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Carbide Split End Blanks

198 SERIES
&

298 SERIES



DIA	DEC.	OVERALL LENGTH	SPLIT LENGTH	SINGLE END PART NUMBER	LIST PRICE	DOUBLE END PART NUMBER	LIST PRICE
1/8	.1250	1-1/2	3/8	198-125150	5.61	298-125150	9.74
1/8	.1250	2	3/8	198-125200	7.59	298-125200	11.46
1/8	.1250	3	3/8	198-125300	9.24	298-125300	15.60
3/16	.1875	2	1/2	198-187200	10.23	298-187200	12.81
3/16	.1875	3	1/2	198-187300	15.35	298-187300	24.58
3/16	.1875	4	1/2	198-187400	20.80	298-187400	26.92
1/4	.2500	2	1/2	198-250200	14.77	298-250200	19.47
1/4	.2500	2-1/2	1/2	198-250250	15.51	298-250250	21.45
1/4	.2500	3	1/2	198-250300	21.03	298-250300	28.38
1/4	.2500	4	1/2	198-250400	30.52	298-250400	37.53
5/16	.3125	2-1/2	1/2	198-312250	23.60	298-312250	29.05
5/16	.3125	3	1/2	198-312300	32.85	298-312300	37.53
5/16	.3125	4	1/2	198-312400	35.15	298-312400	42.82
3/8	.3750	2-1/2	1/2	198-375250	29.04	298-375250	39.02
3/8	.3750	3	1/2	198-375300	38.36	298-375300	43.56
3/8	.3750	4	1/2	198-375400	44.48	298-375400	52.05
7/16	.4375	2-1/2	5/8	198-437250	41.90	298-437250	48.84
7/16	.4375	3	5/8	198-437300	47.85	298-437300	60.05
7/16	.4375	4	5/8	198-437400	61.71	298-437400	69.22
1/2	.5000	3	5/8	198-500300	48.68	298-500300	62.04
1/2	.5000	4	5/8	198-500400	75.24	298-500400	93.85

Special sizes available upon request



Carbide Blanks

Centerless Ground Blanks

100 SERIES



DIA.	DECIMAL EQUIV.	OVERALL LENGTH	PART NUMBER	LIST PRICE
1/8	.1250	1-1/2	100-125150	
1/8	.1250	2	100-125200	
1/8	.1250	3	100-125300	
3/16	.1875	2	100-187200	
3/16	.1875	2-1/2	100-187250	
3/16	.1875	3	100-187300	
3/16	.1875	4	100-187400	
1/4	.2500	2	100-250200	
1/4	.2500	2-1/2	100-250250	
1/4	.2500	3	100-250300	
1/4	.2500	4	100-250400	
5/16	.3125	2-1/2	100-312250	
5/16	.3125	3	100-312300	
5/16	.3125	4	100-312400	
3/8	.3750	2-1/2	100-375250	
3/8	.3750	3	100-375300	
3/8	.3750	3-1/2	100-375350	
3/8	.3750	4	100-375400	
7/16	.4375	2-3/4	100-437275	
7/16	.4375	3	100-437300	
7/16	.4375	4	100-437400	
7/16	.4375	6	100-437600	
1/2	.5000	3	100-500300	
1/2	.5000	4	100-500400	
1/2	.5000	6	100-500600	
5/8	.6250	3-1/2	100-625350	
5/8	.6250	5	100-625500	
5/8	.6250	6	100-625600	
3/4	.7500	4	100-750400	
3/4	.7500	5	100-750500	
3/4	.7500	6	100-750600	
1	1.0000	4	100-100400	
1	1.0000	6	100-100600	

Special sizes available upon request



Carbide Drills – Straight Flute

200 SERIES

140 Degree Point

For use on hardened, treated, and abrasive materials, stainless steel, cryogenic alloys.



PART NUMBER	CUTTING DIAMETER	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
200-0465	56	.0465	1/2	1-1/2	12.54
200-0469	3/64	.0469	1/2	1-1/2	12.54
200-0520	55	.0520	1/2	1-1/2	12.54
200-0550	54	.0550	1/2	1-1/2	12.54
200-0595	53	.0595	1/2	1-1/2	12.54
200-0625	1/16	.0625	5/8	1-5/8	13.46
200-0635	52	.0635	11/16	1-11/16	11.01
200-0670	51	.0670	11/16	1-11/16	11.11
200-0700	50	.0700	11/16	1-11/16	11.22
200-0730	49	.0730	11/16	1-11/16	11.32
200-0760	48	.0760	11/16	1-11/16	11.44
200-0781	5/64	.0781	11/16	1-11/16	11.45
200-0785	47	.0785	3/4	1-3/4	11.64
200-0810	46	.0810	3/4	1-3/4	11.75
200-0820	45	.0820	3/4	1-3/4	11.97
200-0860	44	.0860	3/4	1-3/4	12.18
200-0890	43	.0890	3/4	1-3/4	12.50
200-0935	42	.0935	3/4	1-3/4	12.61
200-0938	3/32	.0938	3/4	1-3/4	12.97
200-0960	41	.0960	13/16	1-13/16	12.93
200-0980	40	.0980	13/16	1-13/16	13.14
200-0995	39	.0995	13/16	1-13/16	13.56
200-1015	38	.1015	13/16	1-13/16	13.67
200-1040	37	.1040	13/16	1-13/16	13.79
200-1065	36	.1065	13/16	1-13/16	14.32
200-1094	7/64	.1094	13/16	1-13/16	14.22
200-1100	35	.1100	7/8	1-7/8	14.53
200-1110	34	.1110	7/8	1-7/8	14.64
200-1130	33	.1130	7/8	1-7/8	14.74
200-1160	32	.1160	7/8	1-7/8	14.85
200-1200	31	.1200	7/8	1-7/8	14.95
200-1250	1/8	.1250	7/8	1-7/8	14.62
200-1285	30	.1285	15/16	1-15/16	15.60
200-1360	29	.1360	15/16	1-15/16	16.65
200-1405	28	.1405	15/16	1-15/16	16.99
200-1406	9/64	.1406	15/16	1-15/16	17.52
200-1440	27	.1440	1	2-1/16	17.62
200-1470	26	.1470	1	2-1/16	17.84
200-1495	25	.1495	1	2-1/16	18.05
200-1520	24	.1520	1	2-1/16	18.48
200-1540	23	.1540	1	2-1/16	18.58
200-1562	5/32	.1562	1	2-1/16	18.45
200-1570	22	.1570	1-1/16	2-1/8	18.91
200-1590	21	.1590	1-1/16	2-1/8	19.66
200-1610	20	.1610	1-1/16	2-1/8	19.76
200-1660	19	.1660	1-1/16	2-1/8	20.62
200-1695	18	.1695	1-1/16	2-1/8	21.15
200-1719	11/64	.1719	1-1/16	2-1/8	21.62
200-1730	17	.1730	1-1/8	2-3/16	22.54
200-1770	16	.1770	1-1/8	2-3/16	23.60
200-1800	15	.1800	1-1/8	2-3/16	23.72
200-1820	14	.1820	1-1/8	2-3/16	24.04
200-1850	13	.1850	1-1/8	2-3/16	24.47
200-1875	3/16	.1875	1-1/8	2-3/16	21.16
200-1890	12	.1890	1-3/16	2-1/4	24.90



Carbide Drills – Straight Flute

200 SERIES

140 Degree Point

For use on hardened, treated, and abrasive materials, stainless steel, cryogenic alloys.



PART NUMBER	CUTTING DIAMETER	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
200-1910	11	.1910	1-3/16	2-1/4	25.00
200-1935	10	.1935	1-3/16	2-1/4	25.21
200-1960	9	.1960	1-3/16	2-1/4	25.64
200-1990	8	.1990	1-3/16	2-1/4	25.96
200-2010	7	.2010	1-3/16	2-1/4	26.27
200-2031	13/64	.2031	1-3/16	2-1/4	26.33
200-2040	6	.2040	1-1/4	2-3/8	26.82
200-2055	5	.2055	1-1/4	2-3/8	27.03
200-2090	4	.2090	1-1/4	2-3/8	27.67
200-2130	3	.2130	1-1/4	2-3/8	28.31
200-2188	7/32	.2188	1-1/4	2-3/8	26.83
200-2210	2	.2210	1-5/16	2-7/16	29.60
200-2280	1	.2280	1-5/16	2-7/16	30.66
200-2340	A	.2340	1-5/16	2-7/16	33.44
200-2344	15/64	.2344	1-5/16	2-7/16	32.62
200-2380	B	.2380	1-3/8	2-1/2	35.04
200-2420	C	.2420	1-3/8	2-1/2	35.26
200-2460	D	.2460	1-3/8	2-1/2	35.47
200-2500	1/4	.2500	1-3/8	2-1/2	31.65
200-2500	E	.2500	1-3/8	2-1/2	31.65
200-2570	F	.2570	1-7/16	2-5/8	39.10
200-2610	G	.2610	1-7/16	2-5/8	41.45
200-2656	17/64	.2656	1-7/16	2-5/8	34.05
200-2660	H	.2660	1-1/2	2-11/16	42.40
200-2720	I	.2720	1-1/2	2-11/16	43.16
200-2770	J	.2770	1-1/2	2-11/16	44.22
200-2810	K	.2810	1-1/2	2-11/16	44.76
200-2812	9/32	.2812	1-1/2	2-11/16	36.30
200-2900	L	.2900	1-9/16	2-3/4	46.68
200-2950	M	.2950	1-9/16	2-3/4	48.07
200-2969	19/64	.2969	1-9/16	2-3/4	40.30
200-3020	N	.3020	1-5/8	2-13/16	51.17
200-3125	5/16	.3125	1-5/8	2-13/16	42.44
200-3160	O	.3160	1-11/16	2-15/16	53.95
200-3230	P	.3230	1-11/16	2-15/16	55.86
200-3281	21/64	.3281	1-11/16	2-15/16	47.15
200-3320	Q	.3320	1-11/16	3	57.90
200-3390	R	.3390	1-11/16	3	60.68
200-3438	11/32	.3438	1-11/16	3	52.10
200-3480	S	.3480	1-3/4	3-1/16	63.98
200-3580	T	.3580	1-3/4	3-1/16	66.12
200-3594	23/64	.3594	1-3/4	3-1/16	56.83
200-3680	U	.3680	1-13/16	3-1/8	70.18
200-3750	3/8	.3750	1-13/16	3-1/8	60.62
200-3770	V	.3770	1-7/8	3-1/4	76.81
200-3860	W	.3860	1-7/8	3-1/4	78.94
200-3906	25/64	.3906	1-7/8	3-1/4	70.13
200-3970	X	.3970	1-15/16	3-5/16	86.84
200-4040	Y	.4040	1-15/16	3-5/16	88.35
200-4062	13/32	.4062	1-15/16	3-5/16	78.80
200-4130	Z	.4130	2	3-3/8	98.16
200-4219	27/64	.4219	2	3-3/8	96.46
200-4375	7/16	.4375	2-1/16	3-7/16	92.40
200-4531	29/64	.4531	2-1/8	3-9/16	116.97
200-4688	15/32	.4688	2-1/8	3-5/8	121.67
200-4844	31/64	.4844	2-3/16	3-11/16	123.81
200-5000	1/2	.5000	2-1/4	3-3/4	114.84



Carbide Drills – Straight Flute Metric

200 SERIES

140 Degree Point

For use on hardened, treated, and abrasive materials, stainless steel, cryogenic alloys.



PART NUMBER	CUTTING DIAMETER	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
200-0591	1.5	.0591	13	38	12.71
200-0787	2.0	.0787	19	44	13.46
200-0984	2.5	.984	21	46	15.91
200-1181	3.0	.1181	22	48	17.95
200-1378	3.5	.1378	24	49	19.97
200-1575	4.0	.1575	27	54	23.72
200-1772	4.5	.1772	29	56	26.82
200-1968	5.0	.1968	30	57	31.41
200-2165	5.5	.2165	32	60	35.67
200-2362	6.0	.2362	33	61	37.71
200-2559	6.5	.2559	35	63	39.53
200-2756	7.0	.2756	38	68	44.34
200-2953	7.5	.2953	40	70	50.00
200-3150	8.0	.3150	41	71	57.15
200-3346	8.5	.3346	43	76	60.35
200-3543	9.0	.3543	44	78	69.87
200-3740	9.5	.3740	46	79	78.62
200-3937	10.0	.3937	48	83	91.86
200-4134	10.5	.4134	51	86	98.71
200-4331	11.0	.4331	52	87	113.88
200-4528	11.5	.4528	54	90	123.70
200-4724	12.0	.4724	54	92	127.98



Carbide Drills – Stub

215 SERIES

135 Degree Split Point

For use on work hardened and gummy materials, high temperature alloy steels, Titanium, Inconel, cast iron and stainless steel.



PART NUMBER	CUTTING DIAMETER	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
215-0465	56	.0465	1/2	1-1/2	10.79
215-0469	3/64	.0469	1/2	1-1/2	11.54
215-0520	55	.0520	1/2	1-1/2	10.79
215-0550	54	.0550	1/2	1-1/2	10.79
215-0595	53	.0595	1/2	1-1/2	10.89
215-0625	1/16	.0625	5/8	1-5/8	10.89
215-0635	52	.0635	11/16	1-11/16	11.15
215-0670	51	.0670	11/16	1-11/16	11.15
215-0700	50	.0700	11/16	1-11/16	11.32
215-0730	49	.0730	11/16	1-11/16	11.39
215-0760	48	.0760	11/16	1-11/16	11.68
215-0781	5/64	.0781	11/16	1-11/16	11.54
215-0785	47	.0785	3/4	1-3/4	11.68
215-0810	46	.0810	3/4	1-3/4	11.68
215-0820	45	.0820	3/4	1-3/4	12.11
215-0860	44	.0860	3/4	1-3/4	12.21
215-0890	43	.0890	3/4	1-3/4	12.38
215-0935	42	.0935	3/4	1-3/4	12.64
215-0938	3/32	.0938	3/4	1-3/4	12.71
215-0960	41	.0960	13/16	1-13/16	12.74
215-0980	40	.0980	13/16	1-13/16	13.43
215-0995	39	.0995	13/16	1-13/16	13.45
215-1015	38	.1015	13/16	1-13/16	13.68
215-1040	37	.1040	13/16	1-13/16	13.68
215-1065	36	.1065	13/16	1-13/16	13.96
215-1094	7/64	.1094	13/16	1-13/16	14.42
215-1100	35	.1100	7/8	1-7/8	14.22
215-1110	34	.1110	7/8	1-7/8	14.62
215-1130	33	.1130	7/8	1-7/8	14.62
215-1160	32	.1160	7/8	1-7/8	14.88
215-1200	31	.1200	7/8	1-7/8	14.88
215-1250	1/8	.1250	7/8	1-7/8	13.70
215-1285	30	.1285	15/16	1-15/16	16.73
215-1360	29	.1360	15/16	1-15/16	16.90
215-1405	28	.1405	15/16	1-15/16	17.19
215-1406	9/64	.1406	15/16	1-15/16	15.28
215-1440	27	.1440	1	2-1/16	17.95
215-1470	26	.1470	1	2-1/16	18.22
215-1495	25	.1495	1	2-1/16	18.48
215-1520	24	.1520	1	2-1/16	19.14
215-1540	23	.1540	1	2-1/16	19.67
215-1562	5/32	.1562	1	2-1/16	15.94
215-1570	22	.1570	1	2-1/16	19.67
215-1590	21	.1590	1-1/16	2-1/8	20.32
215-1610	20	.1610	1-1/16	2-1/8	21.15
215-1660	19	.1660	1-1/16	2-1/8	21.52
215-1695	18	.1695	1-1/16	2-1/8	22.57
215-1719	11/64	.1719	1-1/16	2-1/8	19.93
215-1730	17	.1730	1-1/8	2-3/16	23.10
215-1770	16	.1770	1-1/8	2-3/16	23.36
215-1800	15	.1800	1-1/8	2-3/16	23.55
215-1820	14	.1820	1-1/8	2-3/16	23.63
215-1850	13	.1850	1-1/8	2-3/16	24.06
215-1875	3/16	.1875	1-1/8	2-3/16	20.06
215-1890	12	.1890	1-3/16	2-1/4	23.53
215-1910	11	.1910	1-3/16	2-1/4	24.78
215-1935	10	.1935	1-3/16	2-1/4	24.78



Carbide Drills – Stub

215 SERIES

135 Degree Split Point

For use on work hardened and gummy materials, high temperature alloy steels, Titanium, Inconel, cast iron and stainless steel.



PART NUMBER	CUTTING DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
215-1960	9	.1960	1-3/16	2-1/4	24.78
215-1990	8	.1990	1-3/16	2-1/4	26.16
215-2010	7	.2010	1-3/16	2-1/4	26.83
215-2031	13/64	.2031	1-3/16	2-1/4	23.63
215-2040	6	.2040	1-1/4	2-3/8	28.05
215-2055	5	.2055	1-1/4	2-3/8	28.05
215-2090	4	.2090	1-1/4	2-3/8	28.05
215-2130	3	.2130	1-1/4	2-3/8	29.44
215-2188	7/32	.2188	1-1/4	2-3/8	24.32
215-2210	2	.2210	1-5/16	2-7/16	30.43
215-2280	1	.2280	1-5/16	2-7/16	31.08
215-2340	A	.2340	1-5/16	2-7/16	32.41
215-2344	15/64	.2344	1-5/16	2-7/16	36.29
215-2380	B	.2380	1-3/8	2-1/2	34.60
215-2420	C	.2420	1-3/8	2-1/2	34.25
215-2460	D	.2460	1-3/8	2-1/2	34.25
215-2500	1/4	.2500	1-3/8	2-1/2	28.05
215-2500	E	.2500	1-3/8	2-1/2	32.14
215-2570	F	.2570	1-7/16	2-5/8	40.00
215-2610	G	.2610	1-7/16	2-5/8	41.95
215-2656	17/64	.2656	1-7/16	2-5/8	39.30
215-2660	H	.2660	1-1/2	2-11/16	43.03
215-2720	I	.2720	1-1/2	2-11/16	43.03
215-2770	J	.2770	1-1/2	2-11/16	43.72
215-2810	K	.2810	1-1/2	2-11/16	49.51
215-2812	9/32	.2812	1-1/2	2-11/16	46.00
215-2900	L	.2900	1-9/16	2-3/4	50.19
215-2950	M	.2950	1-9/16	2-3/4	51.28
215-2969	19/64	.2969	1-9/16	2-3/4	42.14
215-3020	N	.3020	1-5/8	2-13/16	52.08
215-3125	5/16	.3125	1-5/8	2-13/16	46.92
215-3160	O	.3160	1-11/16	2-15/16	53.56
215-3230	P	.3230	1-11/16	2-15/16	46.86
215-3281	21/64	.3281	1-11/16	2-15/16	46.89
215-3320	Q	.3320	1-11/16	3	52.60
215-3390	R	.3390	1-11/16	3	57.78
215-3438	11/32	.3438	1-11/16	3	52.09
215-3480	S	.3480	1-3/4	3-1/16	60.82
215-3580	T	.3580	1-3/4	3-1/16	66.96
215-3594	23/64	.3594	1-3/4	3-1/16	61.38
215-3680	U	.3680	1-13/16	3-1/8	69.86
215-3750	3/8	.3750	1-13/16	3-1/8	61.38
215-3770	V	.3770	1-7/8	3-1/4	70.92
215-3860	W	.3860	1-7/8	3-1/4	72.57
215-3906	25/64	.3906	1-7/8	3-1/4	73.06
215-3970	X	.3970	1-15/16	3-5/16	79.04
215-4040	Y	.4040	1-15/16	3-5/16	86.86
215-4062	13/32	.4062	1-15/16	3-5/16	79.33
215-4130	Z	.4130	2	3-3/8	89.27
215-4219	27/64	.4219	2	3-3/8	81.71
215-4375	7/16	.4375	2-1/16	3-7/16	89.43
215-4531	29/64	.4531	2-1/8	3-9/16	109.92
215-4688	15/32	.4688	2-1/8	3-5/8	109.92
215-4844	31/64	.4844	2-3/16	3-11/16	112.80
215-5000	1/2	.5000	2-1/4	3-3/4	112.80



Carbide Drills – Stub / Metric

215 SERIES

135 Degree Split Point

For use on work hardened and gummy materials, high temperature alloy steels, Titanium, Inconel, cast iron and stainless steel.



PART NUMBER	CUTTING DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
215-0394	1.0	.0394	13	38	10.79
215-0433	1.1	.0433	13	38	14.91
215-0472	1.2	.0472	13	38	14.91
215-0512	1.3	.0512	13	38	14.91
215-0551	1.4	.0551	13	38	14.91
215-0591	1.5	.0591	13	38	10.89
215-0630	1.6	.0630	18	43	14.23
215-0669	1.7	.0669	18	43	14.23
215-0709	1.8	.0709	18	43	14.23
215-0748	1.9	.0748	18	43	14.23
215-0787	2.0	.0787	19	45	11.68
215-0827	2.1	.0827	19	45	16.08
215-0866	2.2	.0866	19	45	16.08
215-0906	2.3	.0906	19	45	16.08
215-0945	2.4	.0945	21	46	16.08
215-0984	2.5	.0984	21	46	13.43
215-1024	2.6	.1024	21	46	18.08
215-1063	2.7	.1063	21	46	18.08
215-1102	2.8	.1102	22	48	18.08
215-1142	2.9	.1142	22	48	18.08
215-1181	3.0	.1181	22	48	14.88
215-1220	3.1	.1220	22	48	21.34
215-1260	3.2	.1260	24	52	21.34
215-1299	3.3	.1299	24	52	21.34
215-1339	3.4	.1339	24	52	21.34
215-1378	3.5	.1378	24	52	17.79
215-1417	3.6	.1417	25	52	24.10
215-1457	3.7	.1457	25	52	24.10
215-1496	3.8	.1496	25	52	24.10
215-1535	3.9	.1535	25	52	24.10
215-1575	4.0	.1575	27	53	20.32
215-1614	4.1	.1614	27	53	28.45
215-1654	4.2	.1654	27	53	28.45
215-1693	4.3	.1693	27	53	28.45
215-1732	4.4	.1732	29	55	28.45
215-1772	4.5	.1772	29	55	23.53
215-1811	4.6	.1811	29	55	30.95
215-1850	4.7	.1850	29	55	30.95
215-1890	4.8	.1890	30	57	30.95
215-1929	4.9	.1929	30	57	30.95
215-1968	5.0	.1968	30	57	26.10
215-2008	5.1	.2008	30	57	35.17
215-2047	5.2	.2047	32	60	35.17
215-2087	5.3	.2087	32	60	35.17
215-2126	5.4	.2126	32	60	35.17
215-2165	5.5	.2165	32	60	26.32
215-2205	5.6	.2205	33	61	39.70
215-2244	5.7	.2244	33	61	39.70
215-2283	5.8	.2283	33	61	39.70
215-2323	5.9	.2323	33	61	39.70
215-2362	6.0	.2362	33	61	34.06
215-2402	6.1	.2402	35	63	44.34
215-2441	6.2	.2441	35	63	44.34
215-2480	6.3	.2480	35	63	44.34
215-2520	6.4	.2520	35	63	44.34
215-2559	6.5	.2559	35	63	40.00
215-2598	6.6	.2598	37	67	51.88



Carbide Drills – Stub / Metric

215 SERIES

135 Degree Split Point

For use on work hardened and gummy materials, high temperature alloy steels, Titanium, Inconel, cast iron and stainless steel.



PART NUMBER	CUTTING DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
215-2638	6.7	.2638	37	67	51.88
215-2677	6.8	.2677	38	68	51.88
215-2717	6.9	.2717	38	68	51.88
215-2756	7.0	.2756	38	68	43.72
215-2795	7.1	.2795	38	68	56.93
215-2835	7.2	.2835	40	70	56.93
215-2874	7.3	.2874	40	70	56.93
215-2913	7.4	.2913	40	70	56.93
215-2953	7.5	.2953	40	70	42.14
215-2992	7.6	.2992	41	71	64.44
215-3031	7.7	.3031	41	71	64.44
215-3071	7.8	.3071	41	71	64.44
215-3110	7.9	.3110	41	71	64.44
215-3150	8.0	.3150	41	71	53.66
215-3189	8.1	.3189	43	75	70.65
215-3228	8.2	.3228	43	75	70.65
215-3268	8.3	.3268	43	75	70.65
215-3307	8.4	.3307	43	76	70.65
215-3346	8.5	.3346	43	76	57.78
215-3386	8.6	.3386	43	76	79.16
215-3425	8.7	.3425	43	76	79.16
215-3465	8.8	.3465	44	78	79.16
215-3504	8.9	.3504	44	78	79.16
215-3543	9.0	.3543	44	78	66.96
215-3583	9.1	.3583	44	78	92.05
215-3622	9.2	.3622	46	79	92.05
215-3661	9.3	.3661	46	79	92.05
215-3701	9.4	.3701	46	79	92.05
215-3740	9.5	.3740	46	79	71.38
215-3780	9.6	.3780	48	83	107.45
215-3819	9.7	.3819	48	83	107.45
215-3858	9.8	.3858	48	83	107.45
215-3898	9.9	.3893	48	83	107.45
215-3937	10.0	.3937	48	83	79.04
215-3976	10.1	.3976	49	84	115.52
215-4016	10.2	.4016	49	84	115.52
215-4055	10.3	.4055	49	84	115.52
215-4094	10.4	.4094	51	86	115.52
215-4134	10.5	.4134	51	86	81.70
215-4173	10.6	.4173	51	86	133.26
215-4213	10.7	.4213	51	86	133.26
215-4252	10.8	.4252	52	87	133.26
215-4291	10.9	.4291	52	87	133.26
215-4331	11.0	.4331	52	87	89.53
215-4370	11.1	.4370	52	87	144.80
215-4409	11.2	.4409	54	90	144.80
215-4449	11.3	.4449	54	90	144.80
215-4488	11.4	.4488	54	90	144.80
215-4528	11.5	.4528	54	90	109.92
215-4567	11.6	.4567	54	92	149.81
215-4606	11.7	.4606	54	92	149.81
215-4646	11.8	.4646	54	92	149.81
215-4685	11.9	.4685	54	92	149.81
215-4724	12.0	.4724	54	92	112.79



Carbide Drills – Jobber

220 SERIES

For use on non-ferrous alloys,
cast iron, plastics, aluminum,
and highly abrasive materials.



PART NUMBER	CUTTING DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
220-0465	56	.0465	3/4	1-1/2	11.58
220-0469	3/64	.0469	3/4	1-1/2	11.58
220-0520	55	.0520	3/4	1-1/2	11.32
220-0550	54	.0550	3/4	1-1/2	11.32
220-0595	53	.0595	3/4	1-1/2	11.32
220-0625	1/16	.0625	3/4	1-1/2	9.83
220-0635	52	.0635	3/4	1-1/2	11.32
220-0670	51	.0670	3/4	1-1/2	11.29
220-0700	50	.0700	7/8	1-3/4	11.39
220-0730	49	.0730	7/8	1-3/4	11.58
220-0760	48	.0760	7/8	1-3/4	11.95
220-0781	5/64	.0781	7/8	1-3/4	10.40
220-0785	47	.0785	7/8	1-3/4	11.95
220-0810	46	.0810	7/8	1-3/4	11.95
220-0820	45	.0820	7/8	1-3/4	12.21
220-0860	44	.0860	1	2	12.74
220-0890	43	.0890	1	2	12.74
220-0935	42	.0935	1	2	13.00
220-0938	3/32	.0938	1	2	11.78
220-0960	41	.0960	1	2	13.17
220-0980	40	.0980	1	2	13.43
220-0995	39	.0995	1-1/4	2-1/4	13.70
220-1015	38	.1015	1-1/4	2-1/4	14.22
220-1040	37	.1040	1-1/4	2-1/4	14.22
220-1065	36	.1065	1-1/4	2-1/4	14.22
220-1094	7/64	.1094	1-1/4	2-1/4	12.94
220-1100	35	.1100	1-1/4	2-1/4	14.35
220-1110	34	.1110	1-1/4	2-1/4	14.88
220-1130	33	.1130	1-1/4	2-1/4	14.88
220-1160	32	.1160	1-1/4	2-1/4	15.15
220-1200	31	.1200	1-1/4	2-1/4	15.28
220-1250	1/8	.1250	1-1/4	2-1/4	13.30
220-1285	30	.1285	1-1/4	2-1/4	15.94
220-1360	29	.1360	1-3/8	2-1/2	17.26
220-1405	28	.1405	1-3/8	2-1/2	17.26
220-1406	9/64	.1406	1-3/8	2-1/2	15.94
220-1440	27	.1440	1-3/8	2-1/2	17.26
220-1470	26	.1470	1-3/8	2-1/2	18.48
220-1495	25	.1495	1-3/8	2-1/2	18.48
220-1520	24	.1520	1-3/8	2-1/2	18.48
220-1540	23	.1540	1-3/8	2-1/2	18.88
220-1562	5/32	.1562	1-3/8	2-1/2	16.76
220-1570	22	.1570	1-3/8	2-1/2	19.67
220-1590	21	.1590	1-3/8	2-1/2	20.06
220-1610	20	.1610	1-3/8	2-1/2	20.06
220-1660	19	.1660	1-5/8	2-3/4	20.89
220-1695	18	.1695	1-5/8	2-3/4	20.89
220-1719	11/64	.1719	1-5/8	2-3/4	19.64
220-1730	17	.1730	1-5/8	2-3/4	21.95
220-1770	16	.1770	1-5/8	2-3/4	22.57
220-1800	15	.1800	1-5/8	2-3/4	23.10
220-1820	14	.1820	1-5/8	2-3/4	23.10
220-1850	13	.1850	1-5/8	2-3/4	23.36
220-1875	3/16	.1875	1-5/8	2-3/4	19.64
220-1890	12	.1890	1-5/8	2-3/4	23.92
220-1910	11	.1910	1-5/8	2-3/4	24.32



Carbide Drills – Jobber

220 SERIES

For use on non-ferrous alloys, cast iron, plastics, aluminum, and highly abrasive materials.



PART NUMBER	CUTTING DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
220-1935	10	.1935	1-5/8	2-3/4	24.72
220-1960	9	.1960	1-3/4	3	26.30
220-1990	8	.1990	1-3/4	3	26.30
220-2010	7	.2010	1-3/4	3	26.30
220-2031	13/64	.2031	1-3/4	3	23.93
220-2040	6	.2040	1-3/4	3	27.26
220-2055	5	.2055	1-3/4	3	27.62
220-2090	4	.2090	1-3/4	3	27.62
220-2130	3	.2130	1-3/4	3	28.94
220-2188	7/32	.2188	1-3/4	3	24.39
220-2210	2	.2210	1-3/4	3	30.16
220-2280	1	.2280	1-3/4	3	33.73
220-2340	A	.2340	2	3-1/4	36.66
220-2344	15/64	.2344	2	3-1/4	29.11
220-2380	B	.2380	2	3-1/4	37.72
220-2420	C	.2420	2	3-1/4	37.95
220-2460	D	.2460	2	3-1/4	38.95
220-2500	1/4	.2500	2	3-1/4	28.78
220-2500	E	.2500	2	3-1/4	28.78
220-2570	F	.2570	2	3-1/4	41.18
220-2610	G	.2610	2-1/8	3-1/2	42.67
220-2656	17/64	.2656	2-1/8	3-1/2	30.95
220-2660	H	.2660	2-1/8	3-1/2	42.97
220-2720	I	.2720	2-1/8	3-1/2	43.69
220-2770	J	.2770	2-1/8	3-1/2	44.88
220-2810	K	.2810	2-1/8	3-1/2	45.44
220-2812	9/32	.2812	2-1/8	3-1/2	33.66
220-2900	L	.2900	2-1/8	3-1/2	47.29
220-2950	M	.2950	2-3/8	3-3/4	49.04
220-2969	19/64	.2969	2-3/8	3-3/4	36.64
220-3020	N	.3020	2-3/8	3-3/4	51.94
220-3125	5/16	.3125	2-3/8	3-3/4	38.58
220-3160	O	.3160	2-3/8	3-3/4	54.98
220-3230	P	.3230	2-3/8	3-3/4	56.86
220-3281	21/64	.3281	2-1/2	4	42.87
220-3320	Q	.3320	2-1/2	4	46.55
220-3390	R	.3390	2-1/2	4	62.30
220-3438	11/32	.3438	2-1/2	4	47.35
220-3480	S	.3480	2-1/2	4	66.43
220-3580	T	.3580	2-3/4	4-1/4	68.80
220-3594	23/64	.3594	2-3/4	4-1/4	51.55
220-3680	U	.3680	2-3/4	4-1/4	73.27
220-3750	3/8	.3750	2-3/4	4-1/4	55.11
220-3770	V	.3770	2-3/4	4-1/4	78.11
220-3860	W	.3860	2-7/8	4-1/2	82.07
220-3906	25/64	.3906	2-7/8	4-1/2	63.76
220-3970	X	.3970	2-7/8	4-1/2	89.53
220-4040	Y	.4040	2-7/8	4-1/2	92.63
220-4062	13/32	.4062	2-7/8	4-1/2	70.92
220-4130	Z	.4130	2-7/8	4-1/2	114.90
220-4219	27/64	.4219	2-7/8	4-1/2	77.52
220-4375	7/16	.4375	2-7/8	4-1/2	84.60
220-4531	29/64	.4531	3	4-3/4	91.15
220-4688	15/32	.4688	3	4-3/4	91.15
220-4844	31/64	.4844	3	4-3/4	98.08
220-5000	1/2	.5000	3	4-3/4	101.08
220-5625	9/16	.5625	3-1/4	5	104.41
220-6250	5/8	.6250	4-1/4	6	192.16
220-7500	3/4	.7500	4-1/4	6	225.25



Carbide Drills – Jobber / Metric

220 SERIES

For use on non-ferrous alloys, cast iron, plastics, aluminum, and highly abrasive materials.



