EXPERIENCE • TECHNOLOGY • PERFORMANCE • PRODUCTIVITY




Variable Helix Carbide End Mills

i

Chamfer & New Sizes Added!

For High Performance, Chatter - Free Machining
Provides Versatility in Use for All Ferrous Materials

COBALT MELIN TOOL COMPANY CARBIDE

WWW.MELINTOOL.COM · WWW.MELINMOBILE.COM

HIGH PERFORMANCE CARBIDE END MILLS

Chatter-Free machining enables higher spindle speeds and feed rates. **Less vibration**...Less constraints on productivity improvement. Combined with an end mill having a unique geometry that enables **heavier cuts and more effective chip evacuation** and you can drastically reduce machining time. **Less machining time**...Lower manufacturing costs.

These high performance carbide end mills utilize a geometry combining a variation in helix from flute to flute, an unequal flute division, a special core geometry and an eccentric relief on the cutting edge that provides users a most versatile end mill capable of roughing, semi-roughing, or finishing operations and profiling, slotting and even deep pocketing applications in all ferrous materials.

VXMG Series Variable Helix End Mills

MADE IN USA

- Designed for use in Titanium, Stainless Steel and all other ferrous materials up to 50HRc
- Provides Chatter-Free machining
- Enables higher spindle speed and heavier chip loads
- Eccentric relief on the cutting edge provides enhanced edge strength and smoother cutting action
- Available in stub, standard, and long lengths; also reduced neck and extended no neck styles
- Available with square end and various corner radius sizes
- nACo coated to maximize tool life
- 3/8" diameter and larger can be ordered with a shank flat
- Made from premium submicron grain carbide
- Tolerance +.000/-.002

> Extended Neck Style end mills provide a short length of cut and a reinforced neck, providing maximum rigidity in long reach applications, and enabling an increase of up to 50% in feed rates over long flute tools.

> For applications requiring special reach lengths our No Neck Style end mills are available.

> For large diameter work (sizes 3/8 to 1-1/4 DIA), our Variable Helix Geometry is available as a standard, made from Powdered Metal - Series VHPM.

