

HIGH FEED MACHINING THAT PUSHES THE LIMIT

SN200R, 400R & 500R

Niagara Cutter™ has been the leader in solid carbide milling and is now expanding its range of end mills for high feed milling and select plunge milling applications.

The **NEW** SN200R, SN400R and SN500R series of end mills completes the family of high feed tools by offering a complete range of 2-, 4- and 5-flute end mills to cover a broad range of applications and materials. Available in 3, 5 and 7 times diameter of reach. These end mills also feature a defined radius (r_p) which helps direct radial cutting pressure axially up into the tool holder and spindle. This feature allows for increased metal removal rates in deep pockets and long reach applications.

These end mills also feature an AlTiN coating that offers high heat resistance and superior abrasion resistance to maximize tool life.

RANGE OVERVIEW

- 2-, 4- and 5-flute end mill diameters from 1/16"-1/2" diameter
- 3xD, 5xD and 7xD length versions available

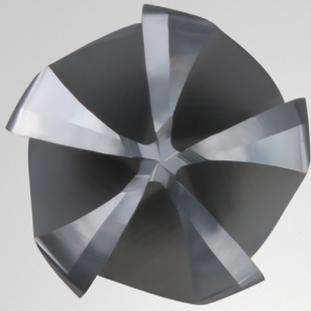


PRODUCT OVERVIEW

- Solid-carbide high feed tools excel in face, slot and plunge milling
- High feed capabilities yield significant productivity gains
- Reduced production costs when processing deep and shallow pockets
- Longer tool life than previous cutters when applied at the same table feed rates
- Low radial forces minimize vibration and machine wear
- Wide application area covered, from steel to exotic materials
- SN200R (2-flutes) high feed series, 3, 5 and 7 x Diameter of reach, Diameters range from (0.063" - 0.500"), cylindrical shank, defined radius (r_p)
- SN400R (4-flutes) high feed series, 3, 5 and 7 x Diameter of reach, Diameters range from (0.125" - 0.500"), cylindrical shank, defined radius (r_p)
- SN500R (5-flutes) high feed series, 3 x Diameter of reach, Diameters range from (0.375" - 0.500"), cylindrical shank, defined radius (r_p)



Niagara Cutter



SN500R

YOUR NIAGARA CUTTER BENEFIT

- Multiple flutes
- Long tool overhang
- Axial directed cutting forces
- High heat and abrasion resistant
- Reduced cycle time, higher metal removal rates
- Deep cavity milling
- Provides smoother cutting in long reach applications
- Long and predictable tool life

