

# Hard Milling with WA1

## Mill hardened materials (HRC 45-62) Reduce costs and eliminate grinding



- Rapid metal removal rates
- Achieve outstanding surface finishes
- Increased tool life vs carbides
- Versatile round insert geometries provide clearance in every direction

### Target Industries

- Mold Shops
- Food processing
- Tool & Die
- Forging
- Mining

### Application Materials

- Tool Steels
- Chilled Irons
- Stellite
- Mold Steels
- Powered Metal
- Weld Overlays

### Cutters



### Insert

- Grade  
**WA1/WA5**
- Shape  
RPGN: Low tool pressure  
RNGN: More rigidity

## Recommend Cutting Conditions

INSERT	DOC	HRC 45-55		HRC 55-60		HRC 60-62	
		Cutting Speed (m/min)	Feed (mm/t)	Cutting Speed (m/min)	Feed (mm/t)	Cutting Speed (m/min)	Feed (mm/t)
RPGN120400	1.3	260-390	0.13	210-360	0.09	160-330	0.08
RNGN120700	1.9	260-560	0.13	210-390	0.1	160-360	0.08

Note: Speeds and Feeds are approximately starting points

## Guidelines for Success

- Minimize overhang and have ridged set-ups
- Keep cutter engagement to 1/2 to 5/8 of the cutter diameter
- Reduce feed upon entrance and exit of the cut by 25%
- Use air blast without coolant
- Use helical interpolation to ramp down into a cavity
- Increase feed rates in corners to compensate for heat loss
- Use climb milling
- Use shrink fit holders whenever possible
- Safety first-do not exceed Cutting Speed
- As DOC gets smaller speed should accelerate to compensate for heat loss
- Adjust speed to maximize plastic deformation

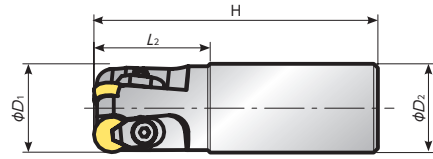
# Milling Cutters

**AHM**  
accel high-speed mill  
**series**  
 (JRPMW/JRNMW...)

\* Recommend using torque wrench 4N • m



A.R.+5°  
 R.R.-7°30'

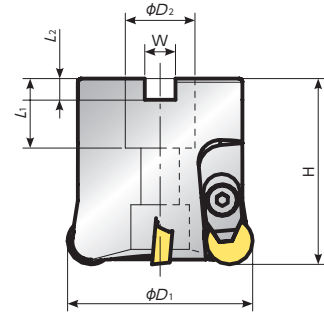


● Metric size cutters

Item Number	Stock		Dimensions (mm)				Clamp	Clamp Screw	Weight (kg)	Insert
			φD <sub>1</sub>	D <sub>2</sub>	H	L <sub>2</sub>				
JRPMW032E250R03	●	3	32	25	120	40	AMS-5T	AOB-5S-T25	0.4	RPGN120400
JRPMW032E320R03	●		32	32					0.6	
JRPMW040E320R03	●		40	32					0.7	



A.R.+5°  
 R.R.-2°30' ~ -5°



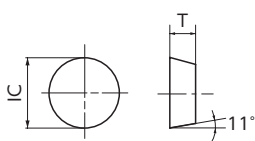
● Metric size cutters

Item Number	Stock		Dimensions (mm)						Shim	Shim Screw	Clamp	Clamp Screw	A.R.	R.R.	Weight (kg)	Insert
			φD <sub>1</sub>	H	D <sub>2</sub>	W	L <sub>1</sub>	L <sub>2</sub>								
JRPMW050S220R04	●	4	50	50	22	10.4	20	6.3	ARP42A	M3 * 8	AMS-5T	AOB-5S-T25	+5°	-5°	0.4	RPGN120400
JRPMW063S220R04	●	4	63	50	22	10.4	20	6.3					+5°	-5°	0.6	
JRPMW080S254R05	●	5	80	50	25.4	9.5	25	6.0					+5°	-2°30'	0.9	

● Inserts

● : 1st Choice    ● : 2nd choice

Item Number	IC	T	Ceramics							
			SiAlON			Whisker		Alumina - TiC		
			SX7	SX3	SX9	WA1	WA5	ZC7		
RPGN 120400 E004	12.70	4.76	●							
RPGN 120400 EX0004	12.70	4.76			●					
RPGN 120400 T00520	12.70	4.76					●			
RPGN 120400 T00525	12.70	4.76					●			
RPGN 120400 T00820	12.70	4.76	●							
RPGN 120400 T01020	12.70	4.76					●	●		

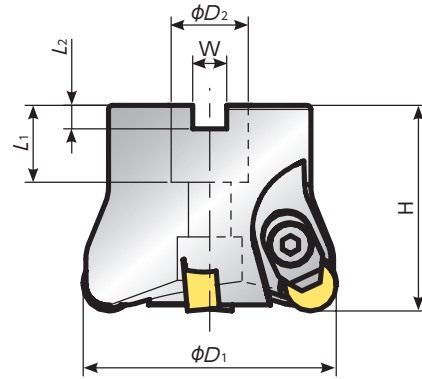


Steel	P							
Stainless Steel	M							
Cast Iron	K	●	●	●	●			●
Non-Ferrous Material	N							
Heat Resistant Alloy	S	●	●	●	●			
Hardened Material	H				●			●

\* Recommend using torque wrench 4N · m



A.R.-5°  
R.R.-10°



● Metric size cutters

Item Number	Stock		Dimensions (mm)						Clamp	Clamp Screw	Weight (kg)	Insert
			$\phi D_1$	H	$\phi D_2$	W	L <sub>1</sub>	L <sub>2</sub>				
JRNMW050S220R03	●	3	50	50	22	10.4	20	6.3	AMS-6T	AOB-6S-T30	0.4	RNGN120700
JRNMW063S220R04	●	4	63	50	22	10.4	20	6.3			0.6	
JRNMW080S254R05	●	5	80	50	25.4	9.5	25	6.0			0.9	

● Inserts

● : 1st Choice    ● : 2nd choice

Item Number	IC	T	Ceramics							
			SiAlON			Whisker		Alumina - TiC		
			SX7	SX3	SX9	WA1	WA5	ZC7		
RNGN 120700 E002	12.70	7.94			●					
RNGN 120700 E004	12.70	7.94	●	●						
RNGN 120700 T00520	12.70	7.94		●	●	●				
RNGN 120700 T00525	12.70	7.94			●	●				
RNGN 120700 T00820	12.70	7.94	●						●	
RNGN 120700 T01020	12.70	7.94					●			
RNGN 120700 T02025	12.70	7.94								●
RNGN 120700 S02025	12.70	7.94								●

● Recommend Cutting Conditions

Work Material	Grade	Dry	Wet	Cutting Speed (m/min)							Feed (mm/t)					Depth of Cut (mm)	
				50	200	350	500	650	800	950	1100	0.05	0.08	0.1	0.12		0.15
S Heat Resistant Alloys	SX7	●															~ 4.0
	SX3	●															~ 4.0
	SX9	●															~ 4.0
H Hardened Steel	WA1/WA5	●	○														~ 4.0
	ZC7	●	○														~ 4.0
	WA1/WA5	●	○														~ 4.0
	ZC7	●	○														~ 4.0