VXMG Series Variable Helix End Mills

VXMG SERIES - VARIABLE HELIX
4 FLUTES, ALL LENGTHS
SQUARE OR RADIUS

TOOL	EDP	CORNER	RADIUS or CHAMFER	LENGTH	DIA	SHK	LOC	REACH	OAL
VXMG-404-NRS	15697	square	0.000	STUB	1/8	1/8	1/4		1-1/2
VXMG-404-R015S	15699	radius	0.015	STUB	1/8	1/8	1/4		1-1/2
VXMG-404	13105	chamfer	.011 x 45°	STD	1/8	1/8	1/2		1-1/2
VXMG-404-NR	15729	square	0.000	STD	1/8	1/8	1/2		2
VXMG-404-R015	15731	radius	0.015	STD	1/8	1/8	1/2		2
VXMG-404-R015N1	15733	radius	0.015	Ext Neck	1/8	1/8	3/16	3/8	2
VXMG-404-R015N2	15735	radius	0.015	Ext Neck	1/8	1/8	3/16	1/2	2
VXMG-404-R015NN	15715	radius	0.015	No Neck	1/8	1/8	3/16	No Neck	2
VXMG-606-NRS	15737	square	0.000	STUB	3/16	3/16	1/4		1-1/2
VXMG-606-R015S	15739	radius	0.015	STUB	3/16	3/16	1/4		1-1/2
VXMG-606	13106	chamfer	.011 x 45°	STD	3/16	3/16	5/8		2
VXMG-606-NR	15741	square	0.000	STD	3/16	3/16	5/8		2
VXMG-606-R015	15743	radius	0.015	STD	3/16	3/16	5/8		2
VXMG-606-R015N1	15745	radius	0.015	Ext Neck	3/16	3/16	1/4	1/2	3
VXMG-606-R015N2	15747	radius	0.015	Ext Neck	3/16	3/16	1/4	3/4	3
VXMG-606-R015NN	15717	radius	0.015	No Neck	3/16	3/16	1/4	No Neck	3
VXMG-808-NRS	15749	square	0.000	STUB	1/4	1/4	3/8		2
VXMG-808-R015S	15751	radius	0.015	STUB	1/4	1/4	3/8		2
VXMG-808-R030S	15753	radius	0.030	STUB	1/4	1/4	3/8		2
VXMGS-808	13107	chamfer	.011 x 45°	STUB	1/4	1/4	1/2		2
VXMG-808	13108	chamfer	.011 x 45°	STD	1/4	1/4	3/4		2-1/2
VXMG-808-NR	15755	square	0.000	STD	1/4	1/4	3/4		2-1/2
VXMG-808-R015	15757	radius	0.015	STD	1/4	1/4	3/4		2-1/2
VXMG-808-R030	15759	radius	0.030	STD	1/4	1/4	3/4		2-1/2
VXMG-808-NRL	15761	square	0.000	LONG	1/4	1/4	1-1/8		3
VXMG-808-R015L	15762	radius	0.015	LONG	1/4	1/4	1-1/8		3
VXMG-808-R030L	15763	radius	0.030	LONG	1/4	1/4	1-1/8		3
VXMG-808-R015N1	15765	radius	0.015	Ext Neck	1/4	1/4	3/8	3/4	3
VXMG-808-R030N1	15767	radius	0.030	Ext Neck	1/4	1/4	3/8	3/4	3
VXMG-808-R015N2	15768	radius	0.015	Ext Neck	1/4	1/4	3/8	1-1/8	3
VXMG-808-R030N2	15769	radius	0.030	Ext Neck	1/4	1/4	3/8	1-1/8	3
VXMG-808-R015N3	15770	radius	0.015	Ext Neck	1/4	1/4	3/8	2-1/8	4
VXMG-808-R030N3	15771	radius	0.030	Ext Neck	1/4	1/4	3/8	2-1/8	4
VXMG-808-R015NN	15719	radius	0.015	No Neck	1/4	1/4	3/8	No Neck	4
VXMG-808-R030NN	15721	radius	0.030	No Neck	1/4	1/4	3/8	No Neck	4
VXMG-1010-NRS	15772	square	0.000	STUB	5/16	5/16	1/2		2
VXMG-1010-R015S	15773	radius	0.015	STUB	5/16	5/16	1/2		2
VXMG-1010-R030S	15774	radius	0.030	STUB	5/16	5/16	1/2		2
VXMG-1010	13109	chamfer	.011 x 45°	STD	5/16	5/16	13/16		2-1/2
VXMG-1010-NR	15775	square	0.000	STD	5/16	5/16	13/16		2-1/2
VXMG-1010-R015	15777	radius	0.015	STD	5/16	5/16	13/16		2-1/2
VXMG-1010-R030	15779	radius	0.030	STD	5/16	5/16	13/16		2-1/2
VXMG-1010-NRL	15781	square	0.000	LONG	5/16	5/16	1-1/8		3
VXMG-1010-R015L	15783	radius	0.015	LONG	5/16	5/16	1-1/8		3
VXMG-1010-R030L	15785	radius	0.030	LONG	5/16	5/16	1-1/8		3

