

Tungaloy

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Keeping the Customer First

Tungaloy Report No. 14 USA

TAC Mill Series : Shoulder milling cutter

NEW

TECMILL

TPM Shell Mills / EPM End Mills

“Tangential Clamping Cutter” A Combination of Strength and Stability!

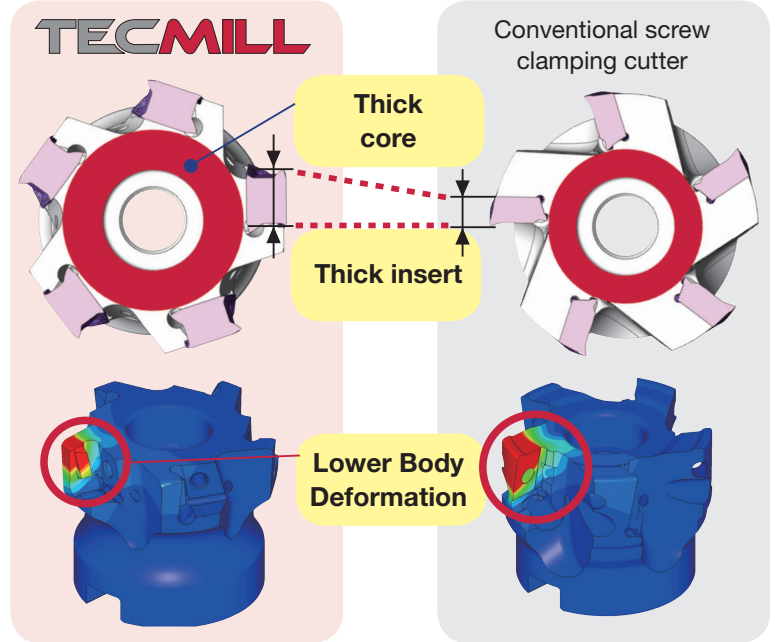
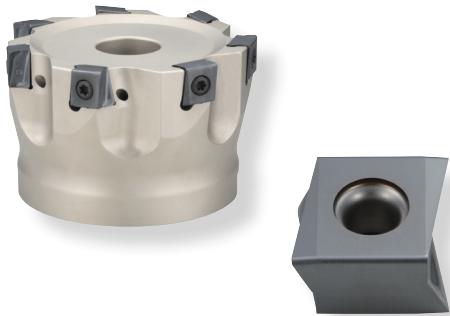


TPM / EPM Type for Shoulder milling

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

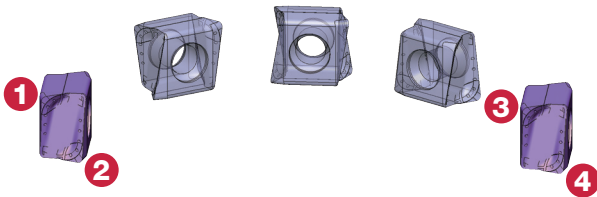
1 High feed rate & high cutting efficiency!

- TECMILL features unique tangential clamping.
- Thicker body core provides tangential clamping and improves body rigidity.
- Tangential clamping dramatically improves cutting edge and body strength.



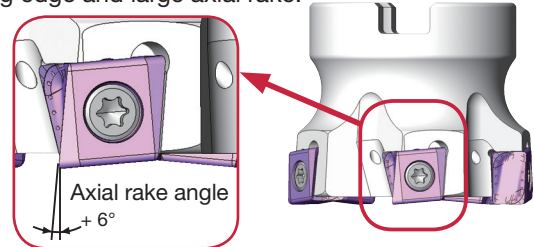
2 With 4-edged insert

4-edged insert offers an economical advantage over conventional positive inserts, reducing tooling costs by 30%



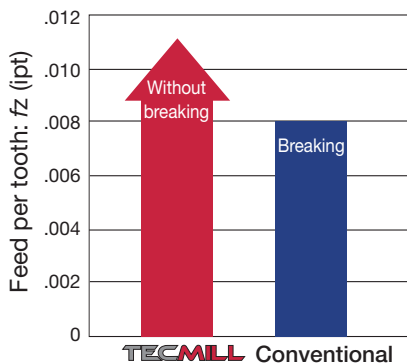
3 Excellent sharpness

Despite the tangential double sided insert, the TECMILL achieves excellent cutting edge sharpness with an inclined cutting edge and large axial rake.

