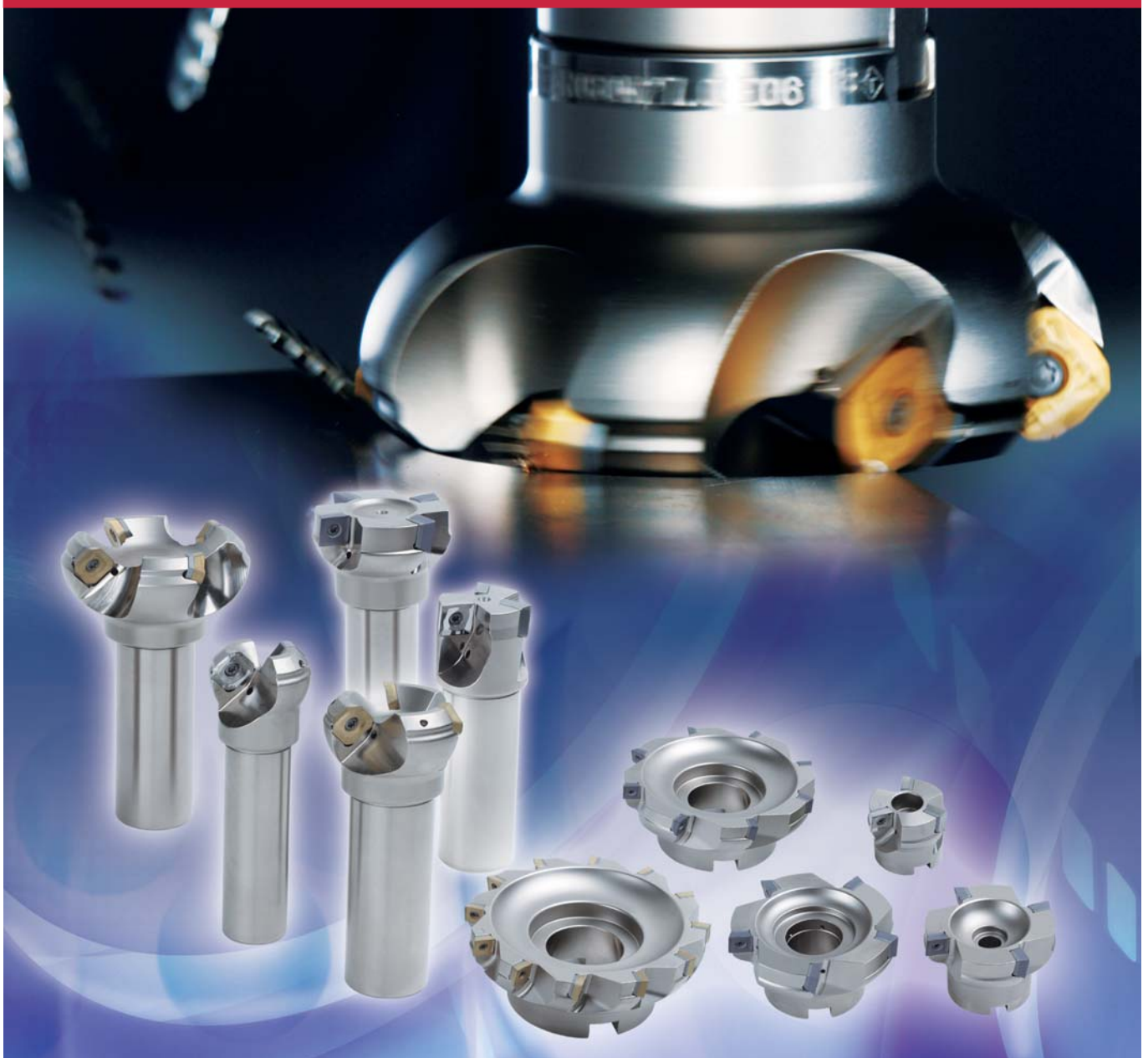
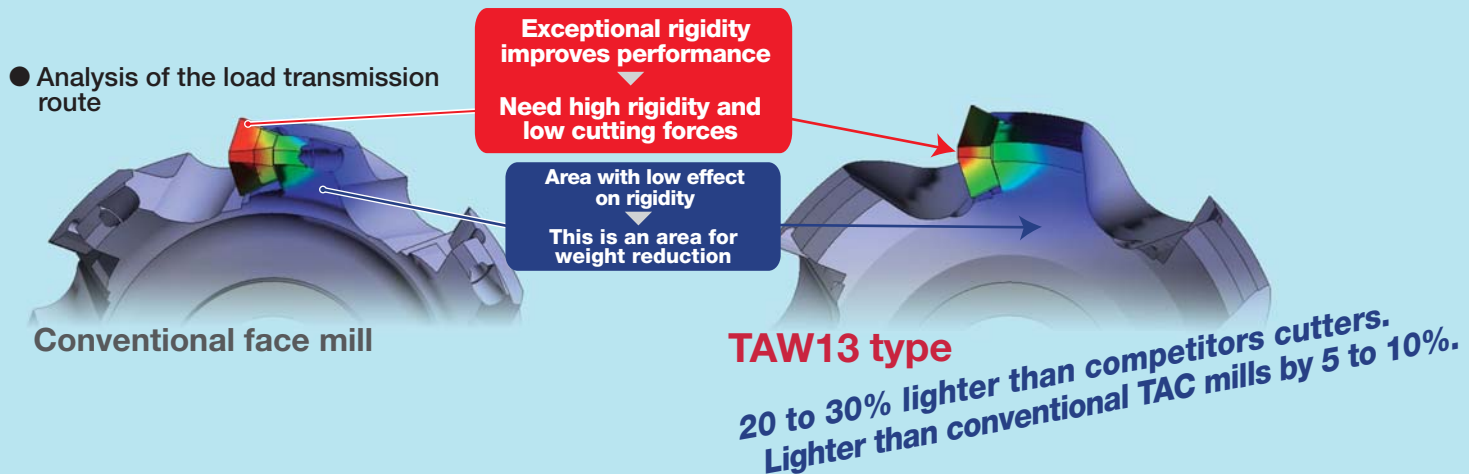


MILLLINE Screw-on type TAC Mills**TAW / TPW** type

The best solution for steel and cast iron milling!



