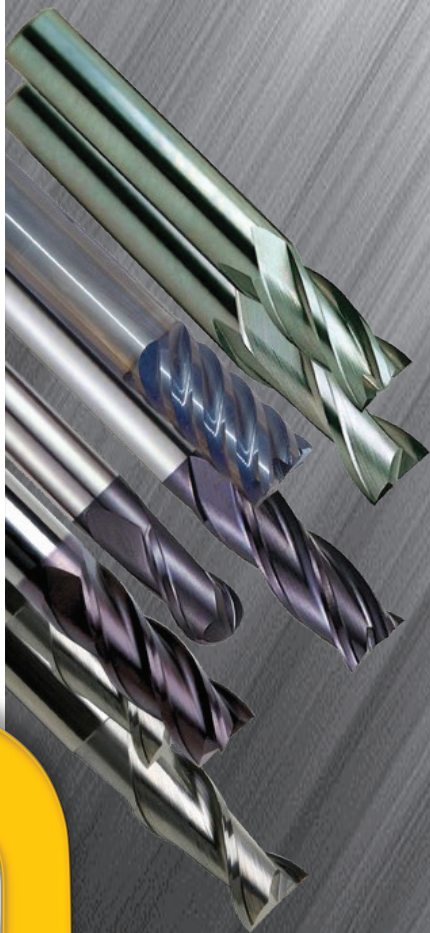


- *UHP/VP Series*
- *HP/VP Series*
- *G/P Series*



2021-2022

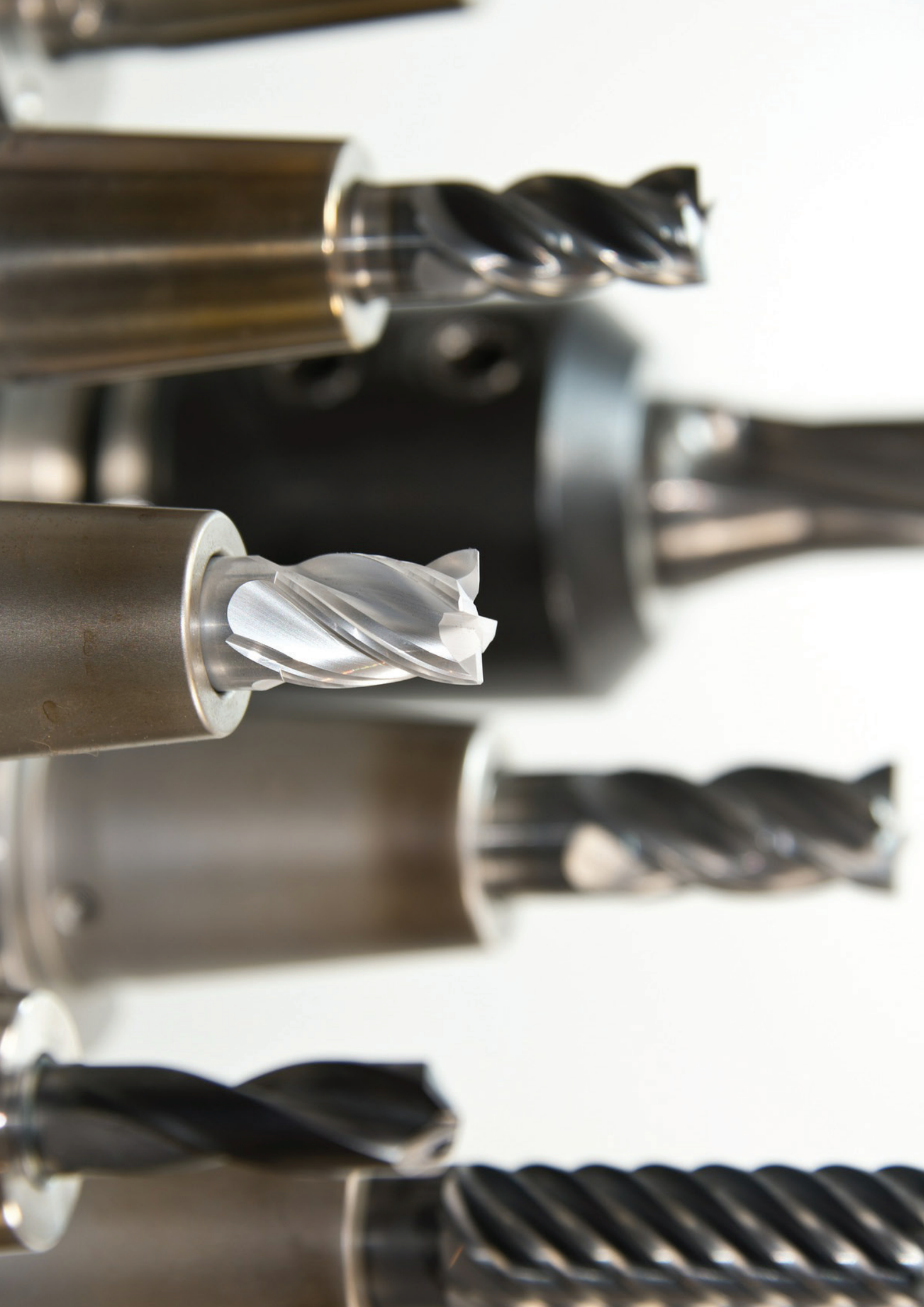
END MILL CATALOG



Made in Canada

BEST CARBIDE
END MILL SERIES

B





GENERAL PURPOSE

Pages 4–13

- General Purpose
- 30 deg Helix Carbide
- 10% Micro Grain Carbide
- Diameter Tolerances: +0.0000" / -0.0020"

HIGH PERFORMANCE VARIABLE PITCH

Pages 14–17

- Special Helix Design With Unique Core
- Unique Honing Process For Enhanced Tool Life
- Variable Pitch to reduce chatter
- 10% Micro Grain Carbide
- Diameter Tolerances: +0.0000" / -0.0020"

ULTRA HIGH PERFORMANCE VARIABLE PITCH

Pages 18–21

- Special Helix Design With Unique Core
- Unique Honing Process For Enhanced Tool Life
- Variable Pitch to reduce chatter
- 10% Premium Micro Grain Carbide
- Diameter Tolerances: +0.0000" / -0.0015"

ALUMINUM

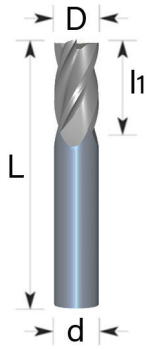
Pages 22–25

- Special Helix Design
- Variable Pitch to reduce chatter
- 10% Extra Fine Sub-Micro Grain Premium Carbide
- Cylindrical Margin on O/D to Stabilize Cutter at High RPM
- Diameter Tolerances: +0.0000" / -0.0004"










COATINGS

- Titanium Aluminum Nitride (TiAlN) is Blue-Grey Color & provides high heat & abrasion resistance to improve tool life & productivity
- Zirconium Nitride (ZrN) is Pale Gold Color & provides high lubricity for machining aluminum & non-ferrous materials
- Diamond Like Carbon (DLC) is Black Color & provides very high abrasion & wear resistant for finish machining aluminum or composite materials

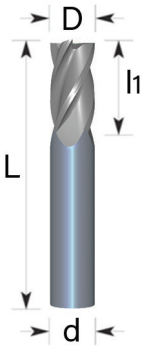
GENERAL PURPOSE SOLID CARBIDE - SQUARE END