Sizes continue on Next Page

VXMG Series Variable Helix End Mills

TOOL	EDP	CORNER	RADIUS or CHAMFER	LENGTH	DIA	SHK	LOC	REACH	OAL
VXMG-1212-NRS	15787	square	0.000	STUB	3/8	3/8	1/2		2
VXMG-1212-R015S	15789	radius	0.015	STUB	3/8	3/8	1/2		2
VXMG-1212-R030S	15791	radius	0.030	STUB	3/8	3/8	1/2		2
VXMGS-1212	13110	chamfer	.011 x 45°	STUB	3/8	3/8	5/8		2
VXMG-1212	13111	chamfer	.011 x 45°	STD	3/8	3/8	1		2-1/2
VXMG-1212-NR	15793	square	0.000	STD	3/8	3/8	1		2-1/2
VXMG-1212-R015	15795	radius	0.015	STD	3/8	3/8	1		2-1/2
VXMG-1212-R030	15797	radius	0.030	STD	3/8	3/8	1		2-1/2
VXMG-1212-NRL	15799	square	0.000	LONG	3/8	3/8	1-1/8		3
VXMG-1212-R015L	15800	radius	0.015	LONG	3/8	3/8	1-1/8		3
VXMG-1212-R030L	15801	radius	0.030	LONG	3/8	3/8	1-1/8		3
VXMG-1212-R015N1	15803	radius	0.015	Ext Neck	3/8	3/8	1/2	1-1/8	3
VXMG-1212-R030N1	15804	radius	0.030	Ext Neck	3/8	3/8	1/2	1-1/8	3
VXMG-1212-R015N2	15805	radius	0.015	Ext Neck	3/8	3/8	1/2	2-1/8	4
VXMG-1212-R030N2	15807	radius	0.030	Ext Neck	3/8	3/8	1/2	2-1/8	4
VXMG-1212-R015N3	15809	radius	0.015	Ext Neck	3/8	3/8	1/2	3-1/8	6
VXMG-1212-R030N3	15811	radius	0.030	Ext Neck	3/8	3/8	1/2	3-1/8	6
VXMG-1212-R015NN	19112	radius	0.015	No Neck	3/8	3/8	1/2	No Neck	6
VXMG-1212-R030NN	19113	radius	0.030	No Neck	3/8	3/8	1/2	No Neck	6
VXMG-1414-R015	15813	radius	0.015	STD	7/16	7/16	1		2-3/4
VXMG-1414-R030	15815	radius	0.030	STD	7/16	7/16	1		2-3/4
VXMG-1616-NRS	15817	square	0.000	STUB	1/2	1/2	5/8		2-1/2
VXMG-1616-R015S	15819	radius	0.015	STUB	1/2	1/2	5/8		2-1/2
VXMG-1616-R030S	15821	radius	0.030	STUB	1/2	1/2	5/8		2-1/2
VXMG-1616-R060S	15822	radius	0.060	STUB	1/2	1/2	5/8		2-1/2
VXMGS-1616	13112	chamfer	.011 x 45°	STUB	1/2	1/2	5/8		2-1/2
VXMG-1616	13113	chamfer	.011 x 45°	STD	1/2	1/2	1		3
VXMG-1616-NR	15823	square	0.000	STD	1/2	1/2	1		3
VXMG-1616-R015	15825	radius	0.015	STD	1/2	1/2	1		3
VXMG-1616-R030	15827	radius	0.030	STD	1/2	1/2	1		3
VXMG-1616-R060	15829	radius	0.060	STD	1/2	1/2	1		3
VXMG-1616-M	19787	chamfer	.011 x 45°	MED	1/2	1/2	1-1/4		3
VXMG-1616-NRM	15831	square	0.000	MED	1/2	1/2	1-1/4		3
VXMG-1616-R015M	15833	radius	0.015	MED	1/2	1/2	1-1/4		3
VXMG-1616-R030M	15835	radius	0.030	MED	1/2	1/2	1-1/4		3
VXMG-1616-R060M	15837	radius	0.060	MED	1/2	1/2	1-1/4		3
VXMG-1616-ML	11657	chamfer	.011 x 45°	MED-LONG	1/2	1/2	1-1/2		3-1/2
VXMG-1616-NRML	19345	square	0.000	MED-LONG	1/2	1/2	1-1/2		4
VXMG-1616-R030ML	19346	radius	0.030	MED-LONG	1/2	1/2	1-1/2		4
VXMG-1616-R060ML	19347	radius	0.060	MED-LONG	1/2	1/2	1-1/2		4
VXMG-1616-NRL	15839	square	0.000	LONG	1/2	1/2	2		4
VXMG-1616-R015L	15841	radius	0.015	LONG	1/2	1/2	2		4
VXMG-1616-R030L	15843	radius	0.030	LONG	1/2	1/2	2		4
VXMG-1616-R060L	15845	radius	0.060	LONG	1/2	1/2	2		4
VXMG-1616-R015N1	15847	radius	0.015	Ext Neck	1/2	1/2	5/8	1-1/2	4
VXMG-1616-R030N1	15849	radius	0.030	Ext Neck	1/2	1/2	5/8	1-1/2	4
VXMG-1616-R060N1	15851	radius	0.060	Ext Neck	1/2	1/2	5/8	1-1/2	4

