5-Flute, Standard, Neck Relief, Ball End & Chip Control, 40 Degree Helix, Extra High Performance Endmills

- RedLine XHP Variable 5-Flute tools offer optimum metal removal rates. By controlling the vibration and chatter through a unique dampening geometry, and through the application of our advanced heat resistant coating over a fine micro-grain carbide substrate, our tools can handle faster speeds and feeds with excellent tool life in even the most difficult to machine materials like Stainless and Titanium.
- These tools can be optimized by using High Efficiency Machining technology.
- Used to Ramp, Plunge, Slot, Rough and Finish Profiles and can be found on pages 62-78.

XHP Variable Index 5-Flute Tools Speeds & Feeds

Material	Grades	Cut	Axial	Radial	Flutes	Stub/Reg SFM AlCrNX	Feed by Endmill Diameter (IPT) 1/8 (.1250)	1/4 (.2500)	3/8 (.3750)	1/2 (.5000)	5/8 (.6250)	3/4 (.7500)	1 (1.000)
P - Steels													
High Strength Tool Steel <= 48 Rc	A2, D2, 01, S7, P20, H13	Slotting	.5 x D	1 x D	5	275	.0005	.0011	.0016	.0022	.0028	.0033	.0044
		Peripheral - Rough	1.25 x D	.3 x D	5	350	.0007	.0015	.0022	.0029	.0036	.0044	.0058
		Peripheral - HEM	3 x D	.05 x D	5	390	.0022	.0043	.0065	.0087	.0109	.0131	.0174
		Finish	2 x D	.015 x D	5	350	.0007	.0015	.0022	.0030	.0038	.0045	.0060
Low Carbon <= 38 Rc	1018, 1020, 12L14, 5120, 8620	Slotting	.5 x D	1 x D	5	325	.0007	.0014	.0021	.0028	.0035	.0042	.0056
		Peripheral - Rough	1.25 x D	.3 x D	5	400	.0010	.0019	.0029	.0038	.0048	.0057	.0076
		Peripheral - HEM	3 x D	.07 x D	5	450	.0028	.0056	.0084	.0112	.0140	.0168	.0224
		Finish	2 x	.015 x D	5	400	.0010	.0019	.0029	.0039	.0049	.0059	.0078
Medium Carbon <= 48 HRC	1045, 4140, 4340, 5140	Slotting	.5 x D	1 x D	5	300	.0006	.0013	.0019	.0026	.0033	.0039	.0052
		Peripheral - Rough	1.25 x D	.3 x D	5	375	.0009	.0017	.0026	.0035	.0044	.0053	.0070
		Peripheral - HEM	3 x D	.05 x D	5	415	.0026	.0052	.0077	.0103	.0129	.0155	.0206
		Finish	2 x D	.015 x D	5	375	.0009	.0018	.0027	.0036	.0045	.0054	.0072
M - Stainless Steels													
Austenitic, FeNi Alloys	303, 304, 316, Invar, Kovar	Slotting	.5 x D	1 x D	5	275	.0006	.0012	.0018	.0024	.0030	.0036	.0048
		Peripheral - Rough	1.25 x D	.3 x D	5	350	.0008	.0016	.0025	.0033	.0041	.0050	.0066
		Peripheral - HEM	3 x D	.05 x D	5	390	.0025	.0049	.0074	.0099	.0124	.0149	.0198
		Finish	2 x D	.015 x D	5	350	.0008	.0017	.0025	.0033	.0041	.0050	.0066
Martensitic & Ferritic	410, 416, 440	Slotting	.5 x D	1 x D	5	300	.0006	.0013	.0019	.0026	.0033	.0039	.0052
		Peripheral - Rough	1.25 x D	.3 x D	5	375	.0009	.0017	.0026	.0035	.0044	.0053	.0070
		Peripheral - HEM	3 x D	.05 x D	5	415	.0026	.0052	.0077	.0103	.0129	.0155	.0206
		Finish	2 x D	.015 x D	5	375	.0009	.0018	.0027	.0036	.0045	.0054	.0072
Precipitation Hardening	17-4, 15-5	Slotting	.5 x D	1 x D	5	250	.0005	.0010	.0015	.0020	.0025	.0030	.0040
		Peripheral - Rough	1.25 x D	.3 x D	5	325	.0007	.0014	.0020	.0027	.0034	.0041	.0054
		Peripheral - HEM	3 x D	.05 x D	5	360	.0020	.0040	.0059	.0079	.0099	.0119	.0158
		Finish	1.5 x D	.015 x D	5	325	.0007	.0014	.0021	.0028	.0035	.0042	.0056
K - Cast Irons													
Gray	ASTM-A48, Class 20, 25,30,35 & 40	Slotting	.5 x D	1 x D	5	300	.0006	.0012	.0018	.0024	.0030	.0036	.0048
		Peripheral - Rough	1.25 x D	.3 x D	5	375	.0008	.0016	.0025	.0033	.0041	.0050	.0066
		Finish	2 x D	.015 x D	5	375	.0008	.0017	.0025	.0033	.0041	.0050	.0066
Malleable		Slotting	.5 x D	1 x D	5	275	.0005	.0010	.0015	.0020	.0025	.0030	.0040
		Peripheral - Rough	1.25 x D	.3 x D	5	350	.0007	.0014	.0020	.0027	.0034	.0041	.0054
		Peripheral - HEM	3 x D	.05 x D	5	390	.0020	.0040	.0060	.0081	.0101	.0122	.0162
		Finish	2 x D	.015 x D	5	350	.0007	.0014	.0021	.0028	.0035	.0042	.0056

D = tool diameter. Reduce feed rates by 20% when using long length tools. Starting parameters shown. Reduce feed rates on ball nose endmills by 10%. NOTE: Speeds and Feeds listed are estimated and will vary by application.

XHP Variable Index 5-Flute Tools Speeds & Feeds (Cont'd)

Material	Grades	Cut	Axial	Radial	Flutes	Stub/Reg SFM AlCrNX	Feed by Endmill Diameter (IPT) 1/8 (.1250)	1/4 (.2500)	3/8 (.3750)	1/2 (.5000)	5/8 (.6250)	3/4 (.7500)	1 (1.000)
S - High Temp Alloys													
Titanium Alloys	6Al-4V, 6-2-4	Slotting	.5 x D	1 x D	5	250	.0005	.0009	.0014	.0018	.0023	.0027	.0036
		Peripheral - Rough	1 x D	.3 x D	5	300	.0006	.0013	.0019	.0025	.0031	.0038	.0050
		Peripheral - HEM	3 x D	.05 x D	5	330	.0018	.0036	.0055	.0073	.0091	.0110	.0146
		Finish	1.5 x D	.015 x D	5	300	.0006	.0013	.0019	.0026	.0033	.0039	.0052
Difficult to machine Titanium Alloys	10-2-3	Slotting	.25 x D	1 x D	5	200	.0003	.0007	.0010	.0014	.0018	.0021	.0028
		Peripheral - Rough	1 x D	.25 x D	5	250	.0005	.0010	.0015	.0020	.0025	.0030	.0040
		Peripheral - HEM	3 x D	.05 x D	5	275	.0015	.0030	.0045	.0059	.0074	.0089	.0118
		Finish	1.5 x D	.01 x D	5	250	.0006	.0012	.0017	.0023	.0029	.0035	.0046

D = tool diameter. Reduce feed rates by 20% when using long length tools. Starting parameters shown. Reduce feed rates on ball nose endmills by 10%. NOTE: Speeds and Feeds listed are estimated and will vary by application.