNER-MJ	3.2	15.1		●	●	●			17.3	16	9.5	-

● : Line up

Reference pages: Standard cutting conditions → **H173**

STANDARD CUTTING CONDITIONS

Bore, shank type

ISO	Workpiece materials	Hardness	Priority	Grades	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)	
P	Low carbon steel S15C, SS400, etc. C15E4, E275A, etc.	- 200 HB	First choice	AH3135	100 - 250	0.12-0.3	
		- 200 HB	Wear resistance	T3225	150 - 350	0.08 - 0.2	
	Carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	- 300 HB	First choice	AH3135	100 - 230	0.1 - 0.25	
		- 300 HB	Wear resistance	T3225	150 - 350	0.08 - 0.2	
M	Prehardend steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3135	100 - 230	0.1 - 0.25	
		30 - 40 HRC	Wear resistance	T3225	120 - 350	0.08 - 0.2	
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	First choice	AH3135	90 - 180	0.1 - 0.25	
K	Grey cast iron FC250, etc. 250, etc.	150 - 250 HB	First choice	AH120	140 - 250	0.12 - 0.3	
		150 - 250 HB	Wear resistance	T1215	120 - 350	0.08 - 0.2	
	Ductile cast iron FCD400, FCD600, etc. 400-15S, 600-3, etc.	150 - 250 HB	First choice	AH120	110 - 200	0.12- 0.3	
		150 - 250 HB	Wear resistance	T1215	120 - 350	0.08 - 0.2	
S	Titanium alloys Ti-6Al-4V, etc.	-	First choice	AH725	30 - 60	0.08 - 0.2	
		-	First choice	AH725	20 - 50	0.06 - 0.1	
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	40 - 50 HRC	First choice	AH725	45 - 70	0.08 - 0.15
		SKD11, etc. X153CrMoV12, etc.	50 - 60 HRC	First choice	AH725	40 - 65	0.06 - 0.1

Roughing type

ISO	Workpiece materials	Hardness	Priority	Grades	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)	
P	Low carbon steel S15C, SS400, etc. C15E4, E275A, etc.	- 200 HB	First choice	AH3135	100 - 250	0.1 - 0.25	
		- 300 HB	Wear resistance	T3225	150 - 350	0.1 - 0.2	
	Carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc.	- 300 HB	First choice	AH3135	100 - 200	0.1 - 0.2	
		- 300 HB	Wear resistance	T3225	150 - 300	0.1 - 0.2	
M	Prehardend steel NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3135	100 - 200	0.1 - 0.2	
		30 - 40 HRC	Wear resistance	T3225	120 - 300	0.1 - 0.2	
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.	-	First choice	AH3135	90 - 150	0.1 - 0.25	
K	Grey cast iron FC250, etc. 250, etc.	150 - 250 HB	First choice	AH120	100 - 250	0.1 - 0.25	
		150 - 250 HB	Wear resistance	T1215	120 - 350	0.1 - 0.25	
	Ductile cast iron FCD400, FCD600, etc. 400-15S, 600-3, etc.	150 - 250 HB	First choice	AH120	100 - 200	0.1 - 0.25	
		150 - 250 HB	Wear resistance	T1215	120 - 350	0.1 - 0.25	
S	Titanium alloys Ti-6Al-4V, etc.	-	First choice	AH725	20 - 50	0.06 - 0.15	
		-	First choice	AH725	20 - 40	0.06 - 0.1	
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	40 - 50 HRC	First choice	AH725	30 - 60	0.08 - 0.15
		SKD11, etc. X153CrMoV12, etc.	50 - 60 HRC	First choice	AH725	25 - 55	0.06 - 0.1

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



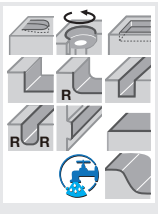
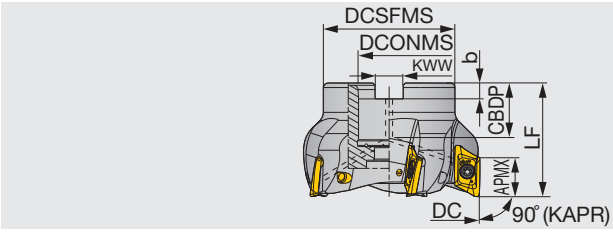
- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

TUNG-ALUMILL

TPV16

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

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



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

SPARE PARTS



Designation	Clamping screw	Grip	Shell locking bolt	Torx bit
TPV16R040M16.0E03	TS40093I/HG	H-TBS	SHM8X1.25X35-C	BT15S
TPV16R050 - 063...	TS40093I/HG	H-TBS	SHM10X1.5X30-C	BT15S
TPV16R080M27.0E05	TS40093I/HG	H-TBS	LHM12X1.75X30-C	BT15S
TPV16R100M32.0E06	TS40093I/HG	H-TBS	SHM16X2X35-C	BT15S
TPV16R125M40.0E07	TS40093I/HG	H-TBS	SHM20X2.5X40-C	BT15S

*Recommended clamping torque (N-m) : TS40093I/HG=4.5

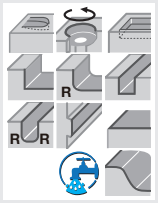
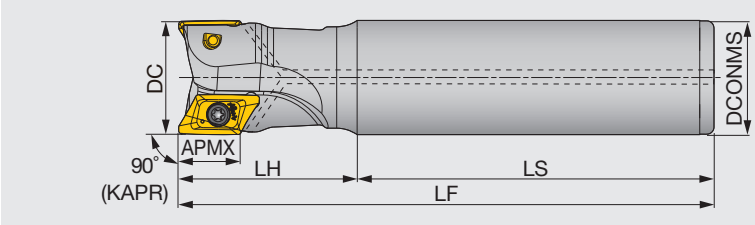
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

TUNG-ALUMILL

EPV16

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

GAMP = +6° ~ +10°, GAMF = -12° ~ -9°



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

SPARE PARTS



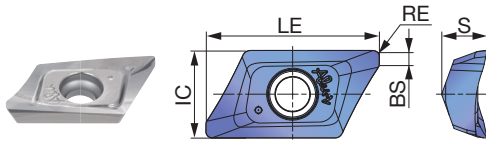
Designation	Clamping screw	Grip	Torx bit
EPV16R025M...	TS40085I/HG	H-TBS	BT15S
EPV16R032M...	TS40093I/HG	H-TBS	BT15S
EPV16R040M...	TS40093I/HG	H-TBS	BT15S

