Member IMC Group Tungaloy

MillLine

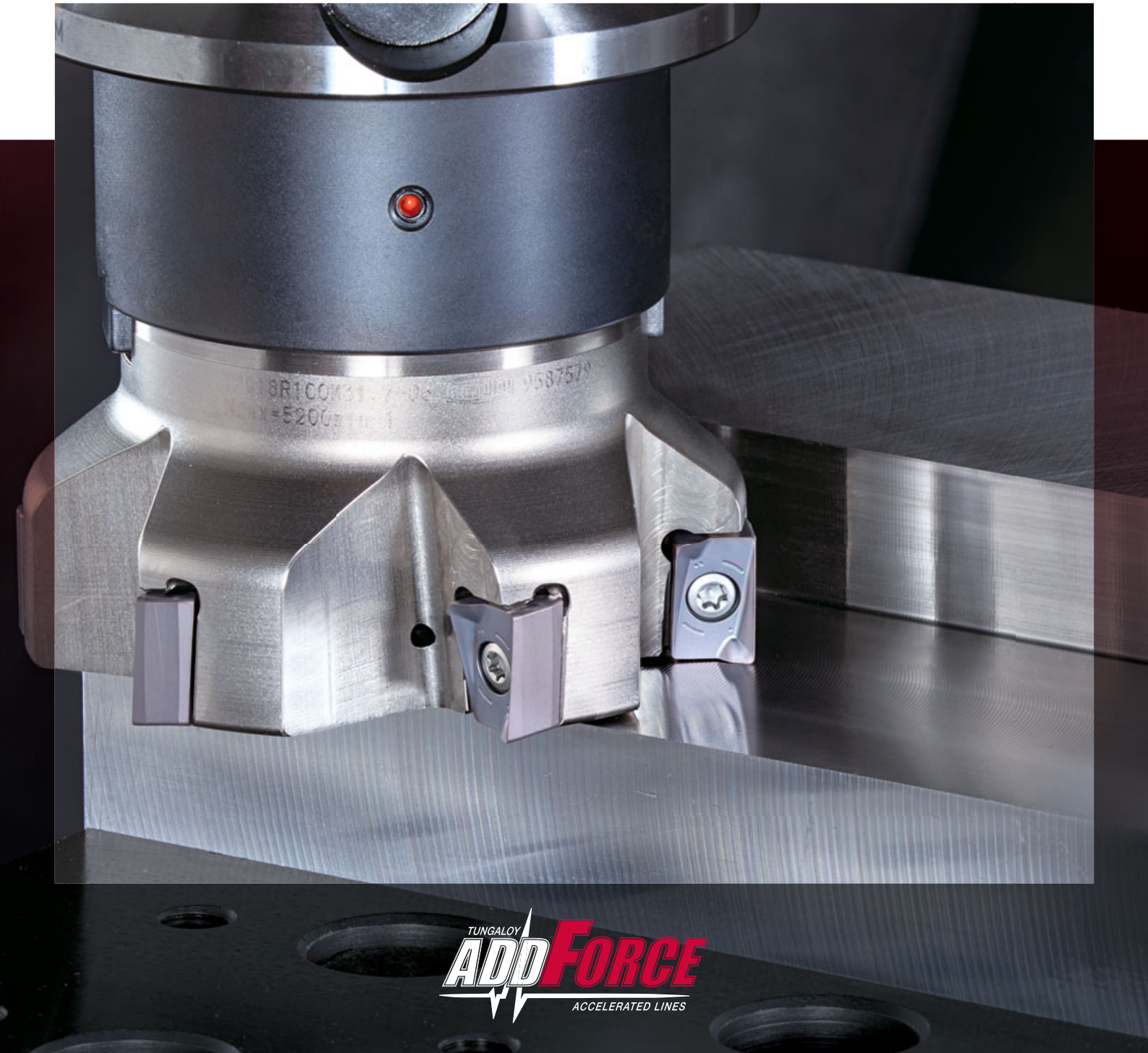
For more information

Shoulder milling cutter

DOREC

Tungaloy Report No. 390S1-G

Expansion of **new insert geometry and latest grades**



DOREC

Introducing ML chipbreaker

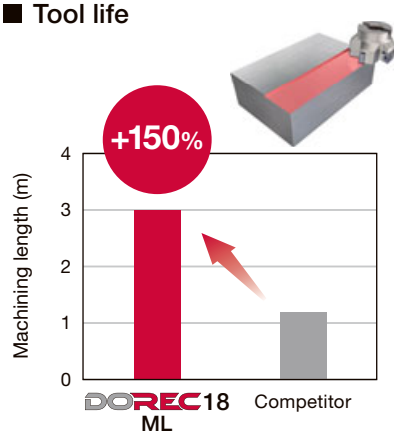
New **ML**

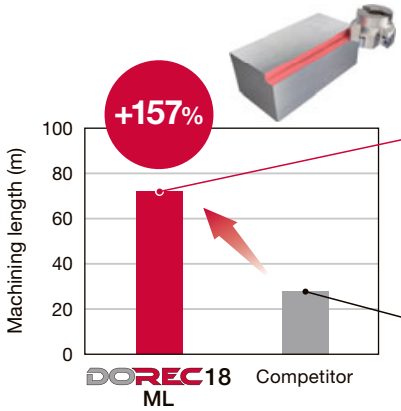
Light cutting geometry
(reduces cutting force by about 20% over MJ chipbreaker)
- Suitable for long overhang and aggressive D.O.C. machining
- First choice in stainless steel and heat resistant alloys

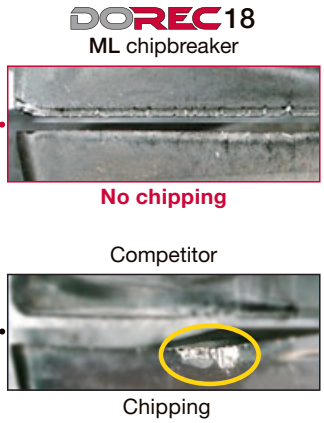
MJ

Balanced geometry for edge integrity and toughness
- Suitable for interrupted machining
- First choice in steel and cast iron

Tool life







M

Cutter	: TPQ18R080M27.0E05 (DC = 80 mm, CICT = 5)
Insert	: LQMU180808PNER-ML AH3135
Workpiece material	: SUS304 / X5CrNi18-9
