

**Tungaloy**

Member IMC Group

Keeping the Customer First

Tungaloy Report

No.013-USA

TAC Mill Series : Face milling cutter

**NEW**

**DO PENT**

TEN Shell Mills / EEN End Mills

**Pentagonal, Double Sided Insert with 10 Cutting Edges!**



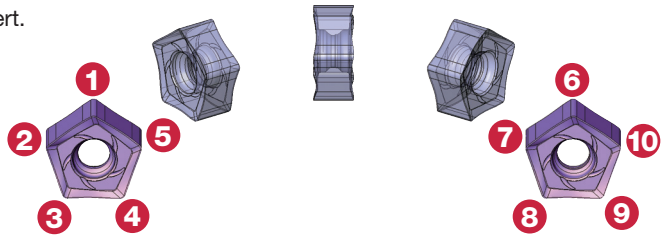
TEN / EEN for Face milling

**Economical corner unit price × Highly efficient cutting  
= Production cost reduction!**

**Features**

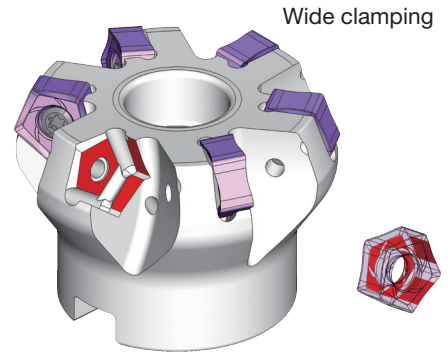
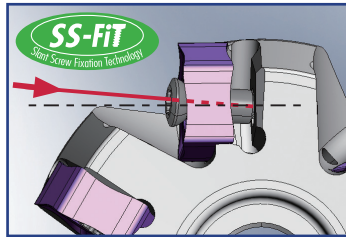
**1 10-edged insert**

- Pentagonal double sided insert. Economical corner unit price!
- 30% tool cost reduction compared to conventional four edge insert.
- Inserts available in MJ (for general machining), AJ (for aluminum) and Wiper type.



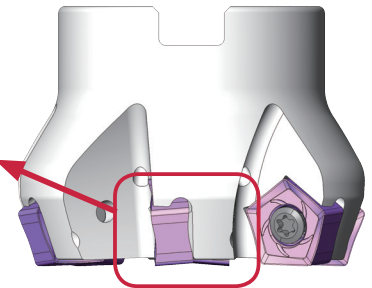
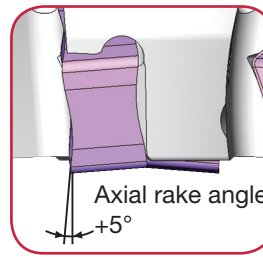
**2 High feed rate & cutting efficiency!**

- Wide clamping design provides insert stability and enables heavy cutting.
- Thick insert design increases rigidity.
- Tungaloy's SS-Fit system improves strength around the screw hole and improves the insert density (only extra close pitch cutters).



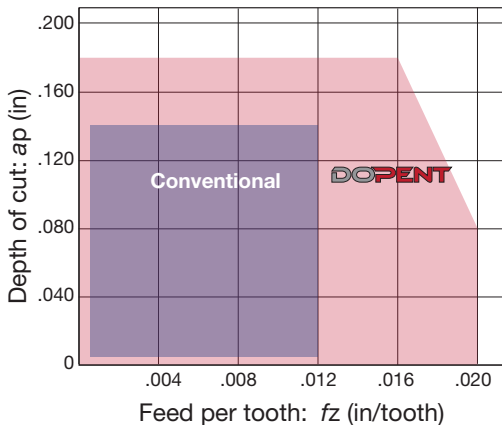
**3 Excellent Sharpness!**

Despite being an economical negative insert with an inclined cutting edge, the large axial rake angle provides remarkable sharpness.

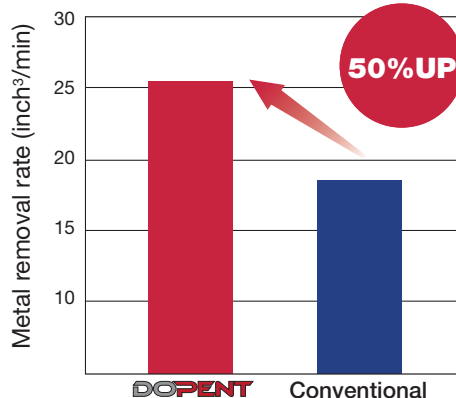


**Cutting performance**

Comparison of application areas



Comparison of cutting condition

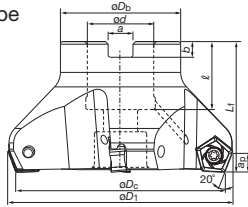


Work material : S55C (200HB)  
 Tool Ø : Ø 4.00 in  
 Cutting speed :  $V_c = 656$  S.F.M.  
 Cutting width :  $a_e = 2.00$  in  
 Conventional tool: Positive insert type  
 Face milling cutter