NEW NIAGARA CUTTER SN200R, 400R, 500R



EDP	DESCRIPTION	METRIC CROSS	FLUTE DIA	SHANK DIA	LOC a_p	OAL	RADIUS r_p	NECK DIA	REACH LENGTH	SHANK LENGTH	FLUTES	COATING
N13984	SN200R-0.063-G1-H007.0-Z2	1.5	1/16	1/4	0.004	2	0.0074	0.055	0.188	1.813	2	AITIN
N13985	SN200R-0.063-G2-H007.0-Z2	1.5	1/16	1/4	0.004	2	0.0074	0.055	0.313	1.688	2	AITIN
N13986	SN200R-0.063-J3-H007.0-Z2	1.5	1/16	1/4	0.004	2	0.0074	0.055	0.438	1.563	2	AITIN
N13987	SN200R-0.094-G1-H011.0-Z2	2.0	3/32	1/4	0.006	2	0.0111	0.082	0.281	1.719	2	AITIN
N13988	SN200R-0.094-G2-H011.0-Z2	2.0	3/32	1/4	0.006	2	0.0111	0.082	0.469	1.531	2	AITIN
N13989	SN200R-0.094-J3-H011.0-Z2	2.0	3/32	1/4	0.006	2-1/2	0.0111	0.082	0.656	1.844	2	AITIN
N13992	SN200R-0.125-G1-H015.0-Z2	3.0	1/8	1/4	0.008	2	0.0148	0.109	0.375	1.625	2	AITIN
N13993	SN200R-0.125-G2-H015.0-Z2	3.0	1/8	1/4	0.008	2-1/2	0.0148	0.109	0.625	1.875	2	AITIN
N13994	SN200R-0.125-J3-H015.0-Z2	3.0	1/8	1/4	0.008	2-1/2	0.0148	0.109	0.875	1.625	2	AITIN
N13995	SN400R-0.125-G1-H015.0-Z4	3.0	1/8	1/4	0.008	2	0.0148	0.109	0.375	1.625	4	AITIN
N13996	SN400R-0.125-G2-H015.0-Z4	3.0	1/8	1/4	0.008	2-1/2	0.0148	0.109	0.625	1.875	4	AITIN
N13997	SN200R-0.156-G1-H020.0-Z2	4.0	5/32	1/4	0.010	2	0.0200	0.136	0.469	1.531	2	AITIN
N13998	SN200R-0.156-G2-H020.0-Z2	4.0	5/32	1/4	0.010	2-1/2	0.0200	0.136	0.781	1.719	2	AITIN
N13999	SN200R-0.156-J3-H020.0-Z2	4.0	5/32	1/4	0.010	2-1/2	0.0200	0.136	1.094	1.406	2	AITIN
N14002	SN400R-0.156-G1-H020.0-Z4	4.0	5/32	1/4	0.010	2	0.0200	0.136	0.469	1.531	4	AITIN
N14003	SN400R-0.156-G2-H020.0-Z4	4.0	5/32	1/4	0.010	2-1/2	0.0200	0.136	0.781	1.719	4	AITIN
N14004	SN200R-0.188-G1-H023.0-Z2	5.0	3/16	1/4	0.012	2	0.0230	0.166	0.562	1.438	2	AITIN
N14005	SN200R-0.188-G2-H023.0-Z2	5.0	3/16	1/4	0.012	2-1/2	0.0230	0.166	0.937	1.563	2	AITIN
N14006	SN200R-0.188-J3-H023.0-Z2	5.0	3/16	1/4	0.012	3	0.0230	0.166	1.313	1.688	2	AITIN
N14007	SN400R-0.188-G1-H023.0-Z4	5.0	3/16	1/4	0.012	2	0.0230	0.166	0.562	1.438	4	AITIN
N14008	SN400R-0.188-G2-H023.0-Z4	5.0	3/16	1/4	0.012	2-1/2	0.0230	0.166	0.937	1.563	4	AITIN