Cutting speed	: *Vc* = 150 m/min
Feed per tooth	: *fz* = 0.13 mm/t
Depth of cut	: *ap* = 3 mm
Width of cut	: *ae* = 50 mm
Coolant	: Dry
Machine	: Vertical M/C, BT50

Performed with only one insert on the cutter

P

Cutter	: TPQ18R080M27.0E05 (DC = 80 mm, CICT = 5)
Insert	: LQMU180808PNER-ML AH3225
Workpiece material	: S55C / C55
Cutting speed	: *Vc* = 180 m/min
Feed per tooth	: *fz* = 0.2 mm/t
Depth of cut	: *ap* = 12 mm
Width of cut	: *ae* = 15 mm
Coolant	: Dry
Machine	: Vertical M/C, BT50

Performed with only one insert on the cutter

Available in the latest grades

Tungaloy's latest PVD and CVD grades optimized for each material groups

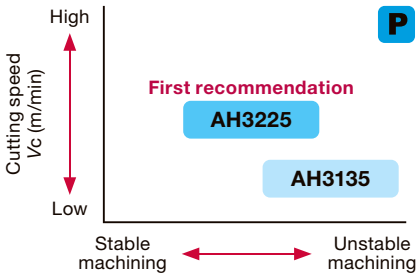
AH3225 P
- Nano multi-layer coating technology with three major properties for optimal cutting edge integrity
- Increased resistance to wear, fracture, oxidation, built-up edge, and delamination