PART NUMBER	CUTTING DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
220-0591	1.5	.0591	19	38	12.11
220-0787	2.0	.0787	22	44	11.32
220-0984	2.5	.0984	25	51	11.95
220-1181	3.0	.1181	32	57	13.70
220-1378	3.5	.1378	35	64	15.28
220-1575	4.0	.1575	35	64	17.26
220-1772	4.5	.1772	41	70	20.06
220-1968	5.0	.1968	44	76	23.10
220-2165	5.5	.2165	44	76	26.30
220-2362	6.0	.2362	51	83	24.40
220-2559	6.5	.2559	51	83	29.08
220-2756	7.0	.2756	54	89	31.69
220-2953	7.5	.2953	60	92	25.86
220-3150	8.0	.3150	60	92	38.81
220-3346	8.5	.3346	64	102	44.00
220-3543	9.0	.3543	64	102	48.58
220-3740	9.5	.3740	70	108	38.81
220-3937	10.0	.3937	73	114	63.21
220-4134	10.5	.4134	73	114	77.51
220-4331	11.0	.4331	73	114	83.98
220-4528	11.5	.4528	76	121	91.45
220-4724	12.0	.4724	76	121	101.10

Carbide Drills – Spade



222 SERIES

SPADE DRILLS

PART NUMBER	CUTTING DIAMETER	DECIMAL EQUIV.	OVERALL LENGTH	LIST PRICE
222-1250	1/8	.1250	1-1/2	8.25
222-1562	5/32	.1562	2	11.55
222-1875	3/16	.1875	2	11.55
222-2188	7/32	.2188	2	18.15
222-2500	1/4	.2500	2	16.50
222-2812	9/32	.2812	2	24.75
222-3125	5/16	.3125	2-1/2	23.10
222-3438	11/32	.3438	2-1/2	33.06
222-3750	3/8	.3750	2-1/2	29.70
222-4062	13/32	.4062	2-1/2	42.90
222-4375	7/16	.4375	2-1/2	39.60
222-4688	15/32	.4688	2-1/2	56.10
222-5000	1/2	.5000	3	52.80



Carbide Drills – Combination

235 SERIES

COMBINATION DRILL and COUNTERSINK



PART NUMBER	DRILL DIA.	TOOL NO.	SHANK DIA.	OVERALL LENGTH	LIST PRICE
235-0000	1/32	0	1/8	1-1/2	14.85
235-0010	3/64	1	1/8	1-1/2	14.03
235-0020	5/64	2	3/16	2	14.85
235-0030	7/64	3	1/4	2	16.50
235-0040	1/8	4	5/16	2-1/2	26.40
235-0050	3/16	5	7/16	2-3/4	46.20
235-0060	7/32	6	1/2	3	59.40
235-0070	1/4	7	5/8	3-1/2	125.40
235-0080	5/16	8	3/4	4	178.20
235-0010 X4	3/64	1	1/8	4	24.75
235-0020 X4	5/64	2	3/16	4	41.25
235-0030 X4	7/64	3	1/4	4	47.95
235-0030 X6	7/64	3	1/4	6	61.05
235-0040 X4	1/8	4	5/16	4	57.75
235-0040 X6	1/8	4	5/16	6	74.25
235-0050 X4	3/16	5	7/16	4	88.50
235-0050 X6	3/16	5	7/16	6	105.60
235-0060 X4	7/32	6	1/2	4	85.80
235-0060 X6	7/32	6	1/2	6	128.70

Carbide Spotting Drills

237 SERIES

SPOTTING DRILLS



PART NUMBER	CUTTING DIA.	ANGLE	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
237-2506	1/4	60	1	2-1/2	24.75
237-2509	1/4	90	1	2-1/2	24.75
237-2512	1/4	120	1	2-1/2	24.75
237-2506 X4	1/4	60	1-3/8	4	39.60
237-2509 X4	1/4	90	1-3/8	4	39.60
237-2512 X4	1/4	120	1-3/8	4	39.60
237-3756	3/8	60	1	2-1/2	37.95
237-3759	3/8	90	1	2-1/2	37.95
237-37512	3/8	120	1	2-1/2	37.95
237-3756 X6	3/8	60	1-1/2	6	64.35
237-3759 X6	3/8	90	1-1/2	6	64.35
237-3712 X6	3/8	120	1-1/2	6	64.35
237-5006	1/2	60	1-1/4	3	70.95
237-5009	1/2	90	1-1/4	3	70.95
237-5012	1/2	120	1-1/4	3	70.95
237-5006 X6	1/2	60	1-1/2	6	110.55
237-5009 X6	1/2	90	1-1/2	6	110.55
237-5012 X6	1/2	120	1-1/2	6	110.55
237-6256	5/8	60	1-1/4	3-1/2	100.65
237-6259	5/8	90	1-1/4	3-1/2	100.65
237-6212	5/8	120	1-1/4	3-1/2	100.65
237-6256 X6	5/8	60	2	6	145.20
237-6259 X6	5/8	90	2	6	145.20
237-6212 X6	5/8	120	2	6	145.20
237-7506	3/4	60	1-1/2	4	138.60
237-7509	3/4	90	1-1/2	4	138.60
237-7512	3/4	120	1-1/2	4	138.60
237-7506 X6	3/4	60	2	6	198.00
237-7509 X6	3/4	90	2	6	198.00
237-7512 X6	3/4	120	2	6	198.00



Carbide Straight Flute Reamers

300 SERIES

Straight Flute Reamers



PART NUMBER	REAMER DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
300-0465	56	.0465	3/8	1-1/2	21.35
300-0469	3/64	.0469	3/8	1-1/2	21.35
300-0520	55	.0520	3/8	1-1/2	21.35
300-0550	54	.0550	3/8	1-1/2	21.35
300-0595	53	.0595	3/8	1-1/2	21.35
300-0625	1/16	.0625	3/8	1-1/2	21.35
300-0635	52	.0635	3/8	1-1/2	21.35
300-0670	51	.0670	1/2	1-3/4	21.35
300-0700	50	.0700	1/2	1-3/4	21.35
300-0730	49	.0730	1/2	1-3/4	21.35
300-0760	48	.0760	1/2	1-3/4	21.35
300-0781	5/64	.0781	1/2	1-3/4	21.35
300-0785	47	.0785	1/2	1-3/4	21.35
300-0810	46	.0810	1/2	2	21.35
300-0820	45	.0820	1/2	2	21.35
300-0860	44	.0860	1/2	2	21.35
300-0890	43	.0890	1/2	2	21.35
300-0935	42	.0935	1/2	2	21.35
300-0938	3/32	.0938	1/2	2	21.35
300-0960	41	.0960	5/8	2-1/4	21.35
300-0980	40	.0980	5/8	2-1/4	21.35
300-0995	39	.0995	5/8	2-1/4	21.35
300-1015	38	.1015	5/8	2-1/4	21.35
300-1040	37	.1040	5/8	2-1/4	21.35
300-1065	36	.1065	5/8	2-1/4	21.35
300-1094	7/64	.1094	5/8	2-1/4	21.35
300-1100	35	.1100	5/8	2-1/4	21.35
300-1110	34	.1110	5/8	2-1/4	21.35
300-1130	33	.1130	5/8	2-1/4	21.35
300-1160	32	.1160	5/8	2-1/4	21.58
300-1200	31	.1200	5/8	2-1/4	21.58
300-1250	1/8	.1250	5/8	2-1/4	21.58
300-1285	30	.1285	5/8	2-1/4	23.86
300-1360	29	.1360	3/4	2-1/2	25.58
300-1405	28	.1405	3/4	2-1/2	25.58
300-1406	9/64	.1406	3/4	2-1/2	28.51
300-1440	27	.1440	3/4	2-1/2	25.58
300-1470	26	.1470	3/4	2-1/2	26.64
300-1495	25	.1495	3/4	2-1/2	26.64
300-1520	24	.1520	3/4	2-1/2	26.64
300-1540	23	.1540	3/4	2-1/2	26.64
300-1562	5/32	.1562	3/4	2-1/2	25.41
300-1570	22	.1570	3/4	2-1/2	26.63
300-1590	21	.1590	3/4	2-1/2	26.63
300-1610	20	.1610	7/8	2-3/4	29.96
300-1660	19	.1660	7/8	2-3/4	29.96
300-1695	18	.1695	7/8	2-3/4	29.96
300-1719	11/64	.1719	7/8	2-3/4	28.88
300-1730	17	.1730	7/8	2-3/4	29.96
300-1770	16	.1770	7/8	2-3/4	29.96
300-1800	15	.1800	7/8	2-3/4	29.96
300-1820	14	.1820	7/8	2-3/4	29.96
300-1850	13	.1850	7/8	2-3/4	29.96



Carbide Straight Flute Reamers

300 SERIES

Straight Flute Reamers



PART NUMBER	REAMER DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
300-1875	3/16	.1875	7/8	2-3/4	28.97
300-1890	12	.1890	7/8	2-3/4	29.96
300-1910	11	.1910	7/8	2-3/4	36.47
300-1935	10	.1935	7/8	2-3/4	36.47
300-1960	9	.1960	1	3	36.47
300-1990	8	.1990	1	3	36.47
300-2010	7	.2010	1	3	36.47
300-2031	13/64	.2031	1	3	35.41
300-2040	6	.2040	1	3	36.47
300-2055	5	.2055	1	3	36.47
300-2090	4	.2090	1	3	36.47
300-2130	3	.2130	1	3	36.47
300-2188	7/32	.2188	1	3	35.61
300-2210	2	.2210	1	3	36.47
300-2280	1	.2280	1	3	39.97
300-2340	A	.2340	1	3	42.80
300-2344	15/64	.2344	1	3	38.45
300-2380	B	.2380	1	3	42.67
300-2420	C	.2420	1	3	42.40
300-2460	D	.2460	1	3	42.08
300-2500	1/4	.2500	1	3	38.64
300-2500	E	.2500	1	3	38.47
300-2570	F	.2570	1-1/8	3-1/4	51.78
300-2610	G	.2610	1-1/8	3-1/4	51.65
300-2656	17/64	.2656	1-1/8	3-1/4	46.63
300-2660	H	.2660	1-1/8	3-1/4	51.58
300-2720	I	.2720	1-1/8	3-1/4	51.51
300-2770	J	.2770	1-1/8	3-1/4	51.41
300-2810	K	.2810	1-1/8	3-1/4	51.32
300-2812	9/32	.2812	1-1/8	3-1/4	46.76
300-2900	L	.2900	1-1/8	3-1/4	50.82
300-2950	M	.2950	1-1/8	3-1/4	50.87
300-2969	19/64	.2969	1-1/8	3-1/4	51.78
300-3020	N	.3020	1-1/8	3-1/4	50.92
300-3125	5/16	.3125	1-1/8	3-1/4	51.98
300-3160	O	.3160	1-1/8	3-1/4	57.59
300-3230	P	.3230	1-1/4	3-1/2	57.70
300-3281	21/64	.3281	1-1/4	3-1/2	57.86
300-3320	Q	.3320	1-1/4	3-1/2	57.92
300-3390	R	.3390	1-1/4	3-1/2	58.28
300-3438	11/32	.3438	1-1/4	3-1/2	58.44
300-3480	S	.3480	1-1/4	3-1/2	58.00
300-3580	T	.3580	1-1/4	3-1/2	63.03
300-3594	23/64	.3594	1-1/4	3-1/2	62.30
300-3680	U	.3680	1-1/4	3-1/2	63.10
300-3750	3/8	.3750	1-1/4	3-1/2	62.34
300-3770	V	.3770	1-1/4	3-1/2	79.33
300-3860	W	.3860	1-1/4	3-1/2	79.40
300-3906	25/64	.3906	1-1/4	3-1/2	68.68
300-3970	X	.3970	1-1/4	3-1/2	91.74
300-4040	Y	.4040	1-1/4	3-1/2	94.05
300-4062	13/32	.4062	1-1/4	3-1/2	71.41
300-4130	Z	.4130	1-1/4	3-1/2	80.19
300-4219	27/64	.4219	1-3/8	4	73.85
300-4375	7/16	.4375	1-3/8	4	80.95
300-4531	29/64	.4531	1-3/8	4	89.27
300-4688	15/32	.4688	1-3/8	4	89.46
300-4844	31/64	.4844	1-1/2	4	96.29
300-5000	1/2	.5000	1-1/2	4	101.00



Straight Flute Reamers / Metric

300 SERIES

Straight Flute Reamers



PART NUMBER	REAMER DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
300-0315	.08	.0315	10	38	37.53
300-0354	0.9	.0354	10	38	37.53
300-0394	1.0	.0394	10	38	33.86
300-0433	1.1	.0433	10	38	37.53
300-0472	1.2	.0472	10	38	37.53
300-0512	1.3	.0512	10	38	37.53
300-0551	1.4	.0551	10	38	37.53
300-0591	1.5	.0591	10	38	37.53
300-0630	1.6	.0630	10	38	39.46
300-0669	1.7	.0669	12	44	39.46
300-0709	1.8	.0709	12	44	39.46
300-0748	1.9	.0748	12	44	39.46
300-0787	2.0	.0787	12	44	36.14
300-0827	2.1	.0827	12	50	40.15
300-0866	2.2	.0866	12	50	40.15
300-0906	2.3	.0906	12	50	40.15
300-0945	2.4	.0945	12	50	40.66
300-0984	2.5	.0984	16	57	40.66
300-1024	2.6	.1024	16	57	40.66
300-1063	2.7	.1063	16	57	40.66
300-1102	2.8	.1102	16	57	40.66
300-1142	2.9	.1142	16	57	41.53
300-1181	3.0	.1181	16	57	37.36
300-1220	3.1	.1220	16	57	41.53
300-1260	3.2	.1260	16	57	41.53
300-1299	3.3	.1299	19	64	44.00
300-1339	3.4	.1339	19	64	44.00
300-1378	3.5	.1378	19	64	44.00
300-1417	3.6	.1417	19	64	44.00
300-1457	3.7	.1457	19	64	44.00
300-1496	3.8	.1496	19	64	44.00
300-1535	3.9	.1535	19	64	44.00
300-1575	4.0	.1575	19	64	39.63
300-1614	4.1	.1614	22	70	48.18
300-1654	4.2	.1654	22	70	48.18
300-1693	4.3	.1693	22	70	48.18
300-1732	4.4	.1732	22	70	48.18
300-1772	4.5	.1772	22	70	51.85
300-1811	4.6	.1811	22	70	51.85
300-1850	4.7	.1850	22	70	51.85
300-1890	4.8	.1890	22	70	51.85
300-1929	4.9	.1929	22	70	51.85
300-1969	5.0	.1969	25	76	52.00
300-2008	5.1	.2008	25	76	57.79
300-2047	5.2	.2047	25	76	57.79
300-2087	5.3	.2087	25	76	57.79
300-2126	5.4	.2126	25	76	57.79
300-2165	5.5	.2165	25	76	57.79
300-2205	5.6	.2205	25	76	60.23
300-2244	5.7	.2244	25	76	60.23
300-2283	5.8	.2283	25	76	60.23
300-2323	5.9	.2323	25	76	60.23
300-2362	6.0	.2362	25	76	58.11
300-2402	6.1	.2402	25	76	64.59



Straight Flute Reamers / Metric

300 SERIES

Straight Flute Reamers



PART NUMBER	REAMER DIAMETER	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
300-2441	6.2	.2441	25	76	64.59
300-2480	6.3	.2480	25	76	64.59
300-2520	6.4	.2520	29	83	69.13
300-2559	6.5	.2559	29	83	69.13
300-2598	6.6	.2598	29	83	69.13
300-2638	6.7	.2638	29	83	69.13
300-2677	6.8	.2677	29	83	69.13
300-2717	6.9	.2717	29	83	69.13
300-2756	7.0	.2756	29	83	62.15
300-2795	7.1	.2795	29	83	69.13
300-2835	7.2	.2835	29	83	71.93
300-2874	7.3	.2874	29	83	71.93
300-2913	7.4	.2913	29	83	71.93
300-2953	7.5	.2953	29	83	71.93
300-2992	7.6	.2992	29	83	71.93
300-3031	7.7	.3031	29	83	73.13
300-3071	7.8	.3071	29	83	73.13
300-3110	7.9	.3110	29	83	73.13
300-3150	8.0	.3150	29	83	72.26
300-3189	8.1	.3189	32	89	89.38
300-3228	8.2	.3228	32	89	89.38
300-3268	8.3	.3268	32	89	89.38
300-3307	8.4	.3307	32	89	89.38
300-3346	8.5	.3346	32	89	89.38
300-3386	8.6	.3386	32	89	89.38
300-3425	8.7	.3425	32	89	89.38
300-3465	8.8	.3465	32	89	96.19
300-3504	8.9	.3504	32	89	96.19
300-3543	9.0	.3543	32	89	86.59
300-3583	9.1	.3583	32	89	86.59
300-3622	9.2	.3622	32	89	100.55
300-3661	9.3	.3661	32	89	100.55
300-3701	9.4	.3701	32	89	100.55
300-3740	9.5	.3740	32	89	100.55
300-3780	9.6	.3780	32	89	100.55
300-3819	9.7	.3819	32	89	100.55
300-3858	9.8	.3858	32	89	100.55
300-3898	9.9	.3898	32	89	112.59
300-3937	10.0	.3937	32	89	101.43
300-3976	10.1	.3976	32	89	122.19
300-4016	10.2	.4016	32	89	122.19
300-4055	10.3	.4055	32	89	122.19
300-4094	10.4	.4094	32	89	122.19
300-4134	10.5	.4134	32	89	122.19
300-4173	10.6	.4173	35	95	137.02
300-4213	10.7	.4213	35	95	137.02
300-4252	10.8	.4252	35	95	137.02
300-4291	10.9	.4291	35	95	137.02
300-4331	11.0	.4331	35	95	123.43
300-4370	11.1	.4370	35	95	137.02



Straight Flute Reamers / Metric

300 SERIES

Straight Flute Reamers



PART NUMBER	REAMER DIA.	DECIMAL EQUIV.	FLUTE LENGTH	OVERALL LENGTH	LIST PRICE
300-4409	11.2	.4409	35	95	162.34
300-4449	11.3	.4449	35	95	162.34
300-4488	11.4	.4488	35	95	162.34
300-4528	11.5	.4528	35	95	162.34
300-4567	11.6	.4567	35	95	162.34
300-4606	11.7	.4606	35	95	162.34
300-4646	11.8	.4646	35	95	162.34
300-4685	11.9	.4685	35	95	162.34
300-4724	12.0	.4724	38	102	164.45
300-4764	12.1	.4764	38	102	182.59
300-4803	12.2	.4803	38	102	182.59
300-4843	12.3	.4843	38	102	182.59
300-4882	12.4	.4882	38	102	182.59
300-4921	12.5	.4921	38	102	182.59
300-4961	12.6	.4961	38	102	182.59
300-5000	12.7	.5000	38	102	182.59
300-5039	12.8	.5039	38	102	208.78
300-5079	12.9	.5079	38	102	208.78
300-5118	13.0	.5118	38	102	188.04



Recommended Speed & Feeds For 350 Aluminum Series

High Performance Zirconium Coated Aluminum End Mills

Type of Cut	Aluminum Alloys 6061-T6, 7075-T6, 440, 356, 380, C61300	Depth of Cut	SFM	End Mill Diameter Chip Load Per Tooth					
		vs. Dia of tool	Speed	1/4"	3/8"	1/2"	5/8"	3/4"	1"
Shallow Slotting	<32 HRC	<50% of Dia.	1200+	0.0045	0.0071	0.0100	0.0123	0.0149	0.0200
	> 32 HRC		600+	0.0036	0.0057	0.0080	0.0098	0.0119	0.0160
Deep Slotting	<32 HRC	75-100 % of Dia.	1200+	0.0036	0.0057	0.0080	0.0098	0.0119	0.0160
	> 32 HRC		600+	0.0027	0.0043	0.0060	0.0074	0.0089	0.0120
Medium Radial 1.0 X Dia Depth	<32 HRC	30% x Dia. Radial	1200+	0.0045	0.0071	0.0100	0.0123	0.0149	0.0200
	> 32 HRC		600+	0.0036	0.0057	0.0080	0.0098	0.0119	0.0160
Heavy Radial 1.0 X Dia Depth	<32 HRC	50% x Dia. Radial	1200+	0.0036	0.0057	0.008	0.0098	0.01188	0.016
	> 32 HRC		1200+	0.0036	0.0057	0.008	0.0098	0.01188	0.016
Medium Radial 2.0 X Dia Depth	<32 HRC	30% x Dia. Radial	1200+	0.0045	0.0071	0.0100	0.0123	0.0149	0.0200
	> 32 HRC		600+	0.0036	0.0057	0.0080	0.0098	0.0119	0.0160
Heavy Radial 2.0 X Dia Depth	<32 HRC	50% x Dia. Radial	1200+	0.0036	0.0057	0.008	0.0098	0.01188	0.016
Finishing Medium Radial	<32 HRC	<25% x Dia.	1200+	0.0045	0.0071	0.0100	0.0123	0.0149	0.0200
	> 32 HRC		600+	0.0036	0.0057	0.0080	0.0098	0.0119	0.0160
Finishing Light Radial	<32 HRC	<10% x Dia.	1200+	0.0045	0.00713	0.01	0.01225	0.01485	0.02
Finishing	<32 HRC	<.010 Radial Depth	1200+	0.0054	0.0086	0.0120	0.0147	0.0178	0.0240
	> 32 HRC		600+	0.0045	0.0071	0.0100	0.0123	0.0149	0.0200

Formulas: RPM= (SFM x 3.82)/tool diameter IPM= number of flutes x RPM x chip load per tooth

This chart is a starting point based on a coated tool. Reduce rates up to 50% using an uncoated tool.

Important Disclaimer: The speed and feed rates are suggested as a general guideline. Machine type, horsepower, spindle speed limitations, toolholding & workholding devices all may impact a cutting tool's ability to perform properly. As a result we are not responsible for tool failure, part damage or injury that may be caused as a result.



Aluminum End Mills

Two Flute Single End

Center Cutting
Solid Micro-Grain Carbide



- New Aluminum Design Geometries to increase chip loads by as much as 100%
- The Aluminum Geometries are engineered to improve chip flow from the cutting zone, to allow heavy chip loads at low or high spindle speeds.
- Tapered cores on the long length of flute, to produce less deflection in the cutting zone.
- Special Ground on Edge Prep to insure process vibration damping in the corners.

DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	LIST PRICE	ZIRCONIUM PART NUMBER	LIST PRICE
1/8	1/8	1/4	1-1/2	250-12504	19.20	250-12504-C5	23.97
1/8	1/8	5/16	1-1/2	250-12505	20.25	250-12505-C5	25.02
1/8	1/8	3/8	1-1/2	250-12506	21.20	250-12506-C5	25.92
1/8	1/8	1/2	2	250-12508	24.65	250-12508-C5	30.48
1/8	1/8	5/8	2	250-12510	39.63	250-12510-C5	45.45
1/8	1/8	3/4	2	250-12512	44.02	250-12512-C5	49.85
1/8	1/8	1	2-1/2	250-12516	61.64	250-12516-C5	69.20
5/32	3/16	5/16	2	250-15605	25.95	250-15605-C5	31.96
5/32	3/16	9/16	2	250-15609	28.85	250-15609-C5	34.82
3/16	3/16	5/16	2	250-18705	26.43	250-18705-C5	32.44
3/16	3/16	3/8	2	250-18706	29.58	250-18706-C5	35.55
3/16	3/16	5/8	2-1/2	250-18710	31.68	250-18710-C5	40.98
3/16	3/16	3/4	2-1/2	250-18712	48.00	250-18712-C5	57.25
3/16	3/16	1	2-1/2	250-18716	49.30	250-18716-C5	58.58
7/32	1/4	3/8	2-1/2	250-21806	39.25	250-21806-C5	52.26
7/32	1/4	3/4	2-1/2	250-21812	43.59	250-21812-C5	56.16
1/4	1/4	3/8	2-1/2	250-25006	35.67	250-25006-C5	48.25
1/4	1/4	1/2	2-1/2	250-25008	37.43	250-25008-C5	49.98
1/4	1/4	5/8	2-1/2	250-25010	39.17	250-25010-C5	51.75
1/4	1/4	3/4	2-1/2	250-25012	39.62	250-25012-C5	52.19
1/4	1/4	1	2-1/2	250-25016	48.42	250-25016-C5	61.00
1/4	1/4	1-1/8	2-1/2	250-25018	56.34	250-25018-C5	68.91
1/4	1/4	1-1/4	3	250-25020	61.75	250-25020-C5	74.33
1/4	1/4	1-1/2	3	250-25024	81.77	250-25024-C5	82.13
1/4	1/4	2	4	250-25032	84.53	250-25032-C5	99.20
9/32	5/16	7/16	2-1/2	250-28107	42.40	250-28107-C5	60.98
9/32	5/16	13/16	2-1/2	250-28113	47.10	250-28113-C5	65.67
5/16	5/16	7/16	2-1/2	250-31207	38.55	250-31207-C5	57.12
5/16	5/16	1/2	2-1/2	250-31208	41.39	250-31208-C5	59.93
5/16	5/16	13/16	2-1/2	250-31213	42.83	250-31213-C5	61.40
5/16	5/16	1-1/8	2-1/2	250-31218	69.98	250-31218-C5	88.55
5/16	5/16	1-1/4	3-1/2	250-31220	81.66	250-31220-C5	105.33
5/16	5/16	1-1/2	3-1/2	250-31224	83.66	250-31224-C5	107.28
5/16	5/16	2-1/8	4	250-31234	93.88	250-31234-C5	117.54
11/32	3/8	1/2	2-1/2	250-34308	49.47	250-34308-C5	68.03
11/32	3/8	1	2-1/2	250-34316	54.98	250-34316-C5	73.53
3/8	3/8	1/2	2-1/2	250-37508	45.00	250-37508-C5	63.55
3/8	3/8	5/8	2-1/2	250-37510	46.22	250-37510-C5	64.77
3/8	3/8	3/4	2-1/2	250-37512	48.42	250-37512-C5	67.00
3/8	3/8	1	2-1/2	250-37516	49.74	250-37516-C5	68.31
3/8	3/8	1-1/4	3	250-37520	66.02	250-37520-C5	84.60



Aluminum End Mills



Aluminum End Mills

DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	LIST PRICE	ZIRCONIUM PART NUMBER	LIST PRICE
3/8	3/8	1-1/2	4	250-37524	94.88	250-37524-C5	118.53
3/8	3/8	2	4	250-37532	101.24	250-37532-C5	124.90
3/8	3/8	2-1/2	6	250-37540	125.99	250-37540-C5	168.58
13/32	7/16	9/16	2-3/4	250-40609	70.53	250-40609-C5	95.37
13/32	7/16	1	2-3/4	250-40616	78.30	250-40616-C5	103.20
7/16	7/16	9/16	2-3/4	250-43709	71.32	250-43709-C5	96.17
7/16	7/16	1	2-3/4	250-43716	71.24	250-43716-C5	96.08
7/16	7/16	2	4	250-43732	110.20	250-43732-C5	139.93
15/32	1/2	5/8	3	250-46810	79.71	250-46810-C5	104.57
15/32	1/2	1-1/4	3	250-46820	88.58	250-46820-C5	125.49
1/2	1/2	5/8	3	250-50010	72.53	250-50010-C5	94.44
1/2	1/2	3/4	3	250-50012	74.83	250-50012-C5	96.65
1/2	1/2	1	3	250-50016	77.48	250-50016-C5	99.38
1/2	1/2	1-1/4	3	250-50020	80.55	250-50020-C5	102.46
1/2	1/2	1-1/2	4	250-50024	109.18	250-50024-C5	135.33
1/2	1/2	2	4	250-50032	126.97	250-50032-C5	153.09
1/2	1/2	2-1/4	6	250-50036	193.68	250-50036-C5	224.87
1/2	1/2	2-1/2	6	250-50040	202.50	250-50040-C5	233.66
1/2	1/2	3-1/4	6	250-50048	212.82	250-50048-C5	243.98
1/2	1/2	4	8	250-50064	362.70	250-50064-C5	415.82
5/8	5/8	3/4	3-1/2	250-62512	138.65	250-62512-C5	167.70
5/8	5/8	1-1/4	3-1/2	250-62520	145.26	250-62520-C5	174.30
5/8	5/8	1-5/8	5	250-62526	173.83	250-62526-C5	209.82
5/8	5/8	2	5	250-62532	226.50	250-62532-C5	262.95
5/8	5/8	2-1/2	5	250-62540	233.35	250-62540-C5	269.80
5/8	5/8	3-3/4	5	250-62544	259.70	250-62544-C5	296.15
5/8	5/8	3-1/4	6	250-62552	337.55	250-62552-C5	380.85
5/8	5/8	4	8	250-62564	474.80	250-62564-C5	545.50
3/4	3/4	1	4	250-75016	194.57	250-75016-C5	230.63
3/4	3/4	1-1/2	4	250-75024	202.50	250-75024-C5	238.60
3/4	3/4	1-5/8	4	250-75026	216.20	250-75026-C5	252.28
3/4	3/4	2	5	250-75032	286.11	250-75032-C5	328.36
3/4	3/4	2-1/4	5	250-75036	299.32	250-75036-C5	341.58
3/4	3/4	2-1/2	5	250-75040	312.52	250-75040-C5	354.81
3/4	3/4	3	6	250-75048	333.00	250-75048-C5	382.97
3/4	3/4	3-1/4	6	250-75052	369.76	250-75052-C5	419.67
3/4	3/4	3-1/2	6	250-75056	453.38	250-75056-C5	503.30
3/4	3/4	4	7	250-75064	501.32	250-75064-C5	560.10
3/4	3/4	5	8	250-75080	633.87	250-75080-C5	704.32
1	1	1-1/4	5	250-10020	350.10	250-10020-C5	427.86
1	1	1-1/2	5	250-10024	369.77	250-10024-C5	427.86
1	1	2	5	250-10032	386.75	250-10032-C5	448.85
1	1	2-1/2	5	250-10040	447.20	250-10040-C5	498.27
1	1	3	6	250-10048	460.54	250-10048-C5	530.40
1	1	3-1/2	6	250-10056	598.64	250-10056-C5	663.62
1	1	4-1/8	7	250-10064	697.97	250-10064-C5	776.32
1	1	5-1/2	8	250-10088	985.98	250-10088-C5	1066.82
1-1/4	1-1/4	1-1/4	4-1/2	250-1-2520	686.67	250-1-2520-C5	758.52
1-1/4	1-1/4	2	4-1/2	250-1-2532	739.50	250-1-2532-C5	811.34
1-1/4	1-1/4	3-1/4	6	250-1-2550	1056.42	250-1-2550-C5	1137.52
1-1/4	1-1/4	5	7-1/2	250-1-2580	1188.28	250-1-2580-C5	1293.89



Aluminum End Mills

Three Flute Single End

Center Cutting

Solid Micro-Grain Carbide



- New Aluminum Design Geometries to increase chip loads by as much as 100%
- The Aluminum Geometries are engineered to improve chip flow from the cutting zone, to allow heavy chip loads at low or high spindle speeds.
- Tapered cores on the long length of flute, to produce less deflection in the cutting zone.
- Special Ground on Edge Prep to insure process vibration damping in the corners.

DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART	UNCOATED LIST	ZIRCONIUM PART	ZIRCONIUM LIST
1/8	1/8	1/4	1-1/2	350-12504	19.20	350-12504-C5	23.97
1/8	1/8	5/16	1-1/2	350-12505	20.25	350-12505-C5	25.02
1/8	1/8	3/8	1-1/2	350-12506	21.20	350-12506-C5	25.92
1/8	1/8	1/2	2	350-12508	24.55	350-12508-C5	30.48
1/8	1/8	5/8	2	350-12510	39.63	350-12510-C5	45.65
1/8	1/8	3/4	2	350-12512	44.02	350-12512-C5	49.85
1/8	1/8	1	2-1/2	350-12516	61.64	350-12516-C5	69.20
5/32	3/16	5/16	2	350-15605	25.95	350-15605-C5	31.96
5/32	3/16	9/16	2	350-15609	28.85	350-15609-C5	34.82
3/16	3/16	5/16	2	350-18705	26.43	350-18705-C5	32.42
3/16	3/16	3/8	2	350-18706	29.58	350-18706-C5	35.50
3/16	3/16	5/8	2-1/2	350-18710	31.68	350-18710-C5	40.93
3/16	3/16	3/4	2-1/2	350-18712	48.00	350-18712-C5	57.25
3/16	3/16	1	2-1/2	350-18716	49.30	350-18716-C5	58.58
7/32	1/4	3/8	2-1/2	350-21806	39.25	350-21806-C5	52.26
7/32	1/4	3/4	2-1/2	350-21812	43.56	350-21812-C5	56.16
1/4	1/4	3/8	2-1/2	350-25006	35.67	350-25006-C5	48.25
1/4	1/4	1/2	2-1/2	350-25008	37.43	350-25008-C5	49.98
1/4	1/4	5/8	2-1/2	350-25010	39.17	350-25010-C5	51.75
1/4	1/4	3/4	2-1/2	350-25012	39.62	350-25012-C5	52.19
1/4	1/4	1	2-1/2	350-25016	48.42	350-25016-C5	62.00
1/4	1/4	1-1/8	2-1/2	350-25018	56.34	350-25018-C5	68.91
1/4	1/4	1-1/4	3	350-25020	61.75	350-25020-C5	74.33
1/4	1/4	1-1/2	3	350-25024	81.77	350-25024-C5	83.13
1/4	1/4	2	4	350-25032	84.53	350-25032-C5	99.20
9/32	5/16	7/16	2-1/2	350-28107	42.40	350-28107-C5	60.98
9/32	5/16	13/16	2-1/2	350-28113	47.16	350-28113-C5	65.67
5/16	5/16	7/16	2-1/2	350-31207	38.55	350-31207-C5	57.12
5/16	5/16	1/2	2-1/2	350-31208	41.39	350-31208-C5	59.93
5/16	5/16	13/16	2-1/2	350-31213	42.83	350-31213-C5	61.40
5/16	5/16	1-1/8	2-1/2	350-31218	69.98	350-31218-C5	88.55
5/16	5/16	1-1/4	3-1/2	350-31220	81.66	350-31220-C5	105.33
5/16	5/16	1-1/2	3-1/2	350-31224	83.66	350-31224-C5	107.28
5/16	5/16	2-1/8	4	350-31234	93.88	350-31234-C5	117.54
11/32	3/8	1/2	2-1/2	350-34308	48.47	350-34308-C5	68.03
11/32	3/8	1	2-1/2	350-34316	54.98	350-34316-C5	73.53
3/8	3/8	1/2	2-1/2	350-37508	45.00	350-37508-C5	63.55
3/8	3/8	5/8	2-1/2	350-37510	46.22	350-37510-C5	64.77
3/8	3/8	3/4	2-1/2	350-37512	48.42	350-37512-C5	67.00
3/8	3/8	1	2-1/2	350-37516	49.74	350-37516-C5	68.31
3/8	3/8	1-1/4	3	350-37520	66.02	350-37520-C5	84.60



Aluminum End Mills



Aluminum End Mills

DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ZIRCONIUM PART NUMBER	ZIRCONIUM LIST PRICE
3/8	3/8	1-1/2	4	350-37524	94.88	350-37524-C5	118.53
3/8	3/8	2	4	350-37532	101.24	350-37532-C5	124.90
3/8	3/8	2-1/2	6	350-37540	125.99	350-37540-C5	167.58
13/32	7/16	9/16	2-3/4	350-40609	70.53	350-40609-C5	95.37
13/32	7/16	1	2-3/4	350-40616	78.35	350-40616-C5	103.20
7/16	7/16	9/16	2-3/4	350-43709	71.32	350-43709-C5	96.17
7/16	7/16	1	2-3/4	350-43716	71.24	350-43716-C5	96.58
7/16	7/16	2	4	350-43732	110.20	350-43732-C5	139.83
15/32	1/2	5/8	3	350-46810	79.71	350-46810-C5	104.57
15/32	1/2	1-1/4	3	350-46816	88.58	350-46816-C5	125.48
1/2	1/2	5/8	3	350-50010	72.53	350-50010-C5	94.44
1/2	1/2	3/4	3	350-50012	74.83	350-50012-C5	96.65
1/2	1/2	1	3	350-50016	77.48	350-50016-C5	99.38
1/2	1/2	1-1/4	3	350-50020	80.55	350-50020-C5	102.46
1/2	1/2	1-1/2	4	350-50024	108.18	350-50024-C5	135.33
1/2	1/2	2	4	350-50032	126.97	350-50032-C5	153.09
1/2	1/2	2-1/4	6	350-50036	193.68	350-50036-C5	224.84
1/2	1/2	2-1/2	6	350-50040	202.50	350-50040-C5	233.63
1/2	1/2	3-1/4	6	350-50048	212.82	350-50048-C5	243.98
1/2	1/2	4	8	350-50064	362.70	350-50064-C5	415.82
5/8	5/8	3/4	3-1/2	350-62512	138.65	350-62512-C5	167.70
5/8	5/8	1-1/4	3-1/2	350-62520	145.26	350-62520-C5	174.30
5/8	5/8	1-5/8	5	350-62526	173.83	350-62526-C5	209.82
5/8	5/8	2	5	350-62532	226.50	350-62532-C5	262.95
5/8	5/8	2-1/2	5	350-62540	233.35	350-62540-C5	269.80
5/8	5/8	3-3/4	5	350-62544	259.70	350-62544-C5	296.10
5/8	5/8	3-1/4	6	350-62552	337.55	350-62552-C5	380.85
5/8	5/8	4	8	350-62564	474.80	350-62564-C5	545.54
3/4	3/4	1	4	350-75016	194.57	350-75016-C5	230.63
3/4	3/4	1-1/2	4	350-75024	202.50	350-75024-C5	238.60
3/4	3/4	1-5/8	4	350-75026	216.20	350-75026-C5	252.28
3/4	3/4	2	5	350-75032	286.11	350-75032-C5	328.36
3/4	3/4	2-1/4	5	350-75036	299.32	350-75036-C5	341.58
3/4	3/4	2-1/2	5	350-75040	312.52	350-75040-C5	354.81
3/4	3/4	3	6	350-75048	333.03	350-75048-C5	382.97
3/4	3/4	3-1/4	6	350-75052	369.76	350-75052-C5	419.67
3/4	3/4	3-1/2	6	350-75056	453.38	350-75056-C5	563.30
3/4	3/4	4	7	350-75064	501.32	350-75064-C5	560.10
3/4	3/4	5	8	350-75080	633.87	350-75080-C5	704.32
1	1	1-1/4	5	350-10020	353.10	350-10020-C5	427.86
1	1	1-1/2	5	350-10024	369.77	350-10024-C5	427.86
1	1	2	5	350-10032	390.75	350-10032-C5	448.54
1	1	2-1/2	5	350-10040	447.28	350-10040-C5	498.27
1	1	3	6	350-10048	460.34	350-10048-C5	533.40
1	1	3-1/2	6	350-10056	598.64	350-10056-C5	663.62
1	1	4-1/8	7	350-10066	697.97	350-10066-C5	770.33
1	1	5-1/2	8	350-10088	985.98	350-10088-C5	1066.82
1-1/4	1-1/4	1-1/4	4-1/2	350-1-2520	686.67	350-1-2520-C5	758.52
1-1/4	1-1/4	2	4-1/2	350-1-2532	739.50	350-1-2532-C5	811.34
1-1/4	1-1/4	3-1/4	6	350-1-2552	1056.42	350-1-2552-C5	1137.51
1-1/4	1-1/4	5	7-1/2	350-1-2580	1188.48	350-1-2580-C5	1293.86



Aluminum End Mills

Three Flute - Necked



DIA.	FLUTE LENGTH	LENGTH BELOW SHANK	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ZIRCONIUM PART NUMBER	ZIRCONIUM LIST PRICE
1/8	1/4	1/2	1-1/2	350-12504N08	30.81	350-12504N08-C5	36.27
1/8	1/4	0	3	350-12504NS0	26.96	350-12504NS0-C5	51.06
1/8	1/4	1-3/8	3	350-12504NS22	52.18	350-12504NS22-C5	60.51
3/16	5/16	1/2	2	350-18705N08	37.43	350-18705N08-C5	43.41
3/16	5/16	0	3	350-18705NS0	44.03	350-18705NS0-C5	53.45
3/16	5/16	1-3/8	3	350-18705NS22	52.17	350-18705NS22-C5	63.15
1/4	3/8	1-1/8	2-1/2	350-25006N18	48.44	350-25006N18-C5	60.99
1/4	3/8	0	4	350-25006NS0	66.05	350-25006NS0-C5	80.69
1/4	3/8	2-1/8	4	350-2506NS34	80.98	350-2506NS34-C5	95.66
1/4	3/4	0	4	350-25012NS0	74.18	350-25012NS0-C5	90.69
1/4	3/4	2-1/8	4	350-25012NS34	96.99	350-25012NS34-C5	107.49
5/16	7/16	1-1/8	2-1/2	350-31207N18	52.83	350-31207N18-C5	71.40
5/16	7/16	0	4	350-31207NS0	70.42	350-31207NS0-C5	94.08
5/16	7/16	2-1/8	4	350-31207NS34	83.66	350-31207NS34-C5	107.28
5/16	13/16	0	4	350-31213NS0	79.18	350-31213NS0-C5	105.74
5/16	13/16	2-1/8	4	350-31213NS34	93.99	350-31213NS34-C5	120.80
3/8	1/2	1-1/8	2-1/2	350-37508N18	59.88	350-37508N18-C5	76.55
3/8	1/2	0	4	350-37508NS0	64.35	350-37508NS0-C5	85.22
3/8	1/2	2-1/8	4	350-37508NS34	79.28	350-37508NS34-C5	100.14
3/8	1	0	4	350-37516NS0	72.33	350-37516NS0-C5	95.73
3/8	1	2-1/8	4	350-37516NS34	89.07	350-37516NS34-C5	112.52
1/2	5/8	1-3/8	3	350-50010N22	84.53	350-50010N22-C5	106.44
1/2	5/8	0	4	350-50010NS0-4	105.63	350-50010NS0-4-C5	131.80
1/2	5/8	2-3/8	4	350-50010NS38	140.85	350-50010NS38-C5	175.04
1/2	5/8	0	6	350-50010NS0-6	126.77	350-50010NS0-6-C5	152.94
1/2	5/8	3-3/8	6	350-50010NS54	167.23	350-50010NS54-C5	198.43
1/2	1-1/4	0	6	350-50020NS0-6	158.24	350-50020NS0-6-C5	222.55
1/2	1-1/4	3-3/8	6	350-50020NS54	187.95	350-50020NS54-C5	262.30
5/8	3/4	1-5/8	3-1/2	350-62512N26	161.10	350-62512N26-C5	190.15
5/8	3/4	0	5	350-62512NS0-5	190.26	350-62512NS0-5-C5	226.53
5/8	3/4	2-3/8	5	350-62512NS38	212.60	350-62512NS38-C5	249.06
5/8	3/4	0	6	350-62512NS0-6	218.94	350-62512NS0-6-C5	262.26
5/8	3/4	3-3/8	6	350-62512NS54	245.35	350-62512NS54-C5	293.31
5/8	1-5/8	0	6	350-62526NS0-6	246.03	350-62526NS0-6-C5	294.63
5/8	1-5/8	3-3/8	6	350-62526NS54	275.65	350-62526NS54-C5	324.27
3/4	1	1-5/8	4	350-75016N26	228.45	350-75016N26-C5	264.59
3/4	1	0	5	350-75016NS0-5	251.13	350-75016NS0-5-C5	290.94
3/4	1	2-1/2	5	350-75016NS40	277.74	350-75016NS40-C5	317.57
3/4	1	0	6	350-75016NS0-6	289.21	350-75016NS0-6-C5	332.49
3/4	1	3-3/8	6	350-75016NS54	320.37	350-75016NS54-C5	363.68
3/4	1-5/8	0	6	350-75026NS0-6	324.95	350-75026NS0-6-C5	373.64
3/4	1-5/8	3-3/8	6	350-75026NS54	360.00	350-75026NS54-C5	408.64



Aluminum End Mills

Three Flute – With Radius



Aluminum End Mills

DIA.	SHANK DIA.	RADIUS	FLUTE LENGTH	OVERALL LENGTH	ZIRCONIUM PART NUMBER	ZIRCONIUM LIST PRICE
1/8	1/8	.020	3/8	1-1/2	350-12506-020-C5	29.82
1/8	1/8	.030	3/8	1-1/2	350-12506-030-C5	29.82
3/16	3/16	.010	5/8	2-1/2	350-18710-010-C5	45.09
3/16	3/16	.030	5/8	2-1/2	350-18710-030-C5	45.09
1/4	1/4	.010	3/8	2-1/2	350-25006-010-C5	55.50
1/4	1/4	.015	3/8	2-1/2	350-25006-015-C5	55.50
1/4	1/4	.020	3/8	2-1/2	350-25006-020-C5	55.50
1/4	1/4	.030	3/8	2-1/2	350-25006-030-C5	55.50
1/4	1/4	.045	3/8	2-1/2	350-25006-045-C5	55.50
1/4	1/4	.060	3/8	2-1/2	350-25006-060-C5	60.33
1/4	1/4	.010	3/4	2-1/2	350-25012-010-C5	60.22
1/4	1/4	.015	3/4	2-1/2	350-25012-015-C5	60.22
1/4	1/4	.020	3/4	2-1/2	350-25012-020-C5	60.22
1/4	1/4	.030	3/4	2-1/2	350-25012-030-C5	60.22
1/4	1/4	.045	3/4	2-1/2	350-25012-045-C5	60.22
1/4	1/4	.060	3/4	2-1/2	350-25012-060-C5	65.24
1/4	1/4	.010	1-1/4	3	350-25020-010-C5	81.77
1/4	1/4	.015	1-1/4	3	350-25020-015-C5	81.77
1/4	1/4	.020	1-1/4	3	350-25020-020-C5	81.77
1/4	1/4	.030	1-1/4	3	350-25020-030-C5	81.77
1/4	1/4	.045	1-1/4	3	350-25020-045-C5	81.77
1/4	1/4	.060	1-1/4	3	350-25020-060-C5	92.91
5/16	5/16	.060	13/16	2-1/2	350-31213-060-C5	76.76
3/8	3/8	.020	1/2	2-1/2	350-37508-020-C5	73.10
3/8	3/8	.030	1/2	2-1/2	350-37508-030-C5	73.10
3/8	3/8	.045	1/2	2-1/2	350-37508-045-C5	73.10
3/8	3/8	.060	1/2	2-1/2	350-37508-060-C5	79.46
3/8	3/8	.090	1/2	2-1/2	350-37508-090-C5	79.46
3/8	3/8	.120	1/2	2-1/2	350-37508-120-C5	79.46
3/8	3/8	.020	1	2-1/2	350-37516-020-C5	73.10
3/8	3/8	.030	1	2-1/2	350-37516-030-C5	73.10
3/8	3/8	.045	1	2-1/2	350-37516-045-C5	73.10
3/8	3/8	.060	1	2-1/2	350-37516-060-C5	79.46
3/8	3/8	.090	1	2-1/2	350-37516-090-C5	79.46
3/8	3/8	.120	1	2-1/2	350-37516-120-C5	79.46
3/8	3/8	.020	1-1/4	3	350-37520-020-C5	97.29
3/8	3/8	.030	1-1/4	3	350-37520-030-C5	97.29
3/8	3/8	.045	1-1/4	3	350-37520-045-C5	97.29
3/8	3/8	.060	1-1/4	3	350-37520-060-C5	105.75
3/8	3/8	.090	1-1/4	3	350-37520-090-C5	105.75
3/8	3/8	.120	1-1/4	3	350-37520-120-C5	105.75
3/8	3/8	.020	2	4	350-37532-020-C5	143.63
3/8	3/8	.030	2	4	350-37532-030-C5	143.63
3/8	3/8	.045	2	4	350-37532-045-C5	143.63
3/8	3/8	.060	2	4	350-37532-060-C5	156.12
3/8	3/8	.090	2	4	350-37532-090-C5	156.12
3/8	3/8	.120	2	4	350-37532-120-C5	156.12



Aluminum End Mills

Three Flute – With Radius



CUTTING DIA.	SHANK DIA.	RADIUS	FLUTE LENGTH	OVERALL LENGTH	ZIRCONIUM PART NUMBER	ZIRCONIUM LIST PRICE
1/2	1/2	.020	5/8	3	350-50010-020-C5	108.62
1/2	1/2	.030	5/8	3	350-50010-030-C5	108.62
1/2	1/2	.060	5/8	3	350-50010-060-C5	118.05
1/2	1/2	.090	5/8	3	350-50010-090-C5	118.05
1/2	1/2	.120	5/8	3	350-50010-120-C5	118.05
1/2	1/2	.020	1-1/4	3	350-50020-020-C5	117.84
1/2	1/2	.030	1-1/4	3	350-50020-030-C5	117.87
1/2	1/2	.060	1-1/4	3	350-50020-060-C5	128.09
1/2	1/2	.090	1-1/4	3	350-50020-090-C5	128.09
1/2	1/2	.120	1-1/4	3	350-50020-120-C5	128.09
1/2	1/2	.020	1-1/2	4	350-50024-020-C5	155.64
1/2	1/2	.030	1-1/2	4	350-50024-030-C5	155.64
1/2	1/2	.060	1-1/2	4	350-50024-060-C5	169.17
1/2	1/2	.090	1-1/2	4	350-50024-090-C5	169.17
1/2	1/2	.120	1-1/2	4	350-50024-120-C5	169.17
1/2	1/2	.020	2	4	350-50032-020-C5	176.06
1/2	1/2	.030	2	4	350-50032-030-C5	176.06
1/2	1/2	.060	2	4	350-50032-060-C5	191.37
1/2	1/2	.090	2	4	350-50032-090-C5	191.37
1/2	1/2	.120	2	4	350-50032-120-C5	191.37
5/8	5/8	.020	1-5/8	3-1/2	350-62526-020-C5	241.31
5/8	5/8	.030	1-5/8	3-1/2	350-62526-030-C5	241.31
5/8	5/8	.060	1-5/8	3-1/2	350-62526-060-C5	262.28
5/8	5/8	.090	1-5/8	3-1/2	350-62526-090-C5	262.28
5/8	5/8	.120	1-5/8	3-1/2	350-62526-120-C5	262.28
3/4	3/4	.030	1	4	350-75016-030-C5	265.29
3/4	3/4	.060	1	4	350-75016-060-C5	288.36
3/4	3/4	.090	1	4	350-75016-090-C5	288.36
3/4	3/4	.120	1	4	350-75016-120-C5	288.36
3/4	3/4	.030	1-5/8	4	350-75026-030-C5	290.13
3/4	3/4	.060	1-5/8	4	350-75026-060-C5	315.36
3/4	3/4	.090	1-5/8	4	350-75026-090-C5	315.36
3/4	3/4	.120	1-5/8	4	350-75026-120-C5	315.36
3/4	3/4	.030	2	5	350-75032-030-C5	377.63
3/4	3/4	.060	2	5	350-75032-060-C5	410.46
3/4	3/4	.090	2	5	350-75032-090-C5	410.46
3/4	3/4	.120	2	5	350-75032-120-C5	410.46
3/4	3/4	.030	3	6	350-75048-030-C5	440.42
3/4	3/4	.060	3	6	350-75048-060-C5	478.71
3/4	3/4	.090	3	6	350-75048-090-C5	478.71
3/4	3/4	.120	3	6	350-75048-120-C5	478.71
1	1	.060	2	5	350-10032-060-C5	561.06
1	1	.090	2	5	350-10032-090-C5	561.06
1	1	.120	2	5	350-10032-120-C5	561.06



Aluminum End Mills

Three Flute – Ball Nose



Aluminum End Mills

DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ZIRCONIUM COATED	ZIRCONIUM LIST PRICE
1/4	3/8	2-1/2	350-25006-BN	44.58	350-25006BN-C5	57.17
1/4	3/4	2-1/2	350-25012-BN	49.53	350-25012BN-C5	62.09
1/4	1-1/4	3	350-25020-BN	77.19	350-25020BN-C5	89.75
5/16	7/16	2-1/2	350-31207-BN	48.20	350-31207BN-C5	66.74
5/16	13/16	2-1/2	350-31213-BN	53.54	350-31213BN-C5	72.86
5/16	1-1/4	3-1/2	350-31220-BN	102.10	350-31220BN-C5	125.73
3/8	1/2	2-1/2	350-37508-BN	56.22	350-37508BN-C5	74.80
3/8	1	2-1/2	350-37516-BN	62.16	350-37516BN-C5	80.73
3/8	1-1/2	4	350-37524-BN	118.61	350-37524BN-C5	127.25
7/16	9/16	2-3/4	350-43709-BN	89.16	350-43709BN-C5	114.00
7/16	1	2-3/4	350-43716-BN	89.05	350-43716BN-C5	113.90
7/16	2	4	350-43732-BN	137.75	350-43732BN-C5	167.39
1/2	5/8	3	350-50010-BN	92.15	350-50010BN-C5	115.47
1/2	1-1/4	3	350-50020-BN	100.68	350-50020BN-C5	125.52
1/2	2	4	350-50032-BN	158.67	350-50032BN-C5	188.31
5/8	3/4	3-1/2	350-62512-BN	173.28	350-62512BN-C5	206.22
5/8	1-5/8	5	350-62526-BN	192.55	350-62526BN-C5	225.45
5/8	2-1/2	5	350-62540-BN	291.67	350-62540BN-C5	332.97
3/4	1	4	350-75016-BN	243.22	350-75016BN-C5	284.16
3/4	1-5/8	4	350-75026-BN	270.70	350-75026BN-C5	311.15
3/4	3-1/4	6	350-75052-BN	416.31	350-75052BN-C5	472.87
1	1-1/4	5	350-10020-BN	441.85	350-10020BN-C5	507.21
1	2	5	350-10032-BN	488.28	350-10032BN-C5	554.28
1	3-1/2	6	350-10056-BN	585.62	350-10056BN-C5	659.34

Three Flute – Necked with Radius



DIA.	RADIUS	FLUTE LENGTH	LENGTH BELOW SHANK	OVERALL LENGTH	ZIRCONIUM PART NUMBER	ZIRCONIUM LIST PRICE
1/4	.015	3/8	1-1/8	2-1/2	350-25006N18-015-C5	102.04
1/4	.015	3/4	2-1/8	4	350-25012NS34-015-C5	138.20
5/16	.015	7/16	1-1/8	2-1/2	350-31207N18-015-C5	93.12
5/16	.015	13/16	2-1/8	4	350-31213NS34-015-C5	141.74
3/8	.030	1/2	2-1/8	4	350-37508NS34-030-C5	124.86
1/2	.030	5/8	3-3/8	6	350-50010NS54-030-C5	222.74
5/8	.030	3/4	3-3/8	6	350-62512NS54-030-C5	313.13
3/4	.030	1	3-3/8	6	350-75016NS54-030-C5	388.25
1	.030	1-1/4	3-3/8	6	350-10020NS54-030-C5	661.65



Aluminum End Mills

Three Flute – Necked, Ball Nose



DIA	FLUTE LENGTH	LENGTH BELOW SHANK	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ZIRCONIUM PART NUMBER	ZIRCONIUM LIST PRICE
1/4	3/8	0	2-1/2	350N25006-1 BN	44.58	350N25006-1 BN-C5	57.16
1/4	3/8	1-1/8	2-1/2	350N25006-2 BN	60.68	350N25006-2 BN-C5	74.06
1/4	3/8	0	4	350N25006-3 BN	82.74	350N25006-3 BN-C5	98.36
1/4	3/8	2-1/8	4	350N25006-4 BN	98.04	350N25006-4 BN-C5	113.66
5/16	7/16	0	2-1/2	350N31207-1 BN	48.20	350N31207-1 BN-C5	66.74
5/16	7/16	1-1/8	2-1/4	350N31207-2 BN	66.18	350N31207-2 BN-C5	85.94
5/16	7/16	0	4	350N31207-3 BN	85.25	350N31207-3 BN-C5	110.49
5/16	7/16	2-1/8	4	350N31207-4 BN	104.79	350N31207-4 BN-C5	130.00
3/8	1/2	0	2-1/2	350N37508-1 BN	56.22	350N37508-1 BN-C5	74.81
3/8	1/2	1-1/8	2-1/2	350N37508-2 BN	75.00	350N37508-2 BN-C5	92.46
3/8	1/2	0	4	350N37508-3 BN	86.62	350N37508-3 BN-C5	102.87
3/8	1/2	2-1/8	4	350N37508-4 BN	99.33	350N37508-4 BN-C5	121.58
1/2	5/8	0	3	350N50010-1 BN	90.65	350N50010-1 BN-C5	115.48
1/2	5/8	1-3/8	3	350N50010-2 BN	105.92	350N50010-2 BN-C5	129.24
1/2	5/8	0	4	350N50010-3 BN	129.35	350N50010-3 BN-C5	157.20
1/2	5/8	2-3/8	4	350N50010-4 BN	155.25	350N50010-4 BN-C5	183.05
1/2	5/8	0	6	350N50010-5 BN	158.57	350N50010-5 BN-C5	201.77
1/2	5/8	3-3/8	6	350N50010-6 BN	200.19	350N50010-6 BN-C5	233.43
5/8	3/4	0	3-1/2	350N62512-1 BN	173.25	350N62512-1 BN-C5	206.22
5/8	3/4	1-5/8	3-1/2	350N62512-2 BN	201.90	350N62512-2 BN-C5	232.85
5/8	3/4	0	5	350N62512-3 BN	232.70	350N62512-3 BN-C5	271.00
5/8	3/4	2-3/8	5	350N62512-4 BN	260.31	350N62512-4 BN-C5	298.13
5/8	3/4	0	6	350N62512-5 BN	262.04	350N62512-5 BN-C5	308.18
5/8	3/4	3-3/8	6	350N62512-6 BN	293.64	350N62512-6 BN-C5	339.80
3/4	1	0	4	350N75016-1 BN	243.84	350N75016-1 BN-C5	284.16
3/4	1	1-5/8	4	350N75016-2 BN	286.29	350N75016-2 BN-C5	324.78
3/4	1	0	5	350N75016-3 BN	307.46	350N75016-3 BN-C5	347.86
3/4	1	2-3/8	5	350N75016-4 BN	340.35	350N75016-4 BN-C5	382.46
3/4	1	0	6	350N75016-5 BN	346.11	350N75016-5 BN-C5	392.27
3/4	1	3-3/8	6	350N75016-6 BN	383.23	350N75016-6 BN-C5	429.57
1	1-1/4	0	5	350N10020-1 BN	441.84	350N10020-1 BN-C5	507.21
1	1-1/4	2-1/8	5	350N10020-2 BN	482.67	350N10020-2 BN-C5	544.58
1	1-1/4	0	6	350N10020-3 BN	597.50	350N10020-3 BN-C5	660.70
1	1-1/4	3-3/8	6	350N10020-4 BN	626.55	350N10020-4 BN-C5	695.81
1	1-1/4	0	7	350N10020-5 BN	632.57	350N10020-5 BN-C5	709.65
1	1-1/4	4-3/8	7	350N10020-6 BN	694.90	350N10020-6 BN-C5	771.98



Variable End Mills

*Lessens chatter *Increases tool life *Allows for more aggressive machining

4 Flute Stub & Regular Length With Radius & Ball Nose



Dia	Flute Length	Overall Length	Radius	ALTIN Part Number	ALTIN List Price	ALTIN Ball Nose Part Number	ALTIN Ball Nose List Price
1/8	1/4	1-1/2	.010	471-125011	16.50	471-1250 BN11	23.10
1/8	1/2	1-1/2	.010	470-125011	19.80	470-1250 BN11	27.16
3/16	1/4	2	.010	471-187511	18.15	471-1875 BN11	26.40
3/16	5/8	2	.010	470-187511	23.10	470-1875 BN11	30.10
1/4	5/16	2	.015	471-250011	26.40	471-2500 BN11	39.60
1/4	3/4	2-1/2	.015	470-250011	29.70	470-2500 BN11	42.90
5/16	3/8	2	.015	471-312511	37.95	471-3125 BN11	52.80
5/16	7/8	2-1/2	.015	470-312511	42.90	470-3125 BN11	59.40
3/8	1/2	2	.020	471-375011	47.85	471-3750 BN11	61.05
3/8	1	2-1/2	.020	470-375011	52.80	470-3750 BN11	66.00
7/16	5/8	2-1/2	.025	471-437511	72.60	471-4375 BN11	84.15
7/16	1-1/8	2-3/4	.025	470-437511	79.20	470-4375 BN11	82.40
1/2	5/8	2-1/2	.030	471-500011	87.45	471-5000 BN11	108.90
1/2	1-1/4	3	.030	470-500011	95.70	470-5000 BN11	118.80
5/8	1	3	.030	471-625011	145.20	471-6250 BN11	199.98
5/8	1-1/2	3-1/2	.030	470-625011	155.10	470-6250 BN11	211.20
3/4	1	3	.040	471-750011	212.85	471-7500 BN11	270.60
3/4	1-3/4	4	.040	470-750011	224.40	470-7500 BN11	288.75
1	1	3	.045	471-100011	318.45	471-1000 BN11	433.95
1	1-3/4	4	.045	470-100011	356.40	470-1000 BN11	458.70

4 Flute Long Reach - With Radius



Dia	Flute Length	Overall Length	Radius	ALTIN Part Number	ALTIN List Price
1/4	3/4	4	.015	475-250011	56.93
5/16	7/8	4	.015	475-312511	59.73
3/8	1	4	.020	475-375011	69.55
1/2	1-1/4	4	.030	475-500011	128.70
1/2	1-1/4	6	.030	475L500011	145.04
5/8	1-1/2	6	.030	475-625011	252.45
3/4	1-3/4	6	.040	475-750011	323.40
1	1-3/4	6	.045	475-100011	458.70



End Mills – Roughers

Four Flute Rougher

Fine Pitch
Center Cutting

Designed for roughing when a reduction in horse power is needed, coupled with a reduction in vibration and chatter in steel, stainless steels, titanium and high temp alloys.



R430 = REGULAR

LR430 = LONG

XLR430 = EXTRA LONG

DIA.	FLUTE LENGTH	OVERALL LENGTH	ALTIN PART	ALTIN LIST
1/8	3/8	1-1/2	R430-1250-11	23.36
3/16	5/8	2	R430-1875-11	27.36
1/4	3/4	2-1/2	R430-2500-11	42.90
1/4	1-1/8	3	LR430-2500-11	68.94
1/4	1-1/2	4	XLR430-2500-11	75.90
5/16	3/4	2-1/2	R430-3125-11	49.50
5/16	1-1/4	3	LR430-3125-11	65.74
5/16	1-5/8	4	XLR430-3125-11	99.00
3/8	1	2-1/2	R430-3750-11	66.00
3/8	1-1/4	3	LR430-3750-11	103.95
3/8	1-3/4	4	XLR430-3750-11	127.64
7/16	1	3	R430-4375-11	72.60
7/16	2	4	LR430-4375-11	151.80
1/2	1-1/4	3	R430-5000-11	85.80
1/2	2	4	LR430-5000-11	155.10
1/2	3	6	XLR430-5000-11	204.60
5/8	1-1/4	3-1/2	R430-6250-11	169.95
5/8	2-1/4	5	LR430-6250-11	310.20
5/8	3	6	XLR430-6250-11	415.80
3/4	1-1/2	4	R430-7500-11	217.14
3/4	2-1/4	5	LR430-7500-11	409.20
3/4	3	6	XLR430-7500-11	514.80
1	1-1/2	4	R430-1000-11	281.33
1	2-1/4	5	LR430-1000-11	539.55
1	3	6	XLR430-1000-11	706.20



End Mills – Roughers

Truncated Rougher For Titanium

3,4,6 Flute
45 Degree Helix



DIA.	FLUTE LENGTH	OVERALL LENGTH	NO. OF FLUTES	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/4	3/8	2-1/2	3	431-2500	78.34	431-250011	83.95
1/4	3/4	2-1/2	3	432-2500	83.79	432-250011	89.43
3/8	1/2	2-1/2	4	431-3750	108.77	431-375011	114.41
3/8	1	2-1/2	4	432-3750	116.41	432-375011	122.05
1/2	5/8	3	4	431-5000	137.05	431-500011	142.69
1/2	1-1/4	3	4	432-5000	146.65	432-500011	152.32
5/8	3/4	3-1/2	4	431-6250	237.14	431-625011	242.78
5/8	1-5/8	3-1/2	4	432-6250	253.75	432-625011	259.40
3/4	1	4	4	431-7500	269.76	431-750011	282.07
3/4	1-5/8	4	4	432-7500	288.65	432-750011	300.96
1	1-1/4	4	6	432-1000	432.94	432-100011	445.25

Fine Knuckle Rougher For Titanium

5 Flute
45 Degree Helix
High Speed Machining



DIA.	FLUTE LENGTH	OVERALL LENGTH	CHAMFER WIDTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
3/8	1/2	2-1/2	.020	433-3750	103.36	433-375011	112.48
3/8	1	2-1/2	.020	434-3750	131.00	434-375011	140.12
7/16	9/16	2-3/4	.020	433-4375	116.95	433-437511	127.17
7/16	1	2-3/4	.020	434-4375	144.95	434-437511	155.17
1/2	5/8	3	.025	433-5000	141.42	433-500011	152.48
1/2	1-1/4	3	.025	434-5000	164.80	434-500011	175.89
5/8	3/4	3-1/2	.025	433-6250	225.73	433-625011	242.12
5/8	1-5/8	3-1/2	.025	434-6250	285.47	434-625011	301.87
3/4	1	4	.025	433-7500	285.58	433-750011	310.08
3/4	1-5/8	4	.025	434-7500	324.75	434-750011	257.50
1	1-1/4	4	.025	433-1000	467.74	433-100011	502.03
1	2	4	.025	434-1000	521.20	434-100011	555.50



4 Flute - Variable Pitch



DIA.	FLUTE LENGTH	OVERALL LENGTH	SQUARE	RAD	SQUARE PART NUMBER	SQUARE LIST PRICE	RADIUS PART NUMBER	RADIUS LIST PRICE
1/8	1/4	2	SQ	.010	438-12504-C15	28.67	438-12504-010-C15	32.12
1/8	1/2	2	SQ	.010	438-12508-C15	36.32	438-12508-010-C15	40.69
3/16	5/16	2	SQ	.010	438-18705-C15	30.14	438-18705-010-C15	33.73
3/16	5/8	2-1/2	SQ	.010	438-18710-C15	33.21	438-18710-010-C15	39.19
1/4	3/8	2	SQ	.020	438-25006-C15	31.59	438-25006-020-C15	38.81
1/4	1/2	2-1/2	SQ	.020	438-25008-C15	35.73	438-25008-020-C15	43.13
1/4	3/4	2-1/2	SQ	.020	438-25012-C15	39.87	438-25012-020-C15	48.69
1/4	1	3	SQ	.020	438-25016-C15	43.47	438-25016-020-C15	53.84
5/16	7/16	2	SQ	.020	438-31207-C15	46.83	438-31207-020-C15	52.13
5/16	13/16	2-1/2	SQ	.020	438-31213-C15	50.91	438-31213-020-C15	57.03
5/16	1	3	SQ	.020	438-31216-C15	55.50	438-31216-020-C15	62.16
3/8	1/2	2	SQ	.020	438-37508-C15	52.70	438-37508-020-C15	59.03
3/8	7/8	2-1/2	SQ	.020	438-37514-C15	57.46	438-37514-020-C15	64.35
3/8	1	2-1/2	SQ	.020	438-37516-C15	62.63	438-37516-020-C15	70.26
3/8	1-1/4	3	SQ	.020	438-37520-C15	68.27	438-37520-020-C15	76.47
7/16	5/8	2-1/2	SQ	.020	438-43710-C15	75.17	438-43710-020-C15	84.20
7/16	7/8	2-3/4	SQ	.020	438-43714-C15	81.93	438-43714-020-C15	91.77
7/16	1-1/8	3	SQ	.020	438-43718-C15	89.31	438-43718-020-C15	100.05
1/2	5/8	2-1/2	SQ	.030	438-50010-C15	83.51	438-50010-030-C15	93.53
1/2	1	3	SQ	.030	438-50016-C15	91.02	438-50016-030-C15	99.39
1/2	1-1/4	3	SQ	.030	438-50020-C15	99.23	438-50020-030-C15	104.82
1/2	1-5/8	4	SQ	.030	438-50026-C15	108.17	438-50026-030-C15	113.86
5/8	7/8	3	SQ	.030	438-62514-C15	138.36	438-62514-030-C15	151.26
5/8	1-1/4	3-1/2	SQ	.030	438-62520-C15	141.17	438-62520-030-C15	161.20
5/8	1-5/8	3-1/2	SQ	.030	438-62526-C15	144.92	438-62526-030-C15	167.31
5/8	2-1/4	5	SQ	.030	438-62536-C15	186.21	438-62536-030-C15	212.31
5/8	3-1/4	6	SQ	.030	438-62552-C15	201.47	438-62552-030-C15	227.31
3/4	7/8	3	SQ	.030	438-75014-C15	235.50	438-75014-030-C15	251.16
3/4	1-1/4	4	SQ	.030	438-75020-C15	239.04	438-75020-030-C15	253.73
3/4	1-5/8	4	SQ	.030	438-75026-C15	243.32	438-75026-030-C15	262.23
3/4	2-1/4	5	SQ	.030	438-75036-C15	267.46	438-75036-030-C15	286.32
3/4	3-1/4	6	SQ	.030	438-75052-C15	309.74	438-75052-030-C15	302.21
1	1-1/2	4	SQ	.030	438-10024-C15	357.30	438-10024-030-C15	400.19
1	2	4	SQ	.030	438-10032-C15	389.46	438-10032-030-C15	436.20
1	2-5/8	5	SQ	.030	438-10042-C15	424.52	438-10042-030-C15	475.47
1	3	6	SQ	.030	438-10048-C15	462.73	438-10048-030-C15	518.27
1	4-1/4	7	SQ	.030	438-10068-C15	504.38	438-10068-030-C15	564.90



