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CARBIDE END MILLS

CARBIDE DRILLS

CARBIDE THREAD MILLS

CARBIDE BURS

INDEX

## Tolerances for Solid Carbide End Mills

**Cutting Diameter:** 1/32" through 1/4"    +.000    -.002  
 17/64" through 1"    +.000    -.003

**Shank Diameter:** h6



Operating Parameters: HPAM High-Performance End Mills for Aluminum

Type of Cut	Aluminum Alloys 6061-T6, 7075-T6, 440, 356, 380, C61300	Depth of Cut % of tool diameter	SFM (speed)	End Mill Diameter Chip Load per Tooth					
				1/4"	3/8"	1/2"	5/8"	3/4"	1"
shallow slotting	< 32 HRC	< 50%	1200 +	.0045	.0071	.0100	.0123	.0149	.0200
	> 32 HRC		600 +	.0036	.0057	.0080	.0098	.0119	.0160
deep slotting	< 32 HRC	75-100%	1200 +	.0036	.0057	.0080	.0098	.0119	.0160
	> 32 HRC		600 +	.0027	.0043	.0060	.0074	.0089	.0120
medium radial 1.0 x dia depth	< 32 HRC	30% x dia. radial	1200 +	.0045	.0071	.0100	.0123	.0149	.0200
	> 32 HRC		600 +	.0036	.0057	.0080	.0098	.0119	.0160
heavy radial 1.0 x dia depth	< 32 HRC	50% x dia. radial	1200 +	.0036	.0057	.0080	.0098	.0119	.016
medium radial 2.0 x dia depth	< 32 HRC	30% x dia. radial	1200 +	.0045	.0071	.0100	.0123	.0149	.0200
	> 32 HRC		600 +	.0036	.0057	.0080	.0098	.0119	.0160
heavy radial 2.0 x dia depth	< 32 HRC	50% x dia. radial	1200 +	.0036	.0057	.0080	.0098	.0119	.0160
finishing medium radial	< 32 HRC	< 25% of dia.	1200 +	.0045	.0071	.0100	.0123	.0149	.0200
	> 32 HRC		600 +	.0036	.0057	.0080	.0098	.0119	.0160
finishing light radial	< 32HRC	< 10% of dia.	1200 +	.0045	.00713	.0100	.01225	.01485	.0200
finishing	< 32 HRC	< .010 radial depth	1200 +	.0054	.0086	.0120	.0147	.0178	.0240
	> 32 HRC		600 +	.0045	.0071	.0100	.0123	.0149	.0200

This chart represents starting points based on a coated tool. Reduce rates up to 50% when using an uncoated tool.

These speed and feed rates are suggested as general guidelines. Machine type, horsepower, spindle speed limitations, toolholding and workholding devices all may impact a cutting tool's ability to perform properly. Greenfield Industries is not responsible for tool failure, part damage, or injury that may be caused by following these general recommendations..

Formulae

$$RPM = (SFM \times 3.82) / \text{tool diameter}$$

$$IPM = \text{number of flutes} \times RPM \times \text{chip load per tooth}$$

Series HPAM for aluminum and nonferrous materials

Features and Benefits of HPAM End Mills

- Delivers superior performance, providing increased tool life and improved part finish.
- Concentric margins stabilize the tool in the cut and reduce chatter at elevated speeds.
- Greater resistance to chipping with increased feed and speed rates over conventional carbide tools.
- Design incorporates rake enhancements in the flute for improved chip flow and higher feed rates at high and low spindle speeds.
- Tool design eliminates excess pressure that causes chip packing.

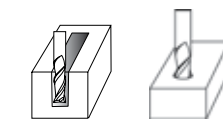
Applications for HPAM End Mills

- 2-flute square end offers excellent performance in roughing and finishing, in ramp cutting and in plunging.
- 2-flute ball nose designed for contouring aluminum, copper, and other non-ferrous materials.
- 3-flute square end gives superior surface finishes without sacrificing metal removal rates in high-speed slotting, profiling, and ramping.