Cutter Diam. D	Shank Diam. d	Length of Cut l1	Overall Length L	Uncoated			TiAlN Coated		
				2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
1/64	1/8	1/16	1-1/2	0040152	0040153	0040154	0060152	0060153	0060154
1/32	1/8	1/16	1-1/2	0010312	0010313	0010314	0030312	0030313	0030314
		3/32		0040312	0040313	0040314	0060312	0060313	0060314
3/64	1/8	3/32	1-1/2	0010462	0010463	0010464	0030462	0030463	0030464
		1/8		0040462	0040463	0040464	0060462	0060463	0060464
1/16	1/8	1/8	1-1/2	0010622	0010623	0010624	0030622	0030623	0030624
		3/16		0040622	0040623	0040624	0060622	0060623	0060624
5/64	1/8	1/4	1-1/2	0040782	0040783	0040784	0060782	0060783	0060784
3/32	1/8	3/16	1-1/2	0010932	0010933	0010934	0030932	0030933	0030934
		3/8		0040932	0040933	0040934	0060932	0060933	0060934
7/64	1/8	3/8	1-1/2	0041092	0041093	0041094	0061092	0061093	0061094
1/8	1/8	1/4	1-1/2	0011252	0011253	0011254	0031252	0031253	0031254
		1/2		0041252	0041253	0041254	0061252	0061253	0061254
		3/4	2-1/2	0071252	--	0071254	0091252	--	0091254
9/64	3/16	1	3	0101252	--	0101254	0121252	--	0121254
		9/16	2	0041402	0041403	0041404	0061402	0061403	0061404
		5/16	2	0011562	0011563	0011564	0031562	0031563	0031564
9/16	0041562	0041563		0041564	0061562	0061563	0061564		
11/64	3/16	9/16	2	0041712	0041713	0041714	0061712	0061713	0061714
3/16	3/16	3/8	2	0011872	0011873	0011874	0031872	0031873	0031874
		5/8		0041872	0041873	0041874	0061872	0061873	0061874
		3/4	2-1/2	0071872	--	0071874	0091872	--	0091874
		1-1/8	3	0101872	--	0101874	0121872	--	0121874
13/64	1/4	5/8	2-1/2	0042032	0042033	0042034	0062032	0062033	0062034
7/32	1/4	7/16	2	0012182	0012183	0012184	0032182	0032183	0032184
		5/8	2-1/2	0042182	0042183	0042184	0062182	0062183	0062184
15/64	1/4	3/4	2-1/2	0042342	0042343	0042344	0062342	0062343	0062344
1/4	1/4	1/2	2	0012502	0012503	0012504	0032502	0032503	0032504
		3/4	2-1/2	0042502	0042503	0042504	0062502	0062503	0062504
		1-1/8	3	0072502	--	0072504	0092502	--	0092504
		1-1/2	4	0102502	--	0102504	0122502	--	0122504
17/64	5/16	7/8	2-1/2	0042652	0042653	0042654	0062652	0062653	0062654
9/32	5/16	7/8	2-1/2	0042812	0042813	0042814	0062812	0062813	0062814
19/64	5/16	7/8	2-1/2	0042962	0042963	0042964	0062962	0062963	0062964
5/16	5/16	1/2	2	0013122	0013123	0013124	0033122	0033123	0033124
		7/8	2-1/2	0043122	0043123	0043124	0063122	0063123	0063124
		1-1/8	3	0073122	--	0073124	0093122	--	0093124
		1-5/8	4	0103122	--	0103124	0123122	--	0123124
21/64	3/8	7/8	2-1/2	0043282	0043283	0043284	0063282	0063283	0063284
11/32	3/8	7/8	2-1/2	0043432	0043433	0043434	0063432	0063433	0063434
23/64	3/8	7/8	2-1/2	0043592	0043593	0043594	0063592	0063593	0063594
3/8	3/8	5/8	2	0013752	0013753	0013754	0033752	0033753	0033754
		1	2-1/2	0043752	0043753	0043754	0063752	0063753	0063754
		1-1/8	3	0073752	--	0073754	0093752	--	0093754
		1-3/4	4	0103752	--	0103754	0123752	--	0123754
25/64	7/16	1	2-1/2	0043902	0043903	0043904	0063902	0063903	0063904

-  Square
-  Round Shank
-  30° Helix
-  Uncoated
-  TiAlN Coated
-  P
-  K
-  M
-  N

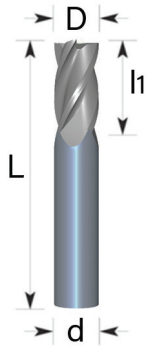
GENERAL PURPOSE SOLID CARBIDE - SQUARE END