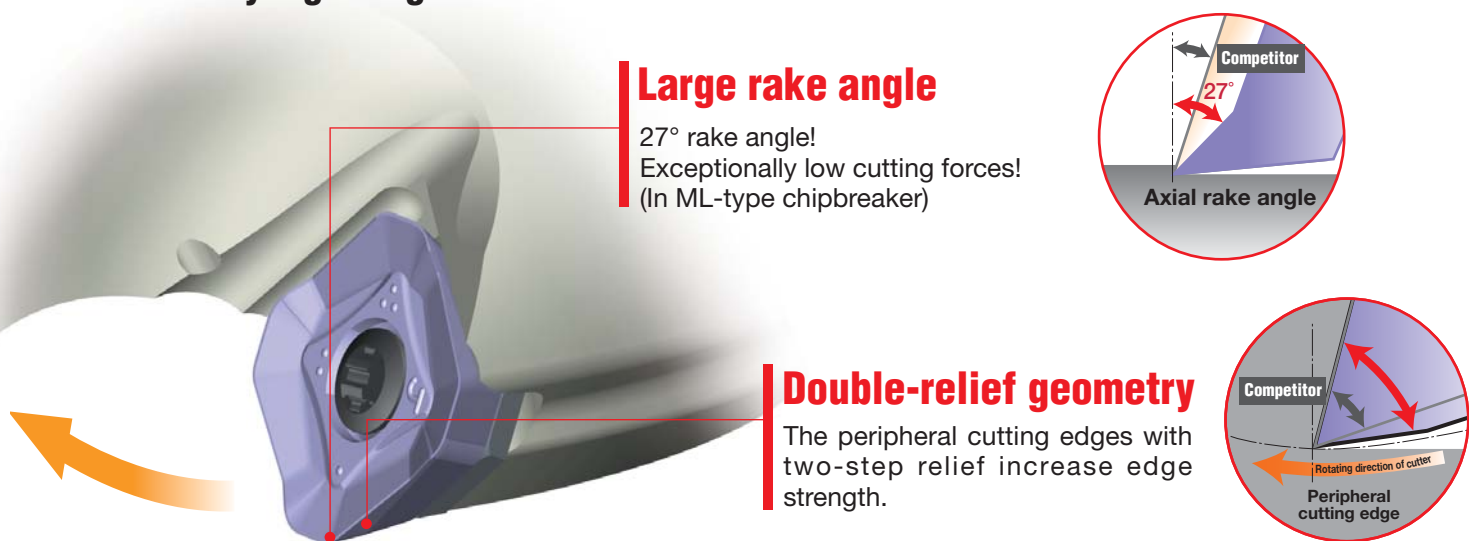
Exact simulation analysis provides light weight cutter with low cutting



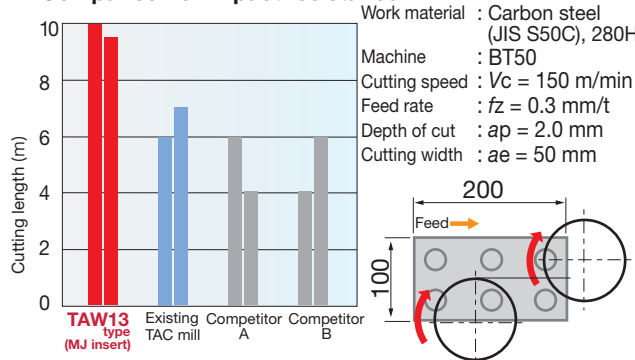
Features

● Low cutting forces and reliability for impact resistance

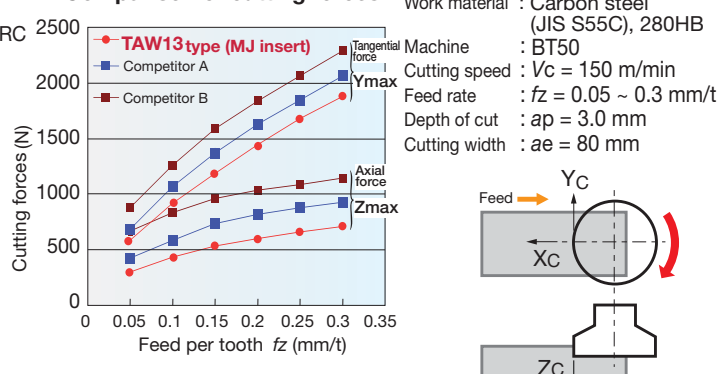
Contributes to free cutting action with extremely high toughness levels.



■ Comparison of impact resistance



■ Comparison of cutting forces



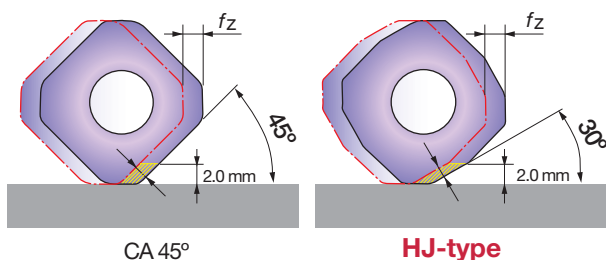
a highly rigid, forces !!



● High productivity

Bodies are available in coarse, close, and extra-close (made to order) pitch design.

TAW13 type with 45° corner angle. **HJ-type** inserts for high feed milling are available.



**Productivity
improved
x 2 times!**

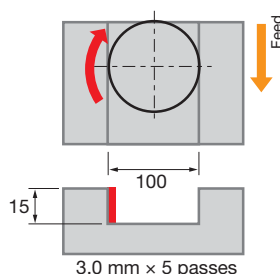
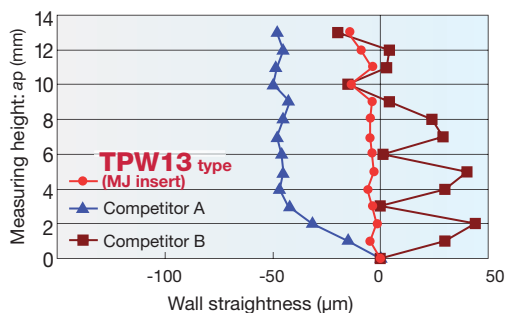
The HJ-type insert with a 30° cutting edge angle can reduce cutting load. Furthermore, the HJ-type allows feed rates to be improved 2 times.

● High accuracy

The body has a highly improved axial and radial run-out that can drastically improve surface quality.

TPW13 type with a 90° corner angle creates highly accurate wall straightness.

■ Accuracy of wall straightness produced with 90° corner angle cutters.



Work material : Carbon steel (JIS S55C), 210HB
 Machine : BT50
 Cutting speed : $V_c = 100$ m/min
 Feed rate : $f_z = 0.1$ mm/t
 Depth of cut : $a_p = 3.0$ mm × 5 passes
 Width of cut : $a_e = 100$ mm (slotting)

● Highly functional body design

Air-holes applicable for through-the-spindle coolant system. (For cutters smaller than $\phi 125$ mm)

Special surface treatment improves resistance to corrosion and rubbing.

Chipbreaker

MJ type First choice

For general purpose well balanced impact resistance and low cutting forces.

P AH120 : for general purpose.

