



COMPLETE METALWORKING SOLUTIONS

(800) 991-4225

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MEMAL SERIES END MILL

SHARP POLISHED FLUTED END MILLS
FOR HIGH-PERFORMANCE MACHINING
OF ALUMINUM MATERIAL



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MEMAL endmills provide a superior surface finish and are engineered to meet the demands of today's aerospace industry.

FEATURES

- Specially defined profile for reductions in cycle time and improved surface finish
- 3 flute specifically designed for roughing and finishing in aluminum and non-ferrous alloys
- Center cutting
- Polished flutes for maximum performance in abrasive aluminums and extended tool life in a wide variety of non-ferrous alloys
- Solid carbide
- CNC ground in the USA

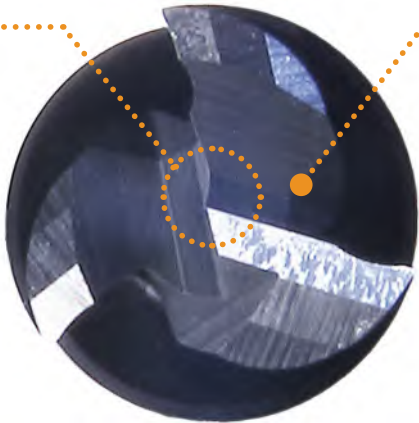


MEMAL Series

The high helix makes it ideal for roughing & finishing due to its high shear angle and cutting aggressiveness for efficient chip evacuation and metal removal rates.

Stronger Cutting Edge

Designed for outstanding performance and accelerated metal removal rates in aluminum and non-ferrous materials



Center Cutting

Chip discharge during plunging, ramping and slotting have been significantly improved for stable, high efficiency cutting

Ideal Flute Geometry

Excellent performance in High Efficiency Milling (HEM)

Square End Mill, 3 Flute
MEMAL



Polished Flute, Irregular Flute, Irregular Helix Geometry

Uncoated tool offers an excellent option for aluminum finishing applications and chatter free machining.

Radius End Mill, 3 Flute
MEMALC



h6 shank tolerance for high precision tool holders

MEMAL - 3 Flute

EDP	Item Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock
23875401	MEMAL3-0125-0375	.1250	-	.3750	2.000	.1250	3	☐
23875418	MEMAL3-0125-0375-R010	.1250	.0100	.3750	2.000	.1250	3	☐
23875425	MEMAL3-0187-0625	.1875	-	.6250	2.000	.1875	3	☐
23875432	MEMAL3-0187-0625-R010	.1875	.0100	.6250	2.000	.1875	3	☐
23875449	MEMAL3-0250-0750	.2500	-	.7500	2.500	.2500	3	☐
23875456	MEMAL3-0250-0750-R010	.2500	.0100	.7500	2.500	.2500	3	☐
23875463	MEMAL3-0312-0750	.3125	-	.7500	2.500	.3125	3	☐
23875470	MEMAL3-0312-0750-R015	.3125	.0150	.7500	2.500	.3125	3	☐
23875487	MEMAL3-0375-1000	.3750	-	1.0000	2.500	.3750	3	☐
23875494	MEMAL3-0375-1000-R015	.3750	.0150	1.0000	2.500	.3750	3	☐
23875500	MEMAL3-0500-1250	.5000	-	1.2500	3.000	.5000	3	☐
23875517	MEMAL3-0500-1250-R015	.5000	.0150	1.2500	3.000	.5000	3	☐
23875524	MEMAL3-0625-1250	.6250	-	1.2500	3.500	.6250	3	☐
23875531	MEMAL3-0625-1250-R015	.6250	.0150	1.2500	3.500	.6250	3	☐
23875548	MEMAL3-0750-1500	.7500	-	1.5000	4.000	.7500	3	☐
23875555	MEMAL3-0750-1500-R030	.7500	.0300	1.5000	4.000	.7500	3	☐
23875562	MEMAL3-1000-2000	1.0000	-	2.0000	4.500	1.0000	3	☐
23875579	MEMAL3-1000-2000-R030	1.0000	.0300	2.0000	4.500	1.0000	3	☐