Cutter Diam. D	Shank Diam. d	Length Overall of Cut l1	Overall Length L	Uncoated			TiAlN Coated		
				2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
13/32	7/16	1	2-1/2	0044062	0044063	0044064	0064062	0064063	0064064
27/64	7/16	1	2-1/2	0044212	0044213	0044214	0064212	0064213	0064214
7/16	7/16	5/8	2-1/2	0014372	0014373	0014374	0034372	0034373	0034374
		1		0044372	0044373	0044374	0064372	0064373	0064374
		2		0074372	--	0074374	0094372	--	0094374
29/64	1/2	1	3	0044532	0044533	0044534	0064532	0064533	0064534
15/32	1/2	1	3	0044682	0044683	0044684	0064682	0064683	0064684
31/64	1/2	1	3	0044842	0044843	0044844	0064842	0064843	0064844
1/2	1/2	5/8	2-1/2	0015002	0015003	0015004	0035002	0035003	0035004
		1	3	0045002	0045003	0045004	0065002	0065003	0065004
		2	4	0075002	--	0075004	0095002	--	0095004
		3	6	0105002	--	0105004	0125002	--	0125004
33/64	9/16	1-1/4	3-1/2	0045152	0045153	0045154	0065152	0065153	0065154
17/32	9/16	1-1/4	3-1/2	0045312	0045313	0045314	0065312	0065313	0065314
35/64	9/16	1-1/4	3-1/2	0045462	0045463	0045464	0065462	0065463	0065464
9/16	9/16	1-1/4	3-1/2	0045622	0045623	0045624	0065622	0065623	0065624
37/64	5/8	1-1/4	3-1/2	0045782	0045783	0045784	0065782	0065783	0065784
19/32	5/8	1-1/4	3-1/2	0045932	0045933	0045934	0065932	0065933	0065934
39/64	5/8	1-1/4	3-1/2	0046092	0046093	0046094	0066092	0066093	0066094
5/8	5/8	3/4	3	0016252	0016253	0016254	0036252	0036253	0036254
		1-1/4	3-1/2	0046252	0046253	0046254	0066252	0066253	0066254
		2-1/4	5	0076252	--	0076254	0096252	--	0096254
3	6	0106252	--	0106254	0126252	--	0126254		
41/64	3/4	1-1/2	4	0046402	0046403	0046404	0066402	0066403	0066404
21/32	3/4	1-1/2	4	0046562	0046563	0046564	0066562	0066563	0066564
43/64	3/4	1-1/2	4	0046712	0046713	0046714	0066712	0066713	0066714
11/16	3/4	1-1/2	4	0046872	0046873	0046874	0066872	0066873	0066874
45/64	3/4	1-1/2	4	0047032	0047033	0047034	0067032	0067033	0067034
23/32	3/4	1-1/2	4	0047182	0047183	0047184	0067182	0067183	0067184
47/64	3/4	1-1/2	4	0047342	0047343	0047344	0067342	0067343	0067344
3/4	3/4	1	3	0017502	0017503	0017504	0037502	0037503	0037504
		1-1/2	4	0047502	0047503	0047504	0067502	0067503	0067504
		2-1/4	5	0077502	--	0077504	0097502	--	0097504
		3	6	0107502	--	0107504	0127502	--	0127504
49/64	7/8	1-1/2	4	0047652	0047653	0047654	0067652	0067653	0067654
25/32	7/8	1-1/2	4	0047812	0047813	0047814	0067812	0067813	0067814
51/64	7/8	1-1/2	4	0047962	0047963	0047964	0067962	0067963	0067964
13/16	7/8	1-1/2	4	0048122	0048123	0048124	0068122	0068123	0068124
53/64	7/8	1-1/2	4	0048282	0048283	0048284	0068282	0068283	0068284
27/32	7/8	1-1/2	4	0048432	0048433	0048434	0068432	0068433	0068434
55/64	7/8	1-1/2	4	0048592	0048593	0048594	0068592	0068593	0068594
7/8	7/8	1-1/2	4	0048752	0048753	0048754	0068752	0068753	0068754
57/64	1	1-1/2	4	0048902	0048903	0048904	0068902	0068903	0068904
29/32	1	1-1/2	4	0049062	0049063	0049064	0069062	0069063	0069064
59/64	1	1-1/2	4	0049212	0049213	0049214	0069212	0069213	0069214
15/16	1	1-1/2	4	0049372	0049373	0049374	0069372	0069373	0069374



