

THE NEW VALUE FRONTIER



MSR

Heavy Roughing Milling Cutter

MonSteR Mill

ADVANCING PRODUCTIVITY

MSR

Heavy Roughing Milling Cutter



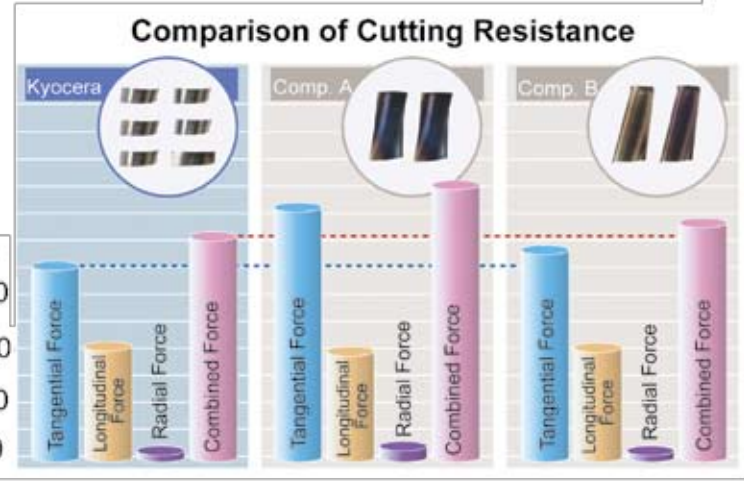
- Double the metal removal rate; double the productivity
- Notched inserts promote larger depths of cut and excellent chip control
- Heavy machining with low cutting forces

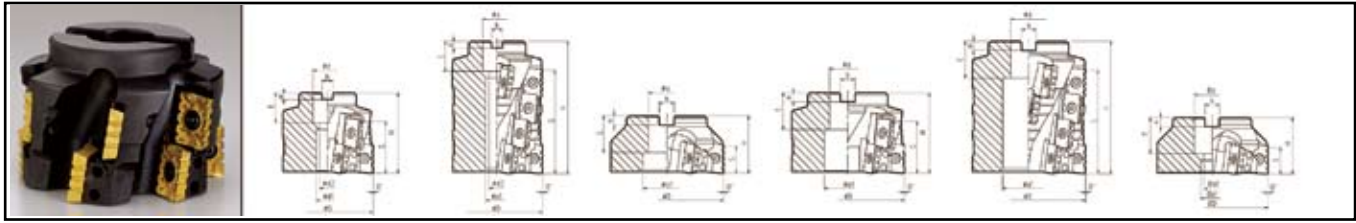


Shown Actual Size



11 Type 17 Type APM25
 Size comparison of milling inserts





■ Inch φD / Inch φd

Description	Stock	# inserts	# lines	Dimensions										Rake Angle		
				unit	Inch φD	Inch φd	φd1	φd2	H	E	a	b	S	A.R.	R.R.	Fig.
MSR3000R-1	●	4	4	in	3.00	1.00	.790	-	1.970	1.020	.240	.370	.925	+9°	-5°	3
MSR3000R-2	●	8	4		3.00	1.00	.790	-	2.760	1.020	.240	.370	1.77			4
MSR4000R-1-1.5	●	6	6		4.00	1.50	1.610	-	1.970	1.260	.310	.500	.925			3
MSR4000R-2-1.5	●	12	6		4.00	1.50	1.610	-	2.760	1.260	.310	.500	1.77			4

■ Metric φD / Inch φd

Description	Stock	# inserts	# lines	Dimensions										Rake Angle		
				unit	Metric φD	Inch φd	φd1	φd2	H	E	a	b	S	A.R.	R.R.	Fig.
MSR063R-1	○	4	4	mm	63	25.4	20	14	65	26	6	9.5	23.5	+9°	-5°	6
MSR063R-2	○	8			85	45			1							
MSR080R-1	○	4	4	80	25.4 (1 in)	20	14	50	26	6	9.5	23.5	+9°	-5°	6	
MSR080R-2	○	8						70				45			1	
MSR080R-4	○	16						115				90			2	
MSR100R-1	○	6						50				23.5			3	
MSR100R-2	○	12	6	100	31.75 (1.25 in)	41	-	70	32	8	12.7	45	+9°	-5°	4	
MSR100R-4	○	24						115				90			5	
MSR125R-1	●	6						60				23.5			3	
MSR125R-2	○	12	6	125	38.1 (1.5 in)	58	-	70	38	10	15.9	45	+9°	-5°	4	
MSR125R-4	○	24						115				90			5	
MSR160R-1	○	8						60				23.5			3	
MSR160R-2	○	16	8	160	50.8 (2 in)	68	-	70	38	11	19.3	45	+9°	-5°	4	
MSR160R-4	○	32						115				90			5	
MSR200R-1	○	10						60				23.5			3	
MSR200R-2	○	20	10	200	47.63 (1.875 in)	-	-	90	38	14	25.7	45	+9°	-5°	4	
MSR250R-1	○	12						60				23.5			3	
MSR250R-2	○	24	12	250	47.63 (1.875 in)	-	-	90	38	14	25.7	45	+9°	-5°	4	

■ See page 5 for applicable inserts

It is important to install the appropriate notched insert into the correct position. Failure to do so may result in damage to the cutter body. The appropriate insert is marked on the pockets of the cutter body.