Steel **T3130** : for high speed milling.

NS740 : for high quality surface finish.

M AH130 PREMIUMTEC

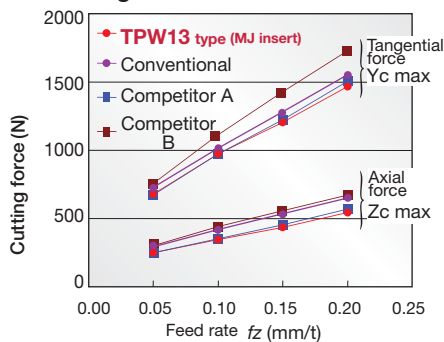
Stainless

K T1115 PREMIUMTEC

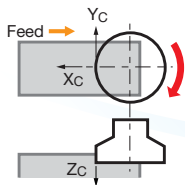
Cast Iron



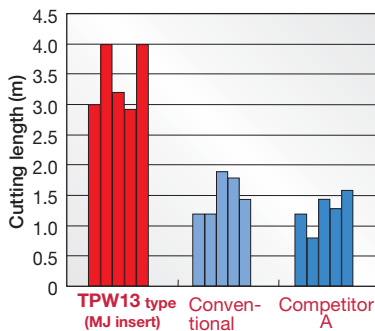
Cutting forces



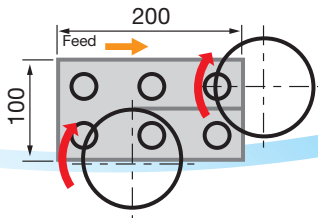
Work material : Carbon steel (JIS S55C)
Machine : BT50
Cutting speed : $V_c = 150$ m/min
Feed rate : $f_z = 0.05 \sim 0.2$ mm/t
Depth of cut : $a_p = 3.0$ mm
Cutting width : $a_e = 80$ mm



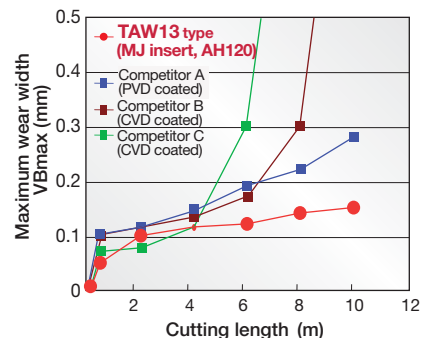
Impact resistance



Work material : Die steel (PX5)
Machine : BT50
Cutting speed : $V_c = 150$ m/min
Feed rate : $f_z = 0.2$ mm/t
Depth of cut : $a_p = 3.0$ mm
Cutting width : $a_e = 50$ mm



Wear resistance



Work material : Chromium molybdenum steel equivalent to JIS SCM440, 30HRC

Machine : BT40
Cutting speed : $V_c = 150$ m/min
Feed rate : $f_z = 0.25$ mm/t
Depth of cut : $a_p = 2.0$ mm
Cutting width : $a_e = 60$ mm
Dry cutting

AJ type For machining aluminium alloys

The DLC coated grades offer excellent welding resistance.

Excellent sharpness with the AJ chipbreaker

+

Excellent welding resistance

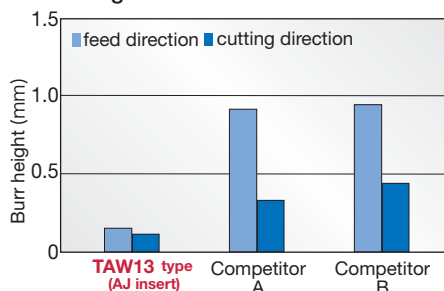
DLC coated grade **DS1100**

Longer tool life,
Better surface finish &
fewer burrs!!

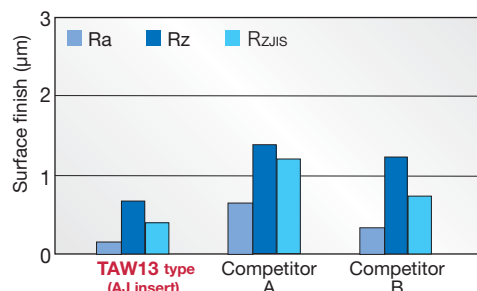


N KS05F : General purpose
Non-ferrous **DS1100** : High surface quality

Burr height

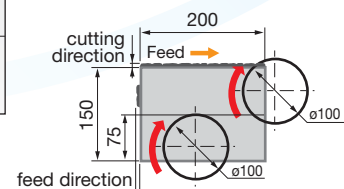


Surface finish



Work material : Aluminium alloy (JIS A5052)

Machine : BT40
Cutting speed : $V_c = 600$ m/min
Feed rate : $f_z = 0.15$ mm/t
Depth of cut : $a_p = 1.0$ mm
Cutting width : $a_e = 75$ mm



HJ type For high productivity

Allows 1.5 to 2 times higher feeds than conventional inserts. (Max. depth of cut: $a_p = 2 \text{ mm}$)
Excellent impact resistance and low cutting forces even under high cutting load in high feed milling.

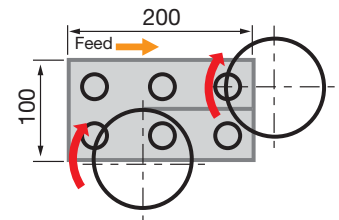
P AH120 : for general purpose machining.
Steel **T3130** : for high speed machining.

M AH130 **PREMIUMTEC** **K T1115** **PREMIUMTEC**
Stainless Cast Iron

■ Comparison of productivity

	Feed per tooth: f_z (mm/t)				
	0.3	0.4	0.5	0.6	0.65
TAW13 (HJ insert)	➔				
Competitor A	➔				
Competitor B	➔				

Work material : Chromium molybdenum steel (JIS SCM440), 30HRC
Machine : BT50
Cutting speed : $V_c = 200 \text{ m/min}$
Feed rate : $f_z = 0.3 \sim 0.65 \text{ mm/t}$
Depth of cut : $a_p = 2.0 \text{ mm}$
Cutting width : $a_e = 50 \text{ mm}$



MJ type (G-class) For finishing and precision machining

Ground insert with high accuracy.
For high surface finish.

P AH120 : for general purpose machining.
Steel **NS740** : for high quality surface finishes.

Wiper insert For finishing

When combined with regular inserts it allows excellent surface finish.

P NS740 : for general purpose.
Steel **DX140** : for high quality surface finish.
M K GH110 : for high quality surface finish.
Stainless Cast Iron

ML type For low cutting forces and less rigid workpieces

Large rake angle contributes to low cutting forces.
Suitable for machining low rigid workpieces.