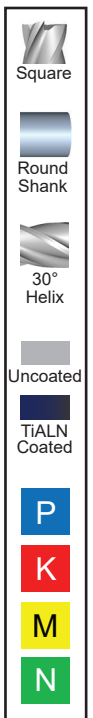
GENERAL PURPOSE SOLID CARBIDE - SQUARE END



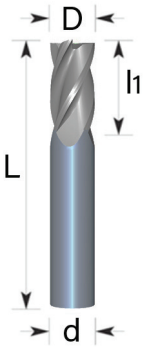
Cutter Diam. D	Shank Diam. d	Length of Cut l1	O.A.L. L	Uncoated			TiALN Coated		
				2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
61/64	1	1-1/2	4	0049532	0049533	0049534	0069532	0069533	0069534
31/32	1	1-1/2	4	0049682	0049683	0049684	0069682	0069683	0069684
63/64	1	1-1/2	4	0049842	0049843	0049844	0069842	0069843	0069844
1	1	1	3	0011002	0011003	0011004	0031002	0031003	0031004
		1-1/2	4	0041002	0041003	0041004	0061002	0061003	0061004
		2-1/4	5	0071002	--	0071004	0091002	--	0091004
		3	6	0101002	--	0101004	0121002	--	0121004

GENERAL PURPOSE - METRIC SOLID CARBIDE - SQUARE END

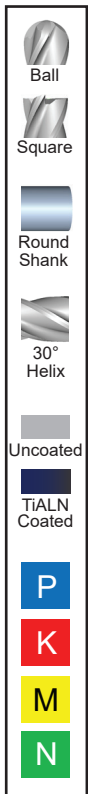
Cutter Diam. D	Shank Diam. d	Length of Cut l1	O.A.L. L	Uncoated			TiALN Coated		
				2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
1	1	3	38	0410102	0410103	0410104	0420102	0420103	0420104
1.5	2	5	38	0410152	0410153	0410154	0420152	0420153	0420154
2	2	6	38	0410202	0410203	0410204	0420202	0420203	0420204
		12	38	0410302	0410303	0410304	0420302	0420303	0420304
3	3	25	75	0450302	--	0450304	0460302	--	0460304
		25	100	0470302	--	0470304	0480302	--	0480304
3.5	4	12	50	0410352	0410353	0410354	0420352	0420353	0420354
		14	50	0410402	0410403	0410404	0420402	0420403	0420404
4	4	25	75	0450402	--	0450404	0460402	--	0460404
		50	100	0470402	--	0470404	0480402	--	0480404
4.5	5	14	50	0410452	0410453	0410454	0420452	0420453	0420454
		16	50	0410502	0410503	0410504	0420502	0420503	0420504
5	5	25	75	0450502	--	0450504	0460502	--	0460504
		30	100	0470502	--	0470504	0480502	--	0480504
6	6	19	63	0410602	0410603	0410604	0420602	0420603	0420604
		25	75	0450602	--	0450604	0460602	--	0460604
7	8	50	100	0470602	--	0470604	0480602	--	0480604
		19	63	0410702	0410703	0410704	0420702	0420703	0420704
8	8	19	63	0410802	0410803	0410804	0420802	0420803	0420804
		30	100	0450802	--	0450804	0460802	--	0460804
9	10	50	150	0470802	--	0470804	0480802	--	0480804
		22	70	0410902	0410903	0410904	0420902	0420903	0420904
10	10	22	70	0411002	0411003	0411004	0421002	0421003	0421004
		38	100	0451002	--	0451004	0461002	--	0461004
11	12	75	150	0471002	--	0471004	0481002	--	0481004
		25	70	0411102	0411103	0411104	0421102	0421103	0421104