■ If marked with a "3" in the pocket, use AP..ER-NB3

■ If marked with a "4" in the pocket, use AP..ER-NB4

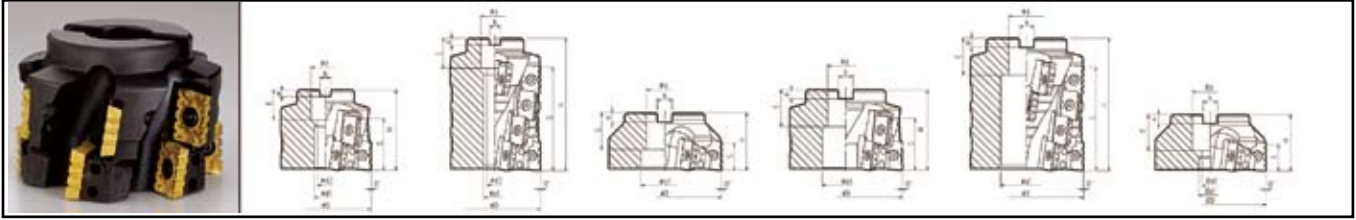
Note: All cutters require the following hardware:

Screws: SB-60120TR & SB-40140TR

Wrench: TT-25L & DT-15

Shim: MAP-2506

Anti-seize compound: MP-1



■ Metric ϕD / Metric ϕd

Description	Stock	# inserts	# lines	Dimensions										Rake Angle		Fig.														
				Unit	Metric ϕD	Metric ϕd	$\phi d1$	$\phi d2$	H	E	a	b	S	A.R.	R.R.															
MSR063R-1M	○	4	4	mm	63	27	20	14	65	22	7.2	12.4	23.5	+9°	-5°	6														
MSR063R-2M	○	8							85				45			1														
MSR080R-1M	○	4	4		80	27	20	14	50	22	7.2	12.4	23.5			+9°	-5°	6												
MSR080R-2M	○	8							70				45					1												
MSR080R-4M	○	16			115	90	2																							
MSR100R-1M	○	6	6		100	32	48	-	50	28	8	14.4	23.5			+9°	-5°	3												
MSR100R-2M	○	12							70				45					4												
MSR100R-4M	○	24							115				90					5												
MSR125R-1M	○	6	6						125	40	58	-	60					30	9	16.4	23.5	+9°	-5°	3						
MSR125R-2M	○	12											70								45			4						
MSR125R-4M	○	24											115								90			5						
MSR160R-1M	○	8	8										160					40	68	-	60			30	10	16.4	23.5	+9°	-5°	3
MSR160R-2M	○	16																			70						45			4
MSR160R-4M	○	32																			115						90			5
MSR200R-1M	○	10	10						200	60	-	-									60	38	15	25.4	23.5	+9°	-5°			3
MSR200R-2M	○	20																			90				45					4
MSR250R-1M	○	12	12	250										60	-						-	60	38	15	25.4					23.5
MSR250R-2M	○	24			90	45	4																							

■ See page 5 for applicable inserts

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Note: All cutters require the following hardware:
 Screws: SB-60120TR & SB-40140TR
 Wrench: TT-25L & DT-15
 Shim: MAP-2506
 Anti-seize compound: MP-1

■ If marked with a “3” in the pocket, use AP..ER-NB3

■ If marked with a “4” in the pocket, use AP..ER-NB4
 (Example)

Description	# of total inserts	# of lines	# of NB3 inserts	# of NB4 inserts
MSR 100R-1	6	6	3	3
MSR 100R-2	12		6	6
MSR 100R-4	24		12	12

■ MSR Inserts

Insert	Description	Dimension					Angle		Insert Grade		
		A	T	ϕd	W	R	α	β	PR660	PR830	PR905
 NB3(P)	APMT 250608 ER-NB3	0.625	0.250	0.256	0.984	.031	15°	11°	O	O	O
	APMT 250608 ER-NB4								O	O	O
 NB4(P)	APMT 250616 ER-NB3	0.625	0.250	0.256	0.984	.063			●	●	●
	APMT 250616 ER-NB4								●	●	●
	APMT 250616 ER-NB3P*	0.625	0.250	0.256	0.984	.063				O	
	APMT 250616 ER-NB4P*									O	