4 Flute - Variable Pitch with Chip Breaker



DIA.	FLUTE LENGTH	OVERALL LENGTH	RAD	PART NUMBER	RADIUS LIST PRICE
1/8	1/4	2	.010	CB438-12504-010-C15	36.93
1/8	1/2	2	.010	CB438-12508-010-C15	46.79
3/16	5/16	2	.010	CB438-18705-010-C15	37.83
3/16	5/8	2-1/2	.010	CB438-18710-010-C15	43.26
1/4	3/8	2	.020	CB438-25006-020-C15	40.70
1/4	1/2	2-1/2	.020	CB438-25008-020-C15	46.82
1/4	3/4	2-1/2	.020	CB438-25012-020-C15	56.00
1/4	1	3	.020	CB438-25016-020-C15	61.92
5/16	7/16	2	.020	CB438-31207-020-C15	59.95
5/16	13/16	2-1/2	.020	CB438-31213-020-C15	65.58
5/16	1	3	.020	CB438-31216-020-C15	71.49
3/8	1/2	2	.020	CB438-37508-020-C15	67.88
3/8	7/8	2-1/2	.020	CB438-37514-020-C15	74.01
3/8	1	2-1/2	.020	CB438-37516-020-C15	80.81
3/8	1-1/4	3	.020	CB438-37520-020-C15	87.95
7/16	5/8	2-1/2	.020	CB438-43710-020-C15	86.83
7/16	7/8	2-3/4	.020	CB438-43714-020-C15	105.54
7/16	1-1/8	3	.020	CB438-43718-020-C15	115.54
1/2	5/8	2-1/2	.030	CB438-50010-030-C15	116.03
1/2	1	3	.030	CB438-50016-030-C15	124.46
1/2	1-1/4	3	.030	CB438-50020-030-C15	133.64
1/2	1-5/8	4	.030	CB438-50026-030-C15	143.66
5/8	7/8	3	.030	CB438-62514-030-C15	173.76
5/8	1-1/4	3-1/2	.030	CB438-62520-030-C15	183.71
5/8	1-5/8	3-1/2	.030	CB438-62526-030-C15	189.82
5/8	2-1/4	5	.030	CB438-62536-030-C15	234.81
5/8	3-1/4	6	.030	CB438-62552-030-C15	249.81
3/4	7/8	3	.030	CB438-75014-030-C15	296.16
3/4	1-1/4	4	.030	CB438-75020-030-C15	298.73
3/4	1-5/8	4	.030	CB438-75026-030-C15	307.23
3/4	2-1/4	5	.030	CB438-75036-030-C15	331.82
3/4	3-1/4	6	.030	CB438-75052-030-C15	377.21
1	1-1/2	4	.030	CB438-10024-030-C15	445.19
1	2	4	.030	CB438-10032-030-C15	481.20
1	2-5/8	5	.030	CB438-10042-030-C15	520.47
1	3	6	.030	CB438-10048-030-C15	563.25
1	4-1/4	7	.030	CB438-10068-030-C15	609.90



4 Flute - Variable Pitch with Reduced Neck

DIA.	FLUTE LENGTH	OVERALL LENGTH	NECK DIA.	LBS	RAD.	PART NUMBER	SQUARE LIST PRICE
1/8	5/32	3	.118	3/8	.010	438-12502-010-NS06-C15	40.62
1/8	5/32	3	.118	1/2	.010	438-12502-010-NS08-C15	51.47
1/8	5/32	3	.118	5/8	.010	438-12502-010-NS10-C15	54.81
3/16	7/32	3	.178	1/2	.010	438-18703-010-NS08-C15	49.22
3/16	7/32	3	.178	3/4	.010	438-18703-010-NS12-C15	54.32
3/16	7/32	3	.178	1	.010	438-18703-010-NS16-C15	59.72
1/4	3/8	3	.237	3/4	.020	438-25006-020-NS12-C15	50.76
1/4	3/8	4	.237	1-1/8	.020	438-25006-020-NS18-C15	58.13
1/4	3/8	4	.237	2-1/8	.020	438-25006-020-NS34-C15	66.03
3/8	1/2	4	.356	1-1/8	.020	438-37508-020-NS18-C15	74.67
3/8	1/2	4	.356	2-1/8	.020	438-37508-020-NS34-C15	81.41
3/8	1/2	6	.356	3-1/8	.020	438-37508-020-NS50-C15	88.88
3/8	1/2	6	.356	4-1/8	.020	438-37508-020-NS66-C15	96.74
1/2	5/8	4	.475	1-1/2	.030	438-50010-030-NS24-C15	118.30
1/2	5/8	4	.475	2-1/4	.030	438-50010-030-NS36-C15	128.97
1/2	5/8	6	.475	3-3/8	.030	438-50010-030-NS54-C15	140.58
1/2	5/8	6	.475	4-1/8	.030	438-50010-030-NS66-C15	153.26
5/8	3/4	4	.593	1-5/8	.030	438-62512-030-NS26-C15	177.12
5/8	3/4	6	.593	2-3/8	.030	438-62512-030-NS38-C15	187.62
5/8	3/4	6	.593	3-3/8	.030	438-62512-030-NS54-C15	199.13
5/8	3/4	6	.593	4-1/8	.030	438-62512-030-NS66-C15	219.17
3/4	1	4	.712	2	.030	438-75016-030-NS32-C15	301.40
3/4	1	6	.712	2-1/2	.030	438-75016-030-NS40-C15	304.47
3/4	1	6	.712	3-3/8	.030	438-75016-030-NS54-C15	314.67
3/4	1	6	.712	4-1/8	.030	438-75016-030-NS66-C15	343.59
1	1-1/4	4	.950	2-1/4	.030	438-10020-030-NS36-C15	506.24
1	1-1/4	6	.950	2-5/8	.030	438-10020-030-NS42-C15	551.79
1	1-1/4	6	.950	3-3/8	.030	438-10020-030-NS54-C15	601.47
1	1-1/4	6	.950	4-1/8	.030	438-10020-030-NS66-C15	655.59



4 Flute - Variable Pitch - Ball Nose



DIA.	FLUTE LENGTH	OVERALL LENGTH	PART NUMBER	LIST PRICE
1/8	1/4	2	438-12504-BN-C15	37.89
1/8	1/2	2	438-12508-BN-C15	48.00
3/16	5/16	2	438-18705-BN-C15	44.04
3/16	9/16	2-1/2	438-18709-BN-C15	46.23
1/4	3/8	2	438-25006-BN-C15	46.32
1/4	1/2	2-1/2	438-25008-BN-C15	50.46
1/4	3/4	2-1/2	438-25012-BN-C15	57.45
5/16	7/16	2	438-31207-BN-C15	61.52
5/16	13/16	2-1/2	438-31213-BN-C15	67.30
3/8	1/2	2	438-37508-BN-C15	69.65
3/8	1	2-1/2	438-37516-BN-C15	82.90
1/2	5/8	2-1/2	438-50010-BN-C15	110.36
1/2	1	3	438-50016-BN-C15	117.29
1/2	1-1/4	3	438-50020-BN-C15	123.70
5/8	7/8	3	438-62514-BN-C15	178.49
5/8	1-1/4	3-1/2	438-62520-BN-C15	190.22
5/8	1-5/8	4	438-62526-BN-C15	197.43
3/4	1	3	438-75016-BN-C15	298.40
3/4	1-5/8	4	438-75026-BN-C15	309.44
1	1-1/4	4	438-10020-BN-C15	472.22
1	2	4	438-10032-BN-C15	541.71



4 FLUTE - 438 SERIES

MATERIAL	AXIAL DOC		RADIAL DOC		DIAMETER															
					1/8				1/4				3/8				1/2			
					SFM	RPM	IPM	CPT	RPM	IPM	CPT	RPM	IPM	CPT	RPM	IPM	CPT			
Med Carbon Steel <375																				
Full Slot	1 x D	1 x D	250	7640	15	0.0005	3820	15	0.0010	2547	18	0.0018	1910	19	0.0025					
30% Radial	1.25 x D	.3 x D	350	10696	26	0.0006	5348	26	0.0012	3565	31	0.0022	2674	32	0.0030					
10% Radial	1.5 X D	.1 x D	500	15280	61	0.001	7640	61	0.0020	5093	73	0.0036	3820	77	0.0050					
Tool Steel <375																				
A2,A6,D2,H13, Full Slot	1 x D	1 x D	225	6876	13	0.0005	3438	13	0.0010	2292	16	0.0017	1719	16	0.0024					
30% Radial	1.25 x D	.3 x D	325	9932	23	0.0006	4966	23	0.0011	3311	27	0.0021	2483	29	0.0029					
10% Radial	1.5 X D	.1 x D	475	14516	55	0.0010	7258	55	0.0019	4839	66	0.0034	3629	70	0.0048					
Cast Iron- gray <220																				
Full Slot	1 x D	1 x D	105	3209	6	0.0005	1604	6	0.0009	1070	7	0.0016	802	7	0.0023					
30% Radial	1.25 x D	.3 x D	200	6112	13	0.0005	3056	13	0.0011	2037	16	0.0019	1528	17	0.0027					
10% Radial	1.5 X D	.1 x D	560	17114	62	0.0009	8557	62	0.0018	5705	74	0.0032	4278	78	0.0045					
Cast Iron- gray malleable																				
Full Slot	.75 x D	1 x D	155	4737	8	0.0004	2368	8	0.0009	1579	10	0.0015	1184	10	0.0022					
30% Radial	1.25 x D	.3 x D	180	5501	11	0.0005	2750	11	0.0010	1834	14	0.0019	1375	14	0.0026					
10% Radial	1.5 x D	.1 x D	300	9168	31	0.0009	4584	31	0.0017	3056	38	0.0031	2292	40	0.0043					
SS 300 Series (303,420)																				
Full Slot	.75 x D	1 x D	120	3667	6	0.0004	1834	6	0.0008	1222	7	0.0015	917	8	0.0021					
30% Radial	1.25 x D	.3 x D	185	5654	11	0.0005	2827	11	0.0010	1885	13	0.0018	1413	14	0.0025					
10% Radial	1.5 x D	.1 x D	300	9168	30	0.0008	4584	30	0.0016	3056	36	0.0029	2292	38	0.0041					
Martensitic SS (400 grades)																				
Full Slot	0.5	1 x D	115	3514	5	0.0004	1757	5	0.0008	1171	7	0.0014	879	7	0.0019					
30% Radial	1.25 x D	.3 x D	180	5501	10	0.0005	2750	10	0.0009	1834	12	0.0017	1375	13	0.0023					
10% Radial	1.5 x D	.1 x D	250	7640	24	0.0008	3820	24	0.0015	2547	28	0.0028	1910	30	0.0039					
High Temp Alloys																				
Inconel Full Slot	.25 x D	1 x D	60	1834	3	0.0004	917	3	0.0007	611	3	0.0013	458	3	0.0019					
Hastalloy 30% Radial	1.25 x D	.3 x D	80	2445	4	0.0004	1222	4	0.0009	815	5	0.0016	611	5	0.0022					
Waspalloy 10% Radial	1.5 x D	.1 x D	125	3820	11	0.0007	1910	11	0.0015	1273	13	0.0026	955	14	0.0037					
Titanium [6AL4V]																				
Grades (5-38) Full Slot	0.5	1 x D	100	3056	4	0.0003	1528	4	0.0007	1019	5	0.0013	764	5	0.0018					
30% Radial	1.25 x D	.3 x D	135	4126	7	0.0004	2063	7	0.0008	1375	8	0.0015	1031	9	0.0021					
10% Radial	1.5 x D	.1 x D	220	6723	19	0.0007	3362	19	0.0014	2241	23	0.0025	1681	24	0.0035					

			5/8				3/4			1		
			SFM	RPM	IPM	CPT	RPM	IPM	CPT	RPM	IPM	CPT
Med Carbon Steel <375												
Full Slot	1 x D	1 x D	250	1528	18	0.0030	1273	17	0.0033	955	17	0.0043
30% Radial	1.25 x D	.3 x D	350	2139	31	0.0036	1783	28	0.0040	1337	28	0.0052
10% Radial	1.5 X D	.1 x D	500	3056	74	0.0060	2547	68	0.0067	1910	66	0.0086
Tool Steel <375												
A2,A6,D2,H13, Full Slot	1 x D	1 x D	225	1375	16	0.0029	1146	14	0.0032	860	14	0.0041
30% Radial	1.25 x D	.3 x D	325	1986	27	0.0034	1655	25	0.0038	1242	24	0.0049
10% Radial	1.5 X D	.1 x D	475	2903	67	0.0057	2419	61	0.0063	1815	60	0.0082
Cast Iron- gray <220												
Full Slot	1 x D	1 x D	105	642	7	0.0027	535	6	0.0030	401	6	0.0039
30% Radial	1.25 x D	.3 x D	200	1222	16	0.0033	1019	15	0.0036	764	14	0.0047
10% Radial	1.5 X D	.1 x D	560	3423	75	0.0055	2852	69	0.0060	2139	67	0.0078
Cast Iron- gray malleable												
Full Slot	.75 x D	1 x D	155	947	10	0.0026	789	9	0.0029	592	9	0.0037
30% Radial	1.25 x D	.3 x D	180	1100	14	0.0031	917	13	0.0034	688	12	0.0044
10% Radial	1.5 x D	.1 x D	300	1834	38	0.0052	1528	35	0.0057	1146	34	0.0074
SS 300 Series (303,420)												
Full Slot	.75 x D	1 x D	120	733	7	0.0025	611	7	0.0027	458	6	0.0035
30% Radial	1.25 x D	.3 x D	185	1131	13	0.0030	942	12	0.0033	707	12	0.0042
10% Radial	1.5 x D	.1 x D	300	1834	36	0.0049	1528	33	0.0054	1146	32	0.0070
Martensitic SS (400 grades)												
Full Slot	0.5	1 x D	115	703	7	0.0023	586	6	0.0026	439	6	0.0033
30% Radial	1.25 x D	.3 x D	180	1100	12	0.0028	917	11	0.0031	688	11	0.0040
10% Radial	1.5 x D	.1 x D	250	1528	29	0.0047	1273	26	0.0051	955	26	0.0067
High Temp Alloys												
Inconel Full Slot	.25 x D	1 x D	60	367	3	0.0022	306	3	0.0024	229	3	0.0032
Hastalloy 30% Radial	1.25 x D	.3 x D	80	489	5	0.0027	407	5	0.0029	306	5	0.0038
Waspalloy 10% Radial	1.5 x D	.1 x D	125	764	14	0.0044	637	12	0.0049	478	12	0.0064
Titanium [6AL4V]												
Grades (5-38) Full Slot	0.5	1 x D	100	611	5	0.0021	509	5	0.0023	382	5	0.0030
30% Radial	1.25 x D	.3 x D	135	825	8	0.0025	688	8	0.0028	516	7	0.0036
10% Radial	1.5 x D	.1 x D	220	1345	23	0.0042	1121	21	0.0046	840	20	0.0060

CPT: Chip per tooth
Surface feet per
SFM: minute
IPM: Inches per minute
DOC: Depth of cut
FPT: Feed per tooth

SFM= .262 x Dia. X RPM
RPM= 3.82 x SFM/DIA.
IPM= FPT x No. Teeth X
RPM
FPT= IPM/ (No. Teeth x
RPM)



5 Flute - Variable Pitch with Radius



DIA.	LOC	OAL	.010 RAD	.020 RAD	.030 RAD	.060 RAD	.090 RAD	.120 RAD	.190 RAD	.250 RAD	PART NUMBER	SQ. LIST PRICE	RAD <= .060 LIST PRICE	RAD > .060 LIST PRICE
1/8	1/4	1-1/2	.010	.020	.030						538-12504-(RAD)-C15	30.68	35.28	
1/8	1/2	2	.010	.020	.030						538-12508-(RAD)-C15	38.87	47.70	
1/8	3/4	2-1/2	.010		.030						538-12512-(RAD)-C15	42.18	48.51	
3/16	5/16	2	.010	.020	.030						538-18705-(RAD)-C15	33.77	40.71	
3/16	9/16	2	.010	.020	.030						538-18709-(RAD)-C15	37.26	42.86	
3/16	3/4	2-1/2	.010		.030						538-18712-(RAD)-C15	44.61	51.30	
1/4	3/8	2	.010	.020	.030	.060					538-25006-(RAD)-C15	37.77	43.44	
1/4	1/2	2-1/2	.010	.020	.030	.060					538-25008-(RAD)-C15	40.32	46.37	
1/4	3/4	2-1/2	.010	.020	.030	.060					538-25012-(RAD)-C15	44.94	51.68	
1/4	1	3	.010	.020	.030	.060					538-25016-(RAD)-C15	46.68	53.69	
1/4	1-1/4	3	.010	.020	.030	.060					538-25020-(RAD)-C15	50.66	58.26	
5/16	7/16	2	.010	.020	.030	.060					538-31207-(RAD)-C15	51.77	59.54	
5/16	13/16	2-1/2	.010	.020	.030	.060					538-31213-(RAD)-C15	54.48	62.66	
5/16	1	3	.010	.020	.030	.060					538-31216-(RAD)-C15	56.22	64.65	
3/8	1/2	2		.020	.030	.060	.090				538-37508-(RAD)-C15	56.39	64.85	71.33
3/8	1	2-1/2		.020	.030	.060	.090				538-37516-(RAD)-C15	61.53	70.75	77.84
3/8	1-1/4	3		.020	.030	.060	.090				538-37520-(RAD)-C15	64.67	74.37	81.80
3/8	1-1/2	4		.020	.030	.060	.090				538-37524-(RAD)-C15	68.81	79.13	87.05
1/2	5/8	2-1/2		.020	.030	.060	.090	.120			538-50010-(RAD)-C15	89.36	102.77	107.96
1/2	1	3		.020	.030	.060	.090	.120			538-50016-(RAD)-C15	99.21	110.00	115.50
1/2	1-1/4	3		.020	.030	.060	.090	.120			538-50020-(RAD)-C15	108.15	115.26	121.02
1/2	1-5/8	4		.020	.030	.060	.090	.120			538-50026-(RAD)-C15	117.90	125.16	131.42
1/2	2	4		.020	.030	.060	.090	.120			538-50032-(RAD)-C15	123.18	133.11	139.77
5/8	3/4	3			.030	.060	.090	.120			538-62512-(RAD)-C15	159.12	182.99	192.14
5/8	1-1/4	3-1/2			.030	.060	.090	.120			538-62520-(RAD)-C15	171.77	197.54	207.41
5/8	1-5/8	3-1/2			.030	.060	.090	.120			538-62526-(RAD)-C15	195.77	225.14	236.39
5/8	2-1/8	4			.030	.060	.090	.120			538-62534-(RAD)-C15	214.14	244.16	256.37
5/8	2-1/2	5			.030	.060	.090	.120			538-62540-(RAD)-C15	231.69	261.41	274.47
3/4	1	3			.030	.060	.090	.120	.190	.250	538-75016-(RAD)-C15	235.37	271.25	284.81
3/4	1-5/8	4			.030	.060	.090	.120	.190	.250	538-75026-(RAD)-C15	256.82	278.76	292.70
3/4	2-1/4	5			.030	.060	.090	.120	.190	.250	538-75036-(RAD)-C15	288.62	331.91	348.57
3/4	2-3/4	5			.030	.060	.090	.120	.190	.250	538-75044-(RAD)-C15	320.76	368.88	387.32
3/4	3-1/4	6			.030	.060	.090	.120	.190	.250	538-75052-(RAD)-C15	338.61	389.40	408.87
1	1-1/4	4			.030	.060	.090	.120	.190	.250	538-10020-(RAD)-C15	384.62	442.31	464.44
1	2	4			.030	.060	.090	.120	.190	.250	538-10032-(RAD)-C15	416.73	479.24	503.21
1	2-5/8	5			.030	.060	.090	.120	.190	.250	538-10042-(RAD)-C15	444.62	509.58	535.07
1	3-1/4	6			.030	.060	.090	.120	.190	.250	538-40052-(RAD)-C15	586.26	674.21	707.91
1	4-1/4	7			.030	.060	.090	.120	.190	.250	538-40068-(RAD)-C15	682.77	785.19	824.45
1-1/4	1-1/2	4-1/2			.030	.060	.090	.120	.190	.250	538-1.25024-(RAD)-C15	685.22	788.12	827.52
1-1/4	2	4-1/2			.030	.060	.090	.120	.190	.250	538-1.25032-(RAD)-C15	702.36	807.72	848.10
1-1/4	2-5/8	6			.030	.060	.090	.120	.190	.250	538-1.25042-(RAD)-C15	718.97	826.82	868.66
1-1/4	3-1/4	6			.030	.060	.090	.120	.190	.250	538-1.25052-(RAD)-C15	797.47	917.09	962.94
1-1/4	4-1/2	7			.030	.060	.090	.120	.190	.250	538-1.25072-(RAD)-C15	903.17	1038.65	1090.58



5 Flute - Variable Pitch with Radius & Reduced Neck



DIA.	LOC	OAL	NECK DIA.	LBS	.010 RAD	.020 RAD	.030 RAD	.060 RAD	.090 RAD	.120 RAD	.190 RAD	.250 RAD	PART NUMBER	SQ. LIST PRICE	RAD <= .060 LIST PRICE	RAD > .060 LIST PRICE
1/8	3/16	2	.118	3/8	.010	.020	.030						538-12503-(RAD)-NS06-C15	38.34	44.10	
1/8	3/16	2	.118	1/2	.010	.020	.030						538-12503-(RAD)-NS08-C15	48.59	55.90	
1/8	3/16	2-1/2	.118	3/4	.010		.030						538-12503-(RAD)-NS12-C15	51.77	59.54	
3/16	1/4	2	.178	1/2	.010	.020	.030						538-18704-(RAD)-NS08-C15	44.27	50.91	
3/16	1/4	2-1/2	.178	3/4	.010	.020	.030						538-18704-(RAD)-NS12-C15	52.02	59.82	
3/16	1/4	2-1/2	.178	1-1/8	.010		.030						538-18704-(RAD)-NS18-C15	54.21	62.34	
1/4	3/8	4	.237	3/4	.010	.020	.030	.060					538-25006-(RAD)-NS12-C15	47.62	54.93	
1/4	3/8	4	.237	1-1/8	.010	.020	.030	.060					538-25006-(RAD)-NS18-C15	56.72	56.72	
1/4	3/8	4	.237	2-1/8	.010	.020	.030	.060					538-25006-(RAD)-NS34-C15	59.31	68.21	
3/8	1/2	4	.356	1-1/8		.020	.030	.060	.090				538-37508-(RAD)-NS18-C15	70.49	81.06	89.16
3/8	1/2	4	.356	2-1/8		.020	.030	.060	.090				538-37508-(RAD)-NS34-C15	76.92	88.46	97.29
3/8	1/2	6	.356	3-1/8		.020	.030	.060	.090				538-37508-(RAD)-NS50-C15	80.84	91.96	102.26
3/8	1/2	6	.356	4-1/8		.020	.030	.060	.090				538-37508-(RAD)-NS66-C15	86.01	98.91	108.80
1/2	5/8	4	.475	1-1/2		.020	.030	.060	.090	.120			538-50010-(RAD)-NS24-C15	103.52	119.64	125.00
1/2	5/8	4	.475	2-1/4		.020	.030	.060	.090	.120			538-50010-(RAD)-NS36-C15	117.14	134.70	141.44
1/2	5/8	6	.475	3-3/8		.020	.030	.060	.090	.120			538-50010-(RAD)-NS54-C15	128.61	147.90	155.30
1/2	5/8	6	.475	4-1/8		.020	.030	.060	.090	.120			538-50010-(RAD)-NS66-C15	152.56	175.11	183.86
5/8	3/4	4	.593	1-5/8			.030	.060	.090	.120			538-62512-(RAD)-NS26-C15	159.80	183.75	192.95
5/8	3/4	6	.593	2-3/8			.030	.060	.090	.120			538-62512-(RAD)-NS38-C15	154.10	189.25	198.88
5/8	3/4	6	.593	3-3/8			.030	.060	.090	.120			538-62512-(RAD)-NS54-C15	171.45	197.18	207.03
5/8	3/4	6	.593	4-1/8			.030	.060	.090	.120			538-62512-(RAD)-NS66-C15	175.40	201.70	211.79
3/4	1	4	.712	2			.030	.060	.090	.120	.190	.250	538-75016-(RAD)-NS32-C15	294.83	339.05	356.00
3/4	1	6	.712	2-1/2			.030	.060	.090	.120	.190	.250	538-75016-(RAD)-NS40-C15	321.05	369.17	387.63
3/4	1	6	.712	3-3/8			.030	.060	.090	.120	.190	.250	538-75016-(RAD)-NS54-C15	334.10	384.29	403.50
3/4	1	6	.712	4-1/8			.030	.060	.090	.120	.190	.250	538-75016-(RAD)-NS66-C15	363.08	417.54	438.42
1	1-1/4	4	.950	2-1/4			.030	.060	.090	.120	.190	.250	538-10020-(RAD)-NS36-C15	480.77	552.89	580.43
1	1-1/4	6	.950	2-5/8			.030	.060	.090	.120	.190	.250	538-10020-(RAD)-NS42-C15	520.92	599.06	629.00
1	1-1/4	6	.950	3-3/8			.030	.060	.090	.120	.190	.250	538-10020-(RAD)-NS54-C15	540.14	622.60	653.78
1	1-1/4	6	.950	4-1/8			.030	.060	.090	.120	.190	.250	538-10020-(RAD)-NS66-C15	556.64	640.13	672.14
1-1/4	1-1/2	5	1.187	2-1/4			.030	.060	.090	.120	.190	.250	538-1.25024-(RAD)-NS36-C15	856.65	985.16	1034.40
1-1/4	1-1/2	6	1.187	2-5/8			.030	.060	.090	.120	.190	.250	538-1.25024-(RAD)-NS42-C15	877.95	1009.69	1016.13
1-1/4	1-1/2	6	1.187	3-3/8			.030	.060	.090	.120	.190	.250	538-1.25024-(RAD)-NS54-C15	898.71	1033.52	1085.19
1-1/4	1-1/2	6	1.187	4-1/8			.030	.060	.090	.120	.190	.250	538-1.25024-(RAD)-NS66-C15	996.53	1146.35	1203.66



MATERIAL	AXIAL		RADIAL		5 FLUTE - 538 SERIES													
	DOC	DOC	DIAMETER															
			1/8				1/4			3/8			1/2					
			SFM	RPM	IPM	CPT	RPM	IPM	CPT	RPM	IPM	CPT	RPM	IPM	CPT			
Med Carbon Steel <375																		
Full Slot	1 x D	1 x D	250	7640	19	0.0005	3820	19	0.0010	2547	23	0.0018	1910	24	0.0025			
30% Radial	1.25 x D	.3 x D	350	10696	32	0.0006	5348	32	0.0012	3565	39	0.0022	2674	40	0.0030			
10% Radial	1.5 X D	.1 x D	500	15280	76	0.001	7640	76	0.0020	5093	92	0.0036	3820	96	0.0050			
Tool Steel <375																		
A2,A6,D2,H13,	Full Slot	1 x D	225	6876	16	0.0005	3438	16	0.0010	2292	20	0.0017	1719	21	0.0024			
	30% Radial	1.25 x D	325	9932	28	0.0006	4966	28	0.0011	3311	34	0.0021	2483	36	0.0029			
	10% Radial	1.5 X D	475	14516	69	0.0010	7258	69	0.0019	4839	83	0.0034	3629	87	0.0048			
Cast Iron- gray <220																		
	Full Slot	1 x D	105	3209	7	0.0005	1604	7	0.0009	1070	9	0.0016	802	9	0.0023			
	30% Radial	1.25 x D	200	6112	17	0.0005	3056	17	0.0011	2037	20	0.0019	1528	21	0.0027			
	10% Radial	1.5 X D	560	17114	77	0.0009	8557	77	0.0018	5705	93	0.0032	4278	97	0.0045			
Cast Iron- gray malleable																		
	Full Slot	.75 x D	155	4737	10	0.0004	2368	10	0.0009	1579	12	0.0015	1184	13	0.0022			
	30% Radial	1.25 x D	180	5501	14	0.0005	2750	14	0.0010	1834	17	0.0019	1375	18	0.0026			
	10% Radial	1.5 x D	300	9168	39	0.0009	4584	39	0.0017	3056	47	0.0031	2292	50	0.0043			
SS 300 Series (303,420)																		
	Full Slot	.75 x D	120	3667	7	0.0004	1834	7	0.0008	1222	9	0.0015	917	9	0.0021			
	30% Radial	1.25 x D	185	5654	14	0.0005	2827	14	0.0010	1885	17	0.0018	1413	17	0.0025			
	10% Radial	1.5 x D	300	9168	37	0.0008	4584	37	0.0016	3056	45	0.0029	2292	47	0.0041			
Martensitic SS (400 grades)																		
	Full Slot	0.5	115	3514	7	0.0004	1757	7	0.0008	1171	8	0.0014	879	9	0.0019			
	30% Radial	1.25 x D	180	5501	13	0.0005	2750	13	0.0009	1834	15	0.0017	1375	16	0.0023			
	10% Radial	1.5 x D	250	7640	30	0.0008	3820	30	0.0015	2547	35	0.0028	1910	37	0.0039			
High Temp Alloys																		
Inconel	Full Slot	.25 x D	60	1834	3	0.0004	917	3	0.0007	611	4	0.0013	458	4	0.0019			
Hastalloy	30% Radial	1.25 x D	80	2445	5	0.0004	1222	5	0.0009	815	6	0.0016	611	7	0.0022			
Waspalloy	10% Radial	1.5 x D	125	3820	14	0.0007	1910	14	0.0015	1273	17	0.0026	955	18	0.0037			
Titanium [6AL4V]																		
Grades (5-38)	Full Slot	0.5	100	3056	5	0.0003	1528	5	0.0007	1019	6	0.0013	764	7	0.0018			
	30% Radial	1.25 x D	135	4126	9	0.0004	2063	9	0.0008	1375	10	0.0015	1031	11	0.0021			
	10% Radial	1.5 x D	220	6723	23	0.0007	3362	23	0.0014	2241	28	0.0025	1681	30	0.0035			

				5/8			3/4			1			
Med Carbon Steel <375				SFM	RPM	IPM	CPT	RPM	IPM	CPT	RPM	IPM	CPT
Full Slot		1 x D	1 x D	250	1528	23	0.0030	1273	21	0.0033	955	21	0.0043
30% Radial		1.25 x D	.3 x D	350	2139	39	0.0036	1783	36	0.0040	1337	35	0.0052
10% Radial		1.5 X D	.1 x D	500	3056	92	0.0060	2547	85	0.0067	1910	83	0.0086
Tool Steel <375													
A2,A6,D2,H13, Full Slot		1 x D	1 x D	225	1375	20	0.0029	1146	18	0.0032	860	18	0.0041
30% Radial		1.25 x D	.3 x D	325	1986	34	0.0034	1655	31	0.0038	1242	31	0.0049
10% Radial		1.5 X D	.1 x D	475	2903	83	0.0057	2419	76	0.0063	1815	75	0.0082
Cast Iron- gray <220													
Full Slot		1 x D	1 x D	105	642	9	0.0027	535	8	0.0030	401	8	0.0039
30% Radial		1.25 x D	.3 x D	200	1222	20	0.0033	1019	18	0.0036	764	18	0.0047
10% Radial		1.5 X D	.1 x D	560	3423	93	0.0055	2852	86	0.0060	2139	83	0.0078
Cast Iron- gray malleable													
Full Slot		.75 x D	1 x D	155	947	12	0.0026	789	11	0.0029	592	11	0.0037
30% Radial		1.25 x D	.3 x D	180	1100	17	0.0031	917	16	0.0034	688	15	0.0044
10% Radial		1.5 x D	.1 x D	300	1834	48	0.0052	1528	44	0.0057	1146	42	0.0074
SS 300 Series (303,420)													
Full Slot		.75 x D	1 x D	120	733	9	0.0025	611	8	0.0027	458	8	0.0035
30% Radial		1.25 x D	.3 x D	185	1131	17	0.0030	942	15	0.0033	707	15	0.0042
10% Radial		1.5 x D	.1 x D	300	1834	45	0.0049	1528	41	0.0054	1146	40	0.0070
Martensitic SS (400 grades)													
Full Slot		0.5	1 x D	115	703	8	0.0023	586	8	0.0026	439	7	0.0033
30% Radial		1.25 x D	.3 x D	180	1100	15	0.0028	917	14	0.0031	688	14	0.0040
10% Radial		1.5 x D	.1 x D	250	1528	36	0.0047	1273	33	0.0051	955	32	0.0067
High Temp Alloys													
Inconel Full Slot		.25 x D	1 x D	60	367	4	0.0022	306	4	0.0024	229	4	0.0032
Hastalloy 30% Radial		1.25 x D	.3 x D	80	489	7	0.0027	407	6	0.0029	306	6	0.0038
Waspalloy 10% Radial		1.5 x D	.1 x D	125	764	17	0.0044	637	16	0.0049	478	15	0.0064
Titanium [6AL4V]													
Grades (5-38) Full Slot		0.5	1 x D	100	611	6	0.0021	509	6	0.0023	382	6	0.0030
30% Radial		1.25 x D	.3 x D	135	825	10	0.0025	688	10	0.0028	516	9	0.0036
10% Radial		1.5 x D	.1 x D	220	1345	28	0.0042	1121	26	0.0046	840	25	0.0060

CPT: Chip per tooth
 Surface feet per
SFM: minute
IPM: Inches per minute
DOC: Depth of cut
FPT: Feed per tooth

SFM= .262 x Dia. X RPM
 RPM= 3.82 x SFM/DIA.
 IPM= FPT x No. Teeth X
 RPM
 FPT= IPM/ (No. Teeth x
 RPM)



7 Flute - Variable Pitch



DIA.	FLUTE LENGTH	OVERALL LENGTH	END STYLE	PART NUMBER	SQUARE LIST PRICE
1/4	3/8	2	SQ	738-25006-C15	63.18
1/4	1/2	2-1/2	SQ	738-25008-C15	71.46
1/4	3/4	2-1/2	SQ	738-25012-C15	73.74
1/4	1-1/4	3	SQ	738-25020-C15	86.94
1/4	1-3/4	4	SQ	738-25028-C15	93.36
5/16	7/16	2	SQ	738-31207-C15	93.06
5/16	13/16	2-1/2	SQ	738-31213-C15	101.82
5/16	1-3/8	3	SQ	738-31222-C15	111.00
5/16	2	4	SQ	738-31232-C15	128.81
3/8	1/2	2	SQ	738-37508-C15	105.40
3/8	7/8	2-1/2	SQ	738-37514-C15	114.90
3/8	1	2-1/2	SQ	738-37516-C15	125.25
3/8	1-1/2	4	SQ	738-37524-C15	136.53
3/8	2-1/2	6	SQ	738-37540-C15	153.17
7/16	9/16	2-1/2	SQ	738-43709-C15	150.03
7/16	1	2-3/4	SQ	738-43716-C15	163.87
7/16	1-1/2	3-1/2	SQ	738-43724-C15	178.62
7/16	2-3/4	5	SQ	738-43744-C15	188.20
1/2	3/4	2-1/2	SQ	738-50012-C15	167.00
1/2	1-1/4	3	SQ	738-50020-C15	182.84
1/2	2	4	SQ	738-50032-C15	198.45
1/2	3-1/4	6	SQ	738-50052-C15	216.33
5/8	3/4	3	SQ	738-62512-C15	182.27
5/8	1-5/8	3-1/2	SQ	738-62526-C15	198.18
5/8	2	5	SQ	738-62532-C15	235.11
5/8	3-1/4	6	SQ	738-62552-C15	268.16
3/4	1	3	SQ	738-75016-C15	215.82
3/4	1-5/8	4	SQ	738-75026-C15	235.29
3/4	2-1/4	5	SQ	738-75036-C15	292.00
3/4	3-1/4	6	SQ	738-75052-C15	317.46
1	1-1/4	4	SQ	738-10020-C15	714.60
1	2	5	SQ	738-10032-C15	778.92
1	3-1/4	6	SQ	738-10052-C15	849.03
1	4-1/8	7	SQ	738-10066-C15	925.45
1-1/4	2	4-1/2	SQ	738-1.25032-C15	857.52
1-1/4	2-5/8	4-1/2	SQ	738-1.25042-C15	934.71
1-1/4	3-1/4	6	SQ	738-1.25052-C15	1018.33
1-1/4	5	7-1/2	SQ	738-1.25080-C15	1110.53



