



SUMITOMO

CARBIDE - CBN - DIAMOND

PWS Series



High Performance Milling Systems

**High efficiency shoulder mill for steel,
stainless steel & cast iron materials**

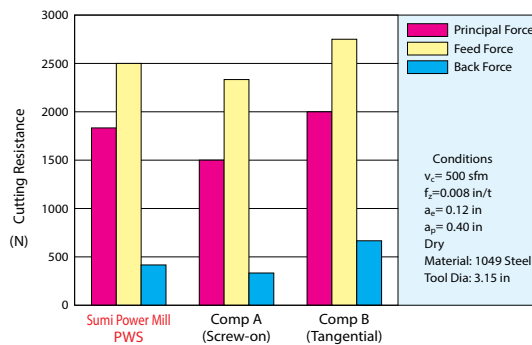
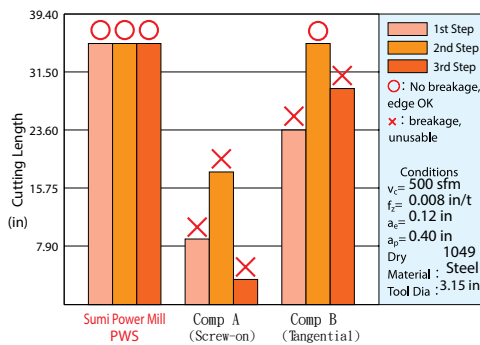




Features & Benefits

- Highly reliable shoulder mill tangentially mounted for never-before-possible cutting edge strength and sharp cutting edges.
- Tangentially mounted inserts for outstanding cutting edge strength combined with optimized breaker for excellent edge sharpness and cutting ability.
- New ACP and ACK milling grades are used to meet the needs of various types of work material
- Serrated insert design created with high-precision molding technology provides stable milling, even in applications with large tool overhang

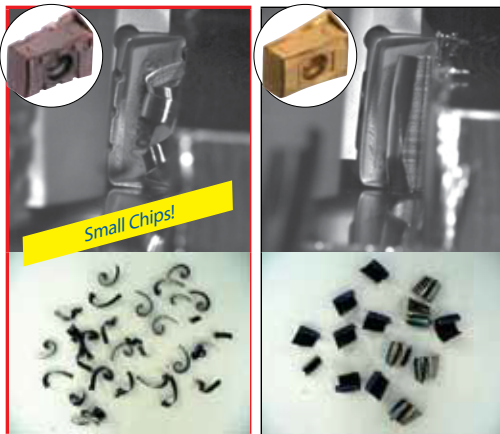
Performance



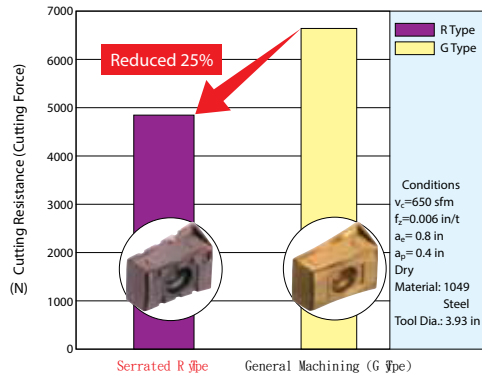
Performance Comparison

Serrated R Type Inserts

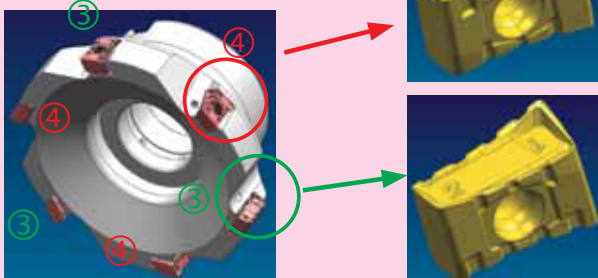
General Purpose G Type Inserts



Comparison of Cutting Forces
 Reduced cutting force and excellent vibration resistance!



⚠ Caution when using Serrated R Type Inserts



1) Installation Precautions

When using R type serrated indexable inserts, attach them so the serrated grooves alternate as shown in the image to the left.

