Tungaloy
Member IMC Group

Keeping the Customer First

Tungaloy Report No. 374-EE

MILLLINE Shoulder milling cutter

NEW

TECMILL

TPM / EPM type

metric

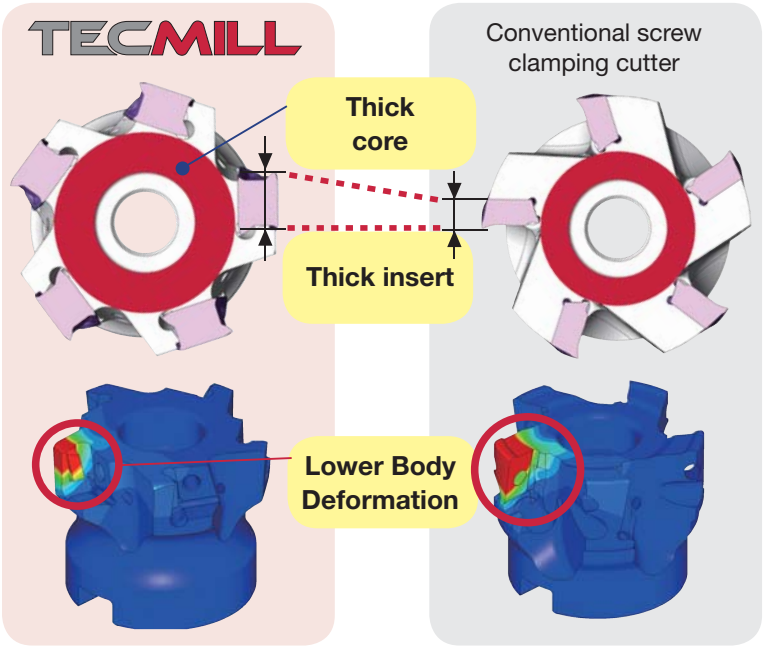
"Tangential Clamping Cutter" A Combination of Strength and Stability!

Features

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.

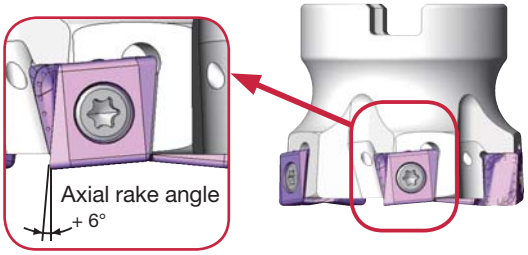


2 Economical 4-edged insert

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

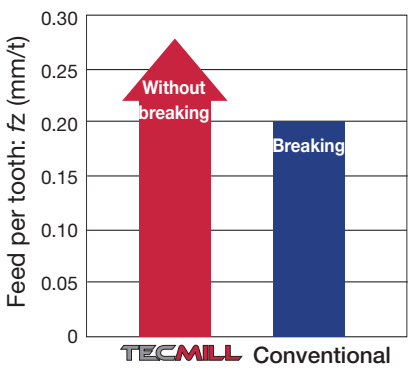
3 Excellent sharpness

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



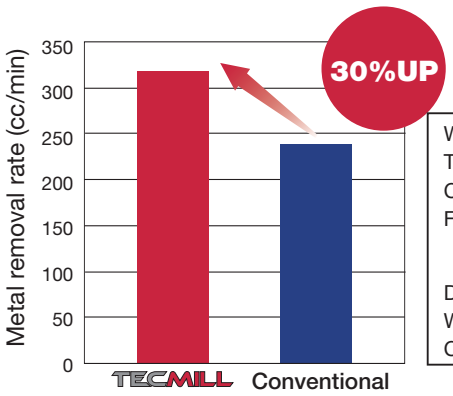
Cutting performance

Comparison of cutting edge toughness



Work material	: S55C (200HB)
Tool Ø	: ø50 mm
Cutting speed	: *Vc* = 250 m/min
Depth of cut	: *ap* = 3 mm
Width of cut	: *ae* = 12.5 mm

Comparison of metal removal rate



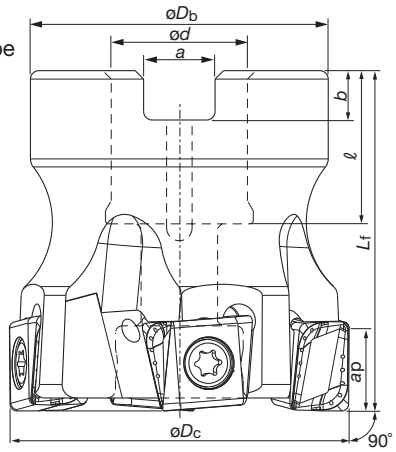
Work material	: S55C (200HB)
Tool Ø	: ø63 mm
Cutting speed	: *Vc* = 150 m/min
Feed per tooth	
TECMILL	: *fz* = 0.2 mm/t (6 tooth)
Conventional	: *fz* = 0.15 mm/t (6 tooth)
Depth of cut	: *ap* = 10 mm
Width of cut	: *ae* = 35 mm
Cutting fluids	: Dry