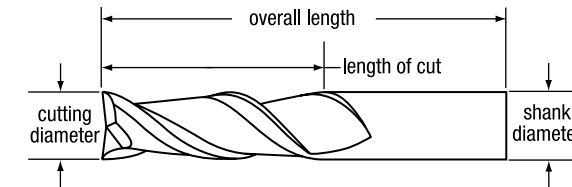
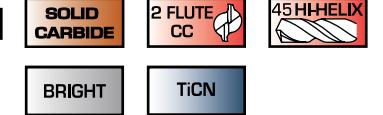


Series HPAM-2 • square end

Applications |



Features |



cutting diameter	cutting diameter			shank diameter	length of cut	overall length	no. of flutes	corner radius	EDP Number	
	fractional	decimal	metric						bright	TiCN
1/8	.1250	3.18	1/8	1/4	1 1/2	2	0.000	B04440	B06440	
1/8	.1250	3.18	1/8	3/8	1 1/2	2	0.000	B04405	B06405	
3/16	.1875	4.76	3/16	5/16	2	2	0.000	B04444	B06444	
3/16	.1875	4.76	3/16	9/16	2	2	0.000	B04409	B06409	
1/4	.2500	6.35	1/4	3/8	2 1/2	2	0.000	B04448	B06448	
1/4	.2500	6.35	1/4	3/4	2 1/2	2	0.000	B04413	B06413	
1/4	.2500	6.35	1/4	1 1/4	3	2	0.000	B04548	B06548	
5/16	.3125	7.94	5/16	7/16	2 1/2	2	0.000	B04452	B06452	
5/16	.3125	7.94	5/16	13/16	2 1/2	2	0.000	B04417	B06417	
5/16	.3125	7.94	5/16	1 1/4	3 1/2	2	0.000	B04552	B06552	
5/16	.3125	7.94	5/16	2 1/8	4	2	0.000	B04617	B06617	
3/8	.3750	9.53	3/8	1/2	2 1/2	2	0.000	B04456	B06456	
3/8	.3750	9.53	3/8	1	2 1/2	2	0.000	B04421	B06421	
3/8	.3750	9.53	3/8	1 1/2	4	2	0.000	B04556	B06556	
3/8	.3750	9.53	3/8	2 1/2	6	2	0.000	B04621	B06621	
7/16	.4375	11.11	7/16	9/16	2 1/2	2	0.000	B04460	B06460	
7/16	.4375	11.11	7/16	1	2 1/2	2	0.000	B04425	B06425	
7/16	.4375	11.11	7/16	2	4	2	0.000	B04560	B06560	
1/2	.5000	12.70	1/2	5/8	3	2	0.000	B04464	B06464	
1/2	.5000	12.70	1/2	1 1/4	3	2	0.000	B04429	B06429	
1/2	.5000	12.70	1/2	2	4	2	0.000	B04564	B06564	
1/2	.5000	12.70	1/2	3 1/8	6	2	0.000	B04629	B06629	
5/8	.6250	15.88	5/8	3/4	3 1/2	2	0.000	B04466	B06466	
5/8	.6250	15.88	5/8	1 5/8	4	2	0.000	B04431	B06431	
5/8	.6250	15.88	5/8	2 1/2	5	2	0.000	B04566	B06566	
5/8	.6250	15.88	5/8	3 3/4	6	2	0.000	B04631	B06631	
3/4	.7500	19.05	3/4	1	4	2	0.000	B04467	B06467	
3/4	.7500	19.05	3/4	1 5/8	4	2	0.000	B04432	B06432	
3/4	.7500	19.05	3/4	3 1/4	6	2	0.000	B04567	B06567	
3/4	.7500	19.05	3/4	4	6 1/2	2	0.000	B04632	B06632	
1	1.0000	25.40	1	1 1/4	5	2	0.000	B04469	B06469	
1	1.0000	25.40	1	2	5	2	0.000	B04434	B06434	
1	1.0000	25.40	1	3 1/4	6	2	0.000	B04569	B06569	
1	1.0000	25.40	1	4 1/8	7	2	0.000	B04634	B06634	