<u>MATERIAL</u>			AXIAL DOC ↓	RADIAL DOC →	7 FLUTE - 738 SERIES												
					DIAMETER												
					1/8			1/4			3/8			1/2			
Med Alloy Steel <375					SFM	RPM	IPM	CPT	RPM	IPM	CPT	RPM	IPM	CPT	RPM	IPM	CPT
10% Radial		1 x D	.1 x D	600	18336	64	0.0005	9168	64	0.0010	6112	77	0.0018	4584	81	0.0025	
5% Radial		1.25 x D	.05 x D	900	27504	116	0.0006	13752	116	0.0012	9168	139	0.0022	6876	146	0.0030	
2% Radial		1.5 X D	.02 x D	1200	36672	257	0.001	18336	257	0.0020	12224	308	0.0036	9168	323	0.0050	
Tool Steel <375																	
A2,A6,D2,H13,		10% Radial	1 x D	.1 x D	500	15280	51	0.0005	7640	51	0.0010	5093	61	0.0017	3820	64	0.0024
		5% Radial	1.25 x D	.05 x D	800	24448	98	0.0006	12224	98	0.0011	8149	117	0.0021	6112	123	0.0029
		2% Radial	1.5 X D	.02 x D	1000	30560	203	0.0010	15280	203	0.0019	10187	244	0.0034	7640	256	0.0048
Cast Iron- gray <220																	
10% Radial		1 x D	.1 x D	700	21392	68	0.0005	10696	68	0.0009	7131	81	0.0016	5348	85	0.0023	
5% Radial		1.25 x D	.05 x D	1000	30560	116	0.0005	15280	116	0.0011	10187	139	0.0019	7640	146	0.0027	
2% Radial		1.5 X D	.02 x D	1300	39728	251	0.0009	19864	251	0.0018	13243	301	0.0032	9932	316	0.0045	
Cast Iron- gray malleable																	
10% Radial		.75 x D	.1 x D	550	16808	50	0.0004	8404	50	0.0009	5603	61	0.0015	4202	64	0.0022	
5% Radial		1.25 x D	.05 x D	800	24448	88	0.0005	12224	88	0.0010	8149	106	0.0019	6112	111	0.0026	
2% Radial		1.5 x D	.02 x D	1000	30560	183	0.0009	15280	183	0.0017	10187	220	0.0031	7640	231	0.0043	
SS 300 Series (303,420)																	
10% Radial		.75 x D	.1 x D	450	13752	39	0.0004	6876	39	0.0008	4584	47	0.0015	3438	49	0.0021	
5% Radial		1.25 x D	.05 x D	650	19864	68	0.0005	9932	68	0.0010	6621	82	0.0018	4966	86	0.0025	
2% Radial		1.5 x D	.02 x D	825	25212	144	0.0008	12606	144	0.0016	8404	172	0.0029	6303	181	0.0041	
Martensitic SS (400 grades)																	
10% Radial		0.5	.1 x D	450	13752	37	0.0004	6876	37	0.0008	4584	45	0.0014	3438	47	0.0019	
5% Radial		1.25 x D	.05 x D	650	19864	65	0.0005	9932	65	0.0009	6621	77	0.0017	4966	81	0.0023	
2% Radial		1.5 x D	.02 x D	825	25212	137	0.0008	12606	137	0.0015	8404	164	0.0028	6303	172	0.0039	
High Temp Alloys																	
Inconel		10% Radial	.25 x D	.1 x D	115	3514	9	0.0004	1757	9	0.0007	1171	11	0.0013	879	11	0.0019
Hastalloy		5% Radial	1.25 x D	.05 x D	170	5195	16	0.0004	2598	16	0.0009	1732	19	0.0016	1299	20	0.0022
Waspalloy		2% Radial	1.5 x D	.02 x D	220	6723	35	0.0007	3362	35	0.0015	2241	42	0.0026	1681	44	0.0037
Titanium [6AL4V]																	
Grades (5-38)		10% Radial	0.5	.1 x D	280	8557	21	0.0003	4278	21	0.0007	2852	25	0.0013	2139	26	0.0018
		5% Radial	1.25 x D	.05 x D	360	11002	32	0.0004	5501	32	0.0008	3667	39	0.0015	2750	41	0.0021
		2% Radial	1.5 x D	.02 x D	450	13752	67	0.0007	6876	67	0.0014	4584	81	0.0025	3438	85	0.0035



Drill Mills

Two Flute - Drill Mill

90 Degree Point



DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/8	1/8	1/2	1-1/2	602-1250	16.10	602-125011	19.47
3/16	3/16	5/8	2	602-1875	19.80	602-187511	24.75
1/4	1/4	3/4	2-1/2	602-2500	23.86	602-250011	32.27
5/16	5/16	13/16	2-1/2	602-3125	32.18	602-312511	43.75
3/8	3/8	1	2-1/2	602-3750	35.90	602-375011	47.45
7/16	7/16	1	2-1/2	602-4375	59.40	602-437511	75.24
1/2	1/2	1	3	602-5000	64.35	602-500011	80.85
5/8	5/8	1-1/4	3-1/2	602-6250	108.90	602-625011	130.35
3/4	3/4	1-1/2	4	602-7500	173.25	602-750011	193.88

Four Flute - Drill Mill

90 Degree Point



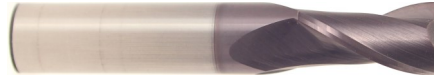
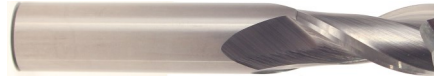
DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/8	1/8	1/2	1-1/2	604-1250	16.10	604-125011	19.47
3/16	3/16	5/8	2	604-1875	19.80	604-187511	24.75
1/4	1/4	3/4	2-1/2	604-2500	23.86	604-250011	32.27
5/16	5/16	13/16	2-1/2	604-3125	32.18	604-312511	43.75
3/8	3/8	1	2-1/2	604-3750	35.90	604-375011	47.45
7/16	7/16	1	2-1/2	604-4375	59.40	604-437511	75.24
1/2	1/2	1	3	604-5000	64.35	604-500011	80.85
5/8	5/8	1-1/4	3-1/2	604-6250	108.90	604-625011	130.35
3/4	3/4	1-1/2	4	604-7500	173.25	604-750011	193.88



End Mills – Two Flute

Two Flute - Square End

Center Cutting



End Mills

412 = STUB	402 = REGULAR	462 = LONG	482 = EXTRA LONG
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DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/64	1/8	1/16	1-1/2	402-0156	18.48	402-0156-11	-
1/32	1/8	1/16	1-1/2	412-0312	9.41	412-0312-11	12.21
1/32	1/8	3/32	1-1/2	402-0312	9.90	402-0312-11	12.84
3/64	1/8	3/32	1-1/2	412-0469	9.41	412-0469-11	12.21
3/64	1/8	1/8	1-1/2	402-0469	9.93	402-0469-11	12.84
1/16	1/8	1/8	1-1/2	412-0625	7.52	412-0625-11	10.33
1/16	1/8	3/16	1-1/2	402-0625	7.23	402-0625-11	10.86
5/64	1/8	1/4	1-1/2	402-0781	7.43	402-0781-11	10.56
3/32	1/8	3/16	1-1/2	412-0938	6.60	412-0938-11	9.37
3/32	1/8	3/8	1-1/2	402-0938	6.93	402-0938-11	9.87
7/64	1/8	3/8	1-1/2	402-1094	6.93	402-1094-11	9.90
1/8	1/8	1/4	1-1/2	412-1250	6.27	412-1250-11	9.08
1/8	1/8	1/2	1-1/2	402-1250	6.60	402-1250-11	9.54
1/8	1/8	3/4	2-1/2	462-1250	13.70	462-1250-11	17.69
1/8	1/8	1	3	482-1250	20.50	482-1250-11	24.50
9/64	3/16	9/16	2	402-1406	15.35	402-1406-11	20.43
5/32	3/16	5/16	2	412-1562	13.96	412-1562-11	18.05
5/32	3/16	9/16	2	402-1562	14.69	402-1562-11	18.98
11/64	3/16	9/16	2	402-1719	15.35	402-1719-11	19.73
3/16	3/16	3/8	2	412-1875	13.58	412-1875-11	17.55
3/16	3/16	5/8	2	402-1875	14.19	402-1875-11	18.48
3/16	3/16	3/4	2-1/2	462-1875	20.00	462-1875-11	25.28
3/16	3/16	1-1/8	3	482-1875	21.45	482-1875-11	26.73
13/64	1/4	5/8	2-1/2	402-2031	19.43	402-2031-11	27.30
7/32	1/4	7/16	2	412-2188	15.11	412-2188-11	20.49
7/32	1/4	5/8	2-1/2	402-2188	17.16	402-2188-11	24.85
15/64	1/4	3/4	2-1/2	402-2344	19.44	402-2344-11	26.93
1/4	1/4	1/2	2	412-2500	13.33	412-2500-11	20.63
1/4	1/4	3/4	2-1/2	402-2500	14.03	402-2500-11	21.77
1/4	1/4	1-1/8	3	462-2500	23.93	462-2500-11	31.61
1/4	1/4	1-1/2	4	482-2500	28.05	482-2500-11	46.83
1/4	1/4	1-1/2	6	482-2501 X6	40.45	482-2501 X6 11	57.91
1/4	1/4	3	6	482-2503 X6	56.93	482-2503 X6 11	74.50
17/64	5/16	7/8	2-1/2	402-2656	23.27	402-2656-11	32.90
9/32	5/16	7/8	2-1/2	402-2812	21.29	402-2812-11	30.62
19/64	5/16	7/8	2-1/2	402-2969	23.27	402-2969-11	31.91



End Mills – Two Flute

Two Flute - Square End

Center Cutting



412 = STUB

402 = REGULAR

462 = LONG

482 = EXTRA LONG

DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
5/16	5/16	1/2	2	412-3125	18.02	412-3125-11	28.31
5/16	5/16	7/8	2-1/2	402-3125	18.98	402-3125-11	29.80
5/16	5/16	1-1/8	3	462-3125	29.70	462-3125-11	40.36
5/16	5/16	1-5/8	4	482-3125	34.65	482-3125-11	46.70
5/16	5/16	1-1/2	6	482-3121 X6	56.49	482-3121 X6-11	81.54
5/16	5/16	3	6	482-3123 X6	69.60	482-3123 X6 11	95.60
21/64	3/8	7/8	2-1/2	402-3281	26.90	402-3281-11	39.34
11/32	3/8	7/8	2-1/2	402-3438	24.75	402-3438-11	35.57
23/64	3/8	7/8	2-1/2	402-3594	26.90	402-3594-11	35.87
3/8	3/8	5/8	2	412-3750	22.90	412-3750-11	33.17
3/8	3/8	7/8	2-1/2	402-3750	24.09	402-3750-11	34.91
3/8	3/8	1-1/8	3	462-3750	41.25	462-3750-11	52.07
3/8	3/8	1-3/4	4	482-3750	45.38	482-3750-11	57.42
3/8	3/8	1-1/2	6	482-3751 X6	61.05	482-3751 X6 11	88.47
3/8	3/8	3	6	482-3753 X6	69.30	482-3753 X6 11	113.74
3/8	3/8	4	7	482-3754 X7	87.25	482-3754 X7 11	131.37
25/64	7/16	7/8	2-1/2	402-3906	42.08	402-3906-11	52.80
13/32	7/16	7/8	2-1/2	402-4062	41.25	402-4062-11	51.98
27/64	7/16	7/8	2-1/2	402-4219	39.60	402-4219-11	49.83
7/16	7/16	5/8	2-1/2	412-4375	31.35	412-4375-11	46.06
7/16	7/16	1	2-1/2	402-4375	34.65	402-4375-11	50.12
7/16	7/16	2	4	462-4375	65.40	462-4375-11	81.25
7/16	7/16	3	6	482-4375	106.12	482-4375-11	122.00
29/64	1/2	1	3	402-4531	46.53	402-4531-11	62.54
15/32	1/2	1	3	402-4688	46.53	402-4688-11	61.88
31/64	1/2	1	3	402-4844	43.73	402-4844-11	61.05
1/2	1/2	5/8	2-1/2	412-5000	39.20	412-5000-11	53.89
1/2	1/2	1	3	402-5000	41.25	402-5000-11	56.73
1/2	1/2	1-1/2	4	462-5001 X4	66.50	462-5001 X4 11	87.45
1/2	1/2	2	4	462-5000	70.69	462-5000-11	90.02
1/2	1/2	3	6	482-5000	110.55	482-5000-11	137.54
1/2	1/2	1-1/2	6	482-5001 X6	98.70	482-5001 X6 11	125.99
1/2	1/2	4	7	482-5004 X7	128.54	482-5004 X7 11	147.13
1/2	1/2	5	8	482-5005 X8	150.55	482-5005 X8 11	188.56
33/64	9/16	1-1/4	3-1/2	402-5156	92.90	402-5156-11	134.21
17/32	9/16	1-1/4	3-1/2	402-5312	92.24	402-5312-11	131.34
35/64	9/16	1-1/4	3-1/2	402-5469	87.45	402-5469-11	124.00
9/16	9/16	1-1/4	3-1/2	402-5625	80.85	402-5625-11	105.00
37/64	5/8	1-1/4	3-1/2	402-5781	96.03	402-5781-11	126.25
19/32	5/8	1-1/4	3-1/2	402-5938	92.40	402-5938-11	124.00
39/64	5/8	1-1/4	3-1/2	402-6094	89.10	402-6094-11	121.67



End Mills – Two Flute

Two Flute - Square End

Center Cutting



412 = STUB

402 = REGULAR

462 = LONG

482 = EXTRA LONG

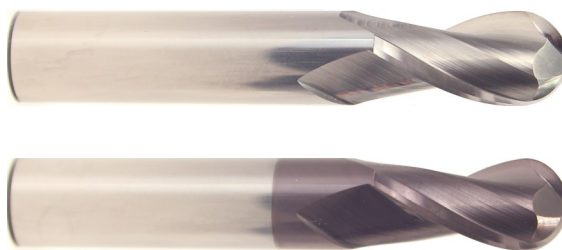
DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
5/8	5/8	3/4	3	412-6250	79.95	412-6250-11	98.65
5/8	5/8	1-1/4	3-1/2	402-6250	84.15	402-6250-11	108.30
5/8	5/8	2-1/4	5	462-6250	128.70	462-6250-11	157.74
5/8	5/8	3	6	482-6250	145.20	482-6250-11	179.05
5/8	5/8	4	7	482-6254 X7	171.50	482-6254 X7 11	194.91
5/8	5/8	5	8	482-6255 X8	210.34	482-6255 X8 11	237.12
5/8	5/8	6	9	482-6256 X9	262.65	482-6256 X9 11	290.53
41/64	3/4	1-1/2	4	402-6406	141.44	402-6406-11	166.72
21/32	3/4	1-1/2	4	402-6562	147.25	402-6562-11	164.01
43/64	3/4	1-1/2	4	402-6719	138.60	402-6719-11	163.68
11/16	3/4	1-1/2	4	402-6875	122.10	402-6875-11	159.72
45/64	3/4	1-1/2	4	402-7031	130.35	402-7031-11	161.87
23/32	3/4	1-1/2	4	402-7188	130.35	402-7188-11	160.71
47/64	3/4	1-1/2	4	402-7344	130.35	402-7344-11	160.28
3/4	3/4	1	3	412-7500	111.31	412-7500-11	137.51
3/4	3/4	1-1/2	4	402-7500	117.15	402-7500-11	144.74
3/4	3/4	2-1/4	5	462-7500	181.50	462-7500-11	214.56
3/4	3/4	3	6	482-7500	201.30	482-7500-11	241.43
3/4	3/4	4	7	482-7504 X7	251.74	482-7504 X7 11	294.95
3/4	3/4	5	8	482-7505 X8	290.40	482-7505 X8 11	321.32
3/4	3/4	6	9	482-7506 X9	317.33	482-7506 X9 11	342.09
3/4	3/4	8	12	482-7508 X12	369.60	482-7508 X12 11	397.33
49/64	7/8	1-1/2	4	402-7656	235.95	402-7656-11	297.66
25/32	7/8	1-1/2	4	402-7812	235.95	402-7812-11	296.40
51/64	7/8	1-1/2	4	402-7969	235.95	402-7969-11	295.12
13/16	7/8	1-1/2	4	402-8125	235.95	402-8125-11	290.40
53/64	7/8	1-1/2	4	402-8281	228.69	402-8281-11	292.22
27/32	7/8	1-1/2	4	402-8438	238.69	402-8438-11	291.32
55/64	7/8	1-1/2	4	402-8594	238.69	402-8594-11	290.40
7/8	7/8	1-1/2	4	402-8750	207.90	402-8750-11	256.18
57/64	1	1-1/2	4	402-8906	243.88	402-8906-11	300.23
29/32	1	1-1/2	4	402-9062	242.88	402-9062-11	298.50
59/64	1	1-1/2	4	402-9219	242.88	402-9219-11	296.77
15/16	1	1-1/2	4	402-9375	232.32	402-9375-11	290.40
61/64	1	1-1/2	4	402-9531	232.32	402-9531-11	288.59
31/32	1	1-1/2	4	402-9688	232.32	402-9688-11	286.74
63/64	1	1-1/2	4	402-9844	232.32	402-9844-11	286.44
1	1	1	3	412-1000	197.34	412-1000-11	246.51
1	1	1-1/2	4	402-1000	212.00	402-1000-11	259.48
1	1	2-1/4	5	462-1000	280.50	462-1000-11	338.45
1	1	3	6	482-1000	379.50	482-1000-11	447.05
1	1	4	7	482-1004 X7	478.50	482-1004 X7 11	555.69
1	1	5	8	482-1005 X8	636.90	482-1005 X8 11	665.10
1	1	6	9	482-1006 X9	739.20	482-1006 X9 11	768.25
1	1	7	10	482-1007 X10	795.30	482-1007 X10 11	831.55
1	1	8	12	482-1008 X12	886.05	482-1008 X12 11	911.11



End Mills – Two Flute

Two Flute—Ball Nose

Center Cutting



412 = STUB

402 = REGULAR

462 = LONG

482 = EXTRA LONG

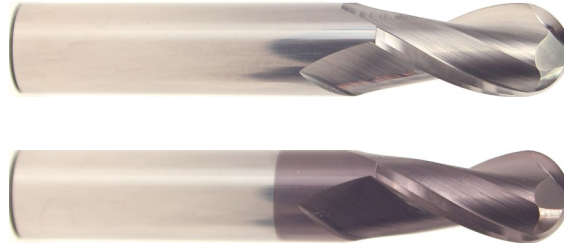
DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER BALL NOSE	UNCOATED LIST PRICE	ALTIN PART NUMBER BALL NOSE	ALTIN LIST PRICE
1/64	1/8	1/16	1-1/2	402-0156-BN	20.15	402-0156-BN11	-
1/32	1/8	1/16	1-1/2	412-0312-BN	14.12	412-0312-BN11	16.90
1/32	1/8	3/32	1-1/2	402-0312-BN	14.85	402-0312-BN11	17.79
3/64	1/8	3/32	1-1/2	412-0469-BN	14.12	412-0469-BN11	16.90
3/64	1/8	1/8	1-1/2	402-0469-BN	14.85	402-0469-BN11	17.79
1/16	1/8	1/8	1-1/2	412-0625-BN	12.54	412-0625-BN11	15.35
1/16	1/8	3/16	1-1/2	402-0625-BN	13.20	402-0625-BN11	16.14
5/64	1/8	1/4	1-1/2	402-0781-BN	13.20	402-0781-BN11	15.05
3/32	1/8	3/16	1-1/2	412-0938-BN	12.54	412-0938-BN11	15.35
3/32	1/8	3/8	1-1/2	402-0938-BN	13.20	402-0938-BN11	16.14
7/64	1/8	3/8	1-1/2	402-1094-BN	13.20	402-1094-BN11	13.86
1/8	1/8	1/4	1-1/2	412-1250-BN	10.03	412-1250-BN11	12.84
1/8	1/8	1/2	1-1/2	402-1250-BN	15.55	402-1250-BN11	13.50
1/8	1/8	3/4	2-1/2	462-1250-BN	22.44	462-1250-BN11	26.43
1/8	1/8	1	3	482-1250-BN	26.60	482-1250-BN11	30.59
9/64	3/16	9/16	2	402-1406-BN	18.15	402-1406-BN11	23.89
5/32	3/16	5/16	2	412-1562-BN	16.65	412-1562-BN11	20.69
5/32	3/16	9/16	2	402-1562-BN	17.49	402-1562-BN11	21.78
11/64	3/16	9/16	2	402-1719-BN	18.15	402-1719-BN11	23.40
3/16	3/16	3/8	2	412-1875-BN	16.63	412-1875-BN11	20.69
3/16	3/16	5/8	2	402-1875-BN	17.49	402-1875-BN11	21.78
3/16	3/16	3/4	2-1/2	462-1875-BN	26.85	462-1875-BN11	32.08
3/16	3/16	1-1/8	3	482-1875-BN	29.50	482-1875-BN11	34.78
13/64	1/4	5/8	2-1/2	402-2031-BN	22.95	402-2031-BN11	31.22
7/32	1/4	5/8	2-1/2	402-2188-BN	21.45	402-2188-BN11	29.14
15/64	1/4	3/4	2-1/2	402-2344-BN	22.95	402-2344-BN11	30.29
1/4	1/4	1/2	2	412-2500-BN	19.14	412-2500-BN11	26.43
1/4	1/4	3/4	2-1/2	402-2500-BN	20.13	402-2500-BN11	27.82
1/4	1/4	1-1/8	3	462-2500-BN	34.75	462-2500-BN11	41.84
1/4	1/4	1-1/2	4	482-2500-BN	38.78	482-2500-BN11	48.41
1/4	1/4	1-1/2	6	482-2501 X6-BN	47.85	482-2501 X6 BN11	64.68
1/4	1/4	3	6	482-2503 X6-BN	63.53	482-2503 X6 BN11	81.10
17/64	5/16	7/8	2-1/2	402-2656-BN	30.03	402-2656-BN11	39.37
9/32	5/16	7/8	2-1/2	402-2812-BN	28.05	402-2812-BN11	37.22
19/64	5/16	7/8	2-1/2	402-2969-BN	30.06	402-2969-BN11	37.98



End Mills – Two Flute

Two Flute - Ball Nose

Center Cutting



412 = STUB	402 = REGULAR	462 = LONG	482 = EXTRA LONG
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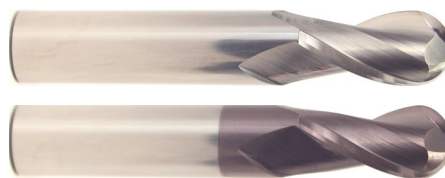
DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART	UNCOATED LIST	ALTIN PART	ALTIN LIST
5/16	5/16	1/2	2	412-3125-BN	24.45	412-3125-BN11	34.75
5/16	5/16	7/8	2-1/2	402-3125-BN	25.74	402-3125-BN11	36.56
5/16	5/16	1-1/8	3	462-3125-BN	58.58	462-3125-BN11	52.73
5/16	5/16	1-5/8	4	482-3125-BN	47.36	482-3125-BN11	59.90
5/16	5/16	1-1/2	6	482-3121 X6-BN	62.70	482-3121 X6-BN11	92.02
5/16	5/16	3	6	482-3123 X6-BN	77.40	482-3123 X6 BN11	95.60
21/64	3/8	7/8	2-1/2	402-3281-BN	33.83	402-3281-BN11	46.13
11/32	3/8	7/8	2-1/2	402-3438-BN	31.35	402-3438-BN11	42.17
23/64	3/8	7/8	2-1/2	402-3594-BN	35.83	402-3594-BN11	44.22
3/8	3/8	5/8	2	412-3750-BN	29.80	412-3750-BN11	40.46
3/8	3/8	7/8	2-1/2	402-3750-BN	31.35	402-3750-BN11	42.17
3/8	3/8	1-1/8	3	462-3750-BN	54.45	462-3750-BN11	65.27
3/8	3/8	1-3/4	4	482-3750-BN	62.70	482-3750-BN11	91.75
3/8	3/8	1-1/2	6	482-3751 X6-BN	81.68	482-3751 X6 BN11	93.62
3/8	3/8	3	6	482-3753 X6-BN	89.92	482-3753 X6 BN11	98.57
3/8	3/8	4	7	482-3754 X7-BN	94.05	482-3754 X7 BN11	113.73
25/64	7/16	7/8	2-1/2	402-3906-BN	52.14	402-3906-BN11	68.41
13/32	7/16	7/8	2-1/2	402-4062-BN	51.15	402-4062-BN11	65.47
27/64	7/16	7/8	2-1/2	402-4219-BN	50.82	402-4219-BN11	63.95
7/16	7/16	5/8	2-1/2	412-4375-BN	45.47	412-4375-BN11	60.16
7/16	7/16	1	2-1/2	402-4375-BN	49.50	402-4375-BN11	64.88
7/16	7/16	2	4	462-4375-BN	79.48	462-4375-BN11	92.96
7/16	7/16	3	6	482-4375-BN	115.50	482-4375-BN11	131.37
29/64	1/2	1	3	402-4531-BN	56.43	402-4531-BN11	75.90
15/32	1/2	1	3	402-4688-BN	55.94	402-4688-BN11	72.60
31/64	1/2	1	3	402-4844-BN	55.94	402-4844-BN11	70.95
1/2	1/2	5/8	2-1/2	412-5000-BN	50.16	412-5000-BN11	64.64
1/2	1/2	1	3	402-5000-BN	52.80	402-5000-BN11	68.27
1/2	1/2	1-1/2	4	462-5001 X4-BN	83.09	462-5001 X4 BN11	99.89
1/2	1/2	2	4	462-5000-BN	87.02	462-5000-BN11	106.36
1/2	1/2	3	6	482-5000-BN	136.95	482-5000-BN11	157.34
1/2	1/2	1-1/2	6	482-5001 X6-BN	122.10	482-5001 X6 BN11	152.39
1/2	1/2	4	7	482-5004 X7-BN	136.95	482-5004 X7 BN11	155.55
1/2	1/2	5	8	482-5005 X8-BN	160.05	482-5005 X8 BN11	198.07
33/64	9/16	1-1/4	3-1/2	402-5156-BN	122.10	402-5156-BN11	152.44
17/32	9/16	1-1/4	3-1/2	402-5312-BN	115.15	402-5312-BN11	158.38
35/64	9/16	1-1/4	3-1/2	402-5469-BN	112.20	402-5469-BN11	144.57
9/16	9/16	1-1/4	3-1/2	402-5625-BN	100.65	402-5625-BN11	124.80
37/64	5/8	1-1/4	3-1/2	402-5781-BN	123.75	402-5781-BN11	143.32
19/32	5/8	1-1/4	3-1/2	402-5938-BN	117.15	402-5938-BN11	142.16
39/64	5/8	1-1/4	3-1/2	402-6094-BN	113.85	402-6094-BN11	141.34



End Mills – Two Flute

Two Flute - Ball End

Center Cutting



412 = STUB

402 = REGULAR

462 = LONG

482 = EXTRA LONG

DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
5/8	5/8	3/4	3	412-6250-BN	95.63	412-6250-BN11	118.57
5/8	5/8	1-1/4	3-1/2	402-6250-BN	100.65	402-6250-BN11	124.81
5/8	5/8	2-1/4	5	462-6250-BN	163.12	462-6250-BN11	192.60
5/8	5/8	3	6	482-6250-BN	191.40	482-6250-BN11	223.58
5/8	5/8	4	7	482-6254 X7-BN	186.45	482-6254 X7 BN11	209.86
5/8	5/8	5	8	482-6255 X8-BN	222.75	482-6255 X8 BN11	249.53
5/8	5/8	6	9	482-6256 X9-BN	278.85	482-6256 X9 BN11	306.74
41/64	3/4	1-1/2	4	402-6406-BN	169.95	402-6406-BN11	251.79
21/32	3/4	1-1/2	4	402-6562-BN	169.95	402-6562-BN11	187.67
43/64	3/4	1-1/2	4	402-6719-BN	168.30	402-6719-BN11	185.13
11/16	3/4	1-1/2	4	402-6875-BN	158.40	402-6875-BN11	183.32
45/64	3/4	1-1/2	4	402-7031-BN	158.40	402-7031-BN11	185.92
23/32	3/4	1-1/2	4	402-7188-BN	158.40	402-7188-BN11	185.86
47/64	3/4	1-1/2	4	402-7344-BN	158.40	402-7344-BN11	193.38
3/4	3/4	1	3	412-7500-BN	131.67	412-7500-BN11	157.87
3/4	3/4	1-1/2	4	402-7500-BN	138.60	402-7500-BN11	166.19
3/4	3/4	2-1/4	5	462-7500-BN	229.35	462-7500-BN11	262.42
3/4	3/4	3	6	482-7500-BN	257.40	482-7500-BN11	296.04
3/4	3/4	4	7	482-7504 X7-BN	316.80	482-7504 X7 BN11	360.90
3/4	3/4	5	8	482-7505 X8-BN	318.45	482-7505 X8 BN11	349.70
3/4	3/4	6	9	482-7506 X9-BN	359.70	482-7506 X9 BN11	384.47
3/4	3/4	8	12	482-7508 X12-BN	400.95	482-7508 X12 BN11	430.27
49/64	7/8	1-1/2	4	402-7656-BN	306.74	402-7656-BN11	357.23
25/32	7/8	1-1/2	4	402-7812-BN	306.74	402-7812-BN11	356.47
51/64	7/8	1-1/2	4	402-7969-BN	306.74	402-7969-BN11	355.74
13/16	7/8	1-1/2	4	402-8125-BN	306.74	402-8125-BN11	356.44
53/64	7/8	1-1/2	4	402-8281-BN	298.00	402-8281-BN11	352.11
27/32	7/8	1-1/2	4	402-8438-BN	298.00	402-8438-BN11	365.30
55/64	7/8	1-1/2	4	402-8594-BN	298.00	402-8594-BN11	352.11
7/8	7/8	1-1/2	4	402-8750-BN	270.60	402-8750-BN11	318.88
57/64	1	1-1/2	4	402-8906-BN	313.00	402-8906-BN11	373.89
29/32	1	1-1/2	4	402-9062-BN	329.50	402-9062-BN11	369.44
59/64	1	1-1/2	4	402-9219-BN	329.50	402-9219-BN11	363.00
15/16	1	1-1/2	4	402-9375-BN	301.12	402-9375-BN11	355.74
61/64	1	1-1/2	4	402-9531-BN	301.12	402-9531-BN11	357.59
31/32	1	1-1/2	4	402-9688-BN	301.12	402-9688-BN11	356.57
63/64	1	1-1/2	4	402-9844-BN	30.12	402-9844-BN11	355.74
1	1	1	3	414-1000 BN	253.61	414-1000-BN11	306.08
1	1	1-1/2	4	402-1000-BN	273.90	402-1000-BN11	322.18
1	1	2-1/4	5	462-1000-BN	356.40	462-1000-BN11	414.35
1	1	3	6	482-1000-BN	445.50	482-1000-BN11	513.05
1	1	4	7	482-1004 X7-BN	554.40	482-1004 X7 BN11	631.55
1	1	5	8	482-1005 X8-BN	671.55	482-1005 X8 BN11	709.68
1	1	6	9	482-1006 X9-BN	790.35	482-1006 X9 BN11	819.41
1	1	7	10	482-1007 X10-BN	839.85	482-1007 X10 BN11	879.08
1	1	8	12	482-1008 X12-BN	925.65	482-1008 X12 BN11	950.71



End Mills – Two Flute - Metric

Two Flute - Square End

Center Cutting



412 = STUB	402 = REGULAR	462 = LONG	482 = EXTRA LONG
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DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1	3	38	402-0394	13.66	402-0394-11	16.81
1.5	5	38	402-0591	13.53	402-0591-11	16.81
2	6	38	402-0787	10.89	402-0787-11	13.68
2.5	7	38	402-0984	10.89	402-0984-11	13.68
3	12	38	402-1181	8.49	402-1181-11	11.41
3	25	75	462-1181	14.70	462-1181-11	18.00
3	25	100	482-1181	21.33	482-1181-11	24.70
3.5	12	50	402-1378	14.82	402-1378-11	17.74
4	14	50	402-1575	14.22	402-1575-11	17.41
4	19	57	462-1575	18.43	462-1575-11	22.29
4	25	75	482-1575	20.43	482-1575-11	23.22
4.5	14	50	402-1772	14.82	402-1772-11	18.22
5	16	50	402-1968	15.97	402-1968-11	19.21
5	25	75	462-1969	20.63	462-1969-11	24.04
5	30	100	482-1969	23.25	482-1969-11	26.57
6	19	63	402-2362	15.68	402-2362-11	19.32
6	25	75	462-2362	25.01	462-2362-11	28.30
6	30	100	482-2362	28.22	482-2362-11	31.40
7	19	63	402-2756	22.28	402-2756-11	25.91
8	19	63	402-3150	20.63	402-3150-11	25.21
8	30	100	462-3150	30.31	462-3150-11	33.23
8	50	150	482-3150	37.80	482-3150-11	43.00
9	22	70	402-3543	37.03	402-3543-11	43.46
10	22	70	402-3937	32.67	402-3937-11	39.45
10	38	100	462-3937	52.09	462-3937-11	57.75
10	75	150	482-3937	75.90	482-3937-11	82.30
11	25	70	402-4331	49.37	402-4331-11	58.83
12	25	75	402-4724	41.25	402-4724-11	50.33
12	50	100	462-4724	73.64	462-4724-11	79.22
12	75	150	482-4724	105.50	482-4724-11	112.20