N14009	SN200R-0.250-E1-H032.0-Z2	6.0	1/4	1/4	0.014	2-1/2	0.0322	0.218	0.750	1.750	2	AITIN
N14012	SN200R-0.250-E2-H032.0-Z2	6.0	1/4	1/4	0.014	3	0.0322	0.218	1.250	1.750	2	AITIN
N14013	SN200R-0.250-J3-H032.0-Z2	6.0	1/4	1/4	0.014	3-1/2	0.0322	0.218	1.750	1.750	2	AITIN
N14014	SN400R-0.250-E1-H032.0-Z4	6.0	1/4	1/4	0.014	2-1/2	0.0322	0.218	0.750	1.750	4	AITIN
N14015	SN400R-0.250-E2-H032.0-Z4	6.0	1/4	1/4	0.014	3	0.0322	0.218	1.250	1.750	4	AITIN
N14016	SN200R-0.313-G1-H037.0-Z2	8.0	5/16	3/8	0.016	2-1/2	0.0373	0.273	0.938	1.563	2	AITIN
N14017	SN200R-0.313-G2-H037.0-Z2	8.0	5/16	3/8	0.016	3-1/2	0.0373	0.273	1.563	1.938	2	AITIN
N14018	SN200R-0.313-J3-H037.0-Z2	8.0	5/16	3/8	0.016	4	0.0373	0.273	2.188	1.813	2	AITIN
N14019	SN400R-0.313-G1-H037.0-Z4	8.0	5/16	3/8	0.016	2-1/2	0.0373	0.273	0.938	1.563	4	AITIN
N14022	SN400R-0.313-G2-H037.0-Z4	8.0	5/16	3/8	0.016	3-1/2	0.0373	0.273	1.563	1.938	4	AITIN
N14023	SN200R-0.375-E1-H043.0-Z2	10.0	3/8	3/8	0.018	3	0.0432	0.329	1.125	1.875	2	AITIN
N14024	SN200R-0.375-E2-H043.0-Z2	10.0	3/8	3/8	0.018	3-1/2	0.0432	0.329	1.875	1.625	2	AITIN
N14025	SN200R-0.375-J3-H043.0-Z2	10.0	3/8	3/8	0.018	4-1/2	0.0432	0.329	2.625	1.875	2	AITIN
N14026	SN400R-0.375-E1-H043.0-Z4	10.0	3/8	3/8	0.018	3	0.0432	0.329	1.125	1.875	4	AITIN
N14027	SN500R-0.375-E1-H043.0-Z5	10.0	3/8	3/8	0.018	3	0.0432	0.329	1.125	1.875	5	AITIN
N14028	SN400R-0.375-E2-H043.0-Z4	10.0	3/8	3/8	0.018	3-1/2	0.0432	0.329	1.875	1.625	4	AITIN
N14029	SN200R-0.500-E1-H061.0-Z2	12.0	1/2	1/2	0.020	3-1/2	0.0614	0.444	1.500	2.000	2	AITIN
N14032	SN200R-0.500-E2-H061.0-Z2	12.0	1/2	1/2	0.020	4-1/2	0.0614	0.444	2.500	2.000	2	AITIN
N14033	SN200R-0.500-J3-H061.0-Z2	12.0	1/2	1/2	0.020	6	0.0614	0.444	3.500	2.500	2	AITIN
N14034	SN400R-0.500-E1-H061.0-Z4	12.0	1/2	1/2	0.020	3-1/2	0.0614	0.444	1.500	2.000	4	AITIN
N14035	SN500R-0.500-E1-H061.0-Z5	12.0	1/2	1/2	0.020	3-1/2	0.0614	0.444	1.500	2.000	5	AITIN
N14036	SN400R-0.500-E2-H061.0-Z4	12.0	1/2	1/2	0.020	4-1/2	0.0614	0.444	2.500	2.000	4	AITIN