*Recommended clamping torque (N-m) : TS40085I/HG=4.5, TS40093I/HG=4.5

Reference pages: Inserts, Standard cutting conditions → **H175**

INSERT

XVCT16-AJ



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Uncoated										LE	IC	S	BS	
			TH10														
XVCT160504R-AJ	0.4	16	●											22.2	11.2	5.9	1.3
XVCT160508R-AJ	0.8	16	●											22.2	11.2	5.9	1
XVCT160512R-AJ	1.2	15.5	●											21.7	11.2	5.8	1
XVCT160516R-AJ	1.6	15	●											21.2	11.2	5.75	1
XVCT160520R-AJ	2	14.5	●											20.8	11.2	5.75	1
XVCT160530R-AJ	3	14	●											19.5	11.2	5.6	1
XVCT160532R-AJ	3.2	14	●											19.2	11.2	5.6	1
XVCT160540R-AJ	4	13	●											18.4	11.2	5.5	1.2
XVCT160550R-AJ	5	13	●											18.4	11.2	5.4	0.4

* When using inserts with corner radius RE ≥ 3.2 mm, standard cutter body has to be modified with "R". "R" = RE - 0.3 mm

● : Line up

STANDARD CUTTING CONDITIONS

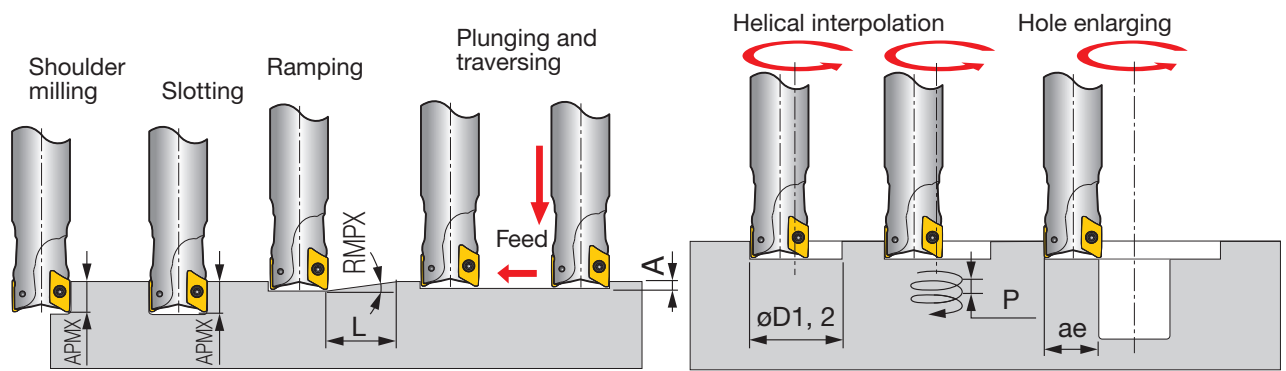
ISO	Workpiece material	Hardness HB	Grade	Chip-breaker	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
N	Aluminium alloy	60	TH10	AJ	300 - 5000	0.15 - 0.35
		100	TH10	AJ	200 - 2000	0.1 - 0.25
	Cast aluminium alloy Si ≤ 12%	75	TH10	AJ	200 - 2000	0.15 - 0.3
		90	TH10	AJ	200 - 1500	0.1 - 0.25
	Cast aluminium alloy Si > 12%	130	TH10	AJ	200 - 1000	0.07 - 0.15
	Copper alloys Pb > 1%	110	TH10	AJ	200 - 800	0.07 - 0.15
	Copper alloys	90	TH10	AJ	300 - 1000	0.1 - 0.15
		100	TH10	AJ	300 - 800	0.1 - 0.15
	Duroplastics, fiber plastics	-	TH10	AJ	100 - 500	0.1 - 0.15
	Hard rubber	-	TH10	AJ	100 - 300	0.1 - 0.15

Safety guidelines

1. Use only the original inserts, cutters and spare parts.
2. Insert pocket must be cleaned before clamping the insert.
3. Clamp torque of screw should be 4.5 N·m.
4. For safety reasons, use a new screw when changing the insert.
5. Maximum RPM values are determined based on the burst test. Using RPM beyond maximum values may cause insert breakage, machine damage or personal injury.
6. XVCT insert has sharp cutting edges. Always wear gloves for protection from injury when handling.



APPLICATION RANGE

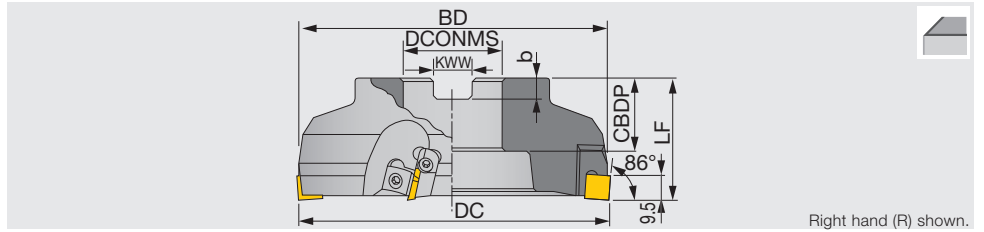
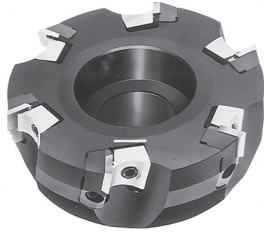