☐ : Non-Stock Standard

☐ = NEW

Chipbreaker

EDP	Item Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock
23875586	MEMALC3-0125-0375	.1250	-	.3750	2.000	.1250	3	☐
23875593	MEMALC3-0125-0375-R010	.1250	.0100	.3750	2.000	.1250	3	☐
23875609	MEMALC3-0187-0625	.1875	-	.6250	2.000	.1875	3	☐
23875616	MEMALC3-0187-0625-R010	.1875	.0100	.6250	2.000	.1875	3	☐
23875623	MEMALC3-0250-0750	.2500	-	.7500	2.500	.2500	3	☐
23875630	MEMALC3-0250-0750-R010	.2500	.0100	.7500	2.500	.2500	3	☐
23875647	MEMALC3-0312-0750	.3125	-	.7500	2.500	.3125	3	☐
23875654	MEMALC3-0312-0750-R015	.3125	.0150	.7500	2.500	.3125	3	☐
23875661	MEMALC3-0375-1000	.3750	-	1.0000	2.500	.3750	3	☐
23875678	MEMALC3-0375-1000-R015	.3750	.0150	1.0000	2.500	.3750	3	☐
23875685	MEMALC3-0500-1250	.5000	-	1.2500	3.000	.5000	3	☐
23875692	MEMALC3-0500-1250-R015	.5000	.0150	1.2500	3.000	.5000	3	☐
23875708	MEMALC3-0625-1250	.6250	-	1.2500	3.500	.6250	3	☐
23875715	MEMALC3-0625-1250-R015	.6250	.0150	1.2500	3.500	.6250	3	☐
23875722	MEMALC3-0750-1500	.7500	-	1.5000	4.000	.7500	3	☐
23875739	MEMALC3-0750-1500-R030	.7500	.0300	1.5000	4.000	.7500	3	☐
23875746	MEMALC3-1000-2000	1.0000	-	2.0000	4.500	1.0000	3	☐
23875753	MEMALC3-1000-2000-R030	1.0000	.0300	2.0000	4.500	1.0000	3	☐

☐ : Non-Stock Standard

☐ = NEW

MEMAL3 FEED/SPEED

Shoulder Milling

Work Material	Wrought Aluminum Alloys 6061-T6/T651, 7075-T6, 2024-T4/T6, 2014									Cast Aluminum Alloys 319, 328, 360, 383								
DC	*HSM			Roughing			Finishing			*HSM			Roughing			Finishing		
	SFM	2100		SFM	1400		SFM	1400		SFM	1400		SFM	1200		SFM	1200	
	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM
1/8	64176	0.0060	1155.2	42784	0.0032	410.7	42784	0.0020	256.7	42784	0.0052	667.4	36672	0.0040	440.1	36672	0.0025	275.0
3/16	42784	0.0060	770.1	28523	0.0032	273.8	28523	0.0020	171.1	28523	0.0052	445.0	24448	0.0040	293.4	24448	0.0025	183.4
1/4	32088	0.0060	577.6	21392	0.0032	205.4	21392	0.0020	128.4	21392	0.0052	333.7	18336	0.0040	220.0	18336	0.0025	137.5
5/16	25670	0.0065	500.6	17114	0.0038	195.1	17114	0.0023	118.1	17114	0.0065	333.7	14669	0.0048	211.2	14669	0.0027	118.8
3/8	21392	0.0075	481.3	14261	0.0047	201.1	14261	0.0025	107.0	14261	0.0077	329.4	12224	0.0059	216.4	12224	0.0029	106.3
1/2	16044	0.0085	409.1	10696	0.0056	179.7	10696	0.0028	89.8	10696	0.0103	330.5	9168	0.0078	214.5	9168	0.0034	93.5
5/8	12835	0.0120	462.1	8557	0.0080	205.4	8557	0.0030	77.0	8557	0.0129	331.1	7334	0.0080	176.0	7334	0.0038	83.6
3/4	10696	0.0145	465.3	7131	0.0096	205.4	7131	0.0033	70.6	7131	0.0155	331.6	6112	0.0111	203.5	6112	0.0040	73.3
1	8022	0.0165	397.1	5348	0.0112	179.7	5348	0.0039	62.6	5348	0.0207	332.1	4584	0.0142	195.3	4584	0.0049	67.4
Depth of Cut	ae: .1xD ~ .4xD ap: .125XD ~ APMX			ae: .3xD ~ .6xD ap: .125XD ~ APMX			ae: .05xD ~ .1xD ap: .125XD ~ APMX			ae: .1xD ~ .4xD ap: .125XD ~ APMX			ae: .3xD ~ .6xD ap: .125XD ~ APMX			ae: .05xD ~ .1xD ap: .125XD ~ APMX		

