Member IMC Group Tungaloy INDUSTRY 4.0

MillLine

Shoulder and face milling cutter

TECMILL

Tungaloy Report No. 374S2-US

Introducing **the latest insert grades** for steel and hardened steels

TUNGALOY ADDFORCE ACCELERATED LINES

TECMILL

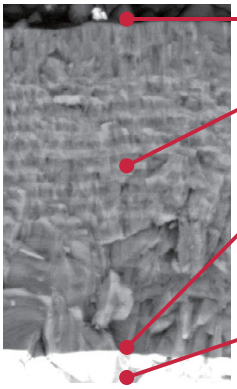
For more information

PVD grades with high wear and chipping resistance for wider application coverages

New

AH3225 P

- Nano multi-layer coating technology with three major properties for optimal cutting edge integrity
- Increased resistance to wear, fracture, oxidation, built-up edge, and delamination



Resistance to built-up edge
The coating surface prevents built-up edge

Resistance to wear, oxidation, and fracture
Multi-layered coating is designed to resist wear and oxidation, while preventing micro-cracks from propagating in the coating layer for improved resistance to edge chipping

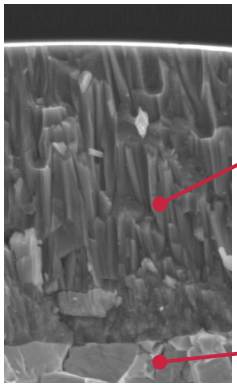
Strong coating / substrate adhesion
Coating is optimized for strong adhesion property with substrate to maintain strong cutting edge integrity

Carbide substrate
High resistance to fracture

New

AH8015 S H

- PVD coated grades with high wear and chipping resistance
- Demonstrates incredible tool life in the machining of heat resistant alloys

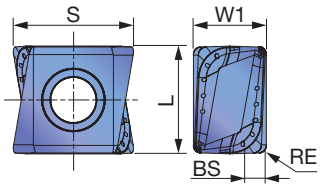


PVD grade featuring high aluminum-content multilayered coating
A combination of over 20% harder coating surface and multilayered coating structure helps prevent micro-cracks from progressing into catastrophic failure.
Enhanced adhesion of coating and substrate eliminates delamination.

New dedicated substrate
Dedicated carbide substrate with excellent fracture resistance

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								S	L	W1	BS
			AH3225	AH8015	AH3135	AH725	AH120	AH140	T1215	T3225				
LMMU110708PNER-MJ	0.031	0.381	●	●	●	●	●	●	●	●	0.460	0.413	0.280	0.079
LMMU110716PNER-MJ	0.063	0.381	●	●	●	●	●	●	●	●	0.453	0.413	0.280	0.047
LMMU110724PNER-MJ	0.094	0.381				●	●	●			0.445	0.413	0.280	0.016
LMMU110732PNER-MJ	0.126	0.381	●	●		●	●	●			0.437	0.413	0.280	-
LMMU160908PNER-MJ	0.031	0.594	●	●	●	●	●	●	●	●	0.681	0.630	0.375	0.094
LMMU160916PNER-MJ	0.063	0.594	●	●	●	●	●	●			0.673	0.630	0.375	0.063
LMMU160924PNER-MJ	0.094	0.594				●	●	●			0.665	0.630	0.375	0.031
LMMU160932PNER-MJ	0.126	0.594				●	●	●			0.661	0.630	0.375	-

● : New product
● : Line up

STANDARD CUTTING CONDITIONS

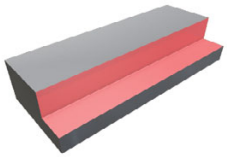
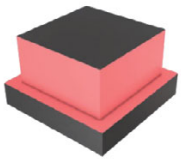
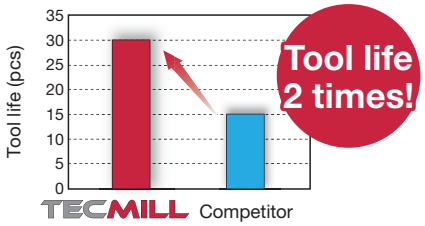
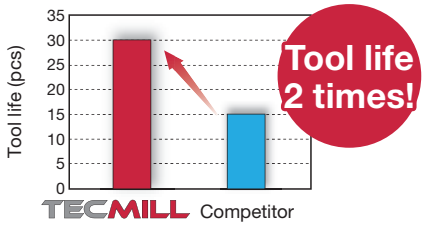
Bore, shank type

ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1015, etc.		- 200 HB	First choice	AH3225	328 - 984	0.005 - 0.012
			- 200 HB	Wear resistance	T3225	492 - 1148	0.003 - 0.008
			- 200 HB	Fracture resistance	AH3135	328 - 820	0.005 - 0.012
	Carbon steel and alloy steel 1055, 4140 etc.		- 300 HB	First choice	AH3225	328 - 820	0.004 - 0.010
			- 300 HB	Wear resistance	T3225	492 - 1148	0.003 - 0.008
			- 300 HB	Fracture resistance	AH3135	328 - 755	0.004 - 0.010
	Prehardened steel NAK80, PX5, etc.		30 - 40 HRC	First choice	AH3225	328 - 755	0.004 - 0.010
			30 - 40 HRC	Wear resistance	T3225	394 - 1148	0.003 - 0.008
			30 - 40 HRC	Fracture resistance	AH3135	328 - 755	0.004 - 0.010
M	Stainless steel S30400, etc.		-	First choice	AH3135	295 - 591	0.004 - 0.010
K	Gray cast iron No.250B, etc.		150 - 250 HB	First choice	AH8015	328 - 984	0.005 - 0.012
			150 - 250 HB	Wear resistance	T1215	394 - 1148	0.003 - 0.008
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250 HB	First choice	AH8015	328 - 656	0.005 - 0.012
			150 - 250 HB	Wear resistance	T1215	394 - 1148	0.003 - 0.008
S	Titanium alloys Ti-6Al-4V, etc.		-	First choice	AH3135	98 - 197	0.002 - 0.008
	Superalloys Inconel718, etc.		-	First choice	AH8015	66 - 164	0.002 - 0.004
H	Hardened steel	H13, etc.	40 - 50 HRC	First choice	AH8015	148 - 230	0.003 - 0.006
		D2, etc.	50 - 60 HRC	First choice	AH8015	131 - 213	0.002 - 0.004

Roughing type

ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steel 1015, etc.		- 200 HB	First choice	AH3225	328 - 984	0.004 - 0.010
			- 200 HB	Wear resistance	T3225	492 - 1148	0.004 - 0.008
			- 200 HB	Fracture resistance	AH3135	328 - 820	0.004 - 0.010
	Carbon steel and alloy steel 1055, 4140 etc.		- 300 HB	First choice	AH3225	328 - 820	0.004 - 0.008
			- 300 HB	Wear resistance	T3225	492 - 1148	0.004 - 0.008
			- 300 HB	Fracture resistance	AH3135	328 - 755	0.004 - 0.010
	Prehardened steel NAK80, PX5, etc.		30 - 40 HRC	First choice	AH3225	328 - 755	0.004 - 0.008
			30 - 40 HRC	Wear resistance	T3225	394 - 1148	0.004 - 0.008
			30 - 40 HRC	Fracture resistance	AH3135	328 - 755	0.004 - 0.010
M	Stainless steel S30400, etc.		-	First choice	AH3135	295 - 591	0.004 - 0.010
K	Gray cast iron No.250B, etc.		150 - 250 HB	First choice	AH8015	328 - 984	0.004 - 0.010
			150 - 250 HB	Wear resistance	T1215	394 - 1148	0.004 - 0.010
	Ductile cast iron 60-40-18, 80-55-06, etc.		150 - 250 HB	First choice	AH8015	328 - 656	0.004 - 0.010
			150 - 250 HB	Wear resistance	T1215	394 - 1148	0.004 - 0.010
S	Titanium alloys Ti-6Al-4V, etc.		-	First choice	AH3135	98 - 197	0.002 - 0.006
	Superalloys Inconel718, etc.		-	First choice	AH8015	66 - 164	0.002 - 0.004
H	Hardened steel	H13, etc.	40 - 50 HRC	First choice	AH8015	98 - 197	0.002 - 0.006
		D2, etc.	50 - 60 HRC	First choice	AH8015	82 - 180	0.002 - 0.004

PRACTICAL EXAMPLES

Workpiece type		Machine part	Machine part
Toolholder		TPM11R200U0075A05 (ø2.000", z = 5)	TPM11R200U0075A05 (ø2.000", z = 5)
Insert		LMMU110708PNER-MJ	LMMU110708PNER-MJ
Grade		AH3225	AH8015
Workpiece material		Austenitic stainless steel  M	Gray cast iron  K
Cutting conditions	Cutting speed: *Vc* (sfm)	492	820
	Feed per tooth: *fz* (ipt)	0.008	0.008
	Feed : *f* (ipr)	37.598	62.677
	Depth of cut : *ap* (in)	0.236	0.197
	Width of cut : *ae* (in)	0.591	0.787
	Machining	Shoulder milling	Shoulder milling
	Coolant	Air blow	Air blow
	Machine	Vertical M/C, CAT50	Vertical M/C, CAT50
Results		 AH3225 offered stable and long tool life thanks to its high anti-chipping performance.	 AH8015 offered stable and long tool life thanks to its high heat resistance and anti-chipping performance even in high speed condition.

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