Designation	Tool DC	Corner radius RE	Max. depth of cut APMX	Max. ramping angle RMPX	Min. length L	Max. plunging depth A	Straight ramp down		Helical ramp down		Hole enlarging Max. width ae
							Step down Max. plunging depth øD1	Min. machining P	Min. machining øD2	Max. pitch/rev P	
EPV16R025...	25	0.4, 0.8	16	22	40	4.2	29.1	4.4	49	13.6	22.5
EPV16R025...	25	1.2	15.5	22	40	4.2	29.1	4.4	49	13.6	22.5
EPV16R025...	25	1.6	15	22	38	3.7	29.1	4.4	49	13.2	22.5
EPV16R025...	25	2	14.5	22	38	3.7	29.1	4.4	49	13.2	22.5
EPV16R025...	25	3, 3.2	14	21	38	2.5	29.1	4.2	49	12.3	22.5
EPV16R025...	25	4, 5	13	18.5	40	2.3	29.1	3.7	49	12.3	22.5
EPV16R032...	32	0.4, 0.8	16	16.5	54	4	43.1	8.8	63	13.6	28.8
EPV16R032...	32	1.2	15.5	16.5	54	4	43.1	8.8	63	13.6	28.8
EPV16R032...	32	1.6	15	16	54	3.5	43.1	8.5	63	13.2	28.8
EPV16R032...	32	2	14.5	16	54	3.5	43.1	8.5	63	13.2	28.8
EPV16R032...	32	3, 3.2	14	15	54	3	43.1	7.9	63	12.3	28.8
EPV16R032...	32	4, 5	13	13.5	56	2.5	43.1	7.1	63	12.3	28.8
T/EPV16R040...	40	0.4, 0.8	16	11.5	79	4	59.1	10.4	79	13.6	36
T/EPV16R040...	40	1.2	15.5	11.5	79	4	59.1	10.4	79	13.6	36
T/EPV16R040...	40	1.6	15	11	80	3.5	59.1	9.9	79	13.2	36
T/EPV16R040...	40	2	14.5	11	80	3.5	59.1	9.9	79	13.2	36
T/EPV16R040...	40	3, 3.2	14	10	82	3	59.1	9	79	12.3	36
T/EPV16R040...	40	4, 5	13	8.5	90	2.5	59.1	7.6	79	12.3	36
TPV16R050...	50	0.4, 0.8	16	9.5	96	4	79.1	13	99	13.6	45
TPV16R050...	50	1.2	15.5	9.5	96	4	79.1	13	99	13.6	45
TPV16R050...	50	1.6	15	9	98	3.5	79.1	12.3	99	13.2	45
TPV16R050...	50	2	14.5	9	98	3.5	79.1	12.3	99	13.2	45
TPV16R050...	50	3.0, 3.2	14	8	103	3	79.1	10.9	99	12.3	45
TPV16R050...	50	4, 5	13	7	110	2.5	79.1	9.5	99	12.3	45
TPV16R063...	63	0.4, 0.8	16	7	130	4	105.1	13.6	125	13.6	56.7
TPV16R063...	63	1.2	15.5	7	130	4	105.1	13.6	125	13.6	56.7
TPV16R063...	63	1.6	15	6.5	136	3.5	105.1	12.8	125	13.2	56.7
TPV16R063...	63	2	14.5	6.5	136	3.5	105.1	12.8	125	13.2	56.7
TPV16R063...	63	3.0, 3.2	14	6	136	3	105.1	11.8	125	12.3	56.7
TPV16R063...	63	4, 5	13	5.5	140	2.5	105.1	10.8	125	12.3	56.7
TPV16R080...	80	0.4, 0.8	16	5	183	4	139.1	13.6	159	13.6	72
TPV16R080...	80	1.2	15.5	5	183	4	139.1	13.6	159	13.6	72
TPV16R080...	80	1.6	15	4.5	197	3.5	139.1	12.4	159	13.2	72
TPV16R080...	80	2	14.5	4.5	197	3.5	139.1	12.4	159	13.2	72
TPV16R080...	80	3, 3.2	14	4	207	3	139.1	11	159	12.3	72
TPV16R080...	80	4, 5	13	3.5	221	2.5	139.1	9.6	159	12.3	72
TPV16R100...	100	0.4, 0.8	16	3.5	262	4	179.1	12.9	199	13.6	90
TPV16R100...	100	1.2	15.5	3.5	262	4	179.1	12.9	199	13.6	90
TPV16R100...	100	1.6	15	3	296	3.5	179.1	11.1	199	13.2	90
TPV16R100...	100	2	14.5	3	296	3.5	179.1	11.1	199	13.2	90
TPV16R100...	100	3, 3.2	14	2.5	332	3	179.1	9.2	199	12.3	90
TPV16R100...	100	4, 5	13	2.5	309	2.5	179.1	9.2	199	11.6	90
TPV16R125...	125	0.4, 0.8	16	2.5	367	4	229.1	12.1	249	13.6	112.5
TPV16R125...	125	1.2	15.5	2.5	367	4	229.1	12.1	249	13.6	112.5
TPV16R125...	125	1.6	15	2	444	3.5	229.1	9.7	249	13.2	112.5
TPV16R125...	125	2	14.5	2	444	3.5	229.1	9.7	249	13.2	112.5
TPV16R125...	125	3, 3.2	14	1.5	554	3	229.1	7.3	249	8.7	112.5
TPV16R125...	125	4, 5	13	1.5	516	2.5	229.1	7.3	249	8.7	112.5

THE4000RIA

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

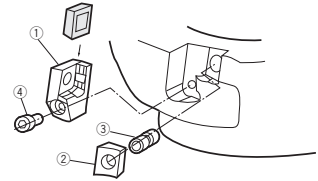
GAMP = 13°, GAMF = +7° ~ +9°



Designation	APMX	DC	CICT	BD	LF	DCONMS	CBDP	KWW	b	WT(kg)	Insert
THE4003RIA	6	80	4	80	50	25.4	26	9.5	6	1.5	S/WE*N42...
THE4004RIA	6	100	5	99	63	31.75	32	12.7	8	2.1	S/WE*N42...
THE4005RIA	6	125	6	124	63	38.1	38	15.9	10	3.2	S/WE*N42...