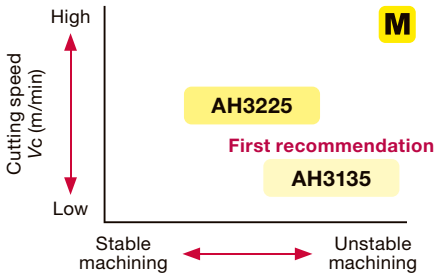
AH8015 K S H
- PVD coated grades with high wear and chipping resistance
- Demonstrates incredible tool life in the machining of heat resistance alloys

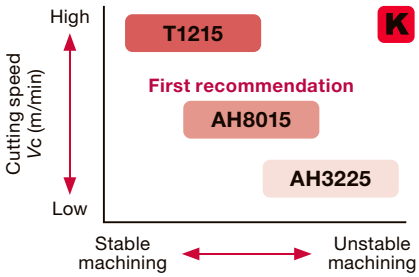
AH3135 M
- PVD grade for high fracture resistance
- Most suitable for steel and stainless steel in general cutting parameters

T1215 K
- CVD grade with outstanding wear and chipping resistance
- Best for cast iron at high-speed machining

Application areas

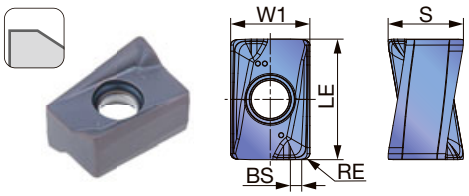






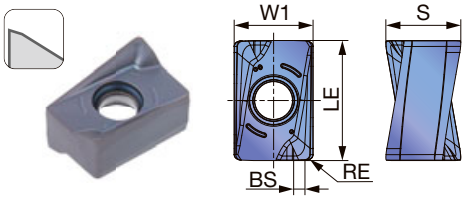
INSERTS

LQMU18-MJ (for general purpose)



New

LQMU18-ML (for low cutting force)



		AH3225	AH3135	AH8015	T1215	AH120	AH140	AH725
P	Steel	★	☆					☆
M	Stainless	☆	★				☆	
K	Cast iron			★	☆	☆		
N	Non-ferrous							
S	Superalloys		☆	★		☆		☆
H	Hard materials			★				☆

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated AH3225	AH3135	AH8015	T1215	AH120	AH140	AH725	LE	S	W1	BS
LQMU180804PNER-MJ	0.4	16	●	●	●		●	●	●	17.5	10.9	11.5	2
LQMU180808PNER-MJ	0.8	16	●	●	●	●	●	●	●	17.5	10.9	11.5	1.6
LQMU180816PNER-MJ	1.6	16	●		●		●	●	●	17.5	10.9	11.5	0.8
LQMU180824PNER-MJ	2.4	16					●	●	●	17.5	10.9	11.5	-
LQMU180804PNER-ML	0.4	16	●	●	●					17.5	10.9	11.5	2
LQMU180808PNER-ML	0.8	16	●	●	●	●				17.5	10.9	11.5	1.6

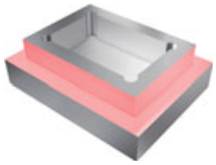
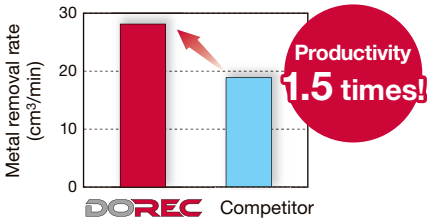
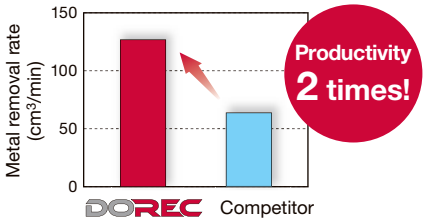
● : New product
● : Line up