Sizes continue on Next Page

VXMG Series Variable Helix End Mills

TOOL	EDP	CORNER	RADIUS or CHAMFER	LENGTH	DIA	SHK	LOC	REACH	OAL
VXMG-1616-R015N2	15853	radius	0.015	Ext Neck	1/2	1/2	5/8	2-1/4	4
VXMG-1616-R030N2	15855	radius	0.030	Ext Neck	1/2	1/2	5/8	2-1/4	4
VXMG-1616-R060N2	15857	radius	0.060	Ext Neck	1/2	1/2	5/8	2-1/4	4
VXMG-1616-R015N3	15858	radius	0.015	Ext Neck	1/2	1/2	5/8	3-3/8	6
VXMG-1616-R030N3	15859	radius	0.030	Ext Neck	1/2	1/2	5/8	3-3/8	6
VXMG-1616-R060N3	15860	radius	0.060	Ext Neck	1/2	1/2	5/8	3-3/8	6
VXMG-1616-R015NN	19114	radius	0.015	No Neck	1/2	1/2	5/8	No Neck	6
VXMG-1616-R030NN	19115	radius	0.030	No Neck	1/2	1/2	5/8	No Neck	6
VXMG-1616-R060NN	19116	radius	0.060	No Neck	1/2	1/2	5/8	No Neck	6
VXMGS-2020	13114	chamfer	.022 X 45°	STUB	5/8	5/8	3/4		3
VXMG-2020-NRS	15861	square	0.000	STUB	5/8	5/8	3/4		3
VXMG-2020-R030S	15862	radius	0.030	STUB	5/8	5/8	3/4		3
VXMG-2020-R060S	15863	radius	0.060	STUB	5/8	5/8	3/4		3
VXMG-2020-R090S	15864	radius	0.090	STUB	5/8	5/8	3/4		3
VXMG-2020	13115	chamfer	.022 X 45°	STD	5/8	5/8	1-1/4		3-1/2
VXMG-2020-NR	15865	square	0.000	STD	5/8	5/8	1-1/4		3-1/2
VXMG-2020-R030	15866	radius	0.030	STD	5/8	5/8	1-1/4		3-1/2
VXMG-2020-R060	15867	radius	0.060	STD	5/8	5/8	1-1/4		3-1/2
VXMG-2020-R090	15868	radius	0.090	STD	5/8	5/8	1-1/4		3-1/2
VXMG-2020-NRL	15869	square	0.000	LONG	5/8	5/8	2-1/4		5
VXMG-2020-R030L	15870	radius	0.030	LONG	5/8	5/8	2-1/4		5
VXMG-2020-R060L	15871	radius	0.060	LONG	5/8	5/8	2-1/4		5
VXMG-2020-R030E	15872	radius	0.030	X-LONG	5/8	5/8	3-1/4		6
VXMG-2020-R060E	15873	radius	0.060	X-LONG	5/8	5/8	3-1/4		6
VXMG-2020-R030N1	15874	radius	0.030	Ext Neck	5/8	5/8	3/4	1-5/8	5
VXMG-2020-R060N1	15875	radius	0.060	Ext Neck	5/8	5/8	3/4	1-5/8	5
VXMG-2020-R090N1	15876	radius	0.090	Ext Neck	5/8	5/8	3/4	1-5/8	5
VXMG-2020-R060N2	15877	radius	0.060	Ext Neck	5/8	5/8	3/4	2-3/8	5
VXMG-2020-R060N3	15878	radius	0.060	Ext Neck	5/8	5/8	3/4	3-3/8	6
VXMG-2020-R060NN	19117	radius	0.060	No Neck	5/8	5/8	3/4	No Neck	6
VXMG-2424-NRS	15879	square	0.000	STUB	3/4	3/4	7/8		3
VXMG-2424-R030S	15880	radius	0.030	STUB	3/4	3/4	7/8		3
VXMG-2424-R060S	15881	radius	0.060	STUB	3/4	3/4	7/8		3
VXMG-2424-R090S	15883	radius	0.090	STUB	3/4	3/4	7/8		3
VXMG-2424-R120S	15885	radius	0.120	STUB	3/4	3/4	7/8		3
VXMGS-2424	13116	chamfer	.022 X 45°	STUB	3/4	3/4	1		3
VXMG-2424	13117	chamfer	.022 X 45°	STD	3/4	3/4	1-1/2		4
VXMG-2424-NR	15887	square	0.000	STD	3/4	3/4	1-1/2		4
VXMG-2424-R030	15889	radius	0.030	STD	3/4	3/4	1-1/2		4
VXMG-2424-R060	15891	radius	0.060	STD	3/4	3/4	1-1/2		4
VXMG-2424-R090	16014	radius	0.090	STD	3/4	3/4	1-1/2		4
VXMG-2424-R120	16015	radius	0.120	STD	3/4	3/4	1-1/2		4
VXMG-2424-NRL	16016	square	0.000	LONG	3/4	3/4	2-1/4		5
VXMG-2424-R030L	16018	radius	0.030	LONG	3/4	3/4	2-1/4		5
VXMG-2424-R060L	16019	radius	0.060	LONG	3/4	3/4	2-1/4		5
VXMG-2424-R090L	16020	radius	0.090	LONG	3/4	3/4	2-1/4		5
VXMG-2424-R120L	16021	radius	0.120	LONG	3/4	3/4	2-1/4		5