SPARE PARTS

Designation	① Locator	② Wedge	③ Wedge fixing screw	④ Locator fixing screw	Wrench
THE4003RIA	LE413R	WP440R	FDS-8SS	CM4X0.7X14	TP-4
THE4004RIA	LE413R	WP440R	FDS-8S	CM4X0.7X14	TP-4

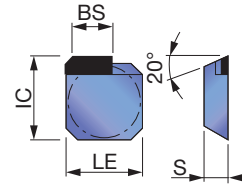
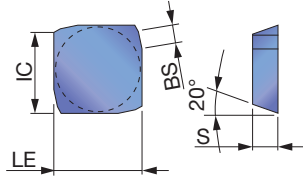
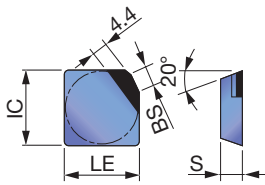


INSERT

SECN42ZFR-DIA

SEEN/SECN 42Z

WECN42ZFR-DIA



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

★ : First choice
☆ : Second choice

Designation	APMX	Uncoated		PCD								LE	IC	S	BS	
		TH10	DX140													
SECN42ZFR-DIA	3.5		●										12.7	12.7	3.18	2.5
SECN42ZFR	6	●											12.7	12.7	3.18	2.5
SEEN42ZFR	6	●											12.7	12.7	3.18	2.5
WECN42ZFR-DIA	0.5		●										12.4	12.93	3.18	6

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

● : Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grades	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
N	Aluminium alloys Si < 13%	TH10	200 ~ 1000	0.05 ~ 0.2
		DX140	200 ~ 1000	0.05 ~ 0.2
	Aluminium alloys Si ≥ 13%	TH10	80 ~ 200	0.1 ~ 0.2
		DX140	200 ~ 400	0.1 ~ 0.2
	Duralumin	TH10	200 ~ 1000	0.05 ~ 0.2
		DX140	200 ~ 1000	0.05 ~ 0.2
	Copper alloys	TH10	200 ~ 500	0.05 ~ 0.2

Note : Use of water-soluble cutting fluid is recommended.
Maximum depth of cut for SECN42ZFR-DIA is 3.5 mm.

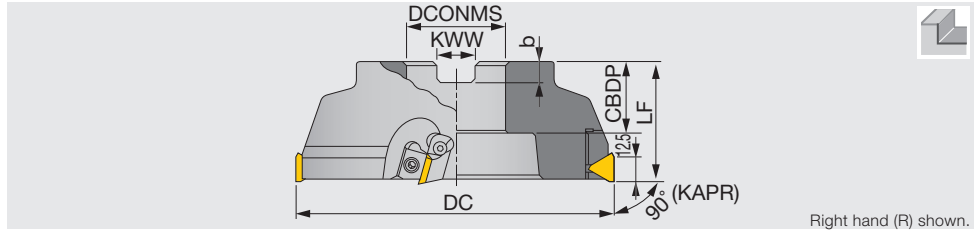


- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

TSE3000R

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

GAMP = +17°, GAMF = +5°



Right hand (R) shown.

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

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

SPARE PARTS

Designation	① Clamp set	② Locator	③ Locator fixing screw	④ Wedge	⑤ Wedge fixing screw	Wrench 1	Wrench 2
TSE3050R..., 63R...	CSL-4	-	-	-	-	-	P-3
TSE300*RIA	-	LE303R	CM4X0.7X12	WF330R	FDS-8S	TP-4	-

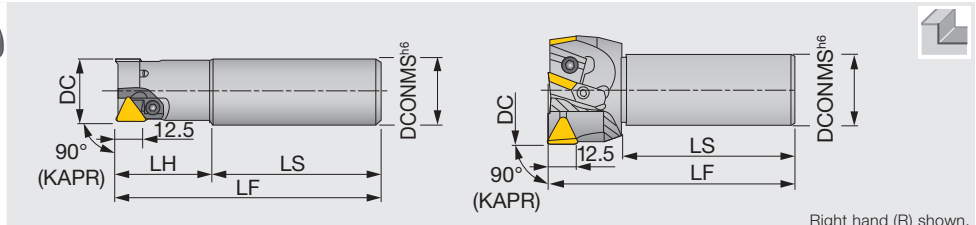
*Recommended clamping torque (N·m) : FDS-8S=8

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

ESE3000R

Square shoulder endmill, shank type, with wedge clamp system, for positive triangular inserts

GAMP = +17°, GAMF = +5°



Right hand (R) shown.

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

Note: The items do not have variable pitch.

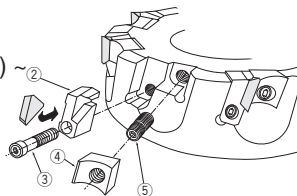
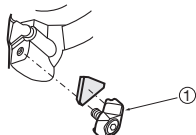
SPARE PARTS

Designation	Clamp set	Locator	Wedge fixing screw	Shell locking bolt	Wedge	Wrench 1	Wrench 2
ESE3020R - ESE3050R	CSL-4	-	-	-	-	-	P-3
ESE3063R	-	LE302R	DS-8S	SHCM4-10	WP302R	TP-4	-

*Recommended clamping torque (N·m) : DS-8S=8

TSE3050R ~ 3063R
ESE3020R ~ 3040R

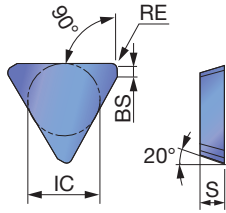
TSE3003R/LIA~
3006R/LIA
ESE3050R (RS**)
3063R (RS**)



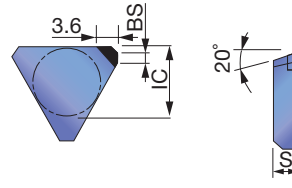
Reference pages: Inserts → **H179**, Standard cutting conditions → **H180**

INSERT

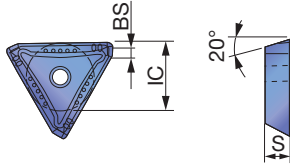
TECN/TEEN 32Z



TECN32ZFR-DIA



TEKR16-MS



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated										Cermet		Uncoated		PCD		IC	S	BS			
			AH120	AH130	AH140	AH330	GH330	T1115	T3130	AH3135	T1215	T3225	NS740	N308	UX30	TH10	DX140							
TECN32ZFR	-	8																				9.525	3.18	1.37
TECN32ZTR	0.8	8													●	●	●					9.525	3.18	1
TEEN32ZFR	-	8																●				9.525	3.18	1.37
TEEN32ZTR	0.8	8	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					9.525	3.18	1
TECN32ZFR-DIA	-	2.5																		●		9.525	3.18	1.37
TEKR1603PEPR-MS	-	8			●																	9.525	3.18	1.49