P AH120
Steel

Flat top type Priority on impact resistance

Flat-top insert provided with excellent impact resistance.
Most suitable for roughing of cast irons and steels.

P AH120 : for general purpose.
Steel **T3130** : for high speed machining.
NS740 : for high quality surface finishes.

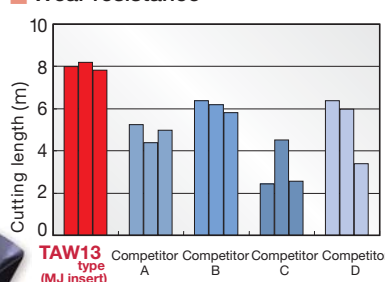
K T1115 **PREMIUMTEC**
Cast Iron

MS type For machining stainless steels

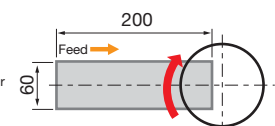
Suitable for machining stainless steel.
Sharp cutting edge and large rake angle eliminate burrs.
Suitable for machining stainless steel.
Sharp cutting edge and large rake angle eliminate burrs.

M AH130 **PREMIUMTEC**
Stainless

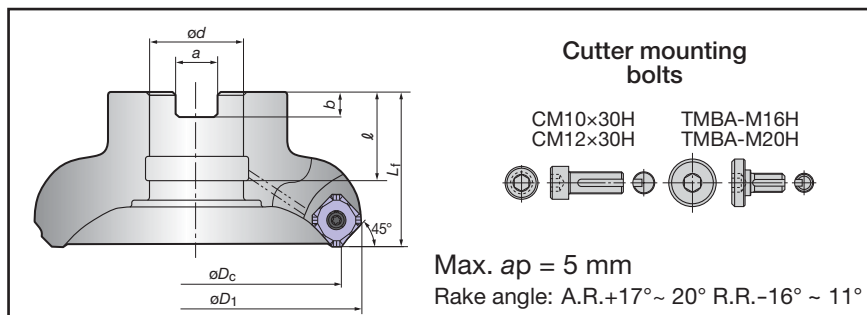
■ Wear resistance



Work material : Stainless steel (JIS SUS304)
Machine : BT50
Cutting speed : $V_c = 150 \text{ m/min}$
Feed rate : $f_z = 0.2 \text{ mm/t}$
Depth of cut : $a_p = 2.0 \text{ mm}$
Cutting width : $a_e = 60 \text{ mm}$



Cutter TAW13 type (Bore type)

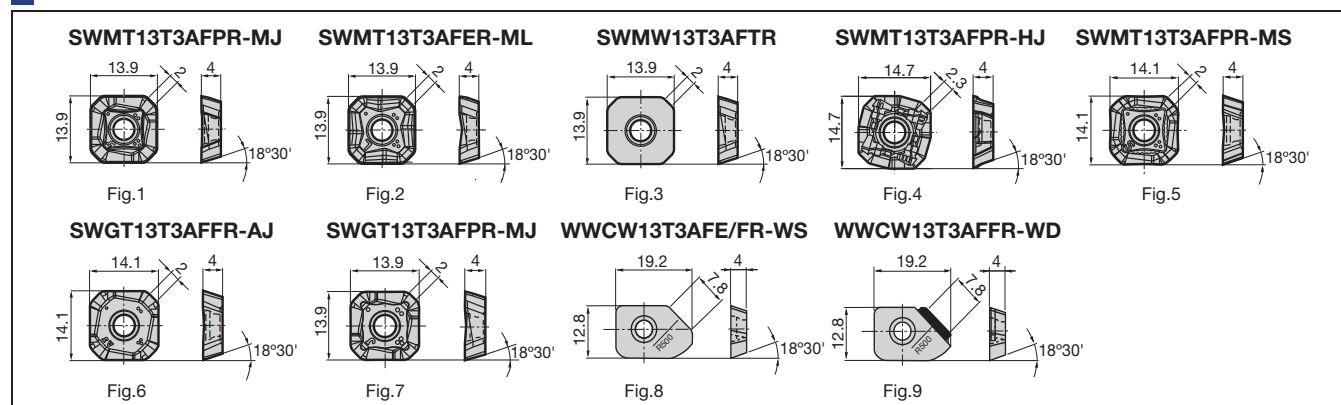


► Replacement parts

Descriptions	Cat No.
Shim screw	DTS5-3.5SS
Shim	FSSA1102
Clamping screw	CSPB-3.5
Wrench	P-3.5 / IP-15D

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

Inserts



Type	Cat. No.	Accuracy	Honing	Stocked grades										Fig.
				Coated						DLC coat	Cermet	Uncoated	T-DIA	
				T3130	T1115	AH120	AH130	AH140	GH110	DS1100	NS740	KS05F	DX140	
Regular	SWMT13T3AFPR-MJ	M	With	●	●	●	●	●			●			1
	SWMT13T3AFER-ML	M	With			●								2
	SWMW13T3AFTR	M	With	●	●	●					●			3
	SWMT13T3AFPR-HJ	M	With	●	●	●	●	●						4
	SWMT13T3AFPR-MS	M	With				●	●						5
	SWGT13T3AFFR-AJ	G	Without							●		●		6
Wiper	SWGT13T3AFPR-MJ	G	With			●					●			7
	WWCW13T3AFER-WS	C	With						●		●			8
	WWCW13T3AFFR-WS	C	Without							●		●		
	WWCW13T3AFFR-WD	C	Without										●	9