End Mills – Two Flute - Metric

Two Flute - Square End

Center Cutting



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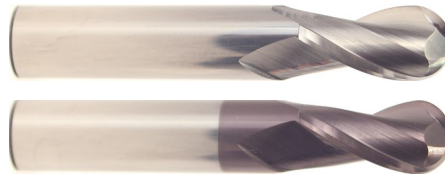
DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART	UNCOATED LIST	ALTIN PART	ALTIN LIST
13	30	88	402-5118	81.97	402-5118-11	89.18
14	30	88	402-5512	76.23	402-5512-11	87.40
14	50	125	462-5512	117.20	462-5512-11	125.40
14	75	150	482-5512	131.03	482-5512-11	139.44
15	32	88	402-5906	109.30	402-5906-11	117.98
16	32	88	402-6299	101.64	402-6299-11	116.26
16	75	150	482-6299	153.00	482-6299-11	161.88
17	36	100	402-6693	124.58	402-6693-11	136.03
18	36	100	402-7087	116.16	402-7087-11	134.48
18	75	150	482-7087	196.35	482-7087-11	207.90
19	38	100	402-7480	149.89	402-7480-11	161.70
20	38	100	402-7874	139.39	402-7874-11	160.03
20	75	150	482-7874	268.95	482-7874-11	313.53
21	38	100	402-8268	183.41	402-8268-11	197.84
22	38	100	402-8661	171.34	402-8661-11	196.00
23	38	100	402-9055	216.48	402-9055-11	231.00
24	38	100	402-9449	235.79	402-9449-11	231.41
25	38	100	402-9843	201.30	402-9843-11	229.37
25	75	150	482-9843	381.15	482-9843-11	394.35



End Mills – Two Flute - Metric

Two Flute - Ball Nose

Center Cutting



412 = STUB

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DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1	3	38	402-0394-BN	15.84	402-0394-BN11	17.42
1.5	5	38	402-0591-BN	15.84	402-0591-BN11	17.42
2	6	38	402-0787-BN	13.07	402-0787-BN11	14.39
2.5	7	38	402-0984-BN	13.67	402-0984-BN11	14.39
3	12	38	402-1181-BN	13.67	402-1181-BN11	14.39
3.5	12	50	402-1378-BN	18.02	402-1378-BN11	19.85
4	14	50	402-1575-BN	17.42	402-1575-BN11	19.21
4.5	14	50	402-1772-BN	18.02	402-1772-BN11	19.87
5	16	50	402-1968-BN	19.17	402-1968-BN11	21.10
6	19	63	402-2362-BN	22.37	402-2362-BN11	24.68
7	19	63	402-2756-BN	34.98	402-2756-BN11	38.48
8	19	63	402-3150-BN	27.50	402-3150-BN11	30.48
9	22	70	402-3543-BN	45.44	402-3543-BN11	49.98
10	22	70	402-3937-BN	41.09	402-3937-BN11	45.18
11	25	70	402-4331-BN	54.45	402-4331-BN11	59.90
12	25	75	402-4724-BN	52.80	402-4724-BN11	58.08
13	30	88	402-5118-BN	79.37	402-5118-BN11	87.29
14	30	88	402-5512-BN	77.55	402-5512-BN11	85.31
15	32	88	402-5906-BN	105.44	402-5906-BN11	114.59
16	32	88	402-6299-BN	103.72	402-6299-BN11	112.43
17	36	100	402-6693-BN	139.84	402-6693-BN11	149.99
18	36	100	402-7087-BN	137.81	402-7087-BN11	148.29
19	38	100	402-7480-BN	173.09	402-7480-BN11	182.24
20	38	100	402-7874-BN	171.34	402-7874-BN11	180.21
21	38	100	402-8268-BN	205.59	402-8268-BN11	219.29
22	38	100	402-8661-BN	203.28	402-8661-BN11	217.01
23	38	100	402-9055-BN	251.46	402-9055-BN11	266.48
24	38	100	402-9449-BN	252.04	402-9449-BN11	267.30
25	38	100	402-9843-BN	249.74	402-9843-BN11	264.81



End Mills – Three Flute

Three Flute - Square End

Center Cutting



DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/32	1/8	3/32	1-1/2	403-0312	9.90	403-0312-11	12.84
3/64	1/8	1/8	1-1/2	403-0469	9.93	403-0469-11	12.84
1/16	1/8	3/16	1-1/2	403-0625	7.92	403-0625-11	10.86
5/64	1/8	1/4	1-1/2	403-0781	7.43	403-0781-11	10.54
3/32	1/8	3/8	1-1/2	403-0938	6.93	403-0938-11	9.87
7/64	1/8	3/8	1-1/2	403-1094	6.93	403-1094-11	9.90
1/8	1/8	1/2	1-1/2	403-1250	6.60	403-1250-11	9.54
9/64	3/16	9/16	2	403-1406	15.35	403-1406-11	20.43
5/32	3/16	9/16	2	403-1562	14.69	403-1562-11	18.98
11/64	3/16	9/16	2	403-1719	15.35	403-1719-11	19.73
3/16	3/16	5/8	2	403-1875	14.19	403-1875-11	18.48
13/64	1/4	5/8	2-1/2	403-2031	19.43	403-2031-11	27.30
7/32	1/4	5/8	2-1/2	403-2188	17.16	403-2188-11	24.85
15/64	1/4	3/4	2-1/2	403-2344	19.44	403-2344-11	26.93
1/4	1/4	3/4	2-1/2	403-2500	14.03	403-2500-11	21.77
17/64	5/16	7/8	2-1/2	403-2656	23.27	403-2656-11	32.90
9/32	5/16	7/8	2-1/2	403-2812	21.29	403-2812-11	30.62
19/64	5/16	7/8	2-1/2	403-2969	23.27	403-2969-11	31.91
5/16	5/16	7/8	2-1/2	403-3125	18.98	403-3125-11	29.80
21/64	3/8	7/8	2-1/2	403-3281	26.90	403-3281-11	39.34
11/32	3/8	7/8	2-1/2	403-3438	24.75	403-3438-11	35.57
23/64	3/8	7/8	2-1/2	403-3594	26.90	403-3594-11	35.87
3/8	3/8	7/8	2-1/2	403-3750	24.09	403-3750-11	35.57
25/64	7/16	7/8	2-1/2	403-3906	42.08	403-3906-11	52.80
13/32	7/16	7/8	2-1/2	403-4062	41.25	403-4062-11	51.98
27/64	7/16	7/8	2-1/2	403-4219	39.60	403-4219-11	49.83
7/16	7/16	1	2-1/2	403-4375	34.65	403-4375-11	50.12
29/64	1/2	1	3	403-4531	46.53	403-4531-11	62.54
15/32	1/2	1	3	403-4688	46.53	403-4688-11	61.88
31/64	1/2	1	3	403-4844	43.73	403-4844-11	61.05
1/2	1/2	1	3	403-5000	41.25	403-5000-11	56.73
9/16	9/16	1-1/4	3-1/2	403-5625	80.85	403-5625-11	105.00
5/8	5/8	1-1/4	3-1/2	403-6250	84.15	403-6250-11	108.30
11/16	3/4	1-1/2	4	403-6875	122.10	403-6875-11	159.72
3/4	3/4	1-1/2	4	403-7500	117.15	403-7500-11	137.51
7/8	7/8	1-1/2	4	403-8750	207.90	403-8750-11	256.18
1	1	1-1/2	4	403-1000	212.00	403-1000-11	259.48



End Mills – Three Flute

Three Flute - Ball Nose

Center Cutting



End Mills

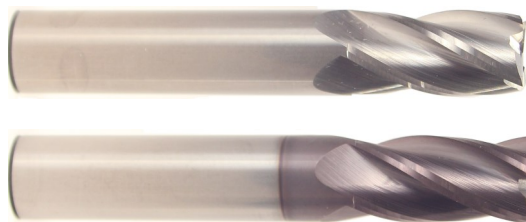
DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/32	1/8	3/32	1-1/2	403-0312-BN	14.85	403-0312-BN11	17.79
3/64	1/8	1/8	1-1/2	403-0469-BN	14.85	403-0469-BN11	17.79
1/16	1/8	3/16	1-1/2	403-0625-BN	13.20	403-0625-BN11	16.14
5/64	1/8	1/4	1-1/2	403-0781-BN	13.20	403-0781-BN11	15.05
3/32	1/8	3/8	1-1/2	403-0938-BN	13.20	403-0938-BN11	16.14
7/64	1/8	3/8	1-1/2	403-1094-BN	13.20	403-1094-BN11	13.86
1/8	1/8	1/2	1-1/2	403-1250-BN	15.55	403-1250-BN11	13.50
9/64	3/16	9/16	2	403-1406-BN	18.15	403-1406-BN11	23.89
5/32	3/16	9/16	2	403-1562-BN	17.49	403-1562-BN11	21.78
11/64	3/16	9/16	2	403-1719-BN	18.15	403-1719-BN11	23.40
3/16	3/16	5/8	2	403-1875-BN	17.49	403-1875-BN11	21.78
13/64	1/4	5/8	2-1/2	403-2031-BN	22.95	403-2031-BN11	31.22
7/32	1/4	5/8	2-1/2	403-2188-BN	21.45	403-2188-BN11	29.14
15/64	1/4	3/4	2-1/2	403-2344-BN	22.95	403-2344-BN11	30.29
1/4	1/4	3/4	2-1/2	403-2500-BN	20.13	403-2500-BN11	27.82
17/64	5/16	7/8	2-1/2	403-2656-BN	30.03	403-2656-BN11	39.37
9/32	5/16	7/8	2-1/2	403-2812-BN	28.05	403-2812-BN11	37.22
19/64	5/16	7/8	2-1/2	403-2969-BN	30.06	403-2969-BN11	37.98
5/16	5/16	7/8	2-1/2	403-3125-BN	25.74	403-3125-BN11	36.56
21/64	3/8	7/8	2-1/2	403-3281-BN	33.83	403-3281-BN11	46.13
11/32	3/8	7/8	2-1/2	403-3438-BN	31.35	403-3438-BN11	42.17
23/64	3/8	7/8	2-1/2	403-3594-BN	35.83	403-3594-BN11	44.22
3/8	3/8	7/8	2-1/2	403-3750-BN	31.35	403-3750-BN11	42.17
25/64	7/16	7/8	2-1/2	403-3906-BN	52.14	403-3906-BN11	68.41
13/32	7/16	7/8	2-1/2	403-4062-BN	51.15	403-4062-BN11	65.47
27/64	7/16	7/8	2-1/2	403-4219-BN	50.82	403-4219-BN11	63.95
7/16	7/16	1	2-1/2	403-4375-BN	49.50	403-4375-BN11	64.88
29/64	1/2	1	3	403-4531-BN	56.43	403-4531-BN11	75.90
15/32	1/2	1	3	403-4688-BN	55.94	403-4688-BN11	72.60
31/64	1/2	1	3	403-4844-BN	55.94	403-4844-BN11	70.95
1/2	1/2	1	3	403-5000-BN	52.80	403-5000-BN11	68.27
9/16	9/16	1-1/4	3-1/2	403-5625-BN	100.65	403-5625-BN11	124.80
5/8	5/8	1-1/4	3-1/2	403-6250-BN	100.65	403-6250-BN11	124.81
11/16	3/4	1-1/2	4	403-6875-BN	158.40	403-6875-BN11	183.32
3/4	3/4	1-1/2	4	403-7500-BN	138.60	403-7500-BN11	166.19
7/8	7/8	1-1/2	4	403-8750-BN	270.60	403-8750-BN11	318.88
1	1	1-1/2	4	403-1000-BN	273.90	403-1000-BN11	322.18



End Mills – Four Flute

Four Flute - Square End

Center Cutting



414 = STUB

404 = REGULAR

464 = LONG

484 = EXTRA LONG

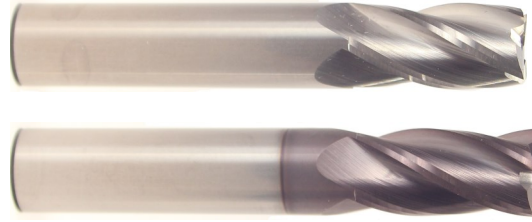
DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/64	1/8	1/16	1-1/2	404-0156	18.48	404-0156-11	-
1/32	1/8	1/16	1-1/2	414-0312	9.41	414-0312-11	12.21
1/32	1/8	3/32	1-1/2	404-0312	9.90	404-0312-11	12.84
3/64	1/8	3/32	1-1/2	414-0469	9.41	414-0469-11	12.21
3/64	1/8	1/8	1-1/2	404-0469	9.93	404-0469-11	12.84
1/16	1/8	1/8	1-1/2	414-0625	7.52	414-0625-11	10.33
1/16	1/8	3/16	1-1/2	404-0625	7.23	404-0625-11	10.86
5/64	1/8	1/4	1-1/2	404-0781	7.43	404-0781-11	10.56
3/32	1/8	3/16	1-1/2	414-0938	6.60	414-0938-11	9.37
3/32	1/8	3/8	1-1/2	404-0938	6.93	404-0938-11	9.87
7/64	1/8	3/8	1-1/2	404-1094	6.93	404-1094-11	9.90
1/8	1/8	1/4	1-1/2	414-1250	6.27	414-1250-11	9.08
1/8	1/8	1/2	1-1/2	404-1250	6.60	404-1250-11	9.54
1/8	1/8	3/4	2-1/2	464-1250	13.70	464-1250-11	17.69
1/8	1/8	1	3	484-1250	20.50	484-1250-11	24.50
9/64	3/16	9/16	2	404-1406	15.35	404-1406-11	20.43
5/32	3/16	5/16	2	414-1562	13.96	414-1562-11	18.05
5/32	3/16	9/16	2	404-1562	14.69	404-1562-11	18.98
11/64	3/16	9/16	2	404-1719	15.35	404-1719-11	19.73
3/16	3/16	3/8	2	414-1875	13.58	414-1875-11	17.55
3/16	3/16	5/8	2	404-1875	14.19	404-1875-11	18.48
3/16	3/16	3/4	2-1/2	464-1875	20.00	464-1875-11	25.28
3/16	3/16	1-1/8	3	484-1875	21.45	484-1875-11	26.73
13/64	1/4	5/8	2-1/2	404-2031	19.43	404-2031-11	27.30
7/32	1/4	7/16	2	414-2188	15.11	414-2188-11	20.49
7/32	1/4	5/8	2-1/2	404-2188	17.16	404-2188-11	24.85
15/64	1/4	3/4	2-1/2	404-2344	19.44	404-2344-11	26.93
1/4	1/4	1/2	2	414-2500	13.33	414-2500-11	20.63
1/4	1/4	3/4	2-1/2	404-2500	14.03	404-2500-11	21.77
1/4	1/4	1-1/8	3	464-2500	23.93	464-2500-11	31.61
1/4	1/4	1-1/2	4	484-2500	28.05	484-2500-11	46.83
1/4	1/4	1-1/2	6	484-2501 X6	40.45	484-2501 X6 11	57.91
1/4	1/4	3	6	484-2503 X6	56.93	484-2503 X6 11	74.50
17/64	5/16	7/8	2-1/2	404-2656	23.27	404-2656-11	32.90
9/32	5/16	7/8	2-1/2	404-2812	21.29	404-2812-11	30.62
19/64	5/16	7/8	2-1/2	404-2969	23.27	404-2969-11	31.91



End Mills – Four Flute

Four Flute - Square End

Center Cutting



414 = STUB	404 = REGULAR	464 = LONG	484 = EXTRA LONG
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DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
5/16	5/16	1/2	2	414-3125	18.02	414-3125-11	28.31
5/16	5/16	7/8	2-1/2	404-3125	18.98	404-3125-11	29.80
5/16	5/16	1-1/8	3	464-3125	29.70	464-3125-11	40.36
5/16	5/16	1-5/8	4	484-3125	34.65	484-3125-11	46.70
5/16	5/16	1-1/2	6	484-3121 X6	56.49	484-3121 X6 11	81.54
5/16	5/16	3	6	484-3123 X6	69.60	484-3123 X6 11	95.60
21/64	3/8	7/8	2-1/2	404-3281	26.90	404-3281-11	39.34
11/32	3/8	7/8	2-1/2	404-3438	24.75	404-3438-11	35.57
23/64	3/8	7/8	2-1/2	404-3594	26.90	404-3594-11	35.87
3/8	3/8	5/8	2	414-3750	22.90	414-3750-11	33.17
3/8	3/8	7/8	2-1/2	404-3750	24.09	404-3750-11	34.91
3/8	3/8	1-1/8	3	464-3750	41.25	464-3750-11	52.07
3/8	3/8	1-3/4	4	484-3750	45.38	484-3750-11	57.42
3/8	3/8	1-1/2	6	484-3751 X6	61.05	484-3751 X6 11	88.47
3/8	3/8	3	6	484-3753 X6	69.30	484-3753 X6 11	113.74
3/8	3/8	4	7	484-3754 X7	87.25	484-3754 X7 11	131.37
25/64	7/16	7/8	2-1/2	404-3906	42.08	404-3906-11	52.80
13/32	7/16	7/8	2-1/2	404-4062	41.25	404-4062-11	51.98
27/64	7/16	7/8	2-1/2	404-4219	39.60	404-4219-11	49.83
7/16	7/16	5/8	2-1/2	414-4375	31.35	414-4375-11	46.06
7/16	7/16	1	2-1/2	404-4375	34.65	404-4375-11	50.12
7/16	7/16	2	4	464-4375	65.40	464-4375-11	81.25
7/16	7/16	3	6	484-4375	106.12	484-4375-11	122.00
29/64	1/2	1	3	404-4531	46.53	404-4531-11	62.54
15/32	1/2	1	3	404-4688	46.53	404-4688-11	61.88
31/64	1/2	1	3	404-4844	43.73	404-4844-11	61.05
1/2	1/2	5/8	2-1/2	414-5000	39.20	414-5000-11	53.89
1/2	1/2	1	3	404-5000	41.25	404-5000-11	56.73
1/2	1/2	1-1/2	4	464-5001 X4	66.50	464-5001 X4 11	87.45
1/2	1/2	2	4	464-5000	70.69	464-5000-11	90.02
1/2	1/2	3	6	484-5000	110.55	484-5000-11	137.54
1/2	1/2	1-1/2	6	484-5001 X6	98.70	484-5001 X6 11	125.99
1/2	1/2	4	7	484-5004 X7	128.54	484-5004 X7 11	147.13
1/2	1/2	5	8	484-5004 X8	150.55	484-5004 X8 11	188.56
33/64	9/16	1-1/4	3-1/2	404-5156	92.90	404-5156-11	134.21
17/32	9/16	1-1/4	3-1/2	404-5312	92.24	404-5312-11	131.34
35/64	9/16	1-1/4	3-1/2	404-5469	87.45	404-5469-11	124.00
9/16	9/16	1-1/4	3-1/2	404-5625	80.85	404-5625-11	105.00
37/64	5/8	1-1/4	3-1/2	404-5781	96.03	404-5781-11	126.25
19/32	5/8	1-1/4	3-1/2	404-5938	92.40	404-5938-11	124.00
39/64	5/8	1-1/4	3-1/2	404-6094	89.10	404-6094-11	121.67



End Mills – Four Flute

Four Flute - Square End

Center Cutting



414 = STUB	404 = REGULAR	464 = LONG	484 = EXTRA LONG
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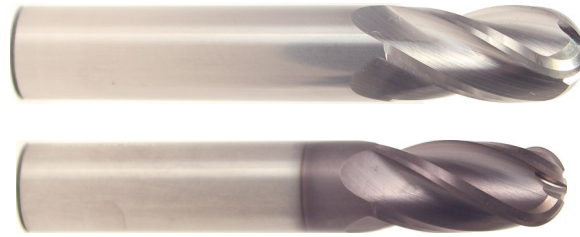
DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTiN PART NUMBER	ALTiN LIST PRICE
5/8	5/8	3/4	3	414-6250	79.95	414-6250-11	98.65
5/8	5/8	1-1/4	3-1/2	404-6250	84.15	404-6250-11	108.30
5/8	5/8	2-1/4	5	464-6250	128.70	464-6250-11	157.74
5/8	5/8	3	6	484-6250	145.20	484-6250-11	179.05
5/8	5/8	4	7	484-6254 X7	171.50	484-6254 X7 11	194.91
5/8	5/8	5	8	484-6255 X8	210.34	484-6255 X8 11	237.12
5/8	5/8	6	9	484-6256 X9	262.65	484-6256 X9 11	290.53
41/64	3/4	1-1/2	4	404-6406	141.44	404-6406-11	166.72
21/32	3/4	1-1/2	4	404-6562	147.25	404-6562-11	164.01
43/64	3/4	1-1/2	4	404-6719	138.60	404-6719-11	163.68
11/16	3/4	1-1/2	4	404-6875	122.10	404-6875-11	159.72
45/64	3/4	1-1/2	4	404-7031	130.35	404-7031-11	161.87
23/32	3/4	1-1/2	4	404-7188	130.35	404-7188-11	160.71
47/64	3/4	1-1/2	4	404-7344	130.35	404-7344-11	160.28
3/4	3/4	1	3	414-7500	111.31	414-7500-11	137.51
3/4	3/4	1-1/2	4	404-7500	117.15	404-7500-11	144.74
3/4	3/4	2-1/4	5	464-7500	181.50	464-7500-11	214.56
3/4	3/4	3	6	484-7500	201.30	484-7500-11	241.43
3/4	3/4	4	7	484-7504 X7	251.74	484-7504 X7 11	294.95
3/4	3/4	5	8	484-7505 X8	290.40	484-7505 X8 11	321.32
3/4	3/4	6	9	484-7506 X9	317.33	484-7506 X9 11	342.09
3/4	3/4	8	12	484-7508 X12	369.60	484-7508 X12 11	397.33
49/64	7/8	1-1/2	4	404-7656	235.95	404-7812-11	297.66
25/32	7/8	1-1/2	4	404-7812	235.95	404-7969-11	296.40
51/64	7/8	1-1/2	4	404-7969	235.95	404-8125-11	295.12
13/16	7/8	1-1/2	4	404-8125	235.95	404-8281-11	290.40
53/64	7/8	1-1/2	4	404-8281	228.69	404-8438-11	292.22
27/32	7/8	1-1/2	4	404-8438	238.69	404-8594-11	291.32
55/64	7/8	1-1/2	4	404-8594	238.69	404-8594-11	290.40
7/8	7/8	1-1/2	4	404-8750	207.90	404-8750-11	256.18
57/64	1	1-1/2	4	404-8906	243.88	404-8906-11	300.23
29/32	1	1-1/2	4	404-9062	242.88	404-9062-11	298.50
59/64	1	1-1/2	4	404-9219	242.88	404-9219-11	296.77
15/16	1	1-1/2	4	404-9375	232.32	404-9375-11	290.40
61/64	1	1-1/2	4	404-9531	232.32	404-9531-11	288.59
31/32	1	1-1/2	4	404-9688	232.32	404-9688-11	286.74
63/64	1	1-1/2	4	404-9844	232.32	404-9844-11	286.44
1	1	1	3	414-1000	197.34	414-1000-11	246.51
1	1	1-1/2	4	404-1000	212.00	404-1000-11	259.48
1	1	2-1/4	5	464-1000	280.50	464-1000-11	338.45
1	1	3	6	484-1000	379.50	484-1000-11	447.05
1	1	4	7	484-1004 X7	478.50	484-1004 X7 11	555.69
1	1	5	8	484-1005 X8	636.90	484-1005 X8 11	665.10
1	1	6	9	484-1006 X9	739.20	484-1006 X9 11	768.25
1	1	7	10	484-1007 X10	795.30	484-1007 X10 11	831.55
1	1	8	12	484-1008 X12	886.05	484-1008 X12 11	911.11



End Mills – Four Flute

Four Flute - Ball Nose

Center Cutting



End Mills

414 = STUB	404 = REGULAR	464 = LONG	484 = EXTRA LONG
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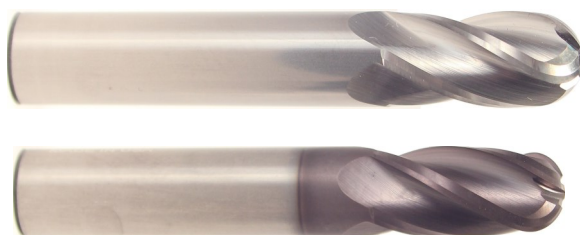
DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/64	1/16	1-1/2	404-0156-BN	20.15	404-0156-BN11	-
1/32	1/16	1-1/2	414-0312-BN	14.12	414-0312-BN11	16.90
1/32	3/32	1-1/2	404-0312-BN	14.85	404-0312-BN11	17.79
3/64	3/32	1-1/2	414-0469-BN	14.12	414-0469-BN11	16.90
3/64	1/8	1-1/2	404-0469-BN	14.85	404-0469-BN11	17.79
1/16	1/8	1-1/2	414-0625-BN	12.54	414-0625-BN11	15.35
1/16	3/16	1-1/2	404-0625-BN	13.20	404-0625-BN11	16.14
5/64	1/4	1-1/2	404-0781-BN	13.20	404-0781-BN11	15.05
3/32	3/16	1-1/2	414-0938-BN	12.54	414-0938-BN11	15.35
3/32	3/8	1-1/2	404-0938-BN	13.20	404-0938-BN11	16.14
7/64	3/8	1-1/2	404-1094-BN	13.20	404-1094-BN11	13.86
1/8	1/4	1-1/2	414-1250-BN	10.03	414-1250-BN11	12.84
1/8	1/2	1-1/2	404-1250-BN	15.55	404-1250-BN11	13.50
1/8	3/4	2-1/2	464-1250-BN	22.44	464-1250-BN11	26.43
1/8	1	3	484-1250-BN	26.60	484-1250-BN11	30.59
9/64	9/16	2	404-1406-BN	18.15	404-1406-BN11	23.89
5/32	5/16	2	414-1562-BN	16.65	414-1562-BN11	20.69
5/32	9/16	2	404-1562-BN	17.49	404-1562-BN11	21.78
11/64	9/16	2	404-1719-BN	18.15	404-1719-BN11	23.40
3/16	3/8	2	414-1875-BN	16.63	414-1875-BN11	20.69
3/16	5/8	2	404-1875-BN	17.49	404-1875-BN11	21.78
3/16	3/4	2-1/2	464-1875-BN	26.85	464-1875-BN11	32.08
3/16	1-1/8	3	484-1875-BN	29.50	484-1875-BN11	34.78
13/64	5/8	2-1/2	404-2031-BN	22.95	404-2031-BN11	31.22
7/32	5/8	2-1/2	404-2188-BN	21.45	404-2188-BN11	29.14
15/64	3/4	2-1/2	404-2344-BN	22.95	404-2344-BN11	30.29
1/4	1/2	2	414-2500-BN	19.14	414-2500-BN11	26.43
1/4	3/4	2-1/2	404-2500-BN	20.13	404-2500-BN11	27.82
1/4	1-1/8	3	464-2500-BN	34.75	464-2500-BN11	41.84
1/4	1-1/2	4	484-2500-BN	38.78	484-2500-BN11	48.41
1/4	1-1/2	6	484-2501 X6-BN	47.85	484-2501 X6 BN11	64.68
1/4	3	6	484-2503 X6-BN	63.53	484-2503 X6 BN11	81.10
17/64	7/8	2-1/2	404-2656-BN	30.03	404-2656-BN11	39.37
9/32	7/8	2-1/2	404-2812-BN	28.05	404-2812-BN11	37.22
19/64	7/8	2-1/2	404-2969-BN	30.06	404-2969-BN11	37.98



End Mills – Four Flute

Four Flute - Ball Nose

Center Cutting



414 = STUB

404 = REGULAR

464 = LONG

484 = EXTRA LONG

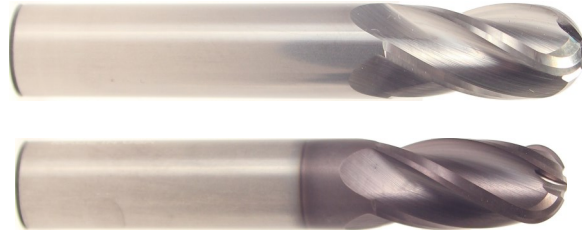
DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
5/16	1/2	2	414-3125-BN	24.45	414-3125-BN11	34.75
5/16	7/8	2-1/2	404-3125-BN	25.74	404-3125-BN11	36.56
5/16	1-1/8	3	464-3125-BN	58.58	464-3125-BN11	52.73
5/16	1-5/8	4	484-3125-BN	47.36	484-3125-BN11	59.90
5/16	1-1/2	6	484-3121 X6-BN	62.70	484-3121 X6 BN11	92.02
5/16	3	6	484-3123 X6-BN	77.40	484-3123 X6 BN11	95.60
21/64	7/8	2-1/2	404-3281-BN	33.83	404-3281-BN11	46.13
11/32	7/8	2-1/2	404-3438-BN	31.35	404-3438-BN11	42.17
23/64	7/8	2-1/2	404-3594-BN	35.83	404-3594-BN11	44.22
3/8	5/8	2	414-3750-BN	29.80	414-3750-BN11	40.46
3/8	7/8	2-1/2	404-3750-BN	31.35	404-3750-BN11	42.17
3/8	1-1/8	3	464-3750-BN	54.45	464-3750-BN11	65.27
3/8	1-3/4	4	484-3750-BN	62.70	484-3750-BN11	91.75
3/8	1-1/2	6	484-3751 X6-BN	81.68	484-3751 X6 BN11	93.62
3/8	3	6	484-3753 X6-BN	89.92	484-3753 X6 BN11	98.57
3/8	4	7	484-3754 X7-BN	94.05	484-3754 X7 BN11	113.73
25/64	7/8	2-1/2	404-3906-BN	52.14	404-3906-BN11	68.41
13/32	7/8	2-1/2	404-4062-BN	51.15	404-4062-BN11	65.47
27/64	7/8	2-1/2	404-4219-BN	50.82	404-4219-BN11	63.95
7/16	5/8	2-1/2	414-4375-BN	45.47	414-4375-BN11	60.16
7/16	1	2-1/2	404-4375-BN	49.50	404-4375-BN11	64.88
7/16	2	4	464-4375-BN	79.48	464-4375-BN11	92.96
7/16	3	6	484-4375-BN	115.50	484-4375-BN11	131.37
29/64	1	3	404-4531-BN	56.43	404-4531-BN11	75.90
15/32	1	3	404-4688-BN	55.94	404-4688-BN11	72.60
31/64	1	3	404-4844-BN	55.94	404-4844-BN11	70.95
1/2	5/8	2-1/2	414-5000-BN	50.16	414-5000-BN11	64.64
1/2	1	3	404-5000-BN	52.80	404-5000-BN11	68.27
1/2	1-1/2	4	464-5001 X4-BN	83.09	464-5001 X4-BN11	99.89
1/2	2	4	464-5000-BN	87.02	464-5000-BN11	106.36
1/2	3	6	484-5000-BN	136.95	484-5000-BN11	157.34
1/2	1-1/2	6	484-5001 X6-BN	122.10	484-5001 X6 BN11	152.39
1/2	4	7	484-5004 X7-BN	136.95	484-5004 X7 BN11	155.55
1/2	5	8	484-5004 X8-BN	160.05	484-5004 X8 BN11	198.07
33/64	1-1/4	3-1/2	404-5156-BN	122.10	404-5156-BN11	152.44
17/32	1-1/4	3-1/2	404-5312-BN	115.15	404-5312-BN11	158.38
35/64	1-1/4	3-1/2	404-5469-BN	112.20	404-5469-BN11	144.57
9/16	1-1/4	3-1/2	404-5625-BN	100.65	404-5625-BN11	124.80
37/64	1-1/4	3-1/2	404-5781-BN	123.75	404-5781-BN11	143.32
19/32	1-1/4	3-1/2	404-5938-BN	117.15	404-5938-BN11	142.16
39/64	1-1/4	3-1/2	404-6094-BN	113.85	404-6094-BN11	141.34



End Mills – Four Flute

Four Flute - Ball Nose

Center Cutting



414 = STUB	404 = REGULAR	464 = LONG	484 = EXTRA LONG
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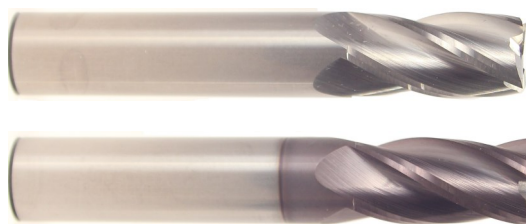
DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTiN PART NUMBER	ALTiN LIST PRICE
5/8	3/4	3	414-6250-BN	95.63	414-6250-BN11	118.57
5/8	1-1/4	3-1/2	404-6250-BN	100.65	404-6250-BN11	124.81
5/8	2-1/4	5	464-6250-BN	163.12	464-6250-BN11	192.60
5/8	3	6	484-6250-BN	191.40	484-6250-BN11	223.58
5/8	4	7	484-6254 X7-BN	186.45	484-6254 X7 BN11	209.86
5/8	5	8	484-6255 X8-BN	222.75	484-6255 X8 BN11	249.53
5/8	6	9	484-6256 X9-BN	278.85	484-6256 X9 BN11	306.74
41/64	1-1/2	4	404-6406-BN	169.95	404-6406-BN11	251.79
21/32	1-1/2	4	404-6562-BN	169.95	404-6562-BN11	187.67
43/64	1-1/2	4	404-6719-BN	168.30	404-6719-BN11	185.13
11/16	1-1/2	4	404-6875-BN	158.40	404-6875-BN11	183.32
45/64	1-1/2	4	404-7031-BN	158.40	404-7031-BN11	185.92
23/32	1-1/2	4	404-7188-BN	158.40	404-7188-BN11	185.86
47/64	1-1/2	4	404-7344-BN	158.40	404-7344-BN11	193.38
3/4	1	3	414-7500-BN	131.67	414-7500-BN11	157.87
3/4	1-1/2	4	404-7500-BN	138.60	404-7500-BN11	166.19
3/4	2-1/4	5	464-7500-BN	229.35	464-7500-BN11	262.42
3/4	3	6	484-7500-BN	257.40	484-7500-BN11	296.04
3/4	4	7	484-7504 X7-BN	316.80	484-7504 X7 BN11	360.90
3/4	5	8	484-7505 X8-BN	318.45	484-7505 X8 BN11	349.70
3/4	6	9	484-7506 X9-BN	359.70	484-7506 X9 BN11	384.47
3/4	8	12	484-7508 X12-BN	400.95	484-7508 X12 BN11	430.27
49/64	1-1/2	4	404-7656-BN	306.74	404-7812-BN11	357.23
25/32	1-1/2	4	404-7812-BN	306.74	404-7969-BN11	356.47
51/64	1-1/2	4	404-7969-BN	306.74	404-8125-BN11	355.74
13/16	1-1/2	4	404-8125-BN	306.74	404-8281-BN11	356.44
53/64	1-1/2	4	404-8281-BN	298.00	404-8438-BN11	352.11
27/32	1-1/2	4	404-8438-BN	298.00	404-8594-BN11	365.30
55/64	1-1/2	4	404-8594-BN	298.00	404-8594-BN11	352.11
7/8	1-1/2	4	404-8750-BN	270.60	404-8750-BN11	318.88
57/64	1-1/2	4	404-8906-BN	313.00	404-8906-BN11	373.89
29/32	1-1/2	4	404-9062-BN	329.50	404-9062-BN11	369.44
59/64	1-1/2	4	404-9219-BN	329.50	404-9219-BN11	363.00
15/16	1-1/2	4	404-9375-BN	301.12	404-9375-BN11	355.74
61/64	1-1/2	4	404-9531-BN	301.12	404-9531-BN11	357.59
31/32	1-1/2	4	404-9688-BN	301.12	404-9688-BN11	356.57
63/64	1-1/2	4	404-9844-BN	30.12	404-9844-BN11	355.74
1	1	3	414-1000-BN	253.61	414-1000-BN11	306.08
1	1-1/2	4	404-1000-BN	273.90	404-1000-BN11	322.18
1	2-1/4	5	464-1000-BN	356.40	464-1000-BN11	414.35
1	3	6	484-1000-BN	445.50	484-1000-BN11	513.05
1	4	7	484-1004 X7-BN	554.40	484-1004 X7 BN11	631.55
1	5	8	484-1005 X8-BN	671.55	484-1005 X8 BN11	709.68
1	6	9	484-1006 X9-BN	790.35	484-1006 X9 BN11	819.41
1	7	10	484-1007 X10-BN	839.85	484-1007 X10 BN11	879.08
1	8	12	484-1008 X12-BN	925.65	484-1008 X12 BN11	950.71