*Conventional:
Positive type, Shoulder milling cutter

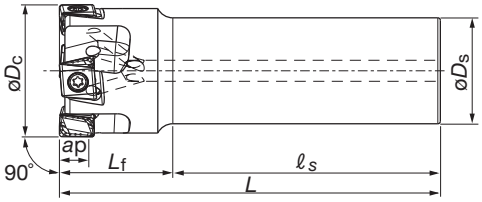
Cutter Body Specification

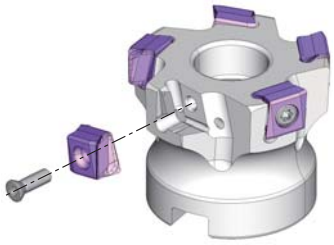
Max. depth of cut
LMMU11 type : Max. *ap* = 9.7 mm
LMMU16 type : Max. *ap* = 15.1 mm

Bore type



Shank type





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

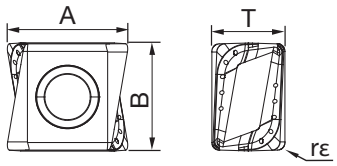
Pitch	Cat. No.	Stock	No. of Inserts	Dimensions (mm)							Weight (kg)	Air hole	Center bolt	Inserts
				ØDc	ØDb	Ød	ℓ	Lf	b	a				
Course	**TPM11R050M22.0E05**	●	5	50	41	22	20	40	6.3	10.4	0.3	with	CM10x30H	**LMMU1107**PNER-MJ**
	TPM11R063M22.0E06	●	6	63	41	22	20	40	6.3	10.4	0.5	with	CM10x30H	
	TPM11R080M27.0E07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

Shank type

Cat. No.	Stock	No. of Inserts	Dimensions (mm)					Weight (kg)	Air hole	Inserts	Parts	
			ØDc	ØDs	ℓ s	Lf	L				Clamping screw	Wrench (Substitution)
EPM11R032M32.0-03	●	3	32	32	80	35	115	0.6	with	**LMMU1107**PNER-MJ**	**CSTB-3.5L110**	**T-15DB (T-15D)**
EPM11R040M32.0-04	●	4	40	32	80	35	115	0.7	with			
EPM11R050M32.0-04	●	4	50	32	80	40	120	0.9	with			
EPM11R063M32.0-06	○	6	63	32	80	40	120	1.2	with			
EPM11R080M32.0-07	○	7	80	32	80	40	120	1.6	with			

● : Stocked items
○ : Stocked in Japan

Insert Specification



Cat. No.	Accuracy	Honing	Stock					Dimensions (mm)				Cutter
			Coated grades									
			AH725	**AH120**	**AH140**	**T3130**	**T1015**	A	B	T	rε	
LMMU110708PNER-MJ	M	with	●	●	●	★	★	11.7	10.5	7.1	0.8	E/TPM11
LMMU110716PNER-MJ	M	with	●	●	●	★	★	11.5	10.5	7.1	1.6	
LMMU110724PNER-MJ	M	with	●	●	●	★	★	11.3	10.5	7.1	2.4	
LMMU110732PNER-MJ	M	with	●	●	●	★	★	11.1	10.5	7.1	3.2	
LMMU160908PNER-MJ	M	with	●	●	●	★	★	17.3	16.0	9.5	0.8	TPM16
LMMU160916PNER-MJ	M	with	●	●	●	★	★	17.1	16.0	9.5	1.6	
LMMU160924PNER-MJ	M	with	●	●	●	★	★	16.9	16.0	9.5	2.4	
LMMU160932PNER-MJ	M	with	●	●	●	★	★	16.8	16.0	9.5	3.2	

★ : Available from 2010

Standard cutting conditions

Material	Hardnes HB	Situation of selection	Recommending Grade	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
Low Carbon steels (S15C, SS400 etc.)	~ 200	First choice	**AH725**	180 (100 - 250)	0.2 (0.12 - 0.3)
		Priority on impact resistance	**AH140**	130 (80 - 180)	
		Priority on wear resistance	**T3130**	200 (120 - 250)	
High Carbon steels (S45C, S55C etc.)	200 ~ 300	First choice	**AH725**	150 (100 - 230)	0.17 (0.12 - 0.25)
		Priority on impact resistance	**AH140**	130 (80 - 180)	
		Priority on wear resistance	**T3130**	180 (120 - 250)	
Alloyed Steels (SCM440, SCr415 etc.)	150 ~ 300	First choice	**AH725**	150 (100 - 230)	0.17 (0.12 - 0.25)
		Priority on impact resistance	**AH140**	120 (80 - 150)	
		Priority on wear resistance	**T3130**	180 (120 - 250)	
Tool Steels (SK, SKH etc.)	~ 300	First choice	**AH725**	120 (100 - 180)	0.17 (0.12 - 0.25)
		Priority on impact resistance	**AH140**	100 (80 - 120)	
		Priority on wear resistance	**T3130**	120 (100 - 180)	
Stainless steels (SUS304, SUS316 etc.)	-	First choice	**AH140**	150 (90 - 180)	0.2 (0.12 - 0.3)
Gray cast irons (FC250, FC300 etc.) Ductile cast irons (FCD400 etc.)	150 ~ 250	First choice	**AH120**	180 (140 - 250)	0.2 (0.12 - 0.3)
		Priority on wear resistance	**T1015**		
Heat-resisting alloy (Ti-6AL-4V, Inconel718 etc.)	-	First choice	**AH725**	35 (20 - 50)	0.15 (0.1 - 0.2)

· To remove excessive chip accumulation use an air blast.
· When cutting interrupted surfaces like a casted 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.

Tungaloy Corporation

http://www.tungaloy.co.jp/

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