Cutting Data For Variable Helix Unequal Index Solid Carbide End Mills

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RUSHMORE USA TOOLS®

RPM = rev./min. **FEED** = inch/min. **SFM** = ft/min. **Fz** = inch/tooth

Speed and Feed Recommendations						Diameter (inch)				Diameter (inch)									
Iso Hardness (Brinell)	Work Materials	Type of cut	Ap x D1	Ae x D1	Parameters	1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2	5/8	3/4	1
P < 380	CARBON STEEL 10**, 11**, 12**, 12l**, 15**"	Side Cutting	1.5 (1.2)	0.5	SFM (Vc)	499 (400-599)				499 (400-598)			525 (420-630)	551 (441-662)	551 (441-661)	551 (441-662)			
					RPM	15249	12200	#	8714	7625	6778	6100	5834	5613	4811	4210	3368	2806	2105
					Fz	0.0002	0.0003	#	0.0005	0.0006	0.0008	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0026	0.0025
					FEED	12.01	15.37	#	18.53	19.21	22.95	25.94	29.86	33.59	32.20	31.16	28.11	28.73	21.21
		Slotting	1 (0.8)	1	SFM (Vc)	499 (400-599)				499 (400-598)			525 (420-630)	551 (441-662)	551 (441-661)	551 (441-662)			
					RPM	15249	12200	#	8714	7625	6778	6100	5834	5613	4811	4210	3368	2806	2105
					Fz	0.0002	0.0003	#	0.0005	0.0006	0.0008	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0026	0.0025
					FEED	12.01	15.37	#	18.53	19.21	22.95	25.94	29.86	33.59	32.20	31.16	28.11	28.73	21.21
K < 260	ALLOY STEEL 41**, 43**, 51**, 86**	Side Cutting	1.5 (1.2)	0.5	SFM (Vc)	351 (281-422)			351 (281-421)	351 (281-422)	351 (281-421)	351 (281-422)	368 (295-441)	384 (308-461)	384 (308-460)	384 (308-461)			
					RPM	10727	8581	#	6129	5363	4767	4291	4089	3912	3353	2934	2347	1956	1467
					Fz	0.0002	0.0003	#	0.0005	0.0006	0.0008	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0026	0.0025
					FEED	8.45	10.81	#	13.03	13.51	16.14	18.24	20.93	23.41	22.44	21.71	19.59	20.02	14.78
		Slotting	1 (0.8)	1	SFM (Vc)	351 (281-422)			351 (281-421)	351 (281-422)	351 (281-421)	351 (281-422)	368 (295-441)	384 (308-461)	384 (308-460)	384 (308-461)			
					RPM	10727	8581	#	6129	5363	4767	4291	4089	3912	3353	2934	2347	1956	1467
					Fz	0.0002	0.0003	#	0.0005	0.0006	0.0008	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0023	0.0025
					FEED	8.45	10.81	#	13.03	13.51	16.14	18.24	20.93	23.41	22.44	21.71	19.59	18.17	14.78
P < 380	TOOL STEEL A2, D2, H13, P20, T15	Side Cutting	1.5 (1.2)	0.5	SFM (Vc)	210 (168-252)				210 (168-252)			220 (176-264)	230 (184-276)					
					RPM	6418	5134	#	3667	3209	2852	2567	2445	2343	2008	1757	1406	1171	879
					Fz	0.0001	0.0002	#	0.0004	0.0004	0.0006	0.0007	0.0009	0.0011	0.0012	0.0013	0.0015	0.0018	0.0018
					FEED	3.03	4.85	5.39	5.49	5.56	6.74	7.68	8.86	9.96	9.33	8.86	8.19	8.30	6.23
		Slotting	1 (0.8)	1	SFM (Vc)	210 (168-252)				210 (168-252)			220 (176-264)	230 (184-276)					
					RPM	6418	5134	#	3667	3209	2852	2567	2445	2343	2008	1757	1406	1171	879
					Fz	0.0001	0.0002	#	0.0004	0.0004	0.0006	0.0007	0.0009	0.0011	0.0012	0.0013	0.0015	0.0018	0.0018
					FEED	3.03	4.85	5.39	5.49	5.56	6.74	7.68	8.86	9.96	9.33	8.86	8.19	8.30	6.23
K < 260	CAST IRON, Gray, Mallable, Ductile	Side Cutting	1.5 (1.2)	0.5	SFM (Vc)	367 (294-440)				367 (294-440)			386(309-463)	404 (324-484)					
					RPM	11216	8972	#	6409	5608	4985	4486	4290	4115	3527	3087	2469	2058	1543
					Fz	0.0002	0.0004	#	0.0007	0.0008	0.0011	0.0013	0.0016	0.0019	0.0021	0.0023	0.0026	0.0032	0.0031
					FEED	10.60	14.13	#	17.16	17.66	21.19	24.02	27.70	31.11	29.44	28.19	25.28	26.25	19.20
		Slotting	1 (0.8)	1	SFM (Vc)	367 (294-440)				367 (294-440)			386(309-463)	404 (324-484)					
					RPM	11216	8972	#	6409	5608	4985	4486	4290	4115	3527	3087	2469	2058	1543