End Mills – Four Flute - Metric

Four Flute - Square End

Center Cutting



414 = STUB

404 = REGULAR

464 = LONG

484 = EXTRA LONG

DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1	3	38	404-0394	13.66	404-0394-11	16.81
1.5	5	38	404-0591	13.53	404-0591-11	16.81
2	6	38	404-0787	10.89	404-0787-11	13.68
2.5	7	38	404-0984	10.89	404-0984-11	13.68
3	12	38	404-1181	8.49	404-1181-11	11.41
3	25	75	464-1181	14.70	464-1181-11	18.00
3	25	100	484-1181	21.33	484-1181-11	24.70
3.5	12	50	404-1378	14.82	404-1378-11	17.74
4	14	50	404-1575	14.22	404-1575-11	17.41
4	19	57	464-1575	18.43	464-1575-11	22.29
4	25	75	484-1575	20.43	484-1575-11	23.22
4.5	14	50	404-1772	14.82	404-1772-11	18.22
5	16	50	404-1968	15.97	404-1968-11	19.21
5	25	75	464-1968	20.63	464-1968-11	24.04
5	30	100	484-1968	23.25	484-1968-11	26.57
6	19	63	404-2362	15.68	404-2362-11	19.32
6	25	75	464-2362	25.01	464-2362-11	28.30
6	30	100	484-2362	28.22	484-2362-11	31.40
7	19	63	404-2756	22.28	404-2756-11	25.91
8	19	63	404-3150	20.63	404-3150-11	25.21
8	30	100	464-3150	30.31	464-3150-11	33.23
8	50	150	484-3150	37.80	484-3150-11	43.00
9	22	70	404-3543	37.03	404-3543-11	43.46
10	22	70	404-3937	32.67	404-3937-11	39.45
10	38	100	464-3937	52.09	464-3937-11	57.75
10	75	150	484-3937	75.90	484-3937-11	82.30
11	25	70	404-4331	49.37	404-4331-11	58.83
12	25	75	404-4724	41.25	404-4724-11	50.33
12	50	100	464-4724	73.64	464-4724-11	79.22
12	75	150	484-4724	105.50	484-4724-11	112.20



End Mills – Four Flute - Metric

Four Flute - Square End

Center Cutting



414 = STUB	404 = REGULAR	464 = LONG	484 = EXTRA LONG
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DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
13	30	88	404-5118	81.97	404-5118-11	89.18
14	30	88	404-5512	76.23	404-5512-11	87.40
14	50	125	464-5512	117.20	464-5512-11	125.40
14	75	150	484-5512	131.03	484-5512-11	139.44
15	32	88	404-5906	109.30	404-5906-11	117.98
16	32	88	404-6299	101.64	404-6299-11	116.26
16	75	150	484-6299	153.00	484-6299-11	161.88
17	36	100	404-6693	124.58	404-6693-11	136.03
18	36	100	404-7087	116.16	404-7087-11	134.48
18	75	150	484-7087	196.35	484-7087-11	207.90
19	38	100	404-7480	149.89	404-7480-11	161.70
20	38	100	404-7874	139.39	404-7874-11	160.03
20	75	150	484-7874	268.95	484-7874-11	313.53
21	38	100	404-8268	183.41	404-8268-11	197.84
22	38	100	404-8661	171.34	404-8661-11	196.00
23	38	100	404-9055	216.48	404-9055-11	231.00
24	38	100	404-9449	235.79	404-9449-11	231.41
25	38	100	404-9843	201.30	404-9843-11	229.37
25	75	150	484-9843	381.15	484-9843-11	394.35



End Mills – Four Flute - Metric

Four Flute - Ball Nose

Center Cutting
Solid Micro-Grain Carbide



414 = STUB

404 = REGULAR

464 = LONG

484 = EXTRA LONG

DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1	3	38	404-0394-BN	15.84	404-0394-BN11	17.42
1.5	5	38	404-0591-BN	15.84	404-0591-BN11	17.42
2	6	38	404-0787-BN	13.07	404-0787-BN11	14.39
2.5	7	38	404-0984-BN	13.67	404-0984-BN11	14.39
3	12	38	404-1181-BN	13.67	404-1181-BN11	14.39
3.5	12	50	404-1378-BN	18.02	404-1378-BN11	19.85
4	14	50	404-1575-BN	17.42	404-1575-BN11	19.21
4.5	14	50	404-1772-BN	18.02	404-1772-BN11	19.87
5	16	50	404-1968-BN	19.17	404-1968-BN11	21.10
6	19	63	404-2362-BN	22.37	404-2362-BN11	24.68
7	19	63	404-2756-BN	34.98	404-2756-BN11	38.48
8	19	63	404-3150-BN	27.50	404-3150-BN11	30.48
9	22	70	404-3543-BN	45.44	404-3543-BN11	49.98
10	22	70	404-3937-BN	41.09	404-3937-BN11	45.18
11	25	70	404-4331-BN	54.45	404-4331-BN11	59.90
12	25	75	404-4724-BN	52.80	404-4724-BN11	58.08
13	30	88	404-5118-BN	79.37	404-5118-BN11	87.29
14	30	88	404-5512-BN	77.55	404-5512-BN11	85.31
15	32	88	404-5906-BN	105.44	404-5906-BN11	114.59
16	32	88	404-6299-BN	103.72	404-6299-BN11	112.43
17	36	100	404-6693-BN	139.84	404-6693-BN11	149.99
18	36	100	404-7087-BN	137.81	404-7087-BN11	148.29
19	38	100	404-7480-BN	173.09	404-7480-BN11	182.24
20	38	100	404-7874-BN	171.34	404-7874-BN11	180.21
21	38	100	404-8268-BN	205.59	404-8268-BN11	219.29
22	38	100	404-8661-BN	203.28	404-8661-BN11	217.01
23	38	100	404-9055-BN	251.46	404-9055-BN11	266.48
24	38	100	404-9449-BN	252.04	404-9449-BN11	267.30
25	38	100	404-9843-BN	249.74	404-9843-BN11	264.81



End Mills – Corner Radius

Corner Radius

Two Flute Single End
Center Cutting



CUTTING DIA.	CORNER RADIUS	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/8	.015	1/2	1-1/2	495-1251	11.62	495-1251-11	14.55
3/16	.020	5/8	2	495-1872	19.31	495-1872-11	23.53
3/16	.030	5/8	2	495-1873	19.31	495-1873-11	23.53
1/4	.020	3/4	2-1/2	495-2502	18.71	495-2502-11	29.83
1/4	.030	3/4	2-1/2	495-2503	18.71	495-2503-11	29.83
1/4	.045	3/4	2-1/2	495-2504	18.71	495-2504-11	29.83
5/16	.020	7/8	2-1/2	495-3122	28.31	495-3122-11	39.14
5/16	.030	7/8	2-1/2	495-3123	28.31	495-3123-11	39.14
5/16	.045	7/8	2-1/2	495-3124	28.31	495-3124-11	39.14
3/8	.020	1	2-1/2	495-3752	34.49	495-3752-11	45.31
3/8	.030	1	2-1/2	495-3753	34.49	495-3753-11	45.31
3/8	.045	1	2-1/2	495-3754	34.49	495-3754-11	45.31
1/2	.020	1	3	495-5002	58.08	495-5002-11	73.56
1/2	.030	1	3	495-5003	58.08	495-5003-11	73.56
1/2	.045	1	3	495-5004	58.08	495-5004-11	73.56
1/2	.060	1	3	495-5006	58.08	495-5006-11	73.56
5/8	.020	1-1/4	3-1/2	495-6252	110.72	495-6252-11	134.87
5/8	.030	1-1/4	3-1/2	495-6253	110.72	495-6253-11	134.87
5/8	.045	1-1/4	3-1/2	495-6254	110.72	495-6254-11	134.87
5/8	.060	1-1/4	3-1/2	495-6256	110.72	495-6256-11	134.87
5/8	.090	1-1/4	3-1/2	495-6259	110.72	495-6259-11	134.87
3/4	.020	1-1/2	4	495-7502	152.49	495-7502-11	180.05
3/4	.030	1-1/2	4	495-7503	152.49	495-7503-11	180.05
3/4	.045	1-1/2	4	495-7504	152.49	495-7504-11	180.05
3/4	.060	1-1/2	4	495-7506	152.49	495-7506-11	180.05
3/4	.090	1-1/2	4	495-7509	152.49	495-7509-11	180.05
3/4	.125	1-1/2	4	495-7500	152.49	495-7500-11	180.05
1	.020	1-1/2	4	495-1002	273.90	495-1002-11	316.57
1	.030	1-1/2	4	495-1003	273.90	495-1003-11	316.57
1	.045	1-1/2	4	495-1004	273.90	495-1004-11	316.57
1	.060	1-1/2	4	495-1006	273.90	495-1006-11	316.57
1	.090	1-1/2	4	495-1009	273.90	495-1009-11	316.57
1	.125	1-1/2	4	495-1000	273.90	495-1000-11	316.57

Other Radius sizes available on request.



End Mills – Corner Radius

Corner Radius

Four Flute Single End
Center Cutting



CUTTING DIA.	CORNER RADIUS	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/8	.015	1/2	1-1/2	496-1251	11.62	496-1251-11	14.55
3/16	.020	5/8	2	496-1872	19.31	496-1872-11	23.53
3/16	.030	5/8	2	496-1873	19.31	496-1873-11	23.53
1/4	.020	3/4	2-1/2	496-2502	18.71	496-2502-11	29.83
1/4	.030	3/4	2-1/2	496-2503	18.71	496-2503-11	29.83
1/4	.045	3/4	2-1/2	496-2504	18.71	496-2504-11	29.83
5/16	.020	7/8	2-1/2	496-3122	28.31	496-3122-11	39.14
5/16	.030	7/8	2-1/2	496-3123	28.31	496-3123-11	39.14
5/16	.045	7/8	2-1/2	496-3124	28.31	496-3124-11	39.14
3/8	.020	1	2-1/2	496-3752	34.49	496-3752-11	45.31
3/8	.030	1	2-1/2	496-3753	34.49	496-3753-11	45.31
3/8	.045	1	2-1/2	496-3754	34.49	496-3754-11	45.31
1/2	.020	1	3	496-5002	58.08	496-5002-11	73.56
1/2	.030	1	3	496-5003	58.08	496-5003-11	73.56
1/2	.045	1	3	496-5004	58.08	496-5004-11	73.56
1/2	.060	1	3	496-5006	58.08	496-5006-11	73.56
5/8	.020	1-1/4	3-1/2	496-6252	110.72	496-6252-11	134.87
5/8	.030	1-1/4	3-1/2	496-6253	110.72	496-6253-11	134.87
5/8	.045	1-1/4	3-1/2	496-6254	110.72	496-6254-11	134.87
5/8	.060	1-1/4	3-1/2	496-6256	110.72	496-6256-11	134.87
5/8	.090	1-1/4	3-1/2	496-6259	110.72	496-6259-11	134.87
3/4	.020	1-1/2	4	496-7502	152.49	496-7502-11	180.05
3/4	.030	1-1/2	4	496-7503	152.49	496-7503-11	180.05
3/4	.045	1-1/2	4	496-7504	152.49	496-7504-11	180.05
3/4	.060	1-1/2	4	496-7506	152.49	496-7506-11	180.05
3/4	.090	1-1/2	4	496-7509	152.49	496-7509-11	180.05
3/4	.125	1-1/2	4	496-7500	152.49	496-7500-11	180.05
1	.020	1-1/2	4	496-1002	273.90	496-1002-11	316.57
1	.030	1-1/2	4	496-1003	273.90	496-1003-11	316.57
1	.045	1-1/2	4	496-1004	273.90	496-1004-11	316.57
1	.060	1-1/2	4	496-1006	273.90	496-1006-11	316.57
1	.090	1-1/2	4	496-1009	273.90	496-1009-11	316.57
1	.125	1-1/2	4	496-1000	273.90	496-1000-11	316.57

Other Radius sizes available on request.



End Mills – Five Flute

Five Flute 45 Degree

A five flute design with 45 degree helix for faster production rates from a freer cutting harmonically balanced odd number of flutes. Increase chip flow over a six flute end mill for finishing and medium to light peripheral roughing in steels, stainless steels, titanium and high temp alloys.



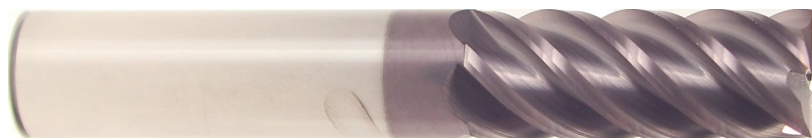
545 = REGULAR	545L = LONG	545XL = EXTRA LONG
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CUTTING DIA.	FLUTE LENGTH	OVERALL LENGTH	ALTIN PART NUMBER	ALTIN LIST PRICE
1/4	3/4	2-1/2	545-250011	28.88
1/4	1-1/8	3	545L250011	44.29
1/4	1-1/2	4	545XL250011	52.73
5/16	3/4	2-1/2	545-312511	41.75
5/16	1-1/8	3	545L312511	56.53
5/16	1-5/8	4	545XL312511	65.37
3/8	1	2-1/2	545-375011	46.43
3/8	1-1/8	3	545L375011	72.93
3/8	1-3/4	4	545XL375011	80.39
7/16	1-3/16	2-3/4	545-437511	61.05
1/2	1-1/4	3	545-500011	75.44
1/2	2	4	545L500011	126.06
1/2	3	6	545XL500011	192.59
5/8	1-5/8	3-1/2	545-625011	144.04
5/8	2-1/4	5	545L625011	220.83
5/8	3	6	545XL625011	250.64
3/4	1-5/8	4	545-750011	192.49
3/4	2-1/4	5	545L750011	300.40
3/4	3	6	545XL750011	338.25
1	2	4	545-1000	345.11
1	2-1/2	5	545L1000	506.55
1	3-1/4	6	545XL1000	626.54
1	4	7	545XXL1000	777.98



End Mills – Six Flute

Six Flute
45 Degree



646 = REGULAR

646L = LONG

646XL = EXTRA LONG

CUTTING DIA.	FLUTE LENGTH	OVERALL LENGTH	ALTIN PART NUMBER	ALTIN LIST PRICE
1/4	3/4	2-1/2	646-250011	28.88
1/4	1-1/8	3	646L250011	44.29
1/4	1-1/2	4	646XL250011	52.73
5/16	3/4	2-1/2	646-312511	41.75
5/16	1-1/8	3	646L312511	56.53
5/16	1-5/8	4	646XL312511	65.37
3/8	1	2-1/2	646-375011	46.43
3/8	1-1/8	3	646L375011	72.93
3/8	1-3/4	4	646XL375011	80.39
7/16	1-3/16	2-3/4	646-437511	61.05
1/2	1-1/4	3	646-500011	75.44
1/2	2	4	646L500011	126.06
1/2	3	6	646XL500011	192.59
5/8	1-5/8	3-1/2	646-625011	144.04
5/8	2-1/4	5	646L625011	220.83
5/8	3	6	646XL625011	250.64
3/4	1-5/8	4	646-750011	192.49
3/4	2-1/4	5	646L750011	300.40
3/4	3	6	646XL750011	338.25
1	2	4	646-1000	345.11
1	2-1/2	5	646L1000	506.55
1	3-1/4	6	646XL1000	626.54
1	4	7	646XXL1000	777.98



End Mills – Two Flute

Double End

Two Flute Double End - Square End

Center Cutting



End Mills

422 – STUB

442 - REGULAR

DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/32	1/16	1-1/2	422-0312	14.85	422-0312-11	16.50
3/64	3/32	1-1/2	422-0469	14.85	422-0469-11	16.50
1/16	1/8	1-1/2	422-0625	13.20	422-0625-11	14.85
3/32	3/16	1-1/2	422-0938	12.54	422-0938-11	14.19
1/8	1/4	1-1/2	422-1250	11.88	422-1250-11	13.53
1/8	3/8	3-1/16	442-1250	46.20	442-1250-11	52.80
5/32	5/16	2	422-1562	18.15	422-1562-11	22.44
5/32	7/16	3-1/8	442-1562	45.54	442-1562-11	52.80
3/16	5/16	2	422-1875	17.33	422-1875-11	21.45
3/16	1/2	3-1/4	442-1875	44.55	442-1875-11	51.98
7/32	3/8	2-1/2	422-2188	20.46	422-2188-11	28.05
7/32	9/16	3-1/2	442-2188	44.55	442-2188-11	51.98
1/4	1/2	2-1/2	422-2500	20.13	422-2500-11	27.06
1/4	5/8	3-1/2	442-2500	44.55	442-2500-11	51.98
5/16	1/2	2-1/2	422-3125	24.09	422-3125-11	33.66
5/16	3/4	3-1/2	442-3125	46.86	442-3125-11	54.62
11/32	3/4	3-1/2	442-3438	50.16	442-3438-11	57.92
3/8	9/16	2-1/2	422-3750	31.35	422-3750-11	41.25
3/8	3/4	3-1/2	442-3750	49.50	442-3750-11	57.26
7/16	9/16	2-3/4	422-4375	47.85	422-4375-11	61.05
7/16	7/8	4	442-4375	75.90	442-4375-11	84.48
1/2	5/8	3	422-5000	52.80	422-5000-11	62.70
1/2	1	4	442-5000	69.30	442-5000-11	80.85



End Mills – Two Flute

Double End

Two Flute Double End - Ball Nose

Center Cutting



422 – STUB

442 - REGULAR

DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/32	1/16	1-1/2	422-0312-BN	26.40	422-0312-BN11	28.05
3/64	3/32	1-1/2	422-0469-BN	26.40	422-0469-BN11	28.05
1/16	1/8	1-1/2	422-0625-BN	23.76	422-0625-BN11	26.40
3/32	3/16	1-1/2	422-0938-BN	23.10	422-0938-BN11	26.40
1/8	1/4	1-1/2	422-1250-BN	22.44	422-1250-BN11	25.74
1/8	3/8	3-1/16	442-1250-BN	56.10	442-1250-BN11	62.70
5/32	5/16	2	422-1562-BN	26.40	422-1562-BN11	30.69
5/32	7/16	3-1/8	442-1562-BN	56.10	442-1562-BN11	63.53
3/16	5/16	2	422-1875-BN	25.74	422-1875-BN11	29.70
3/16	1/2	3-1/4	442-1875-BN	54.45	442-1875-BN11	61.88
7/32	3/8	2-1/2	422-2188-BN	27.39	422-2188-BN11	34.65
7/32	9/16	3-1/2	442-2188-BN	54.45	442-2188-BN11	61.88
1/4	1/2	2-1/2	422-2500-BN	26.73	422-2500-BN11	33.00
1/4	5/8	3-1/2	442-2500-BN	54.45	442-2500-BN11	61.88
5/16	1/2	2-1/2	422-3125-BN	29.70	422-3125-BN11	39.60
5/16	3/4	3-1/2	442-3125-BN	62.70	442-3125-BN11	70.46
11/32	3/4	3-1/2	442-3438-BN	62.70	442-3438-BN11	71.12
3/8	9/16	2-1/2	422-3750-BN	46.20	422-3750-BN11	56.01
3/8	3/4	3-1/2	442-3750-BN	62.70	442-3750-BN11	70.46
7/16	9/16	2-3/4	422-4375-BN	59.40	422-4375-BN11	72.60
7/16	7/8	4	442-4375-BN	92.40	442-4375-BN11	100.98
1/2	5/8	3	422-5000-BN	69.30	422-5000-BN11	82.50
1/2	1	4	442-5000-BN	89.10	442-5000-BN11	100.65



End Mills – Four Flute

Double End

Four Flute Double End - Square End

Center Cutting



424 – STUB

444 - REGULAR

DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/32	1/16	1-1/2	424-0312	14.85	424-0312-11	16.50
3/64	3/32	1-1/2	424-0469	14.85	424-0469-11	16.50
1/16	1/8	1-1/2	424-0625	13.20	424-0625-11	14.85
3/32	3/16	1-1/2	424-0938	12.54	424-0938-11	14.19
1/8	1/4	1-1/2	424-1250	11.88	424-1250-11	13.53
1/8	3/8	3-1/16	444-1250	46.20	444-1250-11	52.80
5/32	5/16	2	424-1562	18.15	424-1562-11	22.44
5/32	7/16	3-1/8	444-1562	45.54	444-1562-11	52.80
3/16	5/16	2	424-1875	17.33	424-1875-11	21.45
3/16	1/2	3-1/4	444-1875	44.55	444-1875-11	51.98
7/32	3/8	2-1/2	424-2188	20.46	424-2188-11	28.05
7/32	9/16	3-1/2	444-2188	44.55	444-2188-11	51.98
1/4	1/2	2-1/2	424-2500	20.13	424-2500-11	27.06
1/4	5/8	3-1/2	444-2500	44.55	444-2500-11	51.98
5/16	1/2	2-1/2	424-3125	24.09	424-3125-11	33.66
5/16	3/4	3-1/2	444-3125	46.86	444-3125-11	54.62
11/32	3/4	3-1/2	444-3438	50.16	444-3438-11	57.92
3/8	9/16	2-1/2	424-3750	31.35	424-3750-11	41.25
3/8	3/4	3-1/2	444-3750	49.50	444-3750-11	57.26
7/16	9/16	2-3/4	424-4375	47.85	424-4375-11	61.05
7/16	7/8	4	444-4375	75.90	444-4375-11	84.48
1/2	5/8	3	424-5000	52.80	424-5000-11	62.70
1/2	1	4	444-5000	69.30	444-5000-11	80.85



End Mills – Four Flute

Double End

Four Flute Double End - Ball Nose

Center Cutting



424 – STUB

444 - REGULAR

DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/32	1/16	1-1/2	424-0312-BN	26.40	424-0312-BN11	28.05
3/64	3/32	1-1/2	424-0469-BN	26.40	424-0469-BN11	28.05
1/16	1/8	1-1/2	424-0625-BN	23.76	424-0625-BN11	26.40
3/32	3/16	1-1/2	424-0938-BN	23.10	424-0938-BN11	26.40
1/8	1/4	1-1/2	424-1250-BN	22.44	424-1250-BN11	25.74
1/8	3/8	3-1/16	444-1250-BN	56.10	444-1250-BN11	62.70
5/32	5/16	2	424-1562-BN	26.40	424-1562-BN11	30.69
5/32	7/16	3-1/8	444-1562-BN	56.10	444-1562-BN11	63.53
3/16	5/16	2	424-1875-BN	25.74	424-1875-BN11	29.70
3/16	1/2	3-1/4	444-1875-BN	54.45	444-1875-BN11	61.88
7/32	3/8	2-1/2	424-2188-BN	27.39	424-2188-BN11	34.65
7/32	9/16	3-1/2	444-2188-BN	54.45	444-2188-BN11	61.88
1/4	1/2	2-1/2	424-2500-BN	26.73	424-2500-BN11	33.00
1/4	5/8	3-1/2	444-2500-BN	54.45	444-2500-BN11	61.88
5/16	1/2	2-1/2	424-3125-BN	29.70	424-3125-BN11	39.60
5/16	3/4	3-1/2	444-3125-BN	62.70	444-3125-BN11	70.46
11/32	3/4	3-1/2	444-3438-BN	62.70	444-3438-BN11	71.12
3/8	9/16	2-1/2	424-3750-BN	46.20	424-3750-BN11	56.01
3/8	3/4	3-1/2	444-3750-BN	62.70	444-3750-BN11	70.46
7/16	9/16	2-3/4	424-4375-BN	59.40	424-4375-BN11	72.60
7/16	7/8	4	444-4375-BN	92.40	444-4375-BN11	100.98
1/2	5/8	3	424-5000-BN	69.30	424-5000-BN11	82.50
1/2	1	4	444-5000-BN	89.10	444-5000-BN11	100.65



End Mills—Long Reach

Two Flute Single End - Necked

Square End



DIA.	FLUTE LENGTH	OVERALL LENGTH	LBS	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
3/16	3/8	3	1-5/8	592-1875	75.93	592-187511	83.97
1/4	3/8	4	2-1/8	592-2500	86.46	592-250011	98.75
5/16	7/16	4	2-1/8	592-3125	97.75	592-312511	110.03
3/8	1/2	4	2-1/8	592-3750	105.90	592-375011	118.21
1/2	5/8	6	3-3/8	592L5000	147.81	592L500011	171.81
1/2	5/8	4	2-1/8	592-5000	122.89	592-500011	146.90
5/8	3/4	6	3-3/8	592L6250	244.96	592L625011	272.12
5/8	3/4	6	2-3/8	592-6250	230.97	592-625011	258.40
3/4	1	6	2-1/2	592L7500	321.22	592L750011	354.78
3/4	1	6	2-1/2	592--7500	302.61	592-750011	336.15
1	1-1/4	6	3-3/8	592--1000	535.16	592-100011	580.62
1	1-1/4	7	4-3/8	592L1000	465.60	592L100011	508.23

Two Flute Single End - Necked

Ball Nose



DIA.	FLUTE LENGTH	OVERALL LENGTH	LBS	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
3/16	3/8	3	1-5/8	592-1875 BN	82.22	592-1875 BN11	89.50
1/4	3/8	4	2-1/8	592-2500 BN	93.46	592-2500 BN11	105.75
5/16	7/16	4	2-1/8	592-3125 BN	104.74	592-3125 BN11	117.03
3/8	1/2	4	2-1/8	592-3750 BN	116.39	592-3750 BN11	128.68
1/2	5/8	6	3-3/8	592-5000 BN	139.21	592-5000 BN11	188.35
1/2	5/8	4	2-1/8	592L5000 BN	164.34	592L5000 BN11	163.23
5/8	3/4	6	3-3/8	592-6250 BN	261.26	592-6250 BN11	288.40
5/8	3/4	6	2-3/8	592L6250 BN	275.24	592L6250 BN11	302.40
3/4	1	6	2-1/2	592-7500 BN	346.85	592-7500 BN11	380.39
3/4	1	6	3-3/8	592L7500 BN	365.44	592L7500 BN11	399.00
1	1-1/4	6	3-3/8	592-1000 BN	535.39	592-1000 BN11	578.06
1	1-1/4	7	4-3/8	592L1000 BN	605.27	592L1000 BN11	650.50



End Mills—Long Reach

Four Flute Single End

Square End



DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/4	3/4	4	594-2500	39.30	594-250011	51.61
5/16	13/16	4	594-3125	47.60	594-312511	60.06
3/8	1	4	594-3750	54.42	594-375011	66.73
7/16	1	6	594-4375	75.88	594-437511	92.40
1/2	1	6	594-5000	105.98	594-500011	129.99
5/8	1-1/4	6	594-6250	160.46	594-625011	187.12
3/4	1-1/2	6	594-7500	247.25	594-750011	280.80
1	1-1/2	6	594-1000	401.74	594-100011	444.41

Four Flute Single End

Ball Nose



DIA.	FLUTE LENGTH	OVERALL LENGTH	UNCOATED PART NUMBER	UNCOATED LIST PRICE	ALTIN PART NUMBER	ALTIN LIST PRICE
1/4	3/4	4	594-2500 BN	44.65	594-2500-BN11	56.97
5/16	13/16	4	594-3125 BN	55.16	594-3125-BN11	67.44
3/8	1	4	594-3750 BN	63.54	594-3750-BN11	75.83
7/16	1	6	594-4375 BN	87.73	594-4375-BN11	106.66
1/2	1	6	594-5000 BN	118.68	594-5000-BN11	142.17
5/8	1-1/4	6	594-6250 BN	193.39	594-6250-BN11	208.33
3/4	1-1/2	6	594-7500 BN	281.01	594-7500-BN11	305.00
1	1-1/2	6	594-1000 BN	458.24	594-1000-BN11	482.25



End Mills— Extra Long Reach

2 & 4 Flute - Corner Radius



DIA.	FLUTE LENGTH	CORNER RADIUS	OVERALL REACH	OVERALL LENGTH	2 FLUTE PART NUMBER	UNCOATED LIST PRICE	4 FLUTE PART NUMBER	UNCOATED LIST PRICE
1/4	3/8	.015	4-3/8	6	597-2500	84.13	598-2500	84.05
5/16	1/2	.015	4-5/16	6	597-3125	94.05	598-3125	94.05
3/8	1/2	.030	4-5/16	6	597-3750	107.25	598-3750	107.25
1/2	3/4	.030	5-3/4	8	597-5000	176.55	598-5000	176.55
5/8	7/8	.030	5-5/8	8	597-6250	226.05	598-6250	226.05
3/4	1	.030	5-5/8	8	597-7500	351.45	598-7500	351.45
1	1-1/4	.060	5-5/8	10	597-1000	6369.90	598-1000	636.90

Two & Four Flute - Ball Nose



DIA.	FLUTE LENGTH	OVERALL REACH	OVERALL LENGTH	2 FLUTE PART NUMBER	UNCOATED LIST PRICE	4 FLUTE PART NUMBER	UNCOATED LIST PRICE
1/4	3/8	4-3/8	6	597-2500 BN	89.10	598-2500 BN	89.10
5/16	1/2	4-5/16	6	597-3125 BN	97.35	598-3125 BN	97.35
3/8	1/2	4-5/16	6	597-3750 BN	112.20	598-3750 BN	112.20
1/2	3/4	5-3/4	8	597-5000 BN	186.45	598-5000 BN	186.45
5/8	7/8	5-5/8	8	597-6250 BN	234.30	598-6250 BN	234.30
3/4	1	5-5/8	8	597-7500BN	364.65	598-7500 BN	364.65
1	1-1/4	5-5/8	10	597-1000BN	650.10	598-1000 BN	650.10



Chatterless Countersinks

Single Flute

H.S.S.



C/SINK DIA.	OVERALL LENGTH	60 DEG INC EDP NUMBER	82 DEG INC EDP NUMBER	90 DEG INC EDP NUMBER	100 DEG INC EDP NUMBER	120 DEG INC EDP NUMBER	LIST PRICE
1/8	1-1/2	94901	95901	96901	97901	98901	15.43
3/16	2	94902	95902	96902	97902	98902	15.84
1/4	2	94903	95903	96903	97903	98903	16.50
5/16	2-1/2	94904	95904	96904	97904	98904	18.07
3/8	2-1/2	94905	95905	96905	97905	98905	21.37
1/2	3	94906	95906	96906	97906	98906	24.17

Single Flute

Carbide



C/SINK DIA.	OVERALL LENGTH	60 DEG INC EDP NUMBER	82 DEG INC EDP NUMBER	90 DEG INC EDP NUMBER	100 DEG INC EDP NUMBER	120 DEG INC EDP NUMBER	LIST PRICE
1/8	1-1/2	93901	93911	93921	93931	93941	21.37
3/16	2	93902	93912	93922	93932	93942	28.30
1/4	2	93903	93913	93923	93933	93943	35.72
5/16	2-1/2	93904	93914	93924	93934	93944	53.63
3/8	2-1/2	93905	93915	93925	93935	93945	65.84
1/2	3	93906	93916	93926	93936	93946	90.09

6 Flute

H.S.S.



C/SINK DIA.	OVERALL LENGTH	60 DEG INC EDP NUMBER	82 DEG INC EDP NUMBER	90 DEG INC EDP NUMBER	100 DEG INC EDP NUMBER	120 DEG INC EDP NUMBER	LIST PRICE
1/8	1-1/2	36201	36301	36401	36501	36801	15.43
3/16	2	36202	36302	36402	36502	36802	15.84
1/4	2	36203	36303	36403	36503	36803	16.50
5/16	2-1/2	36204	36304	36404	36504	36804	18.07
3/8	2-1/2	36205	36305	36405	36505	36805	21.37
1/2	3	36206	36306	36406	36506	36806	24.17

6 Flute

Carbide



C/SINK DIA.	OVERALL LENGTH	60 DEG INC EDP NUMBER	82 DEG INC EDP NUMBER	90 DEG INC EDP NUMBER	100 DEG INC EDP NUMBER	120 DEG INC EDP NUMBER	LIST PRICE
1/8	1-1/2	38201	38301	38401	38501	38601	21.37
3/16	2	38202	38302	38402	38502	38602	28.30
1/4	2	38203	38303	38403	38503	38603	35.72
5/16	2-1/2	38204	38304	38404	38504	38604	53.63
3/8	2-1/2	38205	38305	38405	38505	38605	65.84
1/2	3	38206	38306	38406	38506	38606	90.09



Chatterless Countersinks

701

SERIES - Single Flute Suitable for countersinking non-ferrous metal and soft steel.



DIA.	SHANK DIA.	OVERALL LENGTH	60 DEG INC PART NUMBER	82 DEG INC PART NUMBER	90 DEG INC PART NUMBER	100 DEG INC PART NUMBER	LIST PRICE
1/8*	1/8	1-1/2	701-1256	701-1258	701-1259	701-1210	17.99
3/16*	3/16	2	701-1876	701-1878	701-1879	701-1810	20.13
1/4*	1/4	2	701-2506	701-2508	701-2509	701-2510	25.16
3/8	1/4	2	701-3756	701-3758	701-3758	701-3710	33.33
1/2	1/4	2	701-5006	701-5008	701-5009	701-5010	51.65
5/8	1/2	2-3/4	701-6256	701-6258	701-6259	701-6210	70.79
3/4	1/2	2-3/4	701-7506	701-7508	701-7509	701-7510	106.59
1	1/2	3	701-1006	701-1008	701-1009	701-1010	148.34
1-1/4	3/4	3-1/4	701-1.2506	701-1.2508	701-1.2509	701-1.2510	213.84

703

SERIES - Three Flute Spiral flutes for a chatterless and clean finish.