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

● : Line up
DX140: 1 piece per package

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



STANDARD CUTTING CONDITIONS

Applied to cutter dia. ≤ ø40 mm

ISO	Workpiece material	Grades	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Mild steels Unhardened steels < 180 HB	AH3135	60 ~ 180	0.05 ~ 0.2
		NS740	60 ~ 150	0.05 ~ 0.15
	Carbon steels Alloy steels < 300 HB	AH3135	60 ~ 150	0.05 ~ 0.18
		NS740	60 ~ 130	0.05 ~ 0.15
	Die steels < 30 HRC	AH3135	80 ~ 130	0.05 ~ 0.2
		NS740	60 ~ 130	0.05 ~ 0.15
M	Stainless steels < 250 HB	AH3135	100 ~ 180	0.08 ~ 0.2
K	Cast irons	AH120	100 ~ 150	0.05 ~ 0.2
N	Aluminium alloys	TH10	200 ~ 400	0.05 ~ 0.2
S	Titanium alloys Ti-6Al-4V, etc.	AH130	20 ~ 60	0.05 ~ 0.15
	Heat-resistant alloys Inconel 718, etc.	AH120	20 ~ 40	0.05 ~ 0.1

Applied to cutter dia. ≥ ø50 mm

ISO	Workpiece material	Grades	Roughing (Depth of cut: > 1.5 mm)		Finishing (Depth of cut: 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)
P	Mild steels Unhardened steels < 180 HB	AH3135	130 ~ 230	0.1 ~ 0.2	130 ~ 250	0.1 ~ 0.23
		T3225	130 ~ 300	0.1 ~ 0.23	150 ~ 300	0.1 ~ 0.25
		NS740	130 ~ 200	0.1 ~ 0.18	150 ~ 250	0.1 ~ 0.2
	Carbon steels Alloy steels < 300 HB	AH3135	100 ~ 200	0.1 ~ 0.18	130 ~ 230	0.1 ~ 0.2
		T3225	130 ~ 280	0.1 ~ 0.2	180 ~ 280	0.1 ~ 0.23
		NS740	100 ~ 150	0.1 ~ 0.15	150 ~ 200	0.1 ~ 0.18
Die steels < 30 HRC	AH3135	100 ~ 150	0.1 ~ 0.15	100 ~ 150	0.1 ~ 0.2	
	T3225	100 ~ 250	0.1 ~ 0.15	100 ~ 250	0.1 ~ 0.2	
M	Stainless steels < 250 HB	AH3135	80 ~ 180	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
		T3225	150 ~ 200	0.1 ~ 0.18	200 ~ 250	0.1 ~ 0.25
K	Cast irons Ductile cast iron	T1215	100 ~ 250	0.1 ~ 0.2	100 ~ 250	0.1 ~ 0.2
		AH120	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
N	Aluminium alloys Si < 13%	TH10	200 ~ 1000	0.05 ~ 0.25	350 ~ 1000	0.1 ~ 0.25
		DX140	200 ~ 1000	0.05 ~ 0.15	350 ~ 1000	0.1 ~ 0.2
	Copper alloys	TH10	200 ~ 500	0.1 ~ 0.15	200 ~ 500	0.1 ~ 0.2
S	Titanium alloys Ti-6Al-4V, etc.	AH130	20 ~ 60	0.05 ~ 0.15	20 ~ 60	0.05 ~ 0.15
	Heat-resistant alloys Inconel 718, etc.	AH120	20 ~ 40	0.05 ~ 0.1	20 ~ 40	0.05 ~ 0.1

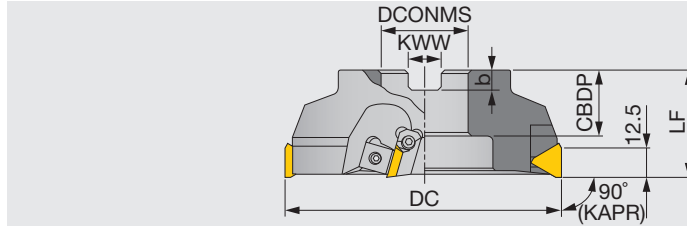
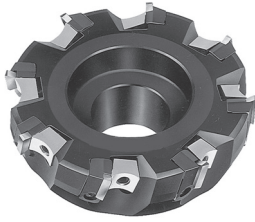
Note:

- Dry cutting is recommended except for aluminium alloys
- Maximum depth of cut for TECN32ZFR-DIA is 2.5 mm.

TSE4000RIA

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

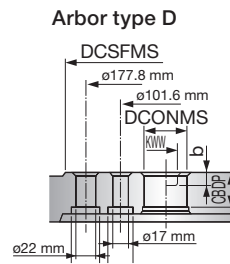
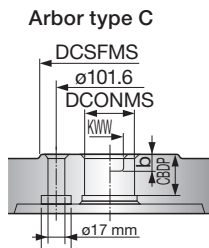
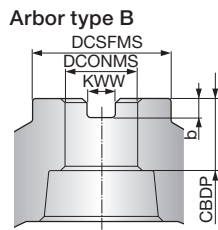
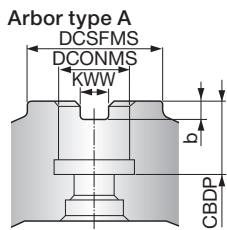
GAMP = +17°, GAMF = +5°



Right hand (R) shown.

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

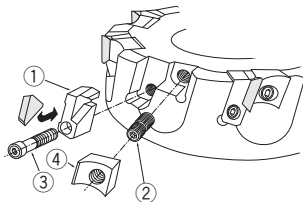
Arbor type



SPARE PARTS

Designation	①Locator	②Wedge fixing screw	③Locator fixing screw	Shell locking bolt	④Wedge	Wrench
TSE4003RIA	LE403R	FDS-8SS	CM4X0.7X14	CAP-CM12X1.75X30	WF330N	TP-4
TSE4004RIA	LE403R	FDS-8S	CM4X0.7X14	CAP-CM16X2.0X40	WF330N	TP-4
TSE4005 - 12...	LE405R	FDS-8S	CM4X0.7X14	-	WF500R	TP-4
TSE4003RIAE	LE403R	FDS-8S	CM4X0.7X14	-	WF330N	TP-4
TSE4004RIAE	LE403R	FDS-8S	CM4X0.7X14	-	WF330N	TP-4
TSE4005RIAE	LE405R	FDS-8S	CM4X0.7X14	-	WF500R	TP-4
TSE4006RIAE	LE405R	FDS-8S	CM4X0.7X14	-	WF500R	TP-4