r_p^* = Programmable radius





ISO GROUP	SMG	a _e x D _c (max)	v _c (sf / min)	SLOT MILLING												
				Zn = 2												
				1/16	3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2				
P	M/A/D 1 - 2	1.00	984	n [rev/min]	60157	40105	30079	24062	20052	15039	12031	10026	7520			
				fz [in]	0.0021	0.0031	0.0041	0.0052	0.0062	0.0083	0.0103	0.0124	0.0165			
			820	1148	vf [in/min]	248	248	248	248	248	248	248	248	248	248	
					ap max.	0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
			M/A/D 3 - 4	1.00	738	n [rev/min]	45118	30079	22559	18047	15039	11280	9024	7520	5640	
						fz [in]	0.0019	0.0028	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	
	656	820			vf [in/min]	169	169	169	169	169	169	169	169	169		
					ap max.	0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
	M/A/D 5 - 6	1.00			574	n [rev/min]	35092	23395	17546	14036	11697	8773	7018	5849	4386	
						fz [in]	0.0017	0.0025	0.0034	0.0042	0.0051	0.0068	0.0084	0.0101	0.0135	
			492	656	vf [in/min]	118	118	118	118	118	118	118	118	118		
					ap max.	0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
P			M/A/D 7a	1.00	312	n [rev/min]	19050	12700	9525	7620	6350	4762	3810	3175	2381	
						fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	
	262	361			vf [in/min]	57	57	57	57	57	57	57	57	57		
					ap max.	0.0032	0.0048	0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160		
	M	E/M/A 8 - 9			1.00	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133
							fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120
361			459	vf [in/min]		75	75	75	75	75	75	75	75	75		
				ap max.		0.0032	0.0048	0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160		
E/M/A 10 - 11			1.00	312		n [rev/min]	19050	12700	9525	7620	6350	4762	3810	3175	2381	
						fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	
		262		361	vf [in/min]	57	57	57	57	57	57	57	57	57		
					ap max.	0.0032	0.0048	0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160		
		K		E/M/A 12 - 13	1.00	574	n [rev/min]	35092	23395	17546	14036	11697	8773	7018	5849	4386
							fz [in]	0.0019	0.0028	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150
492			656			vf [in/min]	132	132	132	132	132	132	132	132	132	
						ap max.	0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	
E/M/A 14 - 15	1.00		410			n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133	
						fz [in]	0.0017	0.0025	0.0034	0.0042	0.0051	0.0068	0.0084	0.0101	0.0135	
			328	492	vf [in/min]	85	85	85	85	85	85	85	85	85		
					ap max.	0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
			S	E 19	1.00	164	n [rev/min]	10026	6684	5013	4010	3342	2507	2005	1671	1253
							fz [in]	0.0011	0.0017	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090
131	197					vf [in/min]	23	23	23	23	23	23	23	23	23	
						ap max.	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	
E 20	1.00	164				n [rev/min]	10026	6684	5013	4010	3342	2507	2005	1671	1253	
						fz [in]	0.0011	0.0017	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	
		131		197	vf [in/min]	23	23	23	23	23	23	23	23	23		
					ap max.	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100		
		E 21		1.00	98	n [rev/min]	6016	4010	3008	2406	2005	1504	1203	1003	752	
						fz [in]	0.0011	0.0017	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	
66	131				vf [in/min]	14	14	14	14	14	14	14	14	14		
					ap max.	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100		
E 22	1.00				377	n [rev/min]	23060	15374	11530	9224	7687	5765	4612	3843	2883	
						fz [in]	0.0011	0.0017	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	
		328		427	vf [in/min]	52	52	52	52	52	52	52	52	52		
					ap max.	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100		



ISO GROUP	SMG	$a_e \times D_c$ (max)	v_c (sf / min)	SLOT MILLING											
					$Z_n = 4$						$Z_n = 5$				
					1/8	5/32	3/16	1/4	5/16	3/8	1/2	3/8	1/2		
P	M/A/D 1 - 2	1.00	984	n [rev/min]	30079	24062	20052	15039	12031	10026	7520	10026	7520		
				fz [in]	0.0041	0.0052	0.0062	0.0083	0.0103	0.0124	0.0165	0.0124	0.0165		
			820	1148	vf [in/min]	496	496	496	496	496	496	496	620	620	
		M/A/D 3 - 4	1.00	738	n [rev/min]	22559	18047	15039	11280	9024	7520	5640	7520	5640	
					fz [in]	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	0.0113	0.0150	
				656	820	vf [in/min]	338	338	338	338	338	338	338	423	423
	M/A/D 5 - 6	1.00	574	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386		
				fz [in]	0.0034	0.0042	0.0051	0.0068	0.0084	0.0101	0.0135	0.0101	0.0135		
			492	656	vf [in/min]	237	237	237	237	237	237	237	296	296	
	P	M/A/D 7a	1.00	312	n [rev/min]	9525	7620	6350	4762	3810	3175	2381	3175	2381	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120	
				262	361	vf [in/min]	114	114	114	114	114	114	114	143	143
M			E/M/A 8 - 9	1.00	410	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133
						fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120
					361	459	vf [in/min]	150	150	150	150	150	150	150	188
	E/M/A 10 - 11	1.00		312	n [rev/min]	9525	7620	6350	4762	3810	3175	2381	3175	2381	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120	
				262	361	vf [in/min]	114	114	114	114	114	114	114	143	143
K	E/M/A 12 - 13	1.00	574	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386		
				fz [in]	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	0.0113	0.0150		
			492	656	vf [in/min]	263	263	263	263	263	263	263	329	329	
		E/M/A 14 - 15	1.00	410	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133	
					fz [in]	0.0034	0.0042	0.0051	0.0068	0.0084	0.0101	0.0135	0.0101	0.0135	
				328	492	vf [in/min]	169	169	169	169	169	169	169	211	211
S	E 19	1.00	164	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253		
				fz [in]	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	0.0068	0.0090		
			131	197	vf [in/min]	45	45	45	45	45	45	45	56	56	
		E 20	1.00	164	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253	
					fz [in]	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	0.0068	0.0090	
				131	197	vf [in/min]	45	45	45	45	45	45	45	56	56
	E 21	1.00	98	n [rev/min]	3008	2406	2005	1504	1203	1003	752	1003	752		
				fz [in]	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	0.0068	0.0090		
			66	131	vf [in/min]	27	27	27	27	27	27	27	34	34	
	E 22	1.00	377	n [rev/min]	11530	9224	7687	5765	4612	3843	2883	3843	2883		
				fz [in]	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	0.0068	0.0090		
			328	427	vf [in/min]	104	104	104	104	104	104	104	130	130	
				ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100		



