



## 11-Flute, Extra High Performance, Finisher Endmills, Corner Radius & Chip Control, 34 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 94-97.



### 11-Flute Finishers Speeds & Feeds

Material	Grades	Cut	Axial	Radial	# of Flutes	SFM	Feed by Endmill Diameter (IPT)					
							3/8	1/2	5/8	3/4	1	1 1/4
							(.3750)	(.5000)	(.6250)	(.7500)	(1.000)	(1.250)
P - Steels												
Low Carbon Steels <= 38 Rc	1018, 1020, 12L14, 5120, 8620	Peripheral - HEM	<2 x D	.07 x D	11	550	.0041	.0055	.0069	.0083	.0110	.0138
			2.5xD	.07 x D	11	530	.0036	.0048	.0060	.0072	.0096	.0120
			3xD	.07 x D	11	515	.0032	.0042	.0053	.0063	.0084	.0105
			3.5xD	.07 x D	11	505	.0027	.0036	.0045	.0054	.0072	.0090
Medium Carbon Steels <= 48 HRC	1045, 4140, 4340, 5140	Peripheral - HEM	3 x D	.01 x D	11	475	.0015	.0020	.0025	.0030	.0040	.0050
			<2 x D	.07 x D	11	530	.0041	.0054	.0068	.0081	.0108	.0135
			2.5xD	.07 x D	11	515	.0035	.0047	.0059	.0071	.0094	.0118
			3xD	.07 x D	11	500	.0031	.0041	.0051	.0062	.0082	.0103
Tool and Die Steels <= 48 Rc	A2, D2, O1, S7, P20, H13	Peripheral - HEM	3.5xD	.07 x D	11	490	.0026	.0035	.0044	.0053	.0070	.0088
			3 x D	.01 x D	11	455	.0014	.0019	.0024	.0029	.0038	.0048
			<2 x D	.06 x D	11	445	.0047	.0063	.0079	.0095	.0126	.0158
			2.5xD	.06 x D	11	430	.0041	.0055	.0069	.0083	.0110	.0138
		Finish	3xD	.06 x D	11	415	.0036	.0048	.0060	.0072	.0096	.0120
			3.5xD	.06 x D	11	410	.0031	.0041	.0051	.0062	.0082	.0103
			3 x D	.01 x D	11	385	.0015	.0020	.0025	.0030	.0040	.0050
M - Stainless Steels												
Austenitic Stainless Steels, FeNi Alloys	303, 304, 316, Invar, Kovar	Peripheral - HEM	<2 x D	.06 x D	11	445	.0050	.0067	.0084	.0101	.0134	.0168
			2.5xD	.06 x D	11	430	.0044	.0059	.0074	.0089	.0118	.0148
			3xD	.06 x D	11	415	.0039	.0052	.0065	.0078	.0104	.0130
			3.5xD	.06 x D	11	410	.0032	.0043	.0054	.0065	.0086	.0108
Martensitic & Ferritic Stainless Steels	410, 416, 440	Peripheral - HEM	3 x D	.01 x D	11	385	.0019	.0025	.0031	.0038	.0050	.0063
			<2 x D	.06 x D	11	450	.0051	.0068	.0085	.0102	.0136	.0170
			2.5xD	.06 x D	11	450	.0045	.0060	.0075	.0090	.0120	.0150
			3xD	.06 x D	11	425	.0041	.0054	.0068	.0081	.0108	.0135
Precipitation Hardening Stainless Steels	17-4, 15-5, 13-8	Peripheral - HEM	3.5xD	.06 x D	11	425	.0033	.0044	.0055	.0066	.0088	.0110
			3 x D	.01 x D	11	390	.0017	.0023	.0029	.0035	.0046	.0058
			<2 x D	.06 x D	11	435	.0051	.0068	.0085	.0102	.0136	.0170