*Recommended clamping torque (N·m) : FDS-8SS/FDS-8S=8



Reference pages: Inserts → **H182**, Standard cutting conditions → **H183**

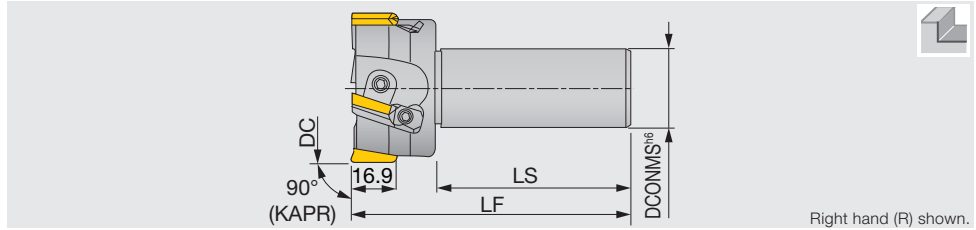


- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling

ESE4000R

Square shoulder endmill, shank type, with wedge clamp system, for positive triangular inserts

GAMP = +17°, GAMF = +1° ~ +4°



Right hand (R) shown.

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

(注) ESE4050RA and ESE4063RA do not have variable pitch.

SPARE PARTS

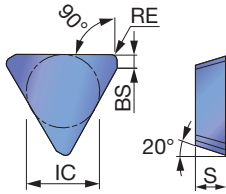
Designation	Locator	Wedge fixing screw	Locator fixing screw	Shell locking bolt	Wedge	Wrench
ESE4050RA	LE402AR	DS-8S	-	SHCM4-10	WT402R	TP-4
ESE4063RA	LE402AR	DS-8	-	SHCM4-10	WT402R	TP-4
ESE4003RIA-S32	LE403R	FDS-8S	CM4X0.7X14	-	WF330N	TP-4

*Recommended clamping torque (N·m) : DS-8S/DS-8/FDS-8S=8

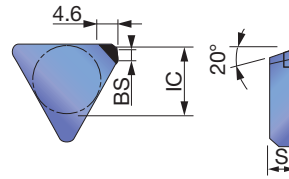
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

INSERT

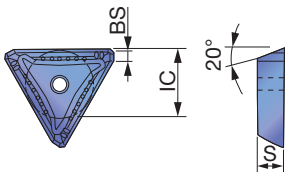
TECN/TEEN 43Z



TECN43ZFR-DIA



TEKR22-MS



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated										Cermet		Uncoated		PCD	IC	S	BS					
			AH120	AH130	AH140	AH330	GH330	T1115	T3130	AH3135	T1215	T3225	NS740	N308	UX30	TH10	DX140								
TECN43ZFR	C0.5	10																				12.7	4.76	2	
TECN43ZTR	1	10																					12.7	4.76	1.31
TEEN43ZFR	C0.5	10																					12.7	4.76	2
TEEN43ZTR	1	10	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	12.7	4.76	1.31
TECN43ZFR-DIA	-	3.5																				●	12.7	4.76	2
TEKR2204PEPR-MS	-	10			●																		12.7	4.76	1.8

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

● : Line up

DX140: 1 piece per package

Reference pages: Standard cutting conditions → **H183**

STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grades	Roughing (Depth of cut: > 1.5 mm)		Finishing (Depth of cut: 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)
P	Mild steels Unhardened steels < 180 HB	AH3135	130 ~ 230	0.1 ~ 0.2	150 ~ 250	0.1 ~ 0.23
		T3225	130 ~ 300	0.1 ~ 0.23	180 ~ 300	0.1 ~ 0.25
		NS740	130 ~ 200	0.1 ~ 0.18	150 ~ 250	0.1 ~ 0.2
	Carbon steels Alloy steels < 300 HB	AH3135	100 ~ 200	0.1 ~ 0.18	130 ~ 230	0.1 ~ 0.2
		T3225	130 ~ 280	0.1 ~ 0.2	180 ~ 280	0.1 ~ 0.23
		NS740	100 ~ 150	0.1 ~ 0.15	150 ~ 200	0.1 ~ 0.18
Die steels < 30 HRC	T3225	100 ~ 250	0.1 ~ 0.15	100 ~ 250	0.1 ~ 0.2	
	AH3135	100 ~ 150	0.1 ~ 0.15	100 ~ 150	0.1 ~ 0.2	
M	Stainless steels < 250 HB	AH3135	80 ~ 180	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
		T3225	150 ~ 200	0.1 ~ 0.18	200 ~ 250	0.1 ~ 0.25
K	Cast irons Ductile cast iron	T1215	100 ~ 250	0.1 ~ 0.2	100 ~ 250	0.1 ~ 0.25
		AH120	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
N	Aluminium alloys Si < 13%	TH10	200 ~ 1000	0.05 ~ 0.25	350 ~ 1000	0.1 ~ 0.25
		DX140	200 ~ 1000	0.05 ~ 0.15	350 ~ 1000	0.1 ~ 0.2
	Copper alloys	TH10	200 ~ 500	0.1 ~ 0.15	200 ~ 500	0.1 ~ 0.2
S	Titanium alloys Ti-6Al-4V, etc.	AH130	20 ~ 60	0.05 ~ 0.15	20 ~ 60	0.05 ~ 0.15
	Heat-resistant alloys Inconel 718, etc.	AH120	20 ~ 40	0.05 ~ 0.1	20 ~ 40	0.05 ~ 0.1

Note:

- Dry cutting is recommended except for aluminium alloys
- Maximum depth of cut for DX140 TECN43ZFR-DIA is 3.5 mm.