*A lower cutting force insert

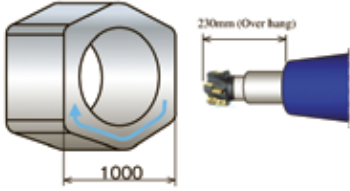


■ MSR Machining Recommendations

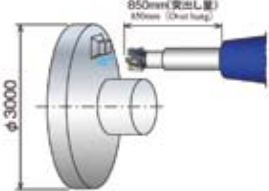


Work Material	Feed Rate (IPT)	Insert Grade (SFM)		
		PR660	PR830	PR905
Carbon Steel	.004-.010	300-600	400-700	-
Alloy Steel	.004-.008	250-450	350-550	-
Tool Steel	.004-.008	200-400	300-500	-
Gray Cast Iron	.004-.012	-	-	650-950
Ductile Iron	.004-.008	-	-	400-600

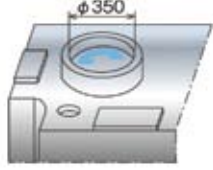


■ Slotting, plunging, CAT50 shank and facemill cutters with 4-edge inserts may be available by special request. Please contact us for more details.

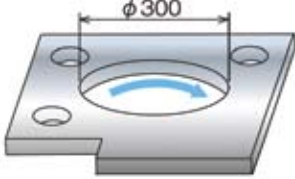




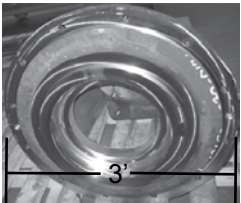


■ **Case Studies**

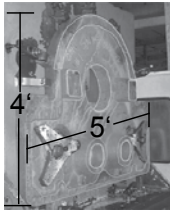


Ductile Iron	
<ul style="list-style-type: none"> • Construction part • V=550 SFM • d x w = 0.20 x 2.0" • F = 26 in/min • No coolant • MSR 100R-2 with APMT 250616ER-NB3 APMT 250616ER-NB4 PR905 	
MSR	Chip evacuation = 165cc/min 
Competitor D	Chip evacuation=51cc/min 
<p>Machining efficiency is 3 times better than the competitor due to the greater chip evacuation</p> <p style="text-align: right; font-size: small;">Evaluation from the customer</p>	

Steel	
<ul style="list-style-type: none"> • Electric Generator • V=650 SFM • d x w = 1.6 x 1.0" • F = 16 in/min • No coolant • MSR 100R-2 with APMT 250616ER-NB3 APMT 250616ER-NB4 PR660 	
MSR	2 pieces per hour 
Competitor B	.5 piece per hour 
<p>Machining efficiency is 4 times better than the competitor</p> <p style="text-align: right; font-size: small;">Evaluation from the customer</p>	

Steel	
<ul style="list-style-type: none"> • Construction part • V=500 SFM • d x w = 0.80 x 0.3" • F = 29 in/min • No coolant • MSR 63R-4 with APMT 250616ER-NB3 APMT 250616ER-NB4 PR905 	
MSR	Chip evacuation = 120cc/min 
Competitor E	Chip evacuation=29cc/min 
<p>Machining efficiency is 4 times better than the competitor, with less vibration and machining noise</p> <p style="text-align: right; font-size: small;">Evaluation from the customer</p>	

Structural Steel	
<ul style="list-style-type: none"> • Plate • V=400 SFM • d x w = 1.0 x .20" • F = 16 in/min • No coolant • MSR 100R-2 with APMT 250616ER-NB3 APMT 250616ER-NB4 PR660 	
MSR	Chip evacuation = 50cc/min 
Competitor B	Chip evacuation=7cc/min 
<p>Machining efficiency is 7 times better than the competitor due to the greater chip evacuation</p> <p style="text-align: right; font-size: small;">Evaluation from the customer</p>	

Steel	
<ul style="list-style-type: none"> • Cover • V=450 SFM • d x w = ~.250 x ~2.5" • F = 13 in/min • No coolant • MSR 400R1 with APMT 250616ER-NB3 APMT 250616ER-NB4 PR830 	
MSR	Material Removal = 8.5 in ³ /min 
Competitor B	Material Removal=5 in ³ /min 
<p>Metal removal rate increases by ~ 70% with fewer passes required.</p> <p style="text-align: right; font-size: small;">Evaluation from the customer</p>	

Steel	
<ul style="list-style-type: none"> • Cover • V=500 SFM • d x w = ~.75 - 1.75" x ~.5 - 3.75" • F = 14 in/min • No coolant • MSR 400R-2 with APMT 250616ER-NB3 APMT 250616ER-NB4 PR830 	
MSR	Material Removal = 42 in ³ /min 
Competitor B	Material Removal=30 in ³ /min 
<p>Metal removal rate increases by ~ 40% and cycle time decreases by ~ 30%.</p> <p style="text-align: right; font-size: small;">Evaluation from the customer</p>	

**The MSR Heavy Milling Cutter
has a proven track record of dramatically
improving machine efficiency in the
following industries:**



Ship Building



Petroleum Industry



Mold Making



Power Generation



Machine Tools



Construction Equipment

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