Sizes continue on Next Page

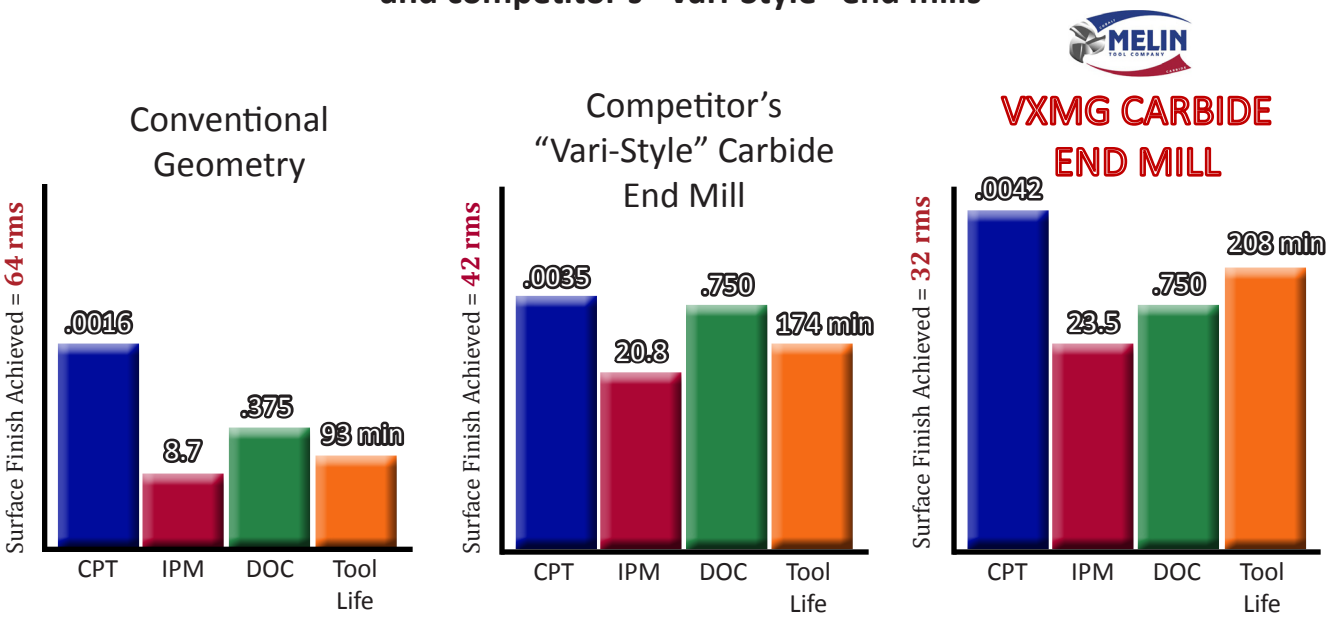
VXMG Series Variable Helix End Mills

TOOL	EDP	CORNER	RADIUS or CHAMFER	LENGTH	DIA	SHK	LOC	REACH	OAL
VXMG-2424-NRE	16022	square	0.000	X-LONG	3/4	3/4	3		6
VXMG-2424-R030E	16024	radius	0.030	X-LONG	3/4	3/4	3		6
VXMG-2424-R060E	16030	radius	0.060	X-LONG	3/4	3/4	3		6
VXMG-2424-R090E	16048	radius	0.090	X-LONG	3/4	3/4	3		6
VXMG-2424-R120E	16049	radius	0.120	X-LONG	3/4	3/4	3		6
VXMG-2424-R030N1	16051	radius	0.030	Ext Neck	3/4	3/4	7/8	2	5
VXMG-2424-R060N1	16052	radius	0.060	Ext Neck	3/4	3/4	7/8	2	5
VXMG-2424-R090N1	16053	radius	0.090	Ext Neck	3/4	3/4	7/8	2	5
VXMG-2424-R120N1	16054	radius	0.120	Ext Neck	3/4	3/4	7/8	2	5
VXMG-2424-R030N2	16056	radius	0.030	Ext Neck	3/4	3/4	7/8	2-1/2	5
VXMG-2424-R060N2	16057	radius	0.060	Ext Neck	3/4	3/4	7/8	2-1/2	5
VXMG-2424-R090N2	16058	radius	0.090	Ext Neck	3/4	3/4	7/8	2-1/2	5
VXMG-2424-R120N2	16059	radius	0.120	Ext Neck	3/4	3/4	7/8	2-1/2	5
VXMG-2424-R030N3	16106	radius	0.030	Ext Neck	3/4	3/4	7/8	3-3/8	6
VXMG-2424-R060N3	16107	radius	0.060	Ext Neck	3/4	3/4	7/8	3-3/8	6
VXMG-2424-R090N3	16108	radius	0.090	Ext Neck	3/4	3/4	7/8	3-3/8	6
VXMG-2424-R120N3	16109	radius	0.120	Ext Neck	3/4	3/4	7/8	3-3/8	6
VXMG-2424-R030NN	19118	radius	0.030	No Neck	3/4	3/4	7/8	No Neck	6
VXMG-2424-R060NN	19119	radius	0.060	No Neck	3/4	3/4	7/8	No Neck	6
VXMG-2424-R090NN	19120	radius	0.090	No Neck	3/4	3/4	7/8	No Neck	6
VXMG-2424-R120NN	19121	radius	0.120	No Neck	3/4	3/4	7/8	No Neck	6
VXMG-3232	13118	chamfer	.022 X 45°	STD	1	1	1-1/2		4