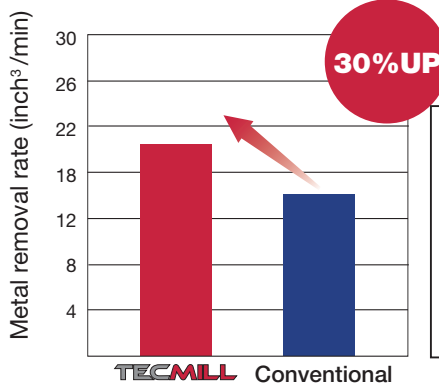


Cutting performance

Comparison of cutting edge toughness



Comparison of metal removal rate

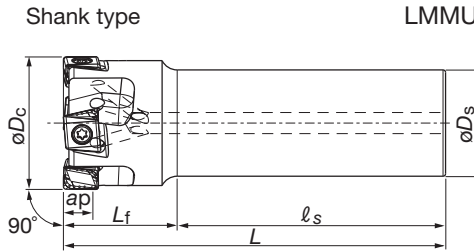
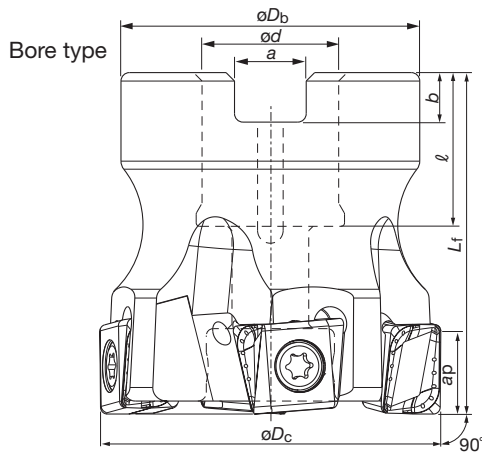


Work material	: SAE 1055 (200HB)
Tool Ø	: ø2.5"
Cutting speed	: Vc = 500 SFM
Feed per tooth	
TECMILL	: fz = .008" ipt (6 tooth)
Conventional	: fz = .006" ipt (6 tooth)
Depth of cut	: ap = .400"
Width of cut	: ae = 1.4"
Cutting fluids	: Dry

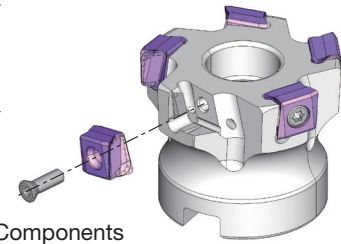
Work material	: SAE 1055 (200HB)
Tool Ø	: ø2.00"
Cutting speed	: Vc = 820SFM
Depth of cut	: ap = .112"
Width of cut	: ae = .500"

*Conventional:
Positive type, Shoulder milling cutter

Cutter Body Specification



Max. depth of cut
 LMMU11 type : Max. $ap = 0.381''$
 LMMU16 type : Max. $ap = 0.594''$