● : Stocked items

Standard cutting conditions TAW 13 type

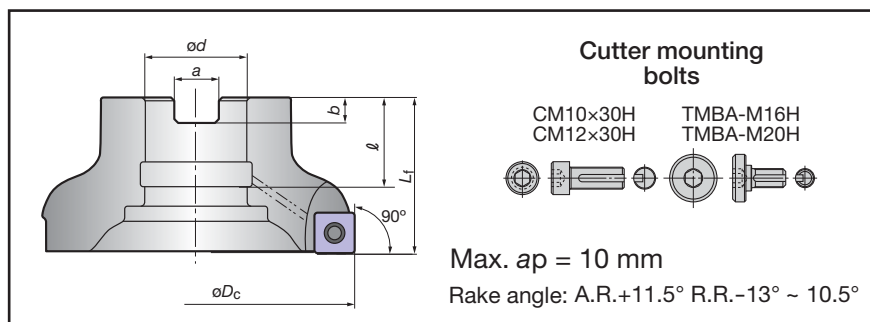
Work material	Recommended insert grade	Cutting speed Vc (m/min)	Roughing (Depth of cut: ap ≥ 1.0 mm)					
			Feed per tooth: fz (mm/t)					
			MJ	ML	HJ	MS	Flat top	AJ
Mild steels Low carbon steels (< 180HB)	AH120 (First choice)	180 (100 - 270)	0.2 (0.05 - 0.3)	0.15 (0.05 - 0.25)	0.4 (0.2 - 0.6)	—	0.2 (0.05 - 0.3)	—
	T3130 (Priority on wear resistance)	220 (150 - 300)	0.2 (0.05 - 0.3)	—	0.4 (0.2 - 0.6)	—	0.2 (0.05 - 0.3)	—
	AH130 / AH140 (Priority on impact resistance)	130 (80 - 180)	0.2 (0.05 - 0.3)	—	—	0.17 (0.1 - 0.25)	—	—
	NS740 (Priority on surface finish)	200 (100 - 300)	0.15 (0.05 - 0.23)	—	—	—	0.15 (0.05 - 0.23)	—
Carbon steels Alloy steels (< 300HB)	AH120 (First choice)	150 (100 - 230)	0.17 (0.05 - 0.25)	0.12 (0.05 - 0.2)	0.3 (0.2 - 0.5)	—	0.17 (0.05 - 0.25)	—
	T3130 (Priority on wear resistance)	200 (150 - 280)	0.17 (0.05 - 0.25)	—	0.3 (0.2 - 0.5)	—	0.17 (0.05 - 0.25)	—
	AH130 / AH140 (Priority on impact resistance)	120 (80 - 150)	0.17 (0.05 - 0.25)	—	0.3 (0.2 - 0.5)	—	—	—
	NS740 (Priority on surface finish)	150 (100 - 230)	0.12 (0.05 - 0.2)	—	—	—	0.12 (0.05 - 0.2)	—
Die steels (< 30HRC)	AH120 (First choice)	140 (100 - 180)	0.12 (0.05 - 0.2)	0.12 (0.05 - 0.2)	0.3 (0.2 - 0.4)	—	0.12 (0.05 - 0.2)	—
	T3130 (Priority on wear resistance)	140 (100 - 180)	0.12 (0.05 - 0.2)	—	0.3 (0.2 - 0.4)	—	0.12 (0.05 - 0.2)	—
Stainless steels (< 250HB)	AH130 / AH140 (First choice)	150 (80 - 200)	0.17 (0.1 - 0.25)	—	0.3 (0.2 - 0.5)	0.15 (0.1 - 0.2)	—	—
	AH120 (Priority on wear resistance)	200 (150 - 250)	0.17 (0.1 - 0.25)	0.15 (0.1 - 0.2)	0.3 (0.2 - 0.5)	—	0.17 (0.1 - 0.25)	—
Grey cast irons Ductile cast irons	T1115 (First choice)	180 (100 - 250)	0.17 (0.05 - 0.25)	—	0.4 (0.2 - 0.6)	—	0.17 (0.05 - 0.25)	—
	AH120 (Priority on impact resistance)	180 (100 - 250)	0.17 (0.05 - 0.25)	0.15 (0.05 - 0.2)	0.4 (0.2 - 0.6)	—	0.17 (0.05 - 0.25)	—
Aluminium alloys (Si < 13 %)	DS1100 / KS05F (First choice)	500 (300 - 1000)	—	—	—	—	—	0.12 (0.05 - 0.2)
Aluminium alloys (Si ≥ 13 %)	DS1100 / KS05F (First choice)	200 (80 - 300)	—	—	—	—	—	0.12 (0.05 - 0.2)
Copper alloys	DS1100 / KS05F (First choice)	350 (200 - 500)	—	—	—	—	—	0.12 (0.05 - 0.2)

Work material	Recommended insert grade	Cutting speed Vc (m/min)	Light cutting to finishing (Depth of cut: ap ≥ 1.0 mm)					
			Feed per tooth: fz (mm/t)					
			MJ	ML	HJ	MS	Flat top	AJ
Mild steels Low carbon steels (< 180HB)	AH120 (First choice)	180 (100 - 270)	0.17 (0.05 - 0.25)	0.12 (0.05 - 0.2)	0.4 (0.2 - 0.6)	—	0.17 (0.05 - 0.25)	—
	T3130 (Priority on wear resistance)	220 (150 - 300)	0.17 (0.05 - 0.25)	—	0.4 (0.2 - 0.6)	—	0.17 (0.05 - 0.25)	—
	AH130 / AH140 (Priority on impact resistance)	130 (80 - 180)	0.17 (0.05 - 0.25)	—	—	0.15 (0.1 - 0.2)	—	—
	NS740 (Priority on surface finish)	200 (100 - 300)	0.12 (0.05 - 0.2)	—	—	—	0.12 (0.05 - 0.2)	—
Carbon steels Alloy steels (< 300HB)	AH120 (First choice)	150 (100 - 230)	0.12 (0.05 - 0.2)	0.1 (0.05 - 0.15)	0.3 (0.2 - 0.5)	—	0.12 (0.05 - 0.2)	—
	T3130 (Priority on wear resistance)	200 (150 - 280)	0.12 (0.05 - 0.2)	—	0.3 (0.2 - 0.5)	—	0.12 (0.05 - 0.2)	—
	AH130 / AH140 (Priority on impact resistance)	120 (80 - 150)	0.12 (0.05 - 0.2)	—	0.3 (0.2 - 0.5)	—	—	—
	NS740 (Priority on surface finish)	150 (100 - 230)	0.12 (0.05 - 0.18)	—	—	—	0.12 (0.05 - 0.18)	—
Die steels (< 30HRC)	AH120 (First choice)	140 (100 - 180)	0.12 (0.05 - 0.18)	0.1 (0.05 - 0.12)	0.3 (0.2 - 0.4)	—	0.12 (0.05 - 0.18)	—
	T3130 (Priority on wear resistance)	140 (100 - 180)	0.12 (0.05 - 0.18)	—	0.3 (0.2 - 0.4)	—	0.12 (0.05 - 0.18)	—
Stainless steels (< 250HB)	AH130 / AH140 (First choice)	150 (80 - 200)	0.15 (0.1 - 0.2)	—	0.3 (0.2 - 0.5)	0.15 (0.1 - 0.18)	—	—
	AH120 (Priority on wear resistance)	200 (150 - 250)	0.15 (0.1 - 0.2)	0.15 (0.1 - 0.18)	0.3 (0.2 - 0.5)	—	0.15 (0.1 - 0.2)	—
Grey cast irons Ductile cast irons	T1115 (First choice)	180 (100 - 250)	0.15 (0.05 - 0.2)	—	0.4 (0.2 - 0.6)	—	0.15 (0.05 - 0.2)	—
	AH120 (Priority on impact resistance)	180 (100 - 250)	0.15 (0.05 - 0.2)	0.12 (0.05 - 0.18)	0.4 (0.2 - 0.6)	—	0.15 (0.05 - 0.2)	—
Aluminium alloys (Si < 13 %)	DS1100 / KS05F (First choice)	500 (300 - 1000)	—	—	—	—	—	0.12 (0.05 - 0.2)
Aluminium alloys (Si ≥ 13 %)	DS1100 / KS05F (First choice)	200 (80 - 300)	—	—	—	—	—	0.12 (0.05 - 0.2)
Copper alloys	DS1100 / KS05F (First choice)	350 (200 - 500)	—	—	—	—	—	0.12 (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.
- TAW13 type can not be used for ramping, plunging and drilling.