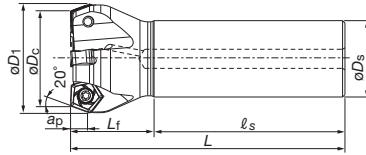
Feed per tooth  
**DOPENT** :  $f_z = .016$  in/t (8 tooth)  
 Conventional :  $f_z = .012$  in/t (7 tooth)  
 Depth of cut :  $a_p = .160$  in

# Cutter Body Specification

Bore type

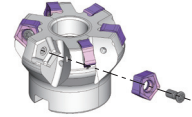


Shank type



Max. depth of cut : Max. ap = .250 in

Bore Type Components



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

## Bore type

Pitch	Cat. No.	Stock	No. of Insert	Dimensions (in)							Weight (Kg)	Coolant Hole	Coolant Thru Center Bolt
				ØDc	ØDb	Ød	ℓ	Lf	b	a			
Coarse	TEN09R200U0075A03	●	3	2.00	1.69	0.75	0.75	1.57	0.20	0.31	.3	with	(C0.375x1.125H)
	TEN09R250U0075A04	●	4	2.50	1.69	0.75	0.75	1.57	0.20	0.31	.5	with	(C0.375x1.125H)
	TEN09R300U0100A04	●	4	3.00	1.97	1.00	1.02	1.97	0.24	0.37	.9	with	(C0.500x1.375H)
	TEN09R400U0150A05	●	5	4.00	3.15	1.50	1.38	1.97	0.39	0.63	1.3	with	(TMBA-0.750H)
	*TEN09R500U0150A06	●	6	5.00	3.15	1.50	1.46	2.48	0.39	0.63	2.6	with	(TMBA-0.750H)
	*TEN09R600U0200A07	●	7	6.00	3.94	2.00	1.50	2.48	0.43	0.75	4.4	without	-
Close	TEN09R200U0075A04	●	4	2.00	1.69	0.75	0.75	1.57	0.20	0.31	.3	with	(C0.375x1.125H)
	TEN09R250U0075A06	●	6	2.50	1.69	0.75	0.75	1.57	0.20	0.31	.5	with	(C0.375x1.125H)
	TEN09R300U0100A07	●	7	3.00	1.97	1.00	1.02	1.97	0.24	0.37	.9	with	(C0.500x1.375H)
	TEN09R400U0150A08	●	8	4.00	3.15	1.50	1.38	1.97	0.39	0.63	1.3	with	(TMBA-0.750H)
	*TEN09R500U0150A10	●	10	5.00	3.15	1.50	1.46	2.48	0.39	0.63	2.7	with	(TMBA-0.750H)
	*TEN09R600U0200A12	●	12	6.00	3.94	2.00	1.50	2.48	0.43	0.75		without	-
Fine	TEN09R200U0075A06	★	6	2.00	1.69	0.75	0.75	1.57	0.20	0.31	.3	with	(C0.375x1.125H)
	TEN09R250U0075A08	★	8	2.50	1.69	0.75	0.75	1.57	0.20	0.31	.5	with	(C0.375x1.125H)
	TEN09R300U0100A10	★	10	3.00	1.97	1.00	1.02	1.97	0.24	0.37	.9	with	(C0.500x1.375H)
	TEN09R400U0150A12	★	12	4.00	3.15	1.50	1.38	1.97	0.39	0.63	1.4	with	(TMBA-0.750H)
	TEN09R500U0150A16	★	16	5.00	3.15	1.50	1.46	2.48	0.39	0.63	2.9	with	(TMBA-0.750H)
	TEN09R600U0200A20	★	20	6.00	3.94	2.00	1.50	2.48	0.43	0.75	4.9	without	-

## Shank type

★ Available second Quarter 2010

Cat. No.	Stock	No. of Insert	Dimensions (in)					Weight	Coolant Hole	Parts	
			ØDc	ØDs	ℓs	Lf	L			Clamping Screw	Wrench (Substitute)
EEN09R125U0125W03	●	3	1.25	1.25	2.28	1.50	3.78	.7	with	CSTR-4L100	T-15DB (T-15D)
EEN09R150U0125W04	●	4	1.50	1.25	2.28	2.00	4.28	.7	with	CSTR-4L100	T-15DB (T-15D)

## Insert Specification

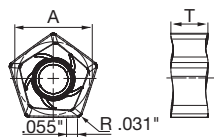


Fig. 1 MJ (General)

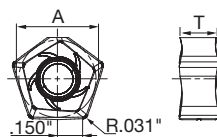


Fig. 2 W (Wiper)