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

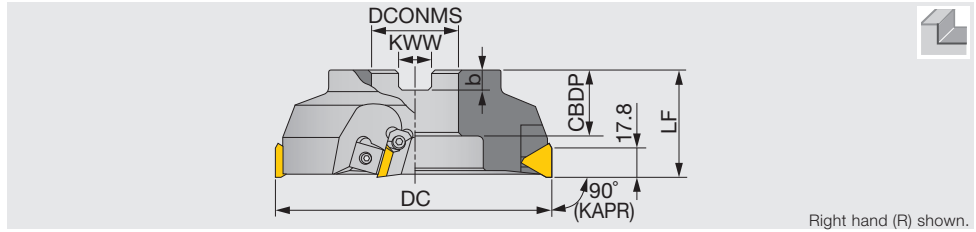
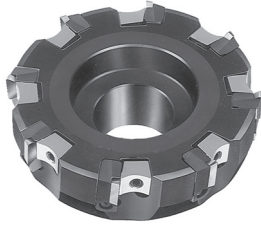


- High Feed Milling
- Face Milling
- Shoulder Milling
- Slot Milling
- Profile Milling
- Approach angle
- 10°-20°
- 45°
- 70°
- 85°
- 88°
- 90°
- Others

TSP4000IA

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

GAMP = +5°, GAMF = 0°



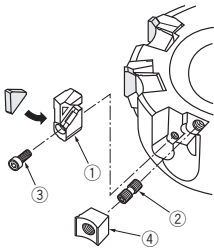
Right hand (R) shown.

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

SPARE PARTS

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

*Recommended clamping torque (N-m) : FDS-8S=8

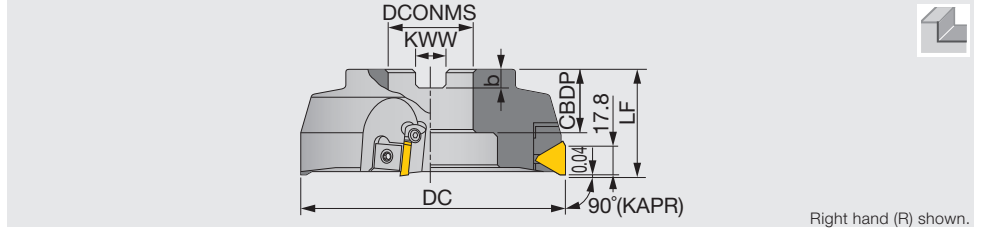
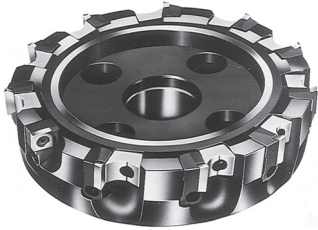


Reference pages: Inserts, Standard cutting conditions → [H186](#) - [H187](#)

TFP4000IA

Square shoulder mill with finisher

GAMP = +5°, GAMF = 0°



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

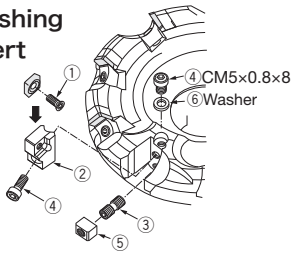
A SPARE PARTS FOR FINISHING INSERT



Designation	① Clamping screw	② Locator	③ Wedge fixing screw	④ Locator fixing screw	⑤ Wedge	Wrench 1	Wrench 2
TFP40...	CSTA-5S	LW400R	FDS-8S	CM4X0.7X14	CM5X0.8X16	FW-305	T-15D / TP-4

*Recommended clamping torque (N·m) : FDS-8S=8

A Finishing insert



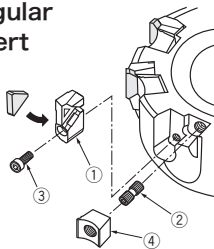
B SPARE PARTS FOR REGULAR INSERT



Designation	① Clamping screw	② Wedge fixing screw	③ Locator fixing screw	④ Wedge	Wrench
TFP4004RIA	LP403R	FDS-8S	CM4X0.7X14	WF330N	TP-4
TFP4005 - 08...	LP405R	FDS-8S	CM4X0.7X14	WF500R	TP-4

*Recommended clamping torque N·m) : FDS-8S=8

B Regular insert



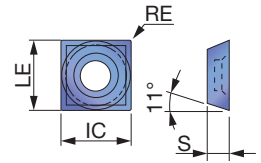
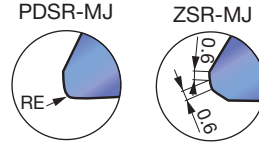
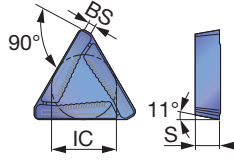
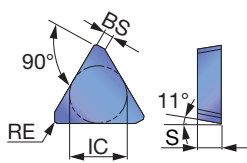
High Feed Milling
Face Milling
Shoulder Milling
Slot Milling
Profile Milling
Approach angle
10°-20°
45°
70°
85°
88°
90°
Others

INSERT

TPCN/TPEN/TPKN 43Z

TPKR/TPMR-MJ

SPHA-FNW



図は右勝手 (R) を示す

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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated					Cermet		Uncoated		IC	LE	S	BS		
			AH120	AH130	AH140	GH330	T1115	T3130	NS740	N308	UX30					TH10	
TPCN43ZFR	C0.5	10									●			12.7	-	4.76	2
TPCN43ZTR	C0.5	10						●	●	●				12.7	-	4.76	2
TPEN43ZTR	C0.5	10						●						12.7	-	4.76	2
TPEN43ZTRCR	1	10												12.7	-	4.76	2
TPKN43ZFR	C0.5	10									●			12.7	-	4.76	2
TPKN43ZTR	C0.5	10	●	●	●	●	●	●	●	●				12.7	-	4.76	2
TPKR43ZSR-MJ	-	10				●	●							12.7	-	4.76	1.5
TPMR2204PDSR-MJ	0.8	10				●	●							12.7	-	4.76	1.2
TPKN43ZFL	C0.5	10								●				12.7	-	4.76	2
SPHA431FNW	0.4	-							●	●				12.7	12.7	4.76	-

● : Line up

STANDARD CUTTING CONDITIONS

TSP4000IA · TFP4000IA (When finishing insert is not in use)