GENERAL PURPOSE - METRIC SOLID CARBIDE - SQUARE END

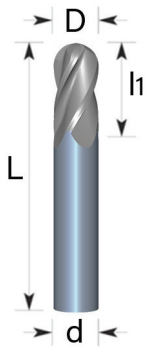


Cutter Diam. D	Shank Diam. d	Length of Cut l1	Overall Length L	Uncoated			TiAlN Coated		
				2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
12	12	25	75	0411202	0411203	0411204	0421202	0421203	0421204
		50	100	0451202	--	0451204	0461202	--	0461204
		75	150	0471202	--	0471204	0481202	--	0481204
14	14	30	88	0411402	0411403	0411404	0421402	0421403	0421404
		50	125	0451402	--	0451404	0461402	--	0461404
		75	150	0471402	--	0471404	0481402	--	0481404
16	16	32	88	0411602	0411603	0411604	0421602	0421603	0421604
		75	150	0451602	--	0451604	0461602	--	0461604
18	18	36	100	0411802	0411803	0411804	0421802	0421803	0421804
		75	150	0451802	--	0451804	0461802	--	0461804
20	20	38	100	0412002	0412003	0412004	0422002	0422003	0422004
		75	150	0452002	--	0452004	0462002	--	0462004
22	25	38	100	0412202	0412203	0412204	0422202	0422203	0422204
25	25	38	100	0412502	0412503	0412504	0422502	0422503	0422504
		75	150	0452502	--	0452504	0462502	--	0462504

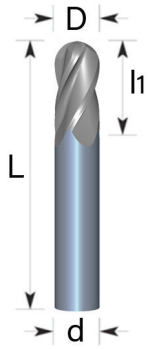


GENERAL PURPOSE SOLID CARBIDE - BALL NOSE

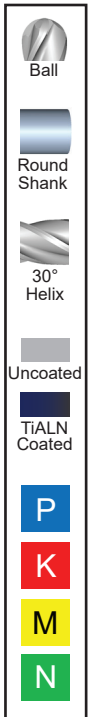
Cutter Diam. D	Shank Diam. d	Length of Cut l1	Overall Length L	Uncoated			TiAlN Coated		
				2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
1/64	1/8	1/16	1-1/2	0160152	0160153	0160154	0180152	0180153	0180154
1/32	1/8	1/16	1-1/2	0130312	0130313	0130314	0150312	0150313	0150314
		3/32	1-1/2	0160312	0160313	0160314	0180312	0180313	0180314
3/64	1/8	3/32	1-1/2	0130462	0130463	0130464	0150462	0150463	0150464
		1/8	1-1/2	0160462	0160463	0160464	0180462	0180463	0180464
1/16	1/8	1/8	1-1/2	0130622	0130623	0130624	0150622	0150623	0150624
		3/16	1-1/2	0160622	0160623	0160624	0180622	0180623	0180624
5/64	1/8	1/4	1-1/2	0160782	0160783	0160784	0180782	0180783	0180784
3/32	1/8	3/16	1-1/2	0130932	0130933	0130934	0150932	0150933	0150934
		3/8	1-1/2	0160932	0160933	0160934	0180932	0180933	0180934
7/64	1/8	3/8	1-1/2	0161092	0161093	0161094	0181092	0181093	0181094
1/8	1/8	1/4	1-1/2	0131252	0131253	0131254	0151252	0151253	0151254
		1/2	1-1/2	0161252	0161253	0161254	0181252	0181253	0181254
		3/4	2-1/2	0191252	--	0191254	0211252	--	0211254
		1	3	0221252	--	0221254	0241252	--	0241254
9/64	3/16	9/16	2	0161402	0161403	0161404	0181402	0181403	0181404
5/32	3/16	5/16	2	0131562	0131563	0131564	0151562	0151563	0151564
		9/16	2	0161562	0161563	0161564	0181562	0181563	0181564
11/64	3/16	9/16	2	0161712	0161713	0161714	0181712	0181713	0181714