ISO GROUP	SMG	x Dc ²	vc (sf / min)	SIDE MILLING											
					Zn = 2										
					1/16	3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2		
P	M/A/D 1 - 2	0.30	984	n [rev/min]	60157	40105	30079	24062	20052	15039	12031	10026	7520		
				fz [in]	0.0034	0.0052	0.0069	0.0086	0.0103	0.0138	0.0172	0.0206	0.0275		
			820	1148	vf [in/min]	414	414	414	414	414	414	414	414	414	
		M/A/D 3 - 4	0.30	738	n [rev/min]	45118	30079	22559	18047	15039	11280	9024	7520	5640	
					fz [in]	0.0031	0.0047	0.0063	0.0078	0.0094	0.0125	0.0156	0.0188	0.0250	
				656	820	vf [in/min]	282	282	282	282	282	282	282	282	282
	M/A/D 5 - 6		0.30	574	n [rev/min]	35092	23395	17546	14036	11697	8773	7018	5849	4386	
					fz [in]	0.0028	0.0042	0.0056	0.0070	0.0084	0.0113	0.0141	0.0169	0.0225	
				492	656	vf [in/min]	197	197	197	197	197	197	197	197	197
		P	M/A/D 7a	0.30	312	n [rev/min]	19050	12700	9525	7620	6350	4762	3810	3175	2381
						fz [in]	0.0025	0.0038	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200
					262	361	vf [in/min]	95	95	95	95	95	95	95	95
M	E/M/A 8 - 9			0.30	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133
						fz [in]	0.0025	0.0038	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200
					361	459	vf [in/min]	125	125	125	125	125	125	125	125
		E/M/A 10 - 11	0.30	459	n [rev/min]	28073	18716	14037	11229	9358	7018	5615	4679	3509	
					fz [in]	0.0025	0.0038	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	
				262	361	vf [in/min]	140	140	140	140	140	140	140	140	140
	K		E/M/A 12 - 13	0.30	574	n [rev/min]	35092	23395	17546	14036	11697	8773	7018	5849	4386
						fz [in]	0.0025	0.0038	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200
					492	656	vf [in/min]	175	175	175	175	175	175	175	175
		E/M/A 14 - 15		0.30	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133
						fz [in]	0.0019	0.0028	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150
					328	492	vf [in/min]	94	94	94	94	94	94	94	94
S			E 19	0.30	164	n [rev/min]	10026	6684	5013	4010	3342	2507	2005	1671	1253
						fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120
					131	197	vf [in/min]	30	30	30	30	30	30	30	30
		E 20		0.30	164	n [rev/min]	10026	6684	5013	4010	3342	2507	2005	1671	1253
						fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120
					131	197	vf [in/min]	30	30	30	30	30	30	30	30
	E 21		0.30	98	n [rev/min]	6016	4010	3008	2406	2005	1504	1203	1003	752	
					fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	
				66	131	vf [in/min]	18	18	18	18	18	18	18	18	18
		E 22	0.30	377	n [rev/min]	23060	15374	11530	9224	7687	5765	4612	3843	2883	
					fz [in]	0.0022	0.0033	0.0044	0.0055	0.0066	0.0088	0.0109	0.0131	0.0175	
				328	427	vf [in/min]	101	101	101	101	101	101	101	101	101
				ap max.	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100		