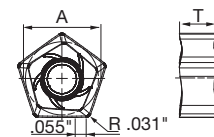


Fig. 3 AJ (For Aluminium)

Cat. No.	Accuracy	Honing	Stock					Dimensions (in)		Shape
			Coated			Uncoated		A	T	
			AH725	AH120	AH140	T3130	TH10			
PNCU0905GNER-MJ	C		●	●	●	●		.480"	.232"	Fig. 1
PNCU0905GNER-W	C		●					.480"	.232"	Fig. 2
PNCU0905GNFR-AJ	C						●	.480"	.248"	Fig. 3

## Installation of the extra close pitch cutter inserts

- The extra close pitch cutter has a slanted screw.
- Locate insert and then fasten the screw. (Fig. A)
- Appropriate torque is 31 in / lbs.
- After fastening the screw, please ensure there is no space between the cutter body and insert. (Fig. B)

Locate insert and then fasten the screw.

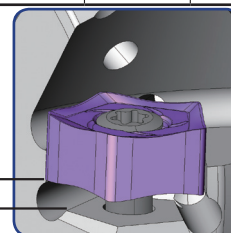


Fig. A

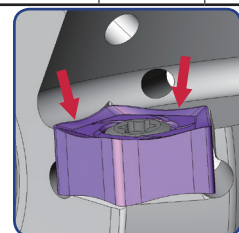


Fig. B

## Standard cutting conditions

Work material	Brinell hardness HB	Grades	Cutting Speed Vc (S.F.M)	Feed per tooth fz (in/t)
Low carbon steels (S15C, SS400 etc.)	~ 200	<b>T3130</b> <b>AH725</b>	330 - 600 - 820	.008 - .012 - .024
High carbon steels (S45C, S55C etc.)	200 ~ 300		330 - 490 - 760	.008 - .011 - .020
Alloyed steels (SCM440, SCr415 etc.)	150 ~ 300		330 - 390 - 600	.008 - .011 - .020
Tool steels (SK, SKH etc.)	~ 300			
Stainless steels (SUS304, SUS316 etc.)	-	<b>AH140</b>	200 - 390 - 460	.007 - .010 - .018
Grey cast irons (FC250, FC300 etc.)	150 ~ 250	<b>AH120</b>	460 - 600 - 820	.007 - .012 - .024
Ductile cast irons (FCD400 etc.)				
Aluminium alloys (Si < 13%)	-	<b>TH10</b>	1640 - 2630 - 4920	.005 - .010 - .020
Aluminium alloys (Si ≥ 13%)			330 - 660 - 980	

- To remove excessive chip accumulation use an air blast.
- When chips stick to the cutting edges (aluminium machining), use a water soluble cutting fluid.
- When interrupted cutting or cutting a casting skin, the cutting feed (fz) should be reduced to below the values shown in the

above table.

- Cutting conditions are limited by machine power and material rigidity. When the cutting width or depth is large, set Vc and fz below the recommended values and check the machine vibration and spindle load.

### NOTES ON USE OF WIPER INSERT

- To achieve a good surface finish, a wiper insert is recommended. (PNCU0905GNER-W) Feed per Rev. should not exceed .150"
- When using the wiper insert, install the insert as shown in Fig. C. And be sure that the groove is at the front as shown in Fig. D.
- The wiper insert has two wiping corners. (Fig. D)
- Do not use the other corners. It may break the tool body.

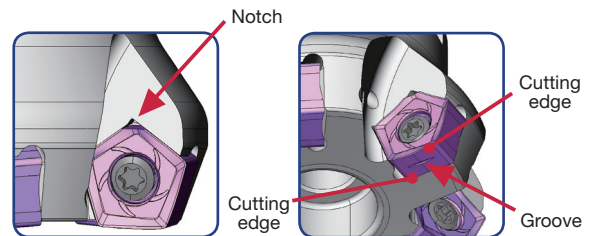


Fig. C

Fig. D

## Tungaloy America, Inc.

1226A Michael Drive, Wood Dale, IL 60191

3726 N. Ventura Dr. Arlington Heights, IL 60004

NEW ADDRESS  
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Inside Sales: 1-888-554-8394

Technical Support: 1-888-554-8391

Fax: 1-888-554-8392

### Tungaloy Canada

432 Elgin Street, Unit 3, Brantford, Ontario, Canada N3S-7P7

Phone: 519-758-5779, Fax: 519-758-5791

### Tungaloy de Mexico S.A.

C Los Arellano 113, Vista Alegre, Aguascalientes, AGS, Mexico 20290

Phone: 011-52-449-929-5410, Fax: 011-52-449-929-5411



[www.tungaloyamerica.com](http://www.tungaloyamerica.com)



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