VXMG-3232-NR	16280	square	0.000	STD	1	1	1-1/2		4
VXMG-3232-R030	16313	radius	0.030	STD	1	1	1-1/2		4
VXMG-3232-R060	16314	radius	0.060	STD	1	1	1-1/2		4
VXMG-3232-R090	16316	radius	0.090	STD	1	1	1-1/2		4
VXMG-3232-R120	16431	radius	0.120	STD	1	1	1-1/2		4
VXMG-3232-NRL	16437	square	0.000	LONG	1	1	2-1/4		5
VXMG-3232-R030L	16438	radius	0.030	LONG	1	1	2-1/4		5
VXMG-3232-R060L	16439	radius	0.060	LONG	1	1	2-1/4		5
VXMG-3232-R090L	16457	radius	0.090	LONG	1	1	2-1/4		5
VXMG-3232-R120L	16459	radius	0.120	LONG	1	1	2-1/4		5
VXMG-3232-R030E	16464	radius	0.030	X-LONG	1	1	3		6
VXMG-3232-R060E	16467	radius	0.060	X-LONG	1	1	3		6
VXMG-3232-R090E	16468	radius	0.090	X-LONG	1	1	3		6
VXMG-3232-R120E	16469	radius	0.120	X-LONG	1	1	3		6
VXMG-3232-R030N1	16538	radius	0.030	Ext Neck	1	1	1-1/2	2-1/4	5
VXMG-3232-R060N1	16539	radius	0.060	Ext Neck	1	1	1-1/2	2-1/4	5
VXMG-3232-R090N1	16589	radius	0.090	Ext Neck	1	1	1-1/2	2-1/4	5
VXMG-3232-R120N1	16598	radius	0.120	Ext Neck	1	1	1-1/2	2-1/4	5
VXMG-3232-R030N2	16599	radius	0.030	Ext Neck	1	1	1-1/2	2-5/8	5
VXMG-3232-R060N2	16604	radius	0.060	Ext Neck	1	1	1-1/2	2-5/8	5
VXMG-3232-R090N2	16612	radius	0.090	Ext Neck	1	1	1-1/2	2-5/8	5
VXMG-3232-R120N2	16616	radius	0.120	Ext Neck	1	1	1-1/2	2-5/8	5
VXMG-3232-R030N3	16617	radius	0.030	Ext Neck	1	1	1-1/2	3-3/8	6
VXMG-3232-R060N3	16622	radius	0.060	Ext Neck	1	1	1-1/2	3-3/8	6
VXMG-3232-R090N3	16623	radius	0.090	Ext Neck	1	1	1-1/2	3-3/8	6
VXMG-3232-R120N3	16624	radius	0.120	Ext Neck	1	1	1-1/2	3-3/8	6