Cutter TPW13 type (Bore type)



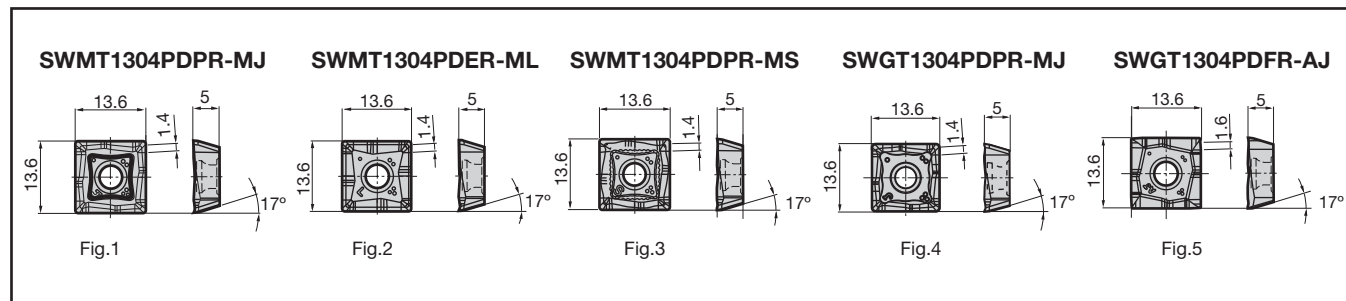
► Replacement parts

Descriptions	Cat No.
Shim screw	DTS5-3.5SS
Shim	FSSP1102
Clamping screw	CSPB-3.5
Wrench	P-3.5 / IP-15D

Pitch	Cat. No.	Stock	No. of inserts	Dimensions (mm)						Weight (kg)	Air hole	Cutter mounting bolts
				ϕD_c	ϕd	ℓ	L_f	b	a			
Standard	TPW13R050M22.0E04	●	4	50	22	20	40	6.3	10.4	0.3	With	CM10x30H
	TPW13R063M22.0E05	●	5	63						0.4		
	TPW13R080M27.0E06	●	6	80	27	22	50	7	12.4	0.8	With	CM12x30H
	TPW13R100M32.0E07	●	7	100	32	28.5		8	14.4	1.2	With	TMBA-M16H
	TPW13R125M40.0E08	●	8	125	40	32	63	9	16.4	2.4	With	TMBA-M20H
Close	TPW13R050M22.0E05	●	5	50	22	20	40	6.3	10.4	0.3	With	CM12x30H
	TPW13R063M22.0E06	●	6	63						0.4		
	TPW13R080M27.0E08	●	8	80	27	22	50	7	12.4	0.8	With	CM12X30H
	TPW13R100M32.0E10	●	10	100	32	28.5		8	14.4	1.2	With	TMBA-M16H
	TPW13R125M40.0E12	●	12	125	40	32	63	9	16.4	2.5	With	TMBA-M20H

● : Stocked items

Inserts



Cat. No.	Accuracy	Honing	Stocked grades								Fig.
			Coated					DLC coat	Cermet	Uncoated	
			T3130	T1115	AH120	AH130	AH140	DS1100	NS740	KS05F	
SWMT1304PDPR-MJ	M	With	●	●	●	●	●		●		1
SWMT1304PDER-ML	M	With			●						2
SWMT1304PDPR-MS	M	With				●	●				3
SWGT1304PDPR-MJ	G	With			●				●		4
SWGT1304PDFR-AJ	G	Without						●		●	5

● : Stocked items

Standard cutting conditions TPW 13 type

Work material	Recommended insert grade	Cutting speed V_c (m/min)	Roughing (Depth of cut: $a_p \geq 1.0$ mm)				Light cutting to finishing (Depth of cut: $a_p \geq 1.0$ mm)			
			Feed per tooth: f_z (mm/t)				Feed per tooth: f_z (mm/t)			
			MJ	ML	MS	AJ	MJ	ML	MS	AJ
Mild steels Low carbon steels ($< 180\text{HB}$)	AH120 (First choice)	180 (100 - 270)	0.17 (0.05 - 0.25)	0.12 (0.05 - 0.2)	—	—	0.15 (0.05 - 0.2)	0.12 (0.05 - 0.18)	—	—
	T3130 (Priority on wear resistance)	220 (150 - 300)	0.17 (0.05 - 0.25)	—	—	—	0.15 (0.05 - 0.2)	—	—	—
	AH130 / AH140 (Priority on impact resistance)	130 (80 - 180)	0.17 (0.05 - 0.25)	—	0.12 (0.05 - 0.2)	—	0.15 (0.05 - 0.2)	—	0.12 (0.05 - 0.18)	—
	NS740 (Priority on surface finish)	200 (100 - 300)	0.1 (0.05 - 0.15)	—	—	—	0.1 (0.05 - 0.12)	—	—	—
Carbon steels Alloy steels ($< 300\text{HB}$)	AH120 (First choice)	150 (100 - 230)	0.15 (0.05 - 0.2)	0.1 (0.05 - 0.15)	—	—	0.12 (0.05 - 0.18)	0.1 (0.05 - 0.12)	—	—
	T3130 (Priority on wear resistance)	200 (150 - 280)	0.15 (0.05 - 0.2)	—	—	—	0.12 (0.05 - 0.18)	—	—	—
	AH130 / AH140 (Priority on impact resistance)	120 (80 - 150)	0.15 (0.05 - 0.2)	—	—	—	0.12 (0.05 - 0.18)	—	—	—
	NS740 (Priority on surface finish)	150 (100 - 230)	0.1 (0.05 - 0.15)	—	—	—	0.08 (0.05 - 0.12)	—	—	—
Die steels ($< 30\text{HRC}$)	AH120 (First choice)	140 (100 - 180)	0.1 (0.05 - 0.15)	0.08 (0.05 - 0.12)	—	—	0.08 (0.05 - 0.12)	0.08 (0.05 - 0.1)	—	—
	T3130 (Priority on wear resistance)	140 (100 - 180)	0.1 (0.05 - 0.15)	—	—	—	0.08 (0.05 - 0.12)	—	—	—
Stainless steels ($< 250\text{HB}$)	AH130 / AH140 (First choice)	150 (80 - 200)	0.15 (0.05 - 0.2)	—	0.12 (0.05 - 0.18)	—	0.12 (0.05 - 0.18)	—	0.12 (0.05 - 0.15)	—
	AH120 (Priority on wear resistance)	200 (150 - 250)	0.15 (0.05 - 0.2)	0.1 (0.05 - 0.15)	—	—	0.12 (0.05 - 0.18)	0.08 (0.05 - 0.12)	—	—
Grey cast irons Ductile cast irons	T1115 (First choice)	180 (100 - 250)	0.15 (0.05 - 0.2)	—	—	—	0.12 (0.05 - 0.18)	—	—	—
	AH120 (Priority on impact resistance)	180 (100 - 250)	0.15 (0.05 - 0.2)	0.1 (0.05 - 0.15)	—	—	0.12 (0.05 - 0.18)	0.08 (0.05 - 0.12)	—	—
Aluminium alloys ($\text{Si} < 13\%$)	DS1100 / KS05F (First choice)	500 (300 - 1000)	—	—	—	0.15 (0.05 - 0.2)	—	—	—	0.15 (0.05 - 0.2)
Aluminium alloys ($\text{Si} \geq 13\%$)	DS1100 / KS05F (First choice)	200 (80 - 300)	—	—	—	0.15 (0.05 - 0.2)	—	—	—	0.15 (0.05 - 0.2)
Copper alloys	DS1100 / KS05F (First choice)	350 (200 - 500)	—	—	—	0.15 (0.05 - 0.2)	—	—	—	0.15 (0.05 - 0.2)