ISO	Workpiece material	Grades	Roughing (Depth of cut: > 1.5 mm)		Finishing (Depth of cut: 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)
P	Mild steels Unhardened steels < 180 HB	AH120 · GH330	100 ~ 230	0.1 ~ 0.25	130 ~ 250	0.1 ~ 0.3
		T3130	130 ~ 300	0.1 ~ 0.28	180 ~ 300	0.1 ~ 0.3
		UX30	100 ~ 180	0.1 ~ 0.25	130 ~ 200	0.1 ~ 0.3
		NS740 · N308	130 ~ 200	0.1 ~ 0.2	150 ~ 250	0.1 ~ 0.25
	Carbon steels Alloy steels < 300 HB	AH120 · GH330	100 ~ 180	0.1 ~ 0.2	150 ~ 200	0.1 ~ 0.28
		T3130	130 ~ 180	0.1 ~ 0.25	180 ~ 280	0.1 ~ 0.28
		UX30	80 ~ 130	0.1 ~ 0.2	100 ~ 150	0.1 ~ 0.28
		NS740 · N308	100 ~ 150	0.1 ~ 0.18	150 ~ 200	0.1 ~ 0.23
Die steels < 30 HRC	T3130 · AH120 · GH330	100 ~ 150	0.1 ~ 0.18	100 ~ 150	0.1 ~ 0.2	
	UX30	80 ~ 130	0.1 ~ 0.18	80 ~ 130	0.1 ~ 0.2	
M	Stainless steels < 250 HB	AH130 · AH140	150 ~ 200	0.15 ~ 0.23	200 ~ 230	0.15 ~ 0.25
		AH120	150 ~ 230	0.15 ~ 0.2	200 ~ 250	0.15 ~ 0.23
K	Cast irons Ductile cast iron	T1115	100 ~ 200	0.1 ~ 0.2	100 ~ 200	0.1 ~ 0.25
		TH10 · UX30	80 ~ 130	0.1 ~ 0.2	80 ~ 130	0.1 ~ 0.25
S	Titanium alloys	AH130	20 ~ 60	0.05 ~ 0.15	20 ~ 60	0.05 ~ 0.15
	Heat-resistant alloys	AH120	20 ~ 40	0.05 ~ 0.1	20 ~ 40	0.05 ~ 0.1

STANDARD CUTTING CONDITIONS FOR MJ INSERT TPM/KR

ISO	Workpiece material	Roughing (Depth of cut: > 1.5 mm)	
		Feed per tooth f_z (mm/t)	
		TPKR43ZSR-MJ	TPMR2204PDSR-MJ
P	Mild steels-Unhardened steels < 180 HB	0.1 ~ 0.23	0.1 ~ 0.4
	Carbon steels · Alloy steels < 300 HB	0.1 ~ 0.2	0.1 ~ 0.35
	Die steels < 30 HRC	0.1 ~ 0.18	0.1 ~ 0.25

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

STANDARD CUTTING CONDITIONS (WHEN FINISHING INSERT IS IN USE)

TFP4000IA (For finishing)

ISO	Workpiece material	Grades		Cutting speed V_c (m/min)
		Regular insert	Finishing insert	
P	Mild steels-Unhardened steels < 180 HB	NS740	N308	180 ~ 300
		N308	N308	180 ~ 250
	Carbon steels · Alloy steels < 300 HB	NS740	N308	150 ~ 250
		N308	N308	150 ~ 230
K	Cast irons. Ductile cast irons	T1115	TH10	100 ~ 150

Notes:

- Above conditions are applied when the finishing insert is used.
- Generally, high-speed, high-feed and small depth of cut are recommended for TFP4000IA type cutters.
- When cutting width is larger than 60 mm, the maximum depth of cut should be around 1 mm.

Starting guideline		
Depth of cut a_p (mm)	Feed per rev. f (mm/rev)	Feed per tooth f_z (mm/t)
> 1.0	1 ~ 1.6	0.15 ~ 0.2
0.2 ~ 0.7	1.6 ~ 2.5	0.18 ~ 0.3
< 0.1	2 ~ 3.5	0.2 ~ 0.4

Notes: When cutting width is larger than 60 mm, the maximum depth of cut should be around 1 mm.

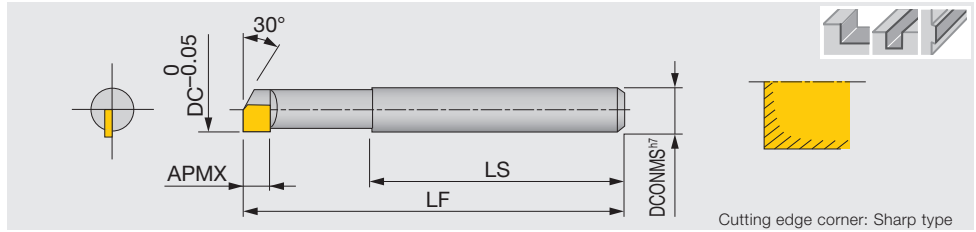
Grade
Insert
Ext. Toolholder
Int. Toolholder
Threading
Grooving
Miniature tool
Milling cutter
Endmill
Drilling tool
Tooling System
User's Guide
Index





DEB1000

T-DIA endmill for high speed aluminium machining



Designation	DX140	NOF	DC	DCONMS	APMX	LS	LF
DEB1040	●	1	4	6	3.5	32	45
DEB1050	●	1	5	6	3.5	35	50
DEB1060	●	1	6	6	3.5	35	50
DEB1070		1	7	8	5	37	55
DEB1080	●	1	8	8	5	37	55
DEB1090		1	9	10	5	40	60
DEB1100	●	1	10	10	5	40	60
DEB1110		1	11	12	5	45	65
DEB1120	●	1	12	12	5	45	65

Note:

- The cutting edge is very sharp. Please handle it carefully. Do not directly measure the cutting edge with micrometer, etc. as it may cause chipping.
- Please keep the tool overhang from the milling chuck as short as possible.
- Please choose a machine that is as rigid as possible.

●: Line up



STANDARD CUTTING CONDITIONS

DEB1000

For side milling $a_p \leq 3D$, $a_e = 0.1 \text{ mm}$

ISO	Workpiece material	Mill dia. (mm)	Cutting Speed V_c (m/min)	No. of revolutions n (min^{-1})	Table feed V_f (mm/min)
N	Aluminium alloys, Copper alloys	ø4	120 - 180	12,000	120
		ø5	120 - 180	9,600	120
		ø6	120 - 180	8,000	120
		ø8	120 - 180	6,000	120
		ø10	120 - 180	4,800	120
		ø12	120 - 180	4,000	100

- Keep the tool overhang as short as possible. When the overhang is long, please reduce the number of revolutions and feed to prevent chattering.
- Please adjust the number of revolutions and feed speed according to the cutting condition, such as depth of cut and machine rigidity.