VXMG Series Variable Helix End Mills

TOOL	EDP	CORNER	RADIUS or CHAMFER	LENGTH	DIA	SHK	LOC	REACH	OAL
VXMG-3232-R030N4	16625	radius	0.030	Ext Neck	1	1	1-1/2	4-1/8	6
VXMG-3232-R060N4	16626	radius	0.060	Ext Neck	1	1	1-1/2	4-1/8	6
VXMG-3232-R090N4	16627	radius	0.090	Ext Neck	1	1	1-1/2	4-1/8	6
VXMG-3232-R120N4	16628	radius	0.120	Ext Neck	1	1	1-1/2	4-1/8	6
VXMG-3232-R030NN	19122	radius	0.030	No Neck	1	1	1-1/2	No Neck	6
VXMG-3232-R060NN	19123	radius	0.060	No Neck	1	1	1-1/2	No Neck	6
VXMG-3232-R090NN	19124	radius	0.090	No Neck	1	1	1-1/2	No Neck	6
VXMG-3232-R120NN	19125	radius	0.120	No Neck	1	1	1-1/2	No Neck	6

Performance comparison to conventional geometry and competitor's "Vari-Style" end mills



Slotting 316L Stainless with a 3/4" DIA X 1-1/2" LOC end mill with a 0.030 radius

- Chip Load per Tooth (CPT)
- Feed Rate - Inches per Minute (IPM)
- Depth of Cut (DOC)
- Tool Life

The **Unique** geometry of **Melin's VXMG Series** end mill significantly improves harmonics over Competitive product, resulting in less vibration, higher productivity and better surface finishes

Reconditioning services are available for VXMG Series End Mills

Assure maximum performance after regrind

Done in-house, tools are reconditioned to original specifications and re-coated with our unique, nACo coating

Contact Customer Service for more information or visit www.melintool.com or www.melinmobile.com

VXMG Series Variable Helix End Mills

SPEED AND FEED RECOMMENDATIONS

> These recommendations are starting points. Ideal parameters depend on material condition, equipment, setup, actual cutting depths, and coolant conditions

> These recommendations are for materials up to 32HRc

**For materials 33-40HRc, maintain the same RPM and decrease above feed rate by 10%*

**For materials 41-50HRc, maintain the same RPM and decrease above feed rate by 30%*

> The cutting parameters are for cutting depths up to:

**Side Milling (profiling) 0.5D radial depth x 1.5D*

**Slotting 1.0D radial depth x 0.5D*

> The higher SFM/IPM is recommended for high end machining centers with higher H/P, truer spindles and rigid setups.

> The lower SFM/IPM is recommended for older machines with lower H/P, spindles with possible run out and less rigid setups.

> When using extended neck style end mills.