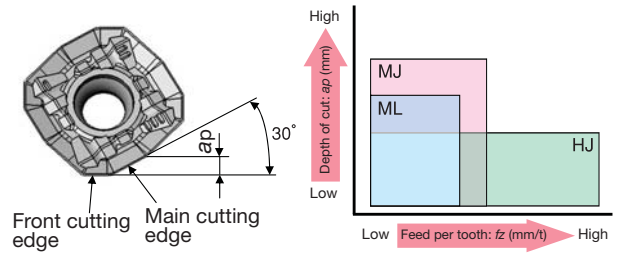
Notes:

- When machining at large depth of cut or large cutting width, V_c and f_z 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 $V_c \leq 100$ m/min.
- When machining mild steel, carbon steel or alloy steel in wet conditions the T3130 is recommended. In this case, V_c and f_z should be reduced.
- TPW13 type can not be used for ramping, plunging and drilling.

● Cautionary points when using HJ inserts

HJ-type inserts have a unique geometry for high feed machining. When using HJ inserts, care should be taken to the follow the below points:

- Use the inserts within the maximum depth of cut, $ap = 2$ mm.
- Do not use the inserts together in the same cutter body with other insert types (such as MJ, MS, etc.)
- The peripheral shape of the HJ-type insert differs from other types (MJ, MS, etc.). However, it can be used in the same insert pocket.



● Cautionary points when using wiper inserts

- When a high surface finish is required, use of a wiper insert (WWCW13T3AF_R-W_) is recommended. In general, installing one wiper insert provides superior surface finish.
- When using the wiper insert, install the insert as shown in Fig.1. If the insert is installed as shown in Fig.2, insert breakage is inevitable and normal surface finish can not be obtained.
- The wiper insert has one wiping corner.
- The peripheral cutting edge of the wiper insert is retracted from the edge of the normal inserts. Therefore, the chip load of the normal insert next to the wiper insert is two times that of other normal inserts.
- When using the wiper insert, a depth of cut (ap) less than 1 mm is recommended.

Fig.1

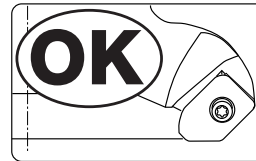
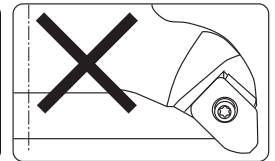
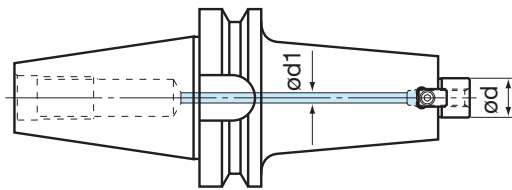


Fig.2



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



Nominal diameter ϕd (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 ϕD_1 (mm)	4 ~ 6	5 ~ 8	6 ~ 9	10 ~ 13	10 ~ 15	10 ~ 15

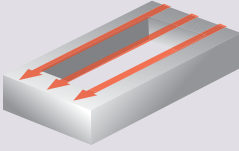
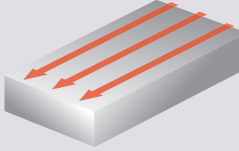
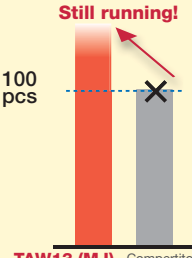
When using the TAW13 or TPW13 type with through center air (coolant or mist), the correct arbor must be used with through center air supplying.

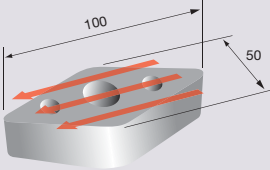
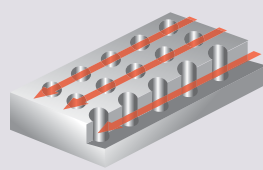
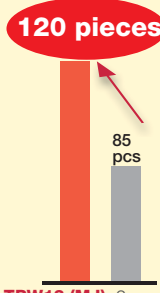
■ Cautionary notes in use

- 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.

Practical Examples

Part of workpiece		Machine component (structural part)	Plate for die
Milling cutter		TAW13R080M27.0E06 ($\phi 80$, $z = 6$)	TAW13R100M32.0E07 ($\phi 100$, $z = 7$)
Insert		SWMT13T3AFPR-MJ	SWMT13T3AFPR-HJ
Grade		AH120	T3130
Workpiece material		Chromium molybdenum steel	Carbon steel (JIS C55)
			
Cutting conditions	Cutting speed: V_c (m/min)	180	240
	Feed rate: f_z (mm/t)	0.15	0.6
	Feed speed: V_f (mm/min)	650	3,200
	Depth of cut: a_p (mm)	2	2
	Cutting width: a_e (mm)	-	~ 80
	Method of machining	Face milling	Face milling
	Coolant	Dry	Water soluble
Machine		Vertical machining center BT50	Vertical machining center BT50
Results		 180% tool life improvement! Smooth cutting without chattering makes tool life stable. TAW13 (MJ) Competitor B	270% Productivity Improvement!! Feed speed: $V_f = 1200 \Rightarrow 3200$ mm/min. Even in high feed machining, the cutting is very smooth and silent.