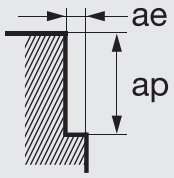
Work Material	Copper Red Brass, High Lead Brass, Yellow Brass, C-17200, Navel Brass, A-17, High Silicon Bronze									Copper Alloys Low Silicon Bronze, Alum/Bronze, Beryllium Copper, Nickel Silver, Oxygen-Free Copper								
DC	*HSM			Roughing			Finishing			*HSM			Roughing			Finishing		
	SFM	1300		SFM	1000		SFM	1000		SFM	1000		SFM	800		SFM	800	
	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM
1/8	39728	0.0056	667.4	30560	0.0027	247.5	30560	0.0021	192.5	30560	0.0056	513.4	24448	0.0027	198.0	24448	0.0021	154.0
3/16	26485	0.0056	445.0	20373	0.0027	165.0	20373	0.0021	128.4	20373	0.0056	342.3	16299	0.0027	132.0	16299	0.0021	102.7
1/4	19864	0.0056	333.7	15280	0.0027	123.8	15280	0.0021	96.3	15280	0.0056	256.7	12224	0.0027	99.0	12224	0.0021	77.0
5/16	15891	0.0060	286.0	12224	0.0033	121.0	12224	0.0022	80.7	12224	0.0060	220.0	9779	0.0033	96.8	9779	0.0022	64.5
3/8	13243	0.0065	258.2	10187	0.0040	122.2	10187	0.0024	73.3	10187	0.0065	198.6	8149	0.0040	97.8	8149	0.0024	58.7
1/2	9932	0.0075	223.5	7640	0.0052	119.2	7640	0.0028	64.2	7640	0.0075	171.9	6112	0.0052	95.3	6112	0.0028	51.3
5/8	7946	0.0085	202.6	6112	0.0061	111.8	6112	0.0030	55.0	6112	0.0085	155.9	4890	0.0061	89.5	4890	0.0031	45.5
3/4	6621	0.0095	188.7	5093	0.0074	113.1	5093	0.0033	50.4	5093	0.0095	145.2	4075	0.0074	90.5	4075	0.0033	40.3
1	4966	0.0110	163.9	3820	0.0095	108.9	3820	0.0040	45.8	3820	0.0110	126.1	3056	0.0095	87.1	3056	0.0040	36.7
Depth of Cut	ae: .1xD ~ .4xD ap: .125XD ~ APMX			ae: .3xD ~ .6xD ap: .125XD ~ APMX			ae: .05xD ~ .1xD ap: .125XD ~ APMX			ae: .1xD ~ .4xD ap: .125XD ~ APMX			ae: .3xD ~ .6xD ap: .125XD ~ APMX			ae: .05xD ~ .1xD ap: .125XD ~ APMX		