**For tools with reach lengths under 2XD to 4XD, reduce SFM by 20% and maintain the above feed rate*

**For tools with reach lengths from 4XD to 6XD, reduce SFM by 40% and maintain the above feed rate.*

MATERIAL	SFM	CUTTING DIAMETER							
		1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
STAINLESS STEELS									
Precipitation									
13-8, 15-5, AM-350/355, 17-4PH	80	0.0007	0.0011	0.0012	0.0015	0.0020	0.0026	0.0031	0.0041
	200	0.0007	0.0010	0.0013	0.0015	0.0020	0.0025	0.0029	0.0039
Austentic									
200 Series, 302, 303, 304L, 316L	250	0.0004	0.0004	0.0006	0.0010	0.0016	0.0018	0.0022	0.0021
	280	0.0004	0.0004	0.0006	0.0010	0.0016	0.0018	0.0023	0.0021
Martensitic									
403, 410, 416	200	0.0007	0.0010	0.0013	0.0016	0.0020	0.0025	0.0029	0.0039
	250	0.0007	0.0010	0.0013	0.0016	0.0020	0.0025	0.0029	0.0039
HIGH TEMP ALLOYS									
Cobalt Base									
Stellite, HS-21, Haynes 25, 188, X-40, L-605	60	0.0003	0.0004	0.0005	0.0008	0.0011	0.0014	0.0016	0.0022
	100	0.0003	0.0004	0.0007	0.0007	0.0013	0.0016	0.0020	0.0026
Nickel Base									
Inconel 600, 625, 718, Nickel 200, 270, Invar,	75	0.0004	0.0003	0.0007	0.0010	0.0017	0.0016	0.0026	0.0026
Monel 400, 405, K-Monel, PermaNickel 300, Incoly 600, 800, Mar-M-246, 247	90	0.0004	0.0004	0.0007	0.0011	0.0018	0.0018	0.0022	0.0022
Iron Base									
Incoloy 800-802, Multimet N-155, Timken 16-26-6	70	0.0004	0.0005	0.0009	0.0014	0.0019	0.0023	0.0028	0.0037
	125	0.0004	0.0005	0.0010	0.0016	0.0021	0.0026	0.0031	0.0042
STEELS									
High Strength Steels									
4140, 4340, 6150, 52100, H-11	500	0.0006	0.0010	0.0016	0.0025	0.0031	0.0035	0.0037	0.0041
	600	0.0006	0.0010	0.0016	0.0025	0.0031	0.0035	0.0037	0.0040
High Alloy Steels - Mold & Die									
A-2, A-6, A-10, P20, 01, 02, 06, D2, H-13	300	0.0005	0.0007	0.0014	0.0020	0.0025	0.0031	0.0033	0.0035
	550	0.0005	0.0007	0.0014	0.0020	0.0025	0.0031	0.0032	0.0035
Medium Alloy Steels									
200, 250, 300	500	0.0005	0.0005	0.0012	0.0020	0.0025	0.0035	0.0040	0.0050
	600	0.0005	0.0005	0.0012	0.0020	0.0025	0.0035	0.0040	0.0050
Low Alloy Steels-Maraging									
10XX, 11XX, 13XX	500	0.0006	0.0008	0.0008	0.0012	0.0018	0.0020	0.0024	0.0027
	600	0.0006	0.0008	0.0008	0.0012	0.0018	0.0020	0.0024	0.0028
CAST IRONS									
Ductile Iron									
Ductile Cast Iron	400	0.0005	0.0007	0.0015	0.0022	0.0030	0.0040	0.0050	0.0061
	550	0.0005	0.0007	0.0015	0.0022	0.0030	0.0040	0.0050	0.0059
Cast Iron									
Grey Cast Iron	450	0.0008	0.0008	0.0008	0.0012	0.0018	0.0020	0.0024	0.0028
	600	0.0008	0.0008	0.0008	0.0012	0.0018	0.0020	0.0024	0.0028
TITANIUM									
Titanium Alloys									
6AL-4V, ASTM 1, 2, 3, 6AL-2S, N-4Zr-2Mo-SI	160	0.0005	0.0005	0.0006	0.0011	0.0014	0.0015	0.0021	0.0025
For 5553, increase IPM by 25%	190	0.0005	0.0005	0.0006	0.0012	0.0014	0.0015	0.0023	0.0028

Note: All speed and feed data are suggested starting points. They may be increased or decreased depending on machine condition, hole depth, finish required, coolant, etc. If end mill depth exceeds 3 diameters, reduce speed and feed for carbide end mills.

MELIN TOOL COMPANY
5565 Venture Drive · Cleveland, OH, 44130
Tel: 216.362.4200 · Tel. toll free: 1.800.521.1078
Fax: 216.362.4230 · Fax toll free: 1.800.521.1558
WWW.MELINTOOL.COM · WWW.MELINMOBILE.COM