ISO GROUP	SMG	x Dc ²	v _c (sf / min)	SIDE MILLING											
					Zn = 4						Zn = 5				
					1/8	5/32	3/16	1/4	5/16	3/8	1/2	3/8	1/2		
P	M/A/D 1 - 2	0.30	984	n [rev/min]	30079	24062	20052	15039	12031	10026	7520	10026	7520		
				fz [in]	0.0069	0.0086	0.0103	0.0138	0.0172	0.0206	0.0275	0.0206	0.0275		
			820	1148	vf [in/min]	827	827	827	827	827	827	827	1034	1034	
					ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
			738	820	n [rev/min]	22559	18047	15039	11280	9024	7520	5640	7520	5640	
					fz [in]	0.0063	0.0078	0.0094	0.0125	0.0156	0.0188	0.0250	0.0188	0.0250	
	M/A/D 3 - 4	0.30	656	820	vf [in/min]	564	564	564	564	564	564	564	705	705	
					ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
			574	656	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386	
					fz [in]	0.0056	0.0070	0.0084	0.0113	0.0141	0.0169	0.0225	0.0169	0.0225	
			492	656	vf [in/min]	395	395	395	395	395	395	395	395	493	493
					ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
M/A/D 5 - 6	0.30	312	361	n [rev/min]	9525	7620	6350	4762	3810	3175	2381	3175	2381		
				fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200		
		262	361	vf [in/min]	190	190	190	190	190	190	190	238	238		
				ap max.	0.0064	0.0080	0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160		
		410	459	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133		
				fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200		
E/M/A 8 - 9	0.30	361	459	vf [in/min]	251	251	251	251	251	251	251	313	313		
				ap max.	0.0064	0.0080	0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160		
		459	361	n [rev/min]	14037	11229	9358	7018	5615	4679	3509	4679	3509		
				fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200		
		262	361	vf [in/min]	281	281	281	281	281	281	281	351	351		
				ap max.	0.0064	0.0080	0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160		
E/M/A 10 - 11	0.30	574	656	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386		
				fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200		
		492	656	vf [in/min]	351	351	351	351	351	351	351	439	439		
				ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200		
		410	492	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133		
				fz [in]	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	0.0113	0.0150		
328	492	vf [in/min]	188	188	188	188	188	188	188	235	235				
		ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200				
K	E/M/A 12 - 13	0.30	574	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386		
				fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200		
			492	656	vf [in/min]	351	351	351	351	351	351	351	439	439	
					ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
			410	492	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133	
					fz [in]	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	0.0113	0.0150	
328	492	vf [in/min]	188	188	188	188	188	188	188	235	235				
		ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200				
S	E 19	0.30	164	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253		
				fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120		
			131	197	vf [in/min]	60	60	60	60	60	60	60	75	75	
					ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100	
			164	197	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120	
	131	197	vf [in/min]	60	60	60	60	60	60	60	75	75			
			ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100			
	E 20	0.30	98	131	n [rev/min]	3008	2406	2005	1504	1203	1003	752	1003	752	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120	
			66	131	vf [in/min]	36	36	36	36	36	36	36	45	45	
					ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100	
			377	427	n [rev/min]	11530	9224	7687	5765	4612	3843	2883	3843	2883	
					fz [in]	0.0044	0.0055	0.0066	0.0088	0.0109	0.0131	0.0175	0.0131	0.0175	
	328	427	vf [in/min]	202	202	202	202	202	202	202	252	252			
			ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100			
	E 21	0.30	164	197	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120	
131			197	vf [in/min]	60	60	60	60	60	60	60	75	75		
				ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100		
98			131	n [rev/min]	3008	2406	2005	1504	1203	1003	752	1003	752		
				fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120		
66	131	vf [in/min]	36	36	36	36	36	36	36	45	45				
		ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100				
E 22	0.30	377	427	n [rev/min]	11530	9224	7687	5765	4612	3843	2883	3843	2883		
				fz [in]	0.0044	0.0055	0.0066	0.0088	0.0109	0.0131	0.0175	0.0131	0.0175		
		328	427	vf [in/min]	202	202	202	202	202	202	202	252	252		
				ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100		