Bore Type Components

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

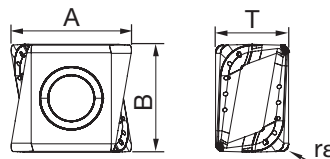
Bore type

Pitch	Cat. No.	Stock	No. of Inserts	Dimensions (in)							Weight (kg)	Air hole	Coolant Center bolt	Inserts	
				ϕD_c	ϕD_b	ϕd	ℓ	L_f	b	a					
Coarse	TPM11R200U0075A05	●	5	2.00	1.77	0.75	0.75	1.57	0.24	0.39	0.3	with	(C0.375x1.125H)	LMMU1107**PNER-MJ	
	TPM11R250U0075A06	●	6	2.50	1.77	0.75	0.75	1.57	0.24	0.39	0.5	with	(C0.375x1.125H)		
	TPM11R300U0100A06	●	7	3.00	2.17	1.00	0.75	1.97	0.24	0.37	0.9	with	(C0.500x1.375H)		
	TPM11R400U0150A08	●	8	4.00	3.07	1.50	1.06	1.97	0.31	0.50	1.4	with	(TMBA-0.750H)		
	TPM16R300U0100A05	●	5	3.00	2.17	1.00	0.75	1.97	0.24	0.37	1.0	with	(C0.500x1.375H)		LMMU1609**PNER-MJ
	TPM16R400U0150A06	●	6	4.00	3.07	1.50	1.06	1.97	0.31	0.50	1.6	with	(TMBA-0.750H)		
TPM16R500U0150A07	●	7	5.00	3.07	1.50	1.06	2.48	0.39	0.63	3.0	with	(TMBA-0.750H)			
Close	TPM11R300U0100A08	●	9	3.00	2.17	1.00	0.75	1.97	0.24	0.37	1.0	with	(C0.500x1.375H)	LMMU1107**PNER-MJ	
	TPM11R400U0150A11	●	11	4.00	3.07	1.50	1.06	1.97	0.31	0.50	1.5	with	(TMBA-0.750H)		

Shank type

Cat. No.	Stock	No. of Inserts	Dimensions (in)					Air hole	Inserts	Parts	
			ϕD_c	ϕD_s	ℓ_s	L_f	L			Clamping screw	Wrench (Substitution)
EPM11R125U0125W03	●	3	1.25	1.25	2.25	1.75	4	with	LMMU1107**PNER-MJ	CSTB-3.5L110	T-15DB (T-15D)
EPM11R150U0125W04	●	4	1.5	1.25	2.25	1.75	4	with			

Insert Specification



Cat. No.	Accuracy	Honing	Stock				Dimensions (in)				Cutter
			Coated grades				A	B	T	r_ϵ	
			AH725	AH120	AH140	T3130					
LMMU110708PNER-MJ	M	with	●	●	●	●	.460	.413	.280	.031	E/TPM11
LMMU110716PNER-MJ	M	with	●	●	●	●	.453	.413	.280	.063	
LMMU110724PNER-MJ	M	with	●	●	●	●	.445	.413	.280	.094	
LMMU110732PNER-MJ	M	with	●	●	●	●	.437	.413	.280	.126	
LMMU160908PNER-MJ	M	with	●	●	●	●	.681	.630	.374	.031	TPM16
LMMU160916PNER-MJ	M	with	●	●	●	●	.673	.630	.374	.063	
LMMU160924PNER-MJ	M	with	●	●	●	●	.665	.630	.374	.094	
LMMU160932PNER-MJ	M	with	●	●	●	●	.661	.630	.374	.126	

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	T3130 AH725	330 - 590 - 820	.005 - .008 - .012
High carbon steels (S45C, S55C etc.)	200 ~ 300		330 - 490 - 760	.005 - .007 - .012
Alloyed steels (SCM440, SCr415 etc.)	150 ~ 300		330 - 390 - 590	
Tool steels (SK, SKH etc.)	~ 300			
Stainless steels (SUS304, SUS316 etc.)	-	AH140	200 - 390 - 460	.005 - .008 - .012
Grey cast irons (FC250, FC300 etc.)	150 ~ 250	AH120	460 - 590 - 820	.005 - .008 - .012
Ductile cast irons (FCD400 etc.)				
Heat-resisting alloy (Inconel 718, Ti-6Al-4V etc.)	-	AH725	70 - 120 - 160	.004 - .006 - .008

- To remove excessive chip accumulation use an air blast.
- When cutting interrupted surfaces like a casting skin, the cutting feed (fz) should be set below the values shown in the above table.
- Tool overhang should be minimized. When machining with long overhang

- applications the tool tends to chatter. Please reduce the feed rate fz.
- Cutting conditions are limited by machine power and material rigidity. When the cutting width or depth is large, set Vc and fz below the recommended values and check the machine vibration and spindle load.

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