2) Cutting Condition Precautions

When set up as shown in the image to the left, the feed rate per tooth is doubled compared to that when attaching the same-shaped inserts on all teeth. This means that feed adjustments should be made so the upper feed limit is as shown below.

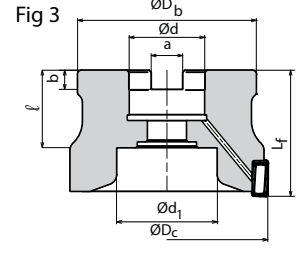
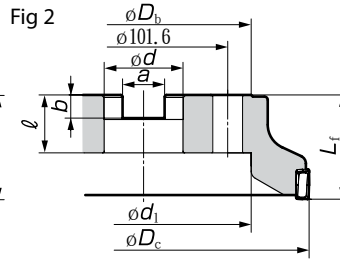
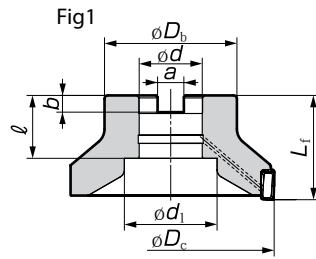
$$f_z = 0.010 \text{ IPT}$$

Example: Use at $f_z = 0.008 \text{ IPT}$

Feed when all teeth are normal

Feed when serrated **0.016 IPT**

Any incorrect use of insert may damage tools.



PWS Cutter Bodies - Standard Pitch - Inch

Catalog Number	Stock	Dimensions								# of Teeth	Weight (lbs)	Fig.
		ϕD_c	ϕD_b	L_f	ϕd	ϕd_1	a	b	ℓ			
PWS42000R	●	2.000	1.750	1.750	0.750	0.609	0.313	0.190	1.020	3	0.90	1
PWS43000R	●	3.000	2.250	1.750	1.000	0.797	0.375	0.220	1.020	5	2.10	1
PWS44000R-1.25	●	4.000	2.870	2.000	1.250	1.000	0.500	0.280	1.020	6	5.29	1
PWS44000R-1.50	●	4.000	3.540	2.500	1.500	2.000	0.625	0.380	2.400	6	5.40	3
PWS45000R	●	5.000	3.750	2.500	1.500	2.000	0.625	0.380	1.535	7	5.29	1
PWS46000R	●	6.000	4.380	2.500	1.500	2.000	0.625	0.380	1.535	8	8.81	1
PWS48000R	●	8.000	5.118	2.500	2.500	-	1.000	0.560	1.594	10	14.33	2
PWS410000R	●	10.000	7.087	2.756	2.500	-	1.000	0.560	1.594	12	27.11	2

PWS Cutter Bodies - Fine Pitch - Inch

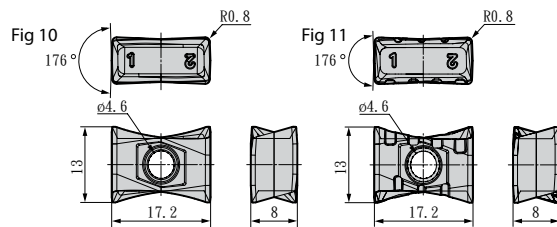
Catalog Number	Stock	Dimensions								# of Teeth	Weight (lbs)	Fig.
		ϕD_c	ϕD_b	L_f	ϕd	ϕd_1	a	b	ℓ			
PWSF42000R	●	2.000	1.750	1.750	0.750	0.609	0.313	0.190	1.020	5	0.90	1
PWSF43000R	●	3.000	2.250	1.750	1.000	0.797	0.375	0.220	1.020	7	1.95	1
PWSF44000R-1.25	●	4.000	2.870	2.000	1.250	1.000	0.500	0.280	1.020	9	5.07	1
PWSF44000R-1.50	●	4.000	3.540	2.500	1.500	2.000	0.625	0.380	2.400	9	5.10	3
PWSF45000R	●	5.000	3.750	2.500	1.500	2.000	0.625	0.380	1.535	10	5.07	1
PWSF46000R	●	6.000	4.380	2.500	1.500	2.000	0.625	0.380	1.535	13	8.59	1
PWSF48000R	●	8.000	5.118	2.500	2.500	-	1.000	0.560	1.594	16	14.10	2
PWSF410000R	●	10.000	7.087	2.756	2.500	-	1.000	0.560	1.594	20	26.90	2

*Cutters with sizes of $\phi 8.000$ inches or above come with seats (no coolant holes). Inserts are not included.