DIA.	SHANK DIA.	OVERALL LENGTH	60 DEG INC PART NUMBER	82 DEG INC PART NUMBER	90 DEG INC PART NUMBER	100 DEG INC PART NUMBER	LIST PRICE
1/8*	1/8	1-1/2	703-1256	703-1258	703-1259	703-1210	17.99
3/16*	3/16	2	703-1876	703-1878	703-1879	703-1810	23.51
1/4*	1/4	2	703-2506	703-2508	703-2509	703-2510	26.73
5/16	1/4	2-1/2	703-3126	703-3128	703-3129	703-3110	31.52
3/8	1/4	2-1/2	703-3756	703-3758	703-3758	703-3710	34.49
1/2	1/4	2-1/2	703-5006	703-5008	703-5009	703-5010	52.64
5/8	1/2	2-5/8	703-6256	703-6258	703-6259	703-6210	86.63
3/4	1/2	2-3/4	703-7506	703-7508	703-7509	703-7510	101.15
7/8	1/2	3	703-8756	703-8758	703-8759	703-8710	146.36
1	1/2	3	703-1006	703-1008	703-1009	703-1010	152.46
1-1/4	3/4	3-1/4	703-1.2506	703-1.2508	703-1.2509	703-1.2510	258.23
1-1/2	3/4	3-1/2	703-1.5006	703-1.5008	703-1.5009	703-1.5010	370.34

706

SERIES - Six Flute For use on hardened steel, high temperature alloys



DIA.	SHANK DIA.	OVERALL LENGTH	60 DEG INC PART NUMBER	82 DEG INC PART NUMBER	90 DEG INC PART NUMBER	100 DEG INC PART NUMBER	LIST PRICE
1/8*	1/8	1-1/2	706-1256	706-1258	706-1259	706-1210	17.99
3/16*	3/16	2	706-1876	706-1878	706-1879	706-1810	23.51
1/4*	1/4	2	706-2506	706-2508	706-2509	706-2510	26.73
5/16	1/4	2-1/2	706-3126	706-3128	706-3129	706-3110	31.52
3/8	1/4	2-1/2	706-3756	706-3758	706-3758	706-3710	34.49
1/2	1/4	2-1/2	706-5006	706-5008	706-5009	706-5010	52.64
5/8	1/2	2-5/8	706-6256	706-6258	706-6259	706-6210	86.63
3/4	1/2	2-3/4	706-7506	706-7508	706-7509	706-7510	101.15
7/8	1/2	3	706-8756	706-8758	706-8759	706-8710	146.36
1	1/2	3	706-1006	706-1008	706-1009	706-1010	152.46
1-1/4	3/4	3-1/4	706-1.2506	706-1.2508	706-1.2509	706-1.2510	258.23
1-1/2	3/4	3-1/2	706-1.5006	706-1.5008	706-1.5009	706-1.5010	370.34

*Indicates Solid Carbide all others have hardened steel shanks



Chatterless Countersinks

Single Flute HSS



BODY SIZE	SHANK DIA.	OVERALL LENGTH	60 DEG INC EDP NUMBER	82 DEG INC EDP NUMBER	90 DEG INC EDP NUMBER	100 DEG INC EDP NUMBER	120 DEG INC EDP NUMBER	LIST PRICE
1/8	1/8	1-1/2	31000	31020	31040	31060	31080	10.07
3/16	3/16	1-1/2	31001	31021	31041	31061	31081	10.32
1/4	3/16	2	31101	31121	31141	31161	31181	10.73
1/4	1/4	2	31002	31022	31042	31062	31082	10.73
5/16	1/4	2	31003	31023	31043	31063	31083	11.72
3/8	1/4	2	31004	31024	31044	31064	31084	12.38
1/2	1/4	2	31005	31025	31045	31065	31085	15.10
5/8	1/2	2-1/2	31006	31026	31046	31066	31086	20.21
3/4	1/2	2-3/4	31007	31027	31047	31067	31087	28.96
7/8	1/2	2-3/4	31008	31028	31048	31068	31088	39.60
1	1/2	2-3/4	31009	31029	31049	31069	31089	48.59
1-1/4	3/4	3-3/8	31010	31030	31050	-	-	91.16
1-1/2	3/4	3-3/8	31011	31031	31051	-	-	122.10
2	3/4	3-3/4	31012	31032	31052	-	-	198.41
2-1/2	1	4-3/4	31013	31033	31053	-	-	443.85
3	1	5	31014	31034	31054	-	-	610.50

Three Flute - H.S.S.



BODY SIZE	SHANK DIA.	OVERALL LENGTH	60 DEG INC EDP NUMBER	82 DEG INC EDP NUMBER	90 DEG INC EDP NUMBER	100 DEG INC EDP NUMBER	120 DEG INC EDP NUMBER	LIST PRICE
3/16	3/16	1-1/2	33001	33021	33041	33061	33081	9.16
1/4	1/4	2	33002	33022	33042	33062	33082	9.40
5/16	1/4	2	33003	33023	33043	33063	33083	11.22
3/8	1/4	2	33004	33024	33044	33064	33084	11.72
1/2	1/4	2	33005	33025	33045	33065	33085	14.44
5/8	1/2	2-1/2	33006	33026	33046	33066	33086	20.54
3/4	1/2	2-1/2	33007	33027	33047	33067	33087	28.22
7/8	1/2	2-3/4	33008	33028	33048	33068	33088	38.86
1	1/2	2-3/4	33009	33029	33049	33069	33089	43.31
1-1/4	3/4	3-3/8	33010	33030	33050	33070	33090	65.92
1-1/2	3/4	3-1/2	33011	33031	33051	33071	33091	95.29
1-3/4	1	4-1/4	33012	33032	33052	33072	33092	127.05
2	1	4-3/8	33013	33033	33053	33073	33093	156.92
2-1/2	1	4-3/4	33014	33034	33054	33074	33094	416.30
3	1	5	33015	33035	33055	33075	33095	570.90



Chatterless Countersinks

Six Flute - H.S.S.

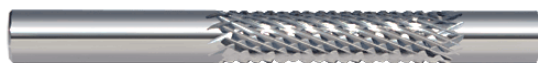


BODY SIZE	SHANK DIA.	OVERALL LENGTH	60 DEG INC EDP NUMBER	82 DEG INC EDP NUMBER	90 DEG INC EDP NUMBER	100 DEG INC EDP NUMBER	120 DEG INC EDP NUMBER	LIST PRICE
1/8	1/8	1-1/2	36000	36020	36040	36060	36080	8.42
3/16	3/16	1-1/2	36001	36021	36041	36061	36081	9.16
1/4	1/4	2	36002	36022	36042	36062	36082	9.40
1/4	3/16	1-1/2	36003	36023	36043	36063	36083	9.40
5/16	1/4	2	36004	36024	36044	36064	36084	11.22
3/8	1/4	2	36005	36025	36045	36065	36085	11.72
1/2	1/4	2	36006	36026	36046	36066	36086	14.44
1/2	3/8	2	36007	36027	36047	36067	36087	14.44
5/8	1/2	2-1/2	36008	36028	36048	36068	36088	20.54
3/4	1/2	2-3/4	36009	36029	36049	36069	36089	28.22
7/8	1/2	2-3/4	36010	36030	36050	36070	36090	38.86
1	1/2	2-3/4	36011	36031	36051	36071	36091	43.31
1-1/4	3/4	3-3/8	36012	36032	36052	36072	36092	65.92
1-1/2	3/4	3-1/2	36013	36033	36053	36073	36093	95.29
1-3/4	1	4-1/4	36014	36034	36054	36074	36094	127.05
2	1	4-3/8	36015	36035	36055	36075	36095	156.92
2-1/2	1	4-3/4	36016	36036	36056	36076	36096	416.30
3	1	5	36017	36037	36057	36077	36097	570.90

Carbide & H.S.S. Countersinks

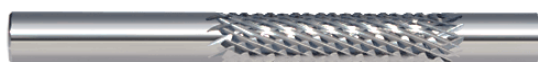


Carbide Burs – 1/4" Shank Piloted



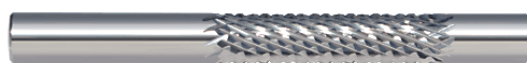
Piloted Bur – Fine Cut

PART NUMBER	DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PILOT DIAMETER	PILOT LENGTH	LIST PRICE
630-1250 F	1/8	1	2-1/2	.1250	3/8	16.75
630-1875 F	3/16	1	2-1/2	.1875	3/8	24.80
630-0449	1/4	1	2-1/2	.2500	3/8	35.18



+ .005 Piloted Bur – Course Cut

PART NUMBER	DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PILOT DIAMETER	PILOT LENGTH	LIST PRICE
630-1255	1/8	1	2-1/2	.1300	3/8	30.15
630-1875	3/16	1	2-1/2	.1925	3/8	35.18
630-0543	1/4	1	2-1/2	.2550	3/8	42.88



+ .010 Piloted Bur – Course Cut

PART NUMBER	DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PILOT DIAMETER	PILOT LENGTH	LIST PRICE
630-1251	1/8	1	2-1/2	.1350	3/8	30.15
630-1871	3/16	1	2-1/2	.1975	3/8	35.18
630-0451	1/4	1	2-1/2	.2600	3/8	56.11



Carbide Burs – 1/4" Shank

801 SERIES- Cylindrical

901 SERIES- Cylindrical

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	801-1250	SA-11*	1/8	1/2	10.10		901-1250	SA-11*	1/8	1/2	10.10
	801-1875	SA-14*	3/16	5/8	10.25		901-1875	SA-14*	3/16	5/8	10.25
	801-2500	SA-1*	1/4	5/8	10.42		901-2500	SA-1*	1/4	5/8	10.42
	801-3125	SA-2	5/16	3/4	12.73		901-3125	SA-2	5/16	3/4	12.73
	801-3750	SA-3	3/8	3/4	15.41		901-3750	SA-3	3/8	3/4	15.41
	801-4375	SA-4	7/16	1	17.92		901-4375	SA-4	7/16	1	17.92
	801-5000	SA-5	1/2	1	21.20		901-5000	SA-5	1/2	1	21.20
	801-6250	SA-6	5/8	1	27.37		901-6250	SA-6	5/8	1	27.31
	801-7500	SA-16	3/4	3/4	45.29		901-7500	SA-16	3/4	3/4	45.29
	801-7501	SA-7	3/4	1	42.38		901-7501	SA-7	3/4	1	42.38
	801-1000	SA-9	1	1	84.76		901-1000	SA-9	1	1	84.76

802 SERIES - Cylindrical Ball Nose

902 SERIES- Cylindrical Ball Nose

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	802-1250	SC-11*	1/8	1/2	10.22		902-1250	SC-11*	1/8	1/2	10.22
	802-1875	SC-14*	3/16	5/8	10.22		902-1875	SC-14*	3/16	5/8	10.22
	802-2500	SC-1*	1/4	5/8	11.56		902-2500	SC-1*	1/4	5/8	11.56
	802-3125	SC-2	5/16	3/4	13.50		902-3125	SC-2	5/16	3/4	13.50
	802-3750	SC-3	3/8	3/4	15.41		902-3750	SC-3	3/8	3/4	15.41
	802-4375	SC-4	7/16	1	18.90		902-4375	SC-4	7/16	1	18.90
	802-5000	SC-5	1/2	1	21.20		902-5000	SC-5	1/2	1	21.20
	802-6250	SC-6	5/8	1	27.74		902-6250	SC-6	5/8	1	27.74
	802-7500	SC-7	3/4	1	56.18		902-7500	SC-7	3/4	1	56.18

803 SERIES - Round Nose Tree

903 SERIES- Round Nose Tree

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	803-2500	SF-1*	1/4	5/8	15.24		903-2500	SF-1*	1/4	5/8	15.24
	803-3750	SF-3	3/8	3/4	17.35		903-3750	SF-3	3/8	3/4	17.35
	803-5001	SF-13	1/2	3/4	19.87		903-5001	SF-13	1/2	3/4	19.87
	803-5000	SF-5	1/2	1	23.12		903-5000	SF-5	1/2	1	23.12
	803-6250	SF-6	5/8	1	38.53		903-6250	SF-6	5/8	1	38.53
	803-7500	SF-7	3/4	1	42.78		903-7500	SF-7	3/4	1	42.78
	803-7501	SF-14	3/4	1-1/4	35.11		903-7501	SF-14	3/4	1-1/4	35.11
	803-7502	SF-15	3/4	1-1/2	57.79		903-7502	SF-15	3/4	1-1/2	57.79

*Indicates solid 1/4" carbide 2" O.A.L., all others have 1/4" diameter hardened steel shank.



Carbide Burs – 1/4" Shank

804 SERIES - Pointed Tree

904 SERIES - Pointed Tree

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	804-2500	SG-1*	1/4	5/8	11.56		904-2500	SG-1*	1/4	5/8	11.56
	804-3125	SG-2	5/16	3/4	12.33		904-3125	SG-2	5/16	3/4	12.33
	804-3750	SG-3	3/8	3/4	14.64		904-3750	SG-3	3/8	3/4	14.64
	804-5001	SG-13	1/2	3/4	17.35		904-5001	SG-13	1/2	3/4	17.35
	804-5000	SG-5	1/2	1	21.21		904-5000	SG-5	1/2	1	21.21
	804-6250	SG-6	5/8	1	28.14		904-6250	SG-6	5/8	1	28.14
	804-7500	SG-7	3/4	1	42.78		904-7500	SG-7	3/4	1	42.78

805 SERIES - Pointed Cone

905 SERIES - Pointed Cone

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	Incl. Ang. Deg.	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	Incl. Ang. Deg.	LIST PRICE
	805-2500	SM-1*	1/4	1/2	22	11.76		905-2500	SM-1*	1/4	1/2	22	11.76
	805-2501	SM-2*	1/4	3/4	14	11.96		905-2501	SM-2*	1/4	3/4	14	11.96
	805-2502	SM-3*	1/4	1	10	12.53		905-2502	SM-3*	1/4	1	10	12.53
	805-3750	SM-4*	3/8	5/8	28	16.01		905-3750	SM-4*	3/8	5/8	28	16.01
	805-5000	SM-5	1/2	7/8	28	20.80		905-5000	SM-5	1/2	7/8	28	20.80
	805-6250	SM-6	5/8	1	31	28.70		905-6250	SM-6	5/8	1	31	28.70

806 SERIES - Egg Shape

906 SERIES - Egg Shape

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	806-2500	SE-1*	1/4	3/8	11.76		906-2500	SE-1*	1/4	3/8	11.76
	806-3750	SE-3	3/8	5/8	15.24		906-3750	SE-3	3/8	5/8	15.24
	806-5000	SE-5	1/2	7/8	21.21		906-5000	SE-5	1/2	7/8	21.21
	806-6250	SE-6	5/8	1	28.50		906-6250	SE-6	5/8	1	28.50
	806-7500	SE-7	3/4	1	43.15		906-7500	SE-7	3/4	1	43.15

*Indicates solid 1/4" carbide 2" O.A.L., all others have 1/4" diameter hardened steel shank.



Carbide Burs – 1/4" Shank

807 SERIES - 14° Included Angle

907 SERIES - 14° Included Angle

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	Incl. Ang. Deg.	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	Incl. Ang. Deg.	LIST PRICE
	807-2500	SL-1*	1/4	5/8	14	11.76		907-2500	SL-1*	1/4	5/8	14	11.76
	807-3125	SL-2	5/16	7/8	14	12.73		907-3125	SL-2	5/16	7/8	14	12.73
	807-3750	SL-3	3/8	1-1/16	14	18.12		907-3750	SL-3	3/8	1-1/16	14	18.12
	807-5000	SL-4	1/2	1-1/8	14	23.32		907-5000	SL-4	1/2	1-1/8	14	23.32
	807-6250	SL-5	5/8	1-5/16	14	42.38		907-6250	SL-5	5/8	1-5/16	14	42.38
	807-7500	SL-7	3/4	1-1/2	14	46.23		907-7500	SL-7	3/4	1-1/2	14	46.23

808 SERIES - Ball Shape

908 SERIES - Ball Shape

DOUBLE CUT	PART NUMBER	SCTI	DIA	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	LIST PRICE
	808-1250	SD-11*	1/8	10.02		908-1250	SD-11*	1/8	10.02
	808-1875	SD-14*	3/16	10.22		908-1875	SD-14*	3/16	10.22
	808-2500	SD-1*	1/4	11.76		908-2500	SD-1*	1/4	11.76
	808-3125	SD-2	5/16	12.53		908-3125	SD-2	5/16	12.53
	808-3750	SD-3	3/8	14.07		908-3750	SD-3	3/8	14.07
	808-5000	SD-5	1/2	18.89		908-5000	SD-5	1/2	18.89
	808-6250	SD-6	5/8	26.03		908-6250	SD-6	5/8	26.03
	808-7500	SD-7	3/4	31.59		908-7500	SD-7	3/4	31.59
	808-1000	SD-9	1	53.37		908-1000	SD-9	1	53.37

849 SERIES - 49° Cone

949 SERIES - 49° Cone

DOUBLE CUT	PART NUMBER	SCTI	DIA	Incl. Ang. Deg.	LIST PRICE	SINGLE CUT	PART NUMBER	SCTI	DIA	Incl. Ang. Deg.	LIST PRICE
	849-2500	SK-1*	1/4	90	11.56		949-2500	SK-1*	1/4	90	11.56
	849-3750	SK-3	3/8	90	14.64		949-3750	SK-3	3/8	90	14.64
	849-5000	SK-5	1/2	90	19.26		949-5000	SK-5	1/2	90	19.26
	849-6250	SK-6	5/8	90	23.52		949-6250	SK-6	5/8	90	23.52
	849-7500	SK-7	3/4	90	27.37		949-7500	SK-7	3/4	90	27.37
	849-1000	SK-9	1	90	41.81		949-1000	SK-9	1	90	41.81

*Indicates solid 1/4" carbide 2" O.A.L., all others have 1/4" diameter hardened steel shank.



Carbide Burs – 1/4" Shank

850 SERIES - 60° Cone

DOUBLE CUT	PART NUMBER	SCTI	DIA	Incl. Ang. Deg.	LIST PRICE
	850-3750	SJ-3	3/8	60	14.64
	850-5000	SJ-5	1/2	60	19.26
	850-6250	SJ-6	5/8	60	23.52
	850-7500	SJ-7	3/4	60	27.37
	850-1000	SJ-9	1	60	41.80

950 SERIES - 60° Cone

SINGLE CUT	PART NUMBER	SCTI	DIA	Incl. Ang. Deg.	LIST PRICE
	950-3750	SJ-3	3/8	60	14.64
	950-5000	SJ-5	1/2	60	19.26
	950-6250	SJ-6	5/8	60	23.52
	950-7500	SJ-7	3/4	60	27.37
	950-1000	SJ-9	1	60	41.80

851 SERIES - Flame Shape

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	851-3125	SH-2	5/16	3/4	13.50
	851-5000	SH-5	1/2	1-1/4	23.52
	851-6250	SH-6	5/8	1-7/16	48.17
	851-7500	SH-7	3/4	1-5/8	65.49

951 SERIES - Flame Shape

SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	951-3125	SH-2	5/16	3/4	13.50
	951-5000	SH-5	1/2	1-1/4	23.52
	951-6250	SH-6	5/8	1-7/16	48.17
	951-7500	SH-7	3/4	1-5/8	65.49

852 SERIES - Inverted Taper

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	Incl. Ang. Deg.	LIST PRICE
	852-2500	SN-1*	1/4	5/16	10	9.82
	852-3750	SN-2	3/8	3/8	13	12.73
	852-5000	SN-4	1/2	1/2	28	19.66
	852-6250	SN-6	5/8	3/4	18	30.82
	852-7500	SN-7	3/4	5/8	30	34.54

952 SERIES - Inverted Taper

SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	Incl. Ang. Deg.	LIST PRICE
	952-2500	SN-1*	1/4	5/16	10	9.82
	952-3750	SN-2	3/8	3/8	13	12.73
	952-5000	SN-4	1/2	1/2	28	19.66
	952-6250	SN-6	5/8	3/4	18	30.82
	952-7500	SN-7	3/4	5/8	30	34.54

*Indicates solid 1/4" carbide 2" O.A.L., all others have 1/4" diameter hardened steel shank.



Carbide Burs – 1/4" Shank 6" Long Steel Shank

861 SERIES - Cylindrical

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	861-3750	SA-3L6	3/8	3/4	29.28
	861-5000	SA-5L6	1/2	1	38.43

961 SERIES - Cylindrical

SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	961-3750	SA-3L6	3/8	3/4	29.28
	961-5000	SA-5L6	1/2	1	38.43

862 SERIES - Cylindrical Ball Nose

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	862-3750	SC-3L6	3/8	3/4	29.48
	862-5000	SC-5L6	1/2	1	38.43

962 SERIES - Cylindrical Ball Nose

SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	962-3750	SC-3L6	3/8	3/4	29.48
	962-5000	SC-5L6	1/2	1	38.43

863 SERIES - Round Nose Tree

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	863-3750	SF-3L6	3/8	3/4	28.91
	863-5000	SF-5L6	1/2	1	37.59

963 SERIES - Round Nose Tree

SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	963-3750	SF-3L6	3/8	3/4	28.91
	963-5000	SF-5L6	1/2	1	37.59

6 inch long, 1/4 inch diameter shanks.



Carbide Burs – 1/4" Shank 6" Long Steel Shank

867 SERIES - 14° Included Angle

DOUBLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	867-3750	SL-3L6	3/8	1-1/6	31.22
	867-5000	SL-4L6	1/2	1-1/8	40.46

967 SERIES - 14° Included Angle

SINGLE CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	967-3750	SL-3L6	3/8	1-1/6	31.22
	967-5000	SL-4L6	1/2	1-1/8	40.46

868 SERIES - Ball Shape

DOUBLE CUT	PART NUMBER	SCTI	DIA	LIST PRICE
	868-3750	SD-3L6	3/8	26.60
	868-5000	SD-5L6	1/2	30.82

968 SERIES - Ball Shape

SINGLE CUT	PART NUMBER	SCTI	DIA	LIST PRICE
	968-3750	SD-3L6	3/8	26.60
	968-5000	SD-5L6	1/2	30.82

6 inch long, 1/4 inch diameter shanks.



Carbide Burs – 1/4" Shank

Aluminum Cut

881 SERIES - Cylindrical

ALUM. CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	881-2500	SA-1A*	1/4	5/8	14.07
	881-3750	SA-3A	3/8	3/4	20.44
	881-5000	SA-5A	1/2	1	30.82
	881-6250	SA-6A	5/8	1	36.62
	881-7500	SA-7A	3/4	1	50.85

882 SERIES - Cylindrical Ball Nose

ALUM. CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	882-2500	SC-1A*	1/4	5/8	14.27
	882-3750	SC-3A	3/8	3/4	20.64
	882-5000	SC-5A	1/2	1	30.82
	882-6250	SC-6A	5/8	1	37.19
	882-7500	SC-7A	3/4	1	51.62

883 SERIES - Round Nose Tree

ALUM. CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	883-2500	SF-1A*	1/4	5/8	14.07
	883-3750	SF-3A	3/8	3/4	20.64
	883-5000	SF-5A	1/2	1	30.65
	883-6250	SF-6A	5/8	1	36.98
	883-7500	SF-14A	3/4	1-1/4	68.78

886 SERIES - Egg Shape

ALUM. CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	886-3750	SE-3A	3/8	5/8	20.80
	886-5000	SE-5A	1/2	7/8	30.82
	886-6250	SE-6A	5/8	1	38.16
	886-7500	SE-7A	3/4	1	51.82

887 SERIES - 14° Included Angle

ALUM. CUT	PART NUMBER	SCTI	DIA	FLUTE LENGTH	LIST PRICE
	887-3750	SL-3A	3/8	1-1/6	24.86
	887-5000	SL-4A	1/2	1-1/8	31.99
	887-6250	SL-5A	5/8	1-5/16	50.75
	887-7500	SL-7A	3/4	1-1/2	78.99

888 SERIES - Ball Shape

ALUM. CUT	PART NUMBER	SCTI	DIA	LIST PRICE
	888-2500	SD-1A*	1/4	13.50
	888-3750	SD-3A	3/8	18.49
	888-5000	SD-5A	1/2	26.80
	888-6250	SD-6A	5/8	33.13
	888-7500	SD-7A	3/4	44.32

*Indicates solid 1/4" carbide 2" O.A.L., all others have 1/4" diameter hardened steel shank.



Carbide Burs

1/8" Shank Diameter – 1-1/2" Overall Length
Solid Carbide

**800 SERIES
DOUBLE
CUT
\$7.15**



SCTI:	SA-42	SA-43	SB-43	SC-42	SG-44	SF-42	SC-41	SA-41	SB-ECO	SE-41
SIZE:	3/32X7/16	1/8X9/16	End Cut	1/8X9/16	1/8X9/16		1/8X1/2	1/8X1/2	3/32X7/16	1/16X1/4
PART #:	800-8001	800-8002	800-8003	800-8004	800-8005	800-8006	800-8007	800-8008	800-8009	800-8010



SCTI:	SM-41	SM-42	SM-43	SN-42	SJ-42	SK-42	SL-42	SD-41	SD-42	SH-41
SIZE:	1/8X11/32	1/8X7/16	1/8X5/8	1/8X3/16	1/8X3/32	1/8X1/16	1/8X1/2	3/32	1/8	1/8X1/4
TAPER DEGREES:	12	14	7	10	60	90	8			
PART#:	800-8011	800-8012	800-8013	800-8014	800-8015	800-8016	800-8017	800-8018	800-8019	800-8020

**900 SERIES
SINGLE
CUT
\$7.15**



SCTI:	SA-42	SA-43	SB-43	SC-42	SG-44	SF-42	SC-41	SA-41	SB-ECO	SE-41
SIZE:	3/32X7/16	1/8X9/16	End Cut	1/8X9/16	1/8X9/16		1/8X1/2	1/8X1/2	3/32X7/16	1/16X1/4
PART #:	900-9001	900-9002	900-9003	900-9004	900-9005	900-9006	900-9007	900-9008	900-9009	900-9010



SCTI:	SM-41	SM-42	SM-43	SN-42	SJ-42	SK-42	SL-42	SD-41	SD-42	SH-41
SIZE:	1/8X11/32	1/8X7/16	1/8X5/8	1/8X3/16	1/8X3/32	1/8X1/16	1/8X1/2	3/32	1/8	1/8X1/4
TAPER DEGREES:	12	14	7	10	60	90	8			
PART #:	900-9011	900-9012	900-9013	900-9014	900-9015	900-9016	900-9017	900-9018	900-9019	900-9020



Carbide Burs

1/4" Diameter Carbide Burs
1/8" Hardened Steel Shank

815 SERIES DOUBLE CUT

\$11.40

Cylindrical Cylindrical Ball Nose Round Nose Tree Pointed Tree Pointed Cone End Cut Ball Shape Egg Shape Inverted Taper



SCTI:	SA-51	SC-51	SF-51	SG-51	SM-51	SB-51	SD-51	SE-51	SN-51
SIZE:	1/4X1/2	1/4X1/2	1/4X1/2	1/4X1/2	1/4X1/2	1/4X3/16	1/4	1/4X3/8	1/4X1/4
TAPER:						22			10
PART#:	815-0001	815-0002	815-0003	815-0004	815-0005	815-0006	815-0007	815-0008	Inverted 815-0009

915 SERIES SINGLE CUT

\$11.40

Cylindrical Cylindrical Ball Nose Round Nose Tree Pointed Tree Pointed Cone End Cut Ball Shape Egg Shape Inverted Taper



SCTI:	SA-51	SC-51	SF-51	SG-51	SM-51	SB-51	SD-51	SE-51	SN-51
SIZE:	1/4X1/2	1/4X1/2	1/4X1/2	1/4X1/2	1/4X1/2	1/4X3/16	1/4	1/4X3/8	1/4X1/4
TAPER:						22			10
PART #:	915-0001	915-0002	915-0003	915-0004	915-0005	915-0006	915-0007	915-0008	Inverted 915-0009



Decimal Equivalent Chart

Sizes	Decimal Inches	Sizes	Decimal Inches	Sizes	Decimal Inches	Sizes	Decimal Inches	Sizes	Decimal Inches
97	.0059	1.35mm	.0531	26	.1470	F	.2570	Z	.4130
96	.0063	54	.0550	3.75mm	.1476	6.6mm	.2598	10.5mm	.4134
95	.0067	1.4mm	.0551	25	.1495	G	.2610	27/64	.4219
94	.0071	1.45mm	.0571	3.8mm	.1496	6.7mm	.2638	11mm	.4331
93	.0075	1.5mm	.0591	24	.1520	17/64	.2656	7/16	.4375
92	.0079	53	.0595	3.9mm	.1535	6.75mm	.2657	11.5mm	.4528
0.2mm	.0079	1.55mm	.0610	23	.1540	H	.2660	29/64	.4531
91	.0083	1/16	.0625	5/32	.1562	6.8mm	.2677	15/32	.4688
90	.0087	1.6mm	.0630	22	.1570	6.9mm	.2717	12mm	.4724
0.22mm	.0087	52	.0635	4mm	.1575	I	.2720	31/64	.4844
89	.0091	1.65mm	.0650	21	.1590	7mm	.2756	12.5mm	.4921
88	.0095	1.7mm	.0669	20	.1610	J	.2770	1/2	.5000
0.25mm	.0098	51	.0670	4.1mm	.1614	7.1mm	.2795	13mm	.5118
87	.0100	1.75mm	.0689	4.2mm	.1654	K	.2810	33/64	.5156
86	.0105	50	.0700	19	.1660	9/32	.2812	17/32	.5312
85	.0110	1.8mm	.0709	4.25mm	.1673	7.2mm	.2835	13.5mm	.5315
0.28mm	.0110	1.85mm	.0728	4.3mm	.1693	7.25mm	.2854	35/64	.5469
84	.0115	49	.0730	18	.1695	7.3mm	.2874	14mm	.5512
0.3mm	.0118	1.9mm	.0748	11/64	.1719	L	.2900	9/16	.5625
83	.0120	48	.0760	17	.1730	7.4mm	.2913	14.5mm	.5709
82	.0125	1.95mm	.0768	4.4mm	.1732	M	.2950	37/64	.5781
0.32mm	.0126	5/64	.0781	16	.1770	7.5mm	.2953	15mm	.5906
81	.0130	47	.0785	4.5mm	.1772	19/64	.2969	19/32	.5938
80	.0315	2mm	.0787	15	.1800	7.6mm	.2992	39/64	.6094
0.35mm	.0138	2.05mm	.0807	4.6mm	.1811	N	.3020	15.5mm	.6102
79	.0145	46	.0810	14	.1820	7.7mm	.3031	5/8	.6250
1/64	.0156	45	.0820	13	.1850	7.75mm	.3051	16mm	.6299
0.4mm	.0157	2.1mm	.0827	4.7mm	.1850	7.8mm	.3071	41/64	.6406
78	.0160	2.15mm	.0846	4.75mm	.1870	7.9mm	.3110	16.5mm	.6496
0.45mm	.0177	44	.0860	3/16	.1875	5/16	.3125	21/32	.6562
77	.0180	2.2mm	.0866	4.8mm	.1890	8mm	.3150	17mm	.6693
0.5mm	.0197	2.25mm	.0886	12	.1890	O	.3160	43/64	.6719
76	.0200	43	.0890	11	.1910	8.1mm	.3189	11/16	.6875
75	.0210	2.3mm	.0906	4.9mm	.1929	8.2mm	.3228	17.5mm	.6890
0.55mm	.0217	2.35mm	.0925	10	.1935	P	.3230	45/64	.7031
74	.0225	42	.0935	9	.1960	8.25mm	.3248	18mm	.7087
0.6mm	.0236	3/32	.0938	5mm	.1969	8.3mm	.3268	23/32	.7188
73	.0240	2.4mm	.0945	8	.1990	21/64	.3281	18.5mm	.7283
72	.0250	41	.0960	5.1mm	.2008	8.4mm	.3307	47/64	.7344
0.65mm	.0256	2.45mm	.0965	7	.2010	Q	.3320	19mm	.7480
71	.0260	40	.0980	13/64	.2031	8.5mm	.3346	3/4	.7500
0.7mm	.0276	2.5mm	.0984	6	.2040	8.6mm	.3386	49/64	.7656
70	.0280	39	.0995	5.2mm	.2047	R	.3390	19.5mm	.7677
69	.0292	38	.1015	5	.2055	8.7mm	.3425	25/32	.7812
0.75mm	.0295	2.6mm	.1024	5.25mm	.2067	11/32	.3438	20mm	.7874
68	.0310	37	.1040	5.3mm	.2087	8.75mm	.3445	51/64	.7969
1/32	.0312	2.7mm	.1063	4	.2090	8.8mm	.3465	20.5mm	.8071
0.8mm	.0315	36	.1065	5.4mm	.2126	S	.3480	13/16	.8125
67	.0320	2.75mm	.1083	3	.2130	8.9mm	.3504	21mm	.8268
66	.0330	7/64	.1094	5.5mm	.2165	9mm	.3543	53/64	.8281
0.85mm	.0335	35	.1100	7/32	.2188	T	.3580	27/32	.8438
65	.0350	2.8mm	.1102	5.6mm	.2205	9.1mm	.3583	21.5mm	.8465
0.9mm	.0354	34	.1110	2	.2210	23/64	.3594	55/64	.8594
64	.0360	33	.1130	5.7mm	.2244	9.2mm	.3622	22mm	.8661
63	.0370	2.9mm	.1142	5.75mm	.2264	9.25mm	.3642	7/8	.8750
0.95mm	.0374	32	.1160	1	.2280	9.3mm	.3661	22.5mm	.8858
62	.0380	3mm	.1181	5.8mm	.2283	U	.3680	57/64	.8906
61	.0390	31	.1200	5.9mm	.2323	9.4mm	.3701	23mm	.9055
1mm	.0394	3.1mm	.1220	A	.2340	9.5mm	.3740	29/32	.9062
60	.0400	1/8	.1250	15/64	.2344	3/8	.3750	59/64	.9219
59	.0410	3.2mm	.1260	6mm	.2362	V	.3770	23.5mm	.9252
1.05mm	.0413	3.25mm	.1280	B	.2380	9.6mm	.3780	15/16	.9375
58	.0420	30	.1285	6.1mm	.2402	9.7mm	.3819	24mm	.9449
57	.0430	3.3mm	.1299	C	.2420	9.75mm	.3839	61/64	.9531
1.1mm	.0433	3.4mm	.1339	6.2mm	.2441	9.8mm	.3858	24.5mm	.9646
1.15mm	.0453	29	.1360	D	.2460	W	.3860	31/32	.9688
56	.0465	3.5mm	.1378	6.25mm	.2461	9.9mm	.3898	25mm	.9843
3/64	.0469	28	.1405	6.3mm	.2480	25/64	.3906	63/64	.9844
1.2mm	.0472	9/64	.1406	E	.2500	10mm	.3937	1	1.0000
1.25mm	.0492	3.6mm	.1417	1/4	.2500	X	.3970		
1.3mm	.0512	27	.1440	6.4mm	.2520	Y	.4040		
55	.0520	3.7mm	.1457	6.5mm	.2559	13/32	.4062		