ISO GROUP	SMG	x Dc ²	v _c (sf / min)	PLUNGE MILLING											
					Zn = 2										
					1/16	3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2		
P	M/A/D 1 - 2	0.30	699	n [rev/min]	42712	28475	21356	17084	14237	10678	8542	7119	5339		
				fz [in]	0.0006	0.0009	0.0013	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050		
			576	822	vf [in/min]	53	53	53	53	53	53	53	53	53	
						ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000
		M/A/D 3 - 4	0.30	518	n [rev/min]	31683	21122	15841	12673	10561	7921	6337	5280	3960	
					fz [in]	0.0006	0.0009	0.0013	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050	
	459			577	vf [in/min]	40	40	40	40	40	40	40	40	40	
					ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000	
	M/A/D 5 - 6	0.30	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133		
				fz [in]	0.0006	0.0009	0.0013	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050		
			361	459	vf [in/min]	31	31	31	31	31	31	31	31	31	
							ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500
P			M/A/D 7a	0.30	213	n [rev/min]	13034	8689	6517	5213	4345	3259	2607	2172	1629
						fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035
	180	246		vf [in/min]	11	11	11	11	11	11	11	11	11		
					ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000	
M	E/M/A 8 - 9	0.30	289	n [rev/min]	17646	11764	8823	7058	5882	4412	3529	2941	2206		
				fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035		
			246	331	vf [in/min]	15	15	15	15	15	15	15	15	15	
					ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000	
	E/M/A 10 - 11	0.30	246	n [rev/min]	15039	10026	7520	6016	5013	3760	3008	2507	1880		
				fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035		
180			246	vf [in/min]	13	13	13	13	13	13	13	13	13		
				ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000		
K	E/M/A 12 - 13	0.30	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133		
				fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035		
			361	459	vf [in/min]	22	22	22	22	22	22	22	22	22	
					ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000	
	E/M/A 14 - 15	0.30	295	n [rev/min]	18047	12031	9024	7219	6016	4512	3609	3008	2256		
				fz [in]	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030		
230			361	vf [in/min]	14	14	14	14	14	14	14	14	14		
				ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000		
S	E 19	0.30	115	n [rev/min]	7018	4679	3509	2807	2339	1755	1404	1170	877		
				fz [in]	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030		
			98	131	vf [in/min]	5	5	5	5	5	5	5	5	5	
					ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000	
	E 20	0.30	115	n [rev/min]	7018	4679	3509	2807	2339	1755	1404	1170	877		
				fz [in]	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030		
			98	131	vf [in/min]	5	5	5	5	5	5	5	5	5	
							ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500
	E 21	0.30	75	n [rev/min]	4612	3075	2306	1845	1537	1153	922	769	577		
				fz [in]	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030		
			49	102	vf [in/min]	3	3	3	3	3	3	3	3	3	
							ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500
E 22	0.30	262	n [rev/min]	16042	10695	8021	6417	5347	4010	3208	2674	2005			
			fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035			
		230	295	vf [in/min]	14	14	14	14	14	14	14	14	14		
						ap=pd	0.1250	0.1875	0.2500	0.3125	0.3750	0.5000	0.6250	0.7500	1.0000

*E = Emulsion M = Mist spray A = Air **Reduce ap 20% and Feed per tooth 15% when using 5 x D version
 Reduce ap 40% and Feed per tooth 30% when using 7 x D version *pd: plunge depth