Inserts

P Steel M Stainless Steel K Cast Iron N Non-ferrous S Super Alloy H Hardened Material

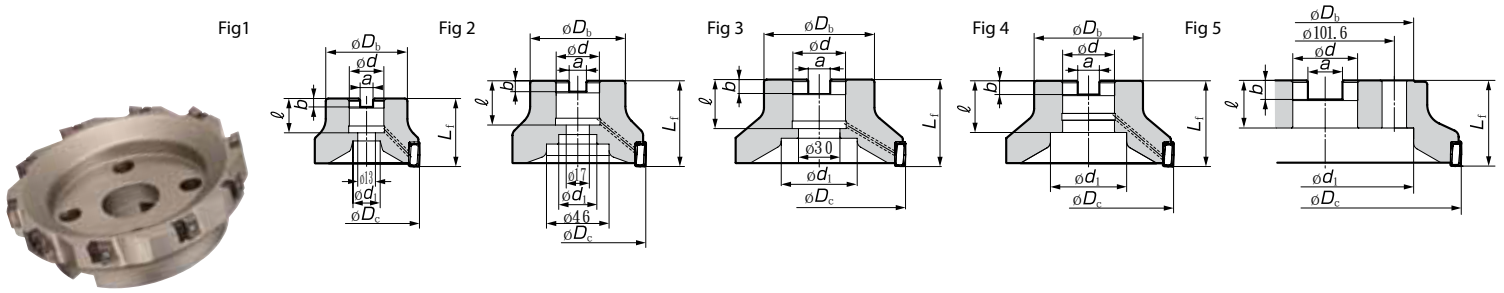
Grade		Coated Carbide					Application	Fig.
Application		P	M	K	N	S		
High speed/Light		●						
General Purpose		●	●	●				
Roughing		●	●	●				
Catalog Number		ACP100	ACP200	ACP300	ACK200	ACK300		
LNMX170808PNSR-L	●	●	●	●	●	●	Light Cut 10	
LNMX170808PNSR-G	●	●	●	●	●	●	General Purpose 10	
LNMX170808PNSR-R	●	●	●	●	●	●	Heavy Cut 11	



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (sfm) Min - Max	Feed Rate f_z (ipt) Min - Max	Recommended Grade
P	Carbon Steel	180-280HB	500 - 1,500	0.004 - 0.014	ACP200
	Alloy Steel	180-280HB	330 - 815	0.004 - 0.001	ACP200
M	Stainless Steel	-	330 - 650	0.006 - 0.001	ACP300
K	Cast Iron/Ductile	250HB	330 - 815	0.004 - 0.014	ACK200
	Cast Iron				

NOTE: The cutting conditions above are a guide. Actual Conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.

