



## 9-Flute, Extra High Performance, Finisher Endmills, Corner Radius & Chip Control, 36 Degree Helix

- More Flutes in the cut means greater production. With an extra solid core get extra rigidity and extended tool life.
- Use with High Efficiency Machining Technology for best results. See pages 208-212.
- These Extra High Performance tools can be found on pages 91-93.

### 9-Flute Finishers Speeds & Feeds

Material	Grades	Cut Type	Axial DOC	Radial DOC	# of Flutes	SFM	Feed by Endmill Diameter (IPT)					
							1/4 (.2500)	3/8 (.3750)	1/2 (.5000)	5/8 (.6250)	3/4 (.7500)	1 (1.000)
Low Carbon Steels <= 38 Rc	1018, 1020, 12L14, 5120, 8620	Peripheral - HEM	<=3 x D	.08 x D	9	485	.0038	.0056	.0075	.0094	.0113	.0150
			>3xD-4xD	.08 x D	9	485	.0034	.0051	.0068	.0084	.0101	.0135
			>4xD-5xD	.08 x D	9	465	.0030	.0045	.0060	.0075	.0090	.0120
		Finish	3 x D	.015 x D	9	420	.0014	.0021	.0028	.0035	.0042	.0056
Medium Carbon Steels <= 48 HRC	1045, 4140, 4340, 5140	Peripheral - HEM	<=3 x D	.08 x D	9	450	.0036	.0053	.0071	.0089	.0107	.0142
			>3xD-4xD	.08 x D	9	450	.0032	.0048	.0064	.0080	.0096	.0128
			>4xD-5xD	.08 x D	9	425	.0028	.0043	.0057	.0071	.0085	.0114
		Finish	3 x D	.015 x D	9	390	.0013	.0019	.0025	.0031	.0038	.0050
Tool and Die Steels <= 48 Rc	A2, D2, O1, S7, P20, H13	Peripheral - HEM	<=3 x D	.08 x D	9	420	.0032	.0048	.0064	.0080	.0096	.0128
			>3xD-4xD	.08 x D	9	420	.0029	.0043	.0058	.0072	.0086	.0115
			>4xD-5xD	.08 x D	9	395	.0026	.0038	.0051	.0064	.0077	.0102
		Finish	3 x D	.015 x D	9	365	.0011	.0016	.0021	.0026	.0032	.0042
M - Stainless Steels												
Austenitic Stainless Steels, FeNi Alloys	303, 304, 316, Invar, Kovar	Peripheral - HEM	<=3 x D	.08 x D	9	450	.0032	.0048	.0064	.0080	.0096	.0128
			>3xD-4xD	.08 x D	9	440	.0029	.0043	.0058	.0072	.0086	.0115
			>4xD-5xD	.07 x D	9	425	.0026	.0038	.0051	.0064	.0077	.0102
		Finish	3 x D	.015 x D	9	390	.0012	.0018	.0024	.0030	.0036	.0048
Martensitic & Ferritic Stainless Steels	410, 416, 440	Peripheral - HEM	<=3 x D	.08 x D	9	450	.0038	.0056	.0075	.0094	.0113	.0150
			>3xD-4xD	.08 x D	9	450	.0034	.0051	.0068	.0084	.0101	.0135
			>4xD-5xD	.08 x D	9	425	.0030	.0045	.0060	.0075	.0090	.0120
		Finish	3 x D	.015 x D	9	390	.0013	.0019	.0025	.0031	.0038	.0050
Precipitation Hardening Stainless Steels	17-4, 15-5, 13-8	Peripheral - HEM	<=3 x D	.08 x D	9	440	.0031	.0047	.0062	.0078	.0093	.0124
			>3xD-4xD	.08 x D	9	440	.0028	.0042	.0056	.0070	.0084	.0112
			>4xD-5xD	.07 x D	9	415	.0025	.0037	.0050	.0062	.0074	.0099
		Finish	3 x D	.015 x D	9	380	.0010	.0015	.0020	.0025	.0030	.0040
K - Cast Irons												
Gray	ASTM-A48 Class 20, 25, 30, 35 & 40	Peripheral - HEM	<=3 x D	.1 x D	9	400	.0036	.0054	.0072	.0090	.0108	.0144
			>3xD-4xD	.08 x D	9	400	.0032	.0049	.0065	.0081	.0097	.0130
			>4xD-5xD	.08 x D	9	390	.0029	.0043	.0058	.0072	.0086	.0115
		Finish	3 x D	.015 x D	9	450	.0013	.0020	.0026	.0033	.0039	.0052
Cast Iron	Malleable	Peripheral - HEM	<=3 x D	.08 x D	9	390	.0029	.0044	.0058	.0073	.0087	.0116
			>3xD-4xD	.08 x D	9	390	.0026	.0039	.0052	.0065	.0078	.0104
			>4xD-5xD	.08 x D	9	375	.0023	.0035	.0046	.0058	.0070	.0093
		Finish	3 x D	.015 x D	9	350	.0011	.0016	.0021	.0026	.0032	.0042
S - High Temp Alloys												
Titanium Alloys	6Al-4V, 6-2-4	Peripheral - HEM	<=3 x D	.1 x D	9	405	.0021	.0031	.0041	.0051	.0062	.0082
			>3xD-4xD	.08 x D	9	405	.0018	.0028	.0037	.0046	.0055	.0074
			>4xD-5xD	.08 x D	9	390	.0016	.0025	.0033	.0041	.0049	.0066
		Finish	3 x D	.015 x D	9	350	.0008	.0012	.0016	.0020	.0024	.0032
Difficult to machine titanium alloys	10-2-3	Peripheral - HEM	<=2.5 x D	.08 x D	9	335	.0020	.0030	.0040	.0050	.0060	.0080
			>2.5xD-3.5xD	.07 x D	9	325	.0018	.0027	.0036	.0045	.0054	.0072
			>3.5xD-4xD	.06 x D	9	305	.0016	.0024	.0032	.0040	.0048	.0064
		Finish	3 x D	.01 x D	9	290	.0007	.0011	.0014	.0018	.0021	.0028
Hastalloy, Waspalloy		Peripheral - HEM	<=1.5 x D	.08 x D	9	100	.0045	.0068	.0090	.0113	.0135	.0180
			>1.5xD-2.5xD	.08 x D	9	95	.0041	.0061	.0081	.0101	.0122	.0162
			>2.5xD-3.5xD	.06 x D	9	85	.0036	.0054	.0072	.0090	.0108	.0144
		Finish	2 x D	.01 x D	9	90	.0024	.0036	.0048	.0060	.0072	.0096
Inconel 718, Rene 88		Peripheral - HEM	<=1.5 x D	.07 x D	9	95	.0046	.0068	.0091	.0114	.0137	.0182
			>1.5xD-2.5xD	.06 x D	9	90	.0041	.0061	.0082	.0102	.0123	.0164
			>2.5xD-3xD	.06 x D	9	85	.0036	.0055	.0073	.0091	.0109	.0146
		Finish	2 x D	.01 x D	9	85	.0023	.0035	.0046	.0058	.0069	.0092

D = Tool Diameter  
HEM = High Efficiency Machining