Work Material	Magnesium									Plastics								
DC	*HSM			Roughing			Finishing			*HSM			Roughing			Finishing		
	SFM	2000		SFM	1600		SFM	1600		SFM	1000		SFM	800		SFM	800	
	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM
1/8	61120	0.0056	1026.8	48896	0.0032	469.4	48896	0.0021	308.0	30560	0.0120	1100.2	24448	0.0024	176.0	24448	0.0013	95.3
3/16	40747	0.0056	684.5	32597	0.0032	312.9	32597	0.0021	205.4	20373	0.0120	733.4	16299	0.0024	117.4	16299	0.0013	63.6
1/4	30560	0.0056	513.4	24448	0.0032	234.7	24448	0.0021	154.0	15280	0.0120	550.1	12224	0.0024	88.0	12224	0.0013	47.7
5/16	24448	0.0062	454.7	19558	0.0048	281.6	19558	0.0032	187.8	12224	0.0160	586.8	9779	0.0032	93.9	9779	0.0016	46.9
3/8	20373	0.0074	452.3	16299	0.0047	229.8	16299	0.0035	171.1	10187	0.0180	550.1	8149	0.0032	78.2	8149	0.0020	48.9
1/2	15280	0.0099	453.8	12224	0.0056	205.4	12224	0.0038	139.4	7640	0.0200	458.4	6112	0.0060	110.0	6112	0.0026	47.7
5/8	12224	0.0123	451.1	9779	0.0080	234.7	9779	0.0042	123.2	6112	0.0240	440.1	4890	0.0064	93.9	4890	0.0033	48.4
3/4	10187	0.0148	452.3	8149	0.0096	234.7	8149	0.0050	122.2	5093	0.0250	382.0	4075	0.0080	97.8	4075	0.0039	47.7
1	7640	0.0198	453.8	6112	0.0112	205.4	6112	0.0067	122.9	3820	0.0270	309.4	3056	0.0120	110.0	3056	0.0052	47.7
Depth of Cut	ae: .1xD ~ .4xD ap: .125XD ~ APMX			ae: .3xD ~ .6xD ap: .125XD ~ APMX			ae: .05xD ~ .1xD ap: .125XD ~ APMX			ae: .05xD ~ .2xD ap: .125XD ~ APMX			ae: .15xD ~ .3xD ap: .125XD ~ APMX			ae: .025xD ~ .1xD ap: .125XD ~ APMX		

D = Tool Diameter
APMX = Flute Length

*HSM = High-Speed Machining
(chip thinning calculations has already been applied to HSM parameters shown)

*If HSM load is too high,
- reduce Chip load in half to reduce load on machine, keep RPM the same



* ae= WOC (Radial WOC)
* ap= DOC (Axial DOC)

MEMAL3 FEED/SPEED

Slotting

Work Material	Wrought Aluminum Alloys 6061-T6/T651, 7075-T6, 2024-T4/T6, 2014						Cast Aluminum Alloys 319, 328, 360, 383						Copper Red Brass, High Lead Brass, Yellow Brass, C-17200, Navel Brass, A-17, High Silicon Bronze					
DC	High Speed			General			High Speed			General			High Speed			General		
	SFM	2100		SFM	1800		SFM	1400		SFM	900		SFM	770		SFM	475	
	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM
1/8	64176	0.0020	385.1	55008	0.0014	231.0	42784	0.0022	282.4	27504	0.0022	181.5	23531	0.0016	112.9	14516	0.0015	65.3
3/16	42784	0.0020	256.7	36672	0.0014	154.0	28523	0.0022	188.2	18336	0.0022	121.0	15687	0.0016	75.3	9677	0.0015	43.5
1/4	32088	0.0020	192.5	27504	0.0014	115.5	21392	0.0022	141.2	13752	0.0022	90.8	11766	0.0016	56.5	7258	0.0015	32.7
5/16	25670	0.0024	184.8	22003	0.0017	112.2	17114	0.0027	138.6	11002	0.0024	79.2	9412	0.0020	56.5	5806	0.0018	31.4
3/8	21392	0.0032	205.4	18336	0.0021	115.5	14261	0.0034	145.5	9168	0.0033	90.8	7844	0.0024	56.5	4839	0.0022	31.9
1/2	16044	0.0041	197.3	13752	0.0027	111.4	10696	0.0045	144.4	6876	0.0043	88.7	5883	0.0030	52.9	3629	0.0029	31.6
5/8	12835	0.0044	169.4	11002	0.0033	108.9	8557	0.0052	133.5	5501	0.0045	74.3	4706	0.0035	49.4	2903	0.0032	27.9
3/4	10696	0.0048	154.0	9168	0.0039	107.3	7131	0.0061	130.5	4584	0.0048	66.0	3922	0.0048	56.5	2419	0.0041	29.8
1	8022	0.0082	197.3	6876	0.0050	103.1	5348	0.0090	144.4	3438	0.0070	72.2	2941	0.0060	52.9	1815	0.0052	28.3
Depth of Cut	ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX		