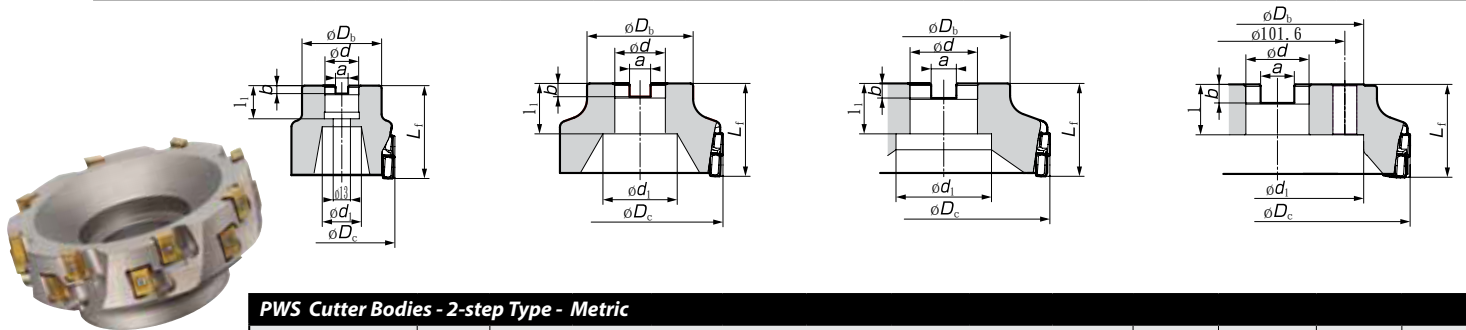


PWS Cutter Bodies - Standard Pitch - Metric

Catalog Number	Stock	Dimensions								# of Teeth	Weight (kg)	Fig.
		ϕD_c	ϕD_b	L_f	ϕd	ϕd_1	a	b	ℓ			
PWS 4080R	●	80	60	50	25.4	20	9.5	6	25	4	1.0	1
PWS 4100R	●	100	70	63	31.75	28	12.7	8	32.5	6	1.8	2
PWS 4125R	●	125	80	63	38.1	55	15.9	10	35.5	6	2.4	3
PWS 4160R	●	160	100	63	50.8	72	19.0	11	38	8	4.0	4
PWS 4200R	●	200	130	63	50.8	130	25.4	14	35	10	6.5	5
PWS 4250R	●	250	130	63	50.8	160	25.4	14	35	12	12.3	5

PWS Cutter Bodies - Fine Pitch - Metric

Catalog Number	Stock	Dimensions								# of Teeth	Weight (kg)	Fig.
		ϕD_c	ϕD_b	L_f	ϕd	ϕd_1	a	b	ℓ			
PWSF4080R	●	80	60	50	25.4	20	9.5	6	25	6	0.9	1
PWSF4100R	●	100	70	63	31.75	28	12.7	8	32.5	8	1.7	2
PWSF4125R	●	125	80	63	38.1	55	15.9	10	35.5	8	2.3	3
PWSF4160R	●	160	100	63	50.8	72	19.0	11	38	10	3.9	4
PWSF4200R	●	200	130	63	50.8	130	25.4	14	35	12	6.4	5
PWSF4250R	●	250	130	63	50.8	160	25.4	14	35	14	12.2	5



PWS Cutter Bodies - 2-step Type - Metric

Catalog Number	Stock	Dimensions								# of Teeth	Effective Teeth	Weight	Fig.
		ϕD_c	ϕD_b	L_f	ϕd	ϕd_1	a	b	ℓ				
PWSR4080R		80	60	70	25.4	29.5	9.5	6	25	8	4	0.9	1
PWSR4100R		100	70	70	31.75	46	12.7	8	32	12	6	1.7	2
PWSR4125R		125	80	70	38.1	56	15.9	10	38	12	6	2.3	3
PWSR4160R		160	100	70	50.8	72	19.0	11	38	16	8	3.9	4
PWSR4200R		200	130	70	50.8	160	25.4	14	38	20	10	6.4	5

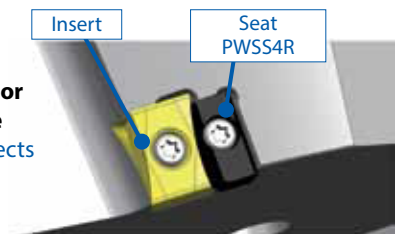
*Cutters with sizes of $\phi 200$ or above come with seats (no coolant holes). Inserts are not included. Please use JIS B1176 hexagonal bolt ($\phi 80$: M12x30 to 35mm, $\phi 100$: M16x40 to 45mm) for securing $\phi 80/\phi 100$ cutter to the arbor.

Spare Parts

Seat Screw	Wrench	Anti-seize Paste	Seat*	Recommended Tightening Torque
BFTX0412IP	TRDR15IP	SUMI-P	PWSS4R	

*Included with $\phi 200$ mm or larger

Large diameter ($\phi 200$ or above) body structure
Safety seat design protects body





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