			2.5xD	.06 x D	11	420	.0045	.0060	.0075	.0090	.0120	.0150
		Finish	3xD	.06 x D	11	405	.0039	.0052	.0065	.0078	.0104	.0130
			3.5xD	.06 x D	11	400	.0032	.0043	.0054	.0065	.0086	.0108
			3 x D	.01 x D	11	375	.0017	.0022	.0028	.0033	.0044	.0055
K - Cast Irons												
Gray	ASTM-A48 Class 20, 25, 30, 35 & 40	Peripheral - HEM	<2 x D	.08 x D	11	365	.0040	.0053	.0066	.0080	.0106	.0133
			2.5xD	.07 x D	11	365	.0035	.0046	.0058	.0069	.0092	.0115
			3xD	.07 x D	11	350	.0030	.0040	.0050	.0060	.0080	.0100
			3.5xD	.065 x D	11	350	.0026	.0034	.0043	.0051	.0068	.0085
Cast Iron	Malleable	Peripheral - HEM	3 x D	.01 x D	11	370	.0017	.0022	.0028	.0033	.0044	.0055
			<2 x D	.07 x D	11	375	.0047	.0063	.0079	.0095	.0126	.0158
			2.5xD	.07 x D	11	375	.0042	.0056	.0070	.0084	.0112	.0140
			3xD	.07 x D	11	360	.0036	.0048	.0060	.0072	.0096	.0120
		Finish	3.5xD	.07 x D	11	360	.0030	.0040	.0050	.0060	.0080	.0100
			3 x D	.01 x D	11	335	.0017	.0023	.0029	.0035	.0046	.0058
S - High Temp Alloys												
Titanium Alloys	6Al-4V, 6-2-4	Peripheral - HEM	<2 x D	.06 x D	11	425	.0045	.0060	.0075	.0090	.0120	.0150
			2.5xD	.06 x D	11	415	.0032	.0043	.0054	.0065	.0086	.0108
			3xD	.06 x D	11	395	.0032	.0042	.0053	.0063	.0084	.0105
			3.5xD	.06 x D	11	395	.0029	.0039	.0049	.0059	.0078	.0098
Difficult to machine titanium alloys	10-2-3	Peripheral - HEM	3 x D	.015 x D	11	370	.0017	.0023	.0029	.0035	.0046	.0058
			<2 x D	0.06	11	350	.0044	.0059	.0074	.0089	.0118	.0148
			2.5xD	0.06	11	330	.0032	.0042	.0053	.0063	.0084	.0105
			3xD	0.055	11	315	.0031	.0041	.0051	.0062	.0082	.0103
Hastalloy, Waspalloy		Peripheral - HEM	3.5xD	0.05	11	310	.0029	.0038	.0048	.0057	.0076	.0095
			3 x D	.01 x D	11	300	.0015	.0020	.0025	.0030	.0040	.0050
			<2 x D	.07 X D	11	105	.0068	.0090	.0113	.0135	.0180	.0225
			2.5xD	.065 x D	11	100	.0061	.0081	.0101	.0122	.0162	.0203
		Finish	3xD	.055 x D	11	90	.0054	.0072	.0090	.0108	.0144	.0180
			3.5xD	.055 x D	11	90	.0049	.0065	.0081	.0097	.0130	.0162
			3 x D	.01 x D	11	90	.0035	.0047	.0059	.0071	.0094	.0118
Inconel 718, Rene 88		Peripheral - HEM	<2 x D	.065 x D	11	100	.0047	.0062	.0078	.0093	.0124	.0155
			2.5xD	.06 x D	11	95	.0045	.0060	.0075	.0090	.0120	.0150
			3xD	.05 x D	11	95	.0045	.0060	.0075	.0090	.0120	.0150
			3.5xD	.05 x D	11	95	.0039	.0052	.0065	.0078	.0104	.0130
		Finish	3 x D	.01 x D	11	90	.0024	.0032	.0040	.0048	.0064	.0080

D = Tool Diameter  
HEM = High Efficiency Machining