Work Material	Copper Alloys Low Silicon Bronze, Alum/Bronze, Beryllium Copper, Nickel Silver, Oxygen-Free Copper						Magnesium						Plastics					
	High Speed			General			High Speed			General			High Speed			General		
DC	SFM	720		SFM	425		SFM	1400		SFM	1000		SFM	720		SFM	600	
	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM	RPM	IPT	IPM
1/8	22003	0.0016	105.6	12988	0.0015	58.4	42784	0.0020	256.7	30560	0.0016	146.7	22003	0.0032	211.2	18336	0.0020	110.0
3/16	14669	0.0016	70.4	8659	0.0015	39.0	28523	0.0020	171.1	20373	0.0016	97.8	14669	0.0032	140.8	12224	0.0020	73.3
1/4	11002	0.0016	52.8	6494	0.0015	29.2	21392	0.0020	128.4	15280	0.0016	73.3	11002	0.0032	105.6	9168	0.0020	55.0
5/16	8801	0.0020	52.8	5195	0.0018	28.1	17114	0.0024	123.2	12224	0.0020	73.3	8801	0.0048	126.7	7334	0.0025	55.0
3/8	7334	0.0024	52.8	4329	0.0022	28.6	14261	0.0032	136.9	10187	0.0024	73.3	7334	0.0052	114.4	6112	0.0029	53.2
1/2	5501	0.0030	49.5	3247	0.0029	28.2	10696	0.0042	134.8	7640	0.0030	68.8	5501	0.0056	92.4	4584	0.0033	45.4
5/8	4401	0.0035	46.2	2598	0.0032	24.9	8557	0.0048	123.2	6112	0.0035	64.2	4401	0.0080	105.6	3667	0.0057	62.7
3/4	3667	0.0048	52.8	2165	0.0041	26.6	7131	0.0064	136.9	5093	0.0048	73.3	3667	0.0096	105.6	3056	0.0073	66.9
1	2750	0.0060	49.5	1624	0.0052	25.3	5348	0.0084	134.8	3820	0.0060	68.8	2750	0.0112	92.4	2292	0.0089	61.2
Depth of Cut	ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX			ae: 1XD ap: .75 ~ APMX		

MITSUBISHI MATERIALS U.S.A. CORPORATION

California Office (Headquarters)

3535 Hyland Avenue, Suite 200
Costa Mesa, CA 92626
Customer Service: 800.523.0800
Technical Service: 800.486.2341

Chicago Office (Engineering)

300 N. Martingale Road, Suite 500
Schaumburg, IL 60173
Main: 847.252.6300
Fax: 847.519.1732

MMC Metal de Mexico, S.A. DE C.V.

Av. La Cañada No.16,
Parque Industrial Bernardo
Quintana, El Marques,
Queretaro C.P. 76246 MEXICO
Main: +52.442.221.61.36
Fax: +52.442.221.61.34

North Carolina-MTEC (Marketing & Technical Center)

105 Corporate Center Drive, Suite A
 Mooresville, NC 28117
Main: 980.312.3100
Fax: 704.746.9292

Toronto Office (Canada Branch)

600 Matheson Blvd. Unit 5 (Office)
Mississauga, ON L5R 4C1
Main: 905.814.0240
Fax: 905.814.0245

Detroit Office (Moldino CS)

41700 Gardenbrook Road, Suite 120
Novi, MI 48375
Main: 248.308.2620
Fax: 248.308.2627

For Your Safety

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.



www.mmc-carbide.com/us

Tools specifications subject to change without notice.

MEMAL-US-2024.10



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customerservice@ahbinc.com