STANDARD CUTTING CONDITIONS

LQMU18

ISO	Workpiece material		Hardness	Priority	Chipbreaker	Grade	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
P	Low carbon steel S15C, etc. C15E4, etc.		- 200 HB	First choice	MJ	AH3225	100 - 250	0.1 - 0.25
				Low cutting force	ML	AH3225	100 - 250	0.1 - 0.25
	High carbon steel S45C, S55C, etc. C45, C55, etc.		200 - 300 HB	First choice	MJ	AH3225	100 - 230	0.1 - 0.2
				Low cutting force	ML	AH3225	100 - 230	0.1 - 0.2
	Alloy steel SCM440, SCr415, etc. 42CrMo4, etc.		- 300 HB	First choice	MJ	AH3225	100 - 230	0.1 - 0.2
				Low cutting force	ML	AH3225	100 - 230	0.1 - 0.2
	Tool steel SKD11, etc. X153CrMoV12, etc.		30 - 40 HRC	First choice	MJ	AH3225	100 - 180	0.1 - 0.2
				Low cutting force	ML	AH3225	100 - 180	0.1 - 0.2
M	Stainless steel SUS304, etc. X5CrNi18-9, etc.		- 200 HB	First choice	ML	AH3135	90 - 180	0.1 - 0.25
				Fracture resistance	MJ	AH3135	90 - 180	0.1 - 0.25
K	Grey cast iron FC250, etc. 250, etc.		150 - 250 HB	First choice	MJ	AH8015	140 - 250	0.1 - 0.25
				Low cutting force	ML	AH8015	140 - 250	0.1 - 0.25
				Wear resistance	MJ	T1215	200 - 400	0.1 - 0.25
	Ductile cast iron FCD400, etc. 450-10S, etc.		150 - 250 HB	First choice	MJ	AH8015	110 - 200	0.1 - 0.25
				Low cutting force	ML	AH8015	110 - 200	0.1 - 0.25
				Wear resistance	MJ	T1215	150 - 300	0.1 - 0.25
S	Titanium alloy Ti-6Al-4V, etc.		-	First choice	ML	AH3135	30 - 60	0.08 - 0.2
				Fracture resistance	MJ	AH3135	30 - 60	0.08 - 0.2
	Superalloys Inconel 718, etc.		-	First choice	ML	AH8015	20 - 50	0.06 - 0.15
				Fracture resistance	MJ	AH8015	20 - 50	0.06 - 0.15
H	Hardened steel	SKD61, etc. X40CrMoV5-1, etc.	40 - 50 HRC	First choice	MJ	AH8015	45 - 70	0.08 - 0.15
		SKD11, etc. X153CrMoV12, etc.	50 - 60 HRC	First choice	MJ	AH8015	40 - 65	0.06 - 0.1

PRACTICAL EXAMPLES

Workpiece type		Machine part	Mold part
Cutter		EPQ18R050M32.0W04 (DC = 50 mm, CICT = 4)	TPQ18R100M31.7-06 (DC = 100 mm, CICT = 6)
Insert		LQMU180808PNER-ML	LQMU180808PNER-ML
Grade		AH8015	AH3225
Workpiece material		FC200 / 200 K	SKD11 / X153CrMoV12  P
Cutting conditions	Cutting speed: *Vc* (m/min)	118	132
	Feed per tooth: *fz* (mm/t)	0.25	0.21
	Depth of cut : *ap* (mm)	1.5	4
	Width of cut : *ae* (mm)	25	60
	Machining	Face milling	Shoulder milling
	Coolant	Dry	Dry
	Overhang length (mm)	210	-
	Machine	Horizontal M/C, HSK A100	Vertical M/C, BT50
Results		 **DoRec**'s light-cutting ML chipbreaker eliminated chatter in a long overhang setup. This allowed higher parameters, achieving 1.5 times productivity increase.	 **DoRec**'s light-cutting ML chipbreaker eliminated chatter and allowed higher cutting depths than previously possible with stability.

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