



3-Flute, High Performance Endmills, 60 Degree Helix



- RedLine 3-flute 60° endmills are perfect for slotting and profiling in all high temperature alloys like Hastalloy, Waspalloy, Inconel, and Titanium.
- If you are looking for additional speed you can achieve up to a 40% increase in surface footage over uncoated tools by purchasing tools with the AlTiN coating.
- These High Performance tools can be found on page 41.

3-Flute 60° Speeds & Feeds

Material	Grades	SFM	SFM	Feed by Endmill Diameter (IPT)								
				Uncoated	AlTiN	1/8	1/4	3/8	1/2	5/8	3/4	1
						(.1250)	(.2500)	(.3750)	(.5000)	(.6250)	(.7500)	(1.000)
P - Steels												
High Strength Tool Steel	A2, D2, P20, H11, H13, S2, 01	225-300	315-420	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
High Strength Tool Steel > 32 HRC		135-180	190-250	.0003-.0005	.0004-.0005	.0005-.0008	.0010-.0015	.0012-.0015	.0015-.0020	.0020-.0030		
Low Carbon	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	250-350	350-490	.0007-.0015	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040	.0040-.0050		
Low Carbon > 32 HRC	Reduce SFM by 40%	150-210	210-290	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
Medium Carbon	1040-1095, 1140-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4330-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100	250-350	350-490	.0007-.0015	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040	.0040-.0050		
Medium Carbon > 32 HRC	Reduce SFM by 40%	150-210	210-290	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
M - Stainless Steels												
Austenitic	301-304L, 310, 316L, 321, 347	250-350	350-490	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
Austenitic > 32 HRC		190-260	265-360	.0003-.0005	.0004-.0005	.0005-.0008	.0010-.0015	.0012-.0015	.0015-.0020	.0020-.0030		
Martensitic	403, 410, 416, 420, 430, 431, 440	200-350	280-490	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
Martensitic > 32 HRC		150-260	210-360	.0003-.0005	.0004-.0005	.0005-.0008	.0010-.0015	.0012-.0015	.0015-.0020	.0020-.0030		
Precipitation Hardening	12/8, 15/5, 17/4, AM-350/355/363, PH13-8MO, PH14-8/MO	200-350	280-490	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
Precipitation Hardening > 32 HRC		150-260	210-360	.0003-.0005	.0004-.0005	.0005-.0008	.0010-.0015	.0012-.0015	.0015-.0020	.0020-.0030		
K - Cast Irons												
Ductile	A536, J434, 60-40-18	300-400	420-560	.0010-.0020	.0010-.0015	.0015-.0020	.0020-.0035	.0035-.0050	.0050-.0070	.0070-.0100		
Gray	A48, A436, A319, Class 20, G4000	350-450	490-630	.0010-.0020	.0010-.0015	.0015-.0020	.0020-.0035	.0035-.0050	.0050-.0070	.0070-.0100		
Malleable	A220, A602, J158	490-630	680-740	.0010-.0020	.0010-.0015	.0015-.0020	.0020-.0035	.0035-.0050	.0050-.0070	.0070-.0100		
N - Non-Ferrous												
Aluminum Alloys	2014, 2024, 6061, 7075	> 500	>700	.0010-.0020	.0010-.0015	.0015-.0020	.0020-.0040	.0050-.0080	.0090-.0110	.0110-.0150		
Aluminum High Silicon	A380, A390	450	630	.0010-.0020	.0010-.0015	.0015-.0020	.0020-.0040	.0050-.0080	.0090-.0110	.0110-.0150		
Brass/Bronze	Aluminum Bronze, Low Silicon Bronze	300-400	420-560	.0007-.0015	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0040	.0040-.0080	.0070-.0100		
Composites		250-1000	350-1400	.0007-.0012	.0010-.0015	.0015-.0020	.0020-.0035	.0035-.0050	.0050-.0070	.0070-.0100		
Copper		400-500	560-700	.0007-.0015	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0040	.0040-.0080	.0070-.0100		
Magnesium	G-10, Fiberglass, Graphite, Graphite Epoxy, Plastics	> 500	>700	.0010-.0020	.0010-.0015	.0015-.0020	.0020-.0035	.0035-.0050	.0050-.0070	.0070-.0100		
S - High Temp W Alloys												
Cobalt Base	Stellite, HS-21, Haynes 25/188, X40, L605	200-275	280-385	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
Cobalt Base > 32 HRC		130-180	180-250	.0003-.0005	.0004-.0005	.0005-.0008	.0010-.0015	.0012-.0015	.0015-.0020	.0020-.0030		
Iron Base	Incoloy 800-802, Multimet N-155 Timkin 16-25-6, Carpenter 22-b3	250-300	350-420	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
Iron Base > 32 HRC		150-180	210-250	.0003-.0005	.0004-.0005	.0005-.0008	.0010-.0015	.0012-.0015	.0015-.0020	.0020-.0030		
Nickel Base	Inconel 625/718, Inco 700, 713C, 718, Monel 400-401, 404, K401, Rene, Rene 41 & 95 Hastelloy, Waspalloy, Udimet 500 & 700	150-200	210-280	.0005-.0010	.0008-.0010	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040		
Nickel Base >32 HRC		90-120	125-165	.0003-.0005	.0004-.0005	.0005-.0008	.0010-.0015	.0012-.0015	.0015-.0020	.0020-.0030		
Titanium	Commercially Pure, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si, Ti-8Al-1Mo, Ti-8Al-4Mo	250-400	350-560	.0007-.0015	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0040	.0040-.0050		

NOTE: Speeds and Feeds listed are estimated and will vary by application.