



## 3-Flute, Roughing, 37 Degree Helix, Extra High Performance Endmills for Aluminum and Non-Ferrous Materials.

- RedLine has a comprehensive offering of shank designs, corner radii, and tool lengths for milling all aluminums including die cast, extrusions and non-ferrous alloys.
- The ZrN coating allows for higher speeds, better tool life with a low affinity for Aluminum.
- Use for straight line and helical ramping.
- These Extra High Performance tools can be found on page 23.

### Aluminum & Non-Ferrous Speeds & Feeds

Material	Grades	Cut Type	Axial DOC	Radial DOC	# of Flutes	SFM	Feed by Endmill Diameter (IPT)								
							1/8 (.1250)	3/16 (.1875)	1/4 (.2500)	5/16 (.3125)	3/8 (.3750)	1/2 (.5000)	5/8 (.6250)	3/4 (.7500)	1 (1.000)
<b>N - Non-Ferrous</b>															
Aluminum Alloys	6061, 7075, 2024	Slotting	1 x D	1 x D	3	800	.0015	.0023	.0030	.0045	.0060	.0075	.0090	.0120	.0150
		Peripheral - Rough	<=2 x D	.5 x D	3	1000	.0020	.0030	.0040	.0060	.0080	.0100	.0120	.0160	.0200
			>2-3 x D	.5 x D	3	1000	.0019	.0028	.0038	.0056	.0075	.0094	.0113	.0150	.0188
			>3-4 x D	.45 x D	3	900	.0016	.0024	.0033	.0049	.0065	.0081	.0098	.0130	.0163
		*Helical Ramp Angle 3.0 deg.				800	.0012	.0018	.0024	.0036	.0048	.0060	.0072	.0096	.0120
Aluminum High Silicon	A380, A390	Slotting	.75 x D	1 x D	3	500	.0011	.0017	.0023	.0034	.0045	.0056	.0068	.0090	.0113
		Peripheral - Rough	<=2 x D	.4 x D	3	700	.0014	.0021	.0029	.0043	.0057	.0071	.0086	.0114	.0143
			>2-3 x D	.4 x D	3	700	.0014	.0021	.0028	.0041	.0055	.0069	.0083	.0110	.0138
			>3-4 x D	.375 x D	3	600	.0012	.0018	.0024	.0036	.0048	.0060	.0072	.0096	.0120
		*Helical Ramp Angle 2.5 deg.				500	.0009	.0014	.0018	.0027	.0036	.0045	.0054	.0072	.0090
Magnesium Alloys		Slotting	1 x D	1 x D	3	800	.0015	.0023	.0030	.0045	.0060	.0075	.0090	.0120	.0150
		Peripheral - Rough	<=2 x D	.5 x D	3	1000	.0020	.0030	.0040	.0060	.0080	.0100	.0120	.0160	.0200
			>2-3 x D	.5 x D	3	1000	.0019	.0028	.0038	.0056	.0075	.0094	.0113	.0150	.0188
			>3-4 x D	.45 x D	3	900	.0016	.0024	.0033	.0049	.0065	.0081	.0098	.0130	.0163
		*Helical Ramp Angle 3.0 deg.				800	.0012	.0018	.0024	.0036	.0048	.0060	.0072	.0096	.0120
Copper Alloys, Brass		Slotting	.75 x D	1 x D	3	500	.0009	.0014	.0019	.0028	.0037	.0046	.0056	.0074	.0093
		Peripheral - Rough	<=2 x D	.4 x D	3	600	.0012	.0017	.0023	.0035	.0046	.0058	.0069	.0092	.0115
			>2-3 x D	.4 x D	3	600	.0011	.0017	.0023	.0034	.0045	.0056	.0068	.0090	.0113
			>3-4 x D	.375 x D	3	500	.0010	.0015	.0020	.0029	.0039	.0049	.0059	.0078	.0098
		*Helical Ramp Angle 2.5 deg.				500	.0007	.0011	.0015	.0022	.0030	.0037	.0044	.0059	.0074
Bronze		Slotting	.75 x D	1 x D	3	500	.0009	.0013	.0018	.0026	.0035	.0044	.0053	.0070	.0088
		Peripheral - Rough	<=2 x D	.4 x D	3	600	.0011	.0017	.0022	.0033	.0044	.0055	.0066	.0088	.0110
			>2-3 x D	.4 x D	3	600	.0011	.0016	.0021	.0032	.0042	.0053	.0063	.0084	.0105
			>3-4 x D	.375 x D	3	500	.0009	.0013	.0018	.0026	.0035	.0044	.0053	.0070	.0088
		*Helical Ramp Angle 2.0 deg.				500	.0007	.0011	.0014	.0021	.0028	.0035	.0042	.0056	.0070
Composites, Plastic, Fiberglass		Slotting	.75 x D	1 x D	3	500	.0011	.0017	.0023	.0034	.0045	.0056	.0068	.0090	.0113
		Peripheral - Rough	<=2 x D	.4 x D	3	700	.0014	.0021	.0029	.0043	.0057	.0071	.0086	.0114	.0143
			>2-3 x D	.4 x D	3	700	.0014	.0021	.0028	.0041	.0055	.0069	.0083	.0110	.0138
			>3-4 x D	.375 x D	3	600	.0012	.0018	.0024	.0036	.0048	.0060	.0072	.0096	.0120
		*Helical Ramp Angle 3.0 deg.				500	.0009	.0014	.0018	.0027	.0036	.0045	.0054	.0072	.0090

\*Straight line Ramp Angle= Helical Ramp Angle x 5 for entry up to 1 x D.