					Fz	0.0002	0.0004	#	0.0007	0.0008	0.0011	0.0013	0.0016	0.0019	0.0021	0.0023	0.0026	0.0032	0.0031
					FEED	10.60	14.13	#	17.16	17.66	21.19	24.02	27.70	31.11	29.44	28.19	25.28	26.25	19.20
M	Stainless steels 300 304, 316, 304l, 316lsus316	Side Cutting	1.5 (1.2)	0.5	SFM (Vc)	377 (302-452)				377 (302-452)									
					RPM	11521	9217	7681	6583	5761	5120	4608	4189	3840	3292	2880	2304	1920	1440
					Fz	0.0002	0.0003	0.0005	0.0006	0.0007	0.0009	0.0011	0.0015	0.0019	0.0020	#	0.0025	#	#
					FEED	9.07	11.61	15.72	16.07	16.33	18.55	20.32	25.07	29.03	26.96	#	22.86	#	#
		Slotting	1 (0.8)	1	SFM (Vc)	377 (302-452)				377 (302-452)									
					RPM	11521	9217	7681	6583	5761	5120	4608	4189	3840	3292	2880	2304	1920	1440
					Fz	0.0002	0.0003	0.0005	0.0006	0.0007	0.0009	0.0011	0.0015	0.0019	0.0020	#	0.0025	#	#
					FEED	9.07	11.61	15.72	16.07	16.33	18.55	20.32	25.07	29.03	26.96	#	22.86	#	#
M	Stainless steels 400 416, 420F, 430F, 440F	Side Cutting	1.5 (1.2)	0.5	SFM (Vc)	528 (423-633)				528 (423-633)									
					RPM	16136	12909	10757	9220	8068	7171	6454	5868	5379	4610	4034	3227	2689	2017
					Fz	0.0002	0.0002	0.0004	0.0004	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	#	0.0018	#	#
					FEED	10.16	12.20	15.25	15.97	16.52	20.08	22.36	25.87	28.80	26.86	#	22.87	#	#
		Slotting	1 (0.8)	1	SFM (Vc)	528 (423-633)				528 (423-633)									
					RPM	16136	12909	10757	9220	8068	7171	6454	5868	5379	4610	4034	3227	2689	2017
					Fz	0.0002	0.0002	0.0004	0.0004	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	#	0.0018	#	#
					FEED	10.16	12.20	15.25	15.97	16.52	19.76	22.36	25.87	28.80	26.86	#	22.87	#	#
M	Stainless steels(PH) 17-4PH, 15-5PH, 13-8PH	Side Cutting	1.5 (1.2)	0.5	SFM (Vc)	341 (273-409)				341 (273-409)									
					RPM	10421	8337	6947	5955	5210	4632	4168	3789	3474	2977	2605	2084	1737	1303
					Fz	0.0002	0.0003	0.0005	0.0006	0.0007	0.0009	0.0011	0.0015	0.0019	0.0020	#	0.0024	#	#
					FEED	8.21	10.50	14.22	14.54	14.77	16.78	18.38	22.68	26.26	24.15	#	20.35	#	#
		Slotting	1 (0.8)	1	SFM (Vc)	341 (273-409)				341 (273-409)									
					RPM	10421	8337	6947	5955	5210	4632	4168	3789	3474	2977	2605	2084	1737	1303
					Fz	0.0002	0.0003	0.0005	0.0006	0.0007	0.0009	0.0011	0.0015	0.0019	0.0020	#	0.0024	#	#
					FEED	8.21	10.50	14.22	14.54	14.77	16.78	18.38	22.68	26.26	24.15	#	20.35	#	#
S	TITANIUM Ti6Al4V, Ti5Al5V5Mo, Ti7Al4Mo	Side Cutting	1	0.35	SFM (Vc)	266 (213-319)				266 (213-319)									
					RPM	8129	6503	5419	4645	4064	3613	3252	2956	2710	2323	2032	1626	1355	1016
					Fz	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0013	0.0017	0.0018	#	0.0022	#	#
					FEED	5.12	7.17	9.39	9.88	10.24	11.66	12.80	15.83	18.35	17.01	#	14.34	#	#
		Slotting	0.5	1	SFM (Vc)	266 (213-319)				266 (213-319)									
					RPM	8129	6503	5419	4645	4064	3613	3252	2956	2710	2323	2032	1626	1355	1016
					Fz	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0013	0.0017	0.0018	#	0.0022	#	#
					FEED	5.12	7.17	9.39	9.88	10.24	11.66	12.80	15.83	18.35	17.01	#	14.34	#	#
S	HIGH TEMPERATURE ALLOY INCONEL, HASTELLOY, RENE	Side Cutting	1	0.25	SFM (Vc)	102 (82-122)				102 (82-122)									
					RPM	3117	2494	2078	1781	1559	1385	1247	1133	1039	891	779	623	520	390
					Fz	0.0002	0.0003	0.0005	0.0006	0.0007	0.0010	0.0012	0.0015	0.0019	0.0020	#	0.0025	#	#
					FEED	2.45	2.75	3.93	4.21	4.42	5.35	6.09	6.96	7.69	7.15	6.75	6.28	6.30	4.85
		Slotting	0.5	1	SFM (Vc)	102 (82-122)				102 (82-122)									
					RPM	3117	2494	2078	1781	1559	1385	1247	1133	1039	891	779	623	520	390
					Fz	0.0002	0.0003	0.0005	0.0006	0.0007	0.0010	0.0012	0.0015	0.0019	0.0020	#	0.0025	#	#
					FEED	2.45	2.75	3.93	4.21	4.42	5.35	6.09	6.96	7.69	7.15	6.75	6.28	6.30	4.85