Part of workpiece		Hydraulic part	Machine component
Cutter		TPW13R080M27.0E06 ($\phi 80$, $z = 6$)	TPW13R080M27.0E06 ($\phi 80$, $z = 6$)
Insert		SWMT1304PDPR-MS	SWMT1304PDPR-MJ
Grade		AH140	AH140
Workpiece material		Chromium molybdenum steel	X5CrNiMo17-12-2
			
Cutting conditions	Cutting speed: V_c (m/min)	120	100
	Feed rate: f_z (mm/t)	0.18	0.1
	Feed speed: V_f (mm/min)	480	-
	Depth of cut: a_p (mm)	1.2	2.8 x 5 Passes
	Cutting width: a_e (mm)	~ 50	80
	Method of machining	Face milling	Face milling and shouldering
	Coolant	Dry	Water soluble
Machine		-	Vertical machining center
Results		120 pieces  140% tool life improvement! Cutting with TPW13 proved very silent with drastically improved surface finish. TPW13 (MJ) Conventional	150% Productivity improvement!! In high impact heavy machining the TPW13 demonstrates stable tool life and reduced chipping.



Tungaloy Corporation (Head office)

11-1 Yoshima-Kogyodanchi
Iwaki-city, Fukushima, 970-1144 Japan
Phone: +81-246-36-8501 Fax: +81-246-36-8542
<http://www.tungaloy.co.jp/>

Tungaloy America, Inc.

3726 N Ventura Drive, Arlington Heights, IL 60004, U.S.A.
Phone: +1-888-554-8394 Fax: +1-888-554-8392
<http://www.tungaloyamerica.com>

Tungaloy Canada

432 Elgin St. Unit 3, Brantford, Ontario N3S 7P7, Canada
Phone: +1-519-758-5779 Fax: +1-519-758-5791
<http://www.tungaloyamerica.com/>

Tungaloy de Mexico S.A.

C Los Arellano 113, Parque Industrial Siglo XXI
Aguascalientes, AGS, Mexico 20290
Phone: +52-449-929-5410 Fax: +52-449-929-5411
<http://www.tungaloyamerica.com/>

Tungaloy do Brasil Comércio de Ferramentas de Corte Ltda.

Rua dos Sabias N.104
13280-000 Vinhedo, São Paulo, Brazil
Phone: +55-19-38262757 Fax: +55-19-38262757
<http://www.tungaloy.co.jp/br/>

Tungaloy Germany GmbH

Elisabeth-Selbert-Str. 3
D-40764 Langenfeld, Germany
Phone: +49-2173-90420-0 Fax: +49-2173-90420-19
<http://www.tungaloy.de>

Tungaloy France S.A.S.

ZA Courtaboeuf - Le Rio, 1 rue de la Terre de feu
F-91952 Courtaboeuf Cedex, France
Phone: +33-1-6486-4300 Fax: +33-1-6907-7817
<http://www.tungaloy-eu.com>

Tungaloy Italia S.r.l.

Via E. Andolfato 10
I-20126 Milano, Italy
Phone: +39-02-252012-1 Fax: +39-02-252012-65
<http://www.tungaloy-eu.com/>

Tungaloy Czech s.r.o

Tuřanka 115
CZ-627 00 Brno, Czech Republic
Phone: +420-532 123 391 Fax: +420-532 123 392
<http://www.tungaloy.co.jp/cz/>

Tungaloy Ibérica S.L.

C/La Pau, n°46
E-08243 Manresa (BCN), SPAIN
Phone: +34 93 1131360 Fax: +34 93 1131361
<http://www.tungaloy.co.jp/es/>

Tungaloy Scandinavia AB

S:t Lars Väg 42A
SE-22270 Lund, Sweden
Phone: +46-462119200 Fax: +46-462119207
<http://www.tungaloy.co.jp/se/>

Tungaloy Rus, LLC

36-G Kostukova str.
308012 Belgorod, Russia
Phone: +7 4722 58 57 57 Fax: +7 4722 58 57 83
<http://www.tungaloy.co.jp/ru/>

Tungaloy Polska Sp. z o.o.

ul. Genewska 24
03-963 Warszawa, Poland
Phone: +48-22-617-0890 Fax: +48-22-617-0890
<http://www.tungaloy.co.jp/pl/>

Tungaloy U.K. Ltd

Woodgate Business Park, Bartley Green
Birmingham B32 3DE, UK
Phone: +44 121 244 3064 Fax: +44 121 270 9694
<http://www.tungaloy.co.jp/uk> salesinfo@tungaloyuk.co.uk

Tungaloy Cutting Tool (Shanghai) Co.,Ltd.

Rm No 401 No.88 Zhabei, Jiangchang No.3 Rd
Shanghai 200436, China
Phone: +86-21-3632-1880 Fax: +86-21-3621-1918
<http://www.tungaloy.co.jp/tcts/>

Tungaloy Cutting Tool (Thailand) Co.,Ltd.

11th Floor, Sorachai Bldg. 23/7, Soi Sukhumvit 63
Klongtonnue, Wattana, Bangkok 10110, Thailand
Phone: +66-2-714-3130 Fax: +66-2-714-3134
<http://www.tungaloy.co.th/>

Tungaloy Singapore (Pte.), Ltd.

50 Kallang Avenue #06-03 Noel Corporate Building
Singapore 339505
Phone: +65-6391-1833 Fax: +65-6299-4557
<http://www.tungaloy.co.jp/tspl/>

Tungaloy India Pvt. Ltd.

Unit#13, B wing, 8th Floor, Kamala Mills Compound
Trade World, Lower Parel (West), Mumbai - 4000 13, India
Phone: +91-22-6124-8804 Fax: +91-22-6124-8899
<http://www.tungaloy.co.jp/in/>

Tungaloy Korea Co., Ltd

#1312, Byucksan Digital Valley 5-cha
60-73 Gasan-dong, Geumcheon-gu
153-788 Seoul, Korea
Phone: +82-2-6393-8930 Fax: +82-2-6393-8952
<http://www.tungaloy.co.jp/kr/>

Tungaloy Malaysia Sdn Bhd

50 K-2, Kelana Mall, Jalan SS6/14, Kelana Jaya, 47301
Petaling Jaya, Selangor Darul Ehsan, Malaysia
Phone: +603-7805-3222 Fax: +603-7804-8563
<http://www.tungaloy.co.jp/my/>

Tungaloy Australia Pty Ltd

Unit 308/33 Lexington Drive
Bella Vista NSW 2153, Australia
Phone: +612-9672-6844 Fax: +612-9672-6866
<http://www.tungaloy.co.jp/au>

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Tungaloy Corporation

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Tungaloy Group
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