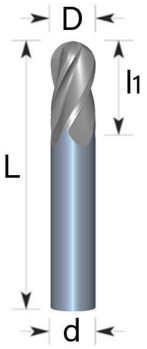
GENERAL PURPOSE SOLID CARBIDE - BALL NOSE



Cutter Diam.	Shank Diam.	Length of Cut	O.A.L.	Uncoated			TiAlN Coated			
				D	d	l1	L	2 Flute Part #	3 Flute Part #	4 Flute Part #
3/16	3/16	3/8	2		0131872	0131873	0131874	0151872	0151873	0151874
		5/8			0161872	0161873	0161874	0181872	0181873	0181874
		3/4	2-1/2		0191872	--	0191874	0211872	--	0211874
		1-1/8	3		0221872	--	0221874	0241872	--	0241874
13/64	1/4	5/8	2-1/2		0162032	0162033	0162034	0182032	0182033	0182034
7/32	1/4	7/16	2		0132182	0132183	0132184	0152182	0152183	0152184
		5/8	2-1/2		0162182	0162183	0162184	0182182	0182183	0182184
15/64	1/4	3/4	2-1/2		0162342	0162343	0162344	0182342	0182343	0182344
1/4	1/4	1/2	2		0132502	0132503	0132504	0152502	0152503	0152504
		3/4	2-1/2		0162502	0162503	0162504	0182502	0182503	0182504
		1-1/8	3		0192502	--	0192504	0212502	--	0212504
		1-1/2	4		0222502	--	0222504	0242502	--	0242504
17/64	5/16	7/8	2-1/2		0162652	0162653	0162654	0182652	0182653	0182654
9/32	5/16	7/8	2-1/2		0162812	0162813	0162814	0182812	0182813	0182814
19/64	5/16	7/8	2-1/2		0162962	0162963	0162964	0182962	0182963	0182964
5/16	5/16	1/2	2		0133122	0133123	0133124	0153122	0153123	0153124
		7/8	2-1/2		0163122	0163123	0163124	0183122	0183123	0183124
		1-1/8	3		0193122	--	0193124	0213122	--	0213124
		1-5/8	4		0223122	--	0223124	0243122	--	0243124
21/64	3/8	7/8	2-1/2		0163282	0163283	0163284	0183282	0183283	0183284
11/32	3/8	7/8	2-1/2		0163432	0163433	0163434	0183432	0183433	0183434
23/64	3/8	7/8	2-1/2		0163592	0163593	0163594	0183592	0183593	0183594
3/8	3/8	5/8	2		0133752	0133753	0133754	0153752	0153753	0153754
		1	2-1/2		0163752	0163753	0163754	0183752	0183753	0183754
		1-1/8	3		0193752	--	0193754	0213752	--	0213754
		1-3/4	4		0223752	--	0223754	0243752	--	0243754
25/64	7/16	1	2-1/2		0163902	0163903	0163904	0183902	0183903	0183904
13/32	7/16	1	2-1/2		0164062	0164063	0164064	0184062	0184063	0184064
27/64	7/16	1	2-1/2		0164212	0164213	0164214	0184212	0184213	0184214
7/16	7/16	5/8	2-1/2		0134372	0134373	0134374	0154372	0154373	0154374
		1			0164372	0164373	0164374	0184372	0184373	0184374
		2	4		0194372	--	0194374	0214372	--	0214374
29/64	1/2	1	3		0164532	0164533	0164534	0184532	0184533	0184534
15/32	1/2	1	3		0164682	0164683	0164684	0184682	0184683	0184684
31/64	1/2	1	3		0164842	0164843	0164844	0184842	0184843	0184844
1/2	1/2	5/8	2-1/2		0135002	0135003	0135004	0155002	0155003	0155004
		1	3		0165002	0165003	0165004	0185002	0185003	0185004
		2	4		0195002	--	0195004	0215002	--	0215004
		3	6		0225002	--	0225004	0245002	--	0245004
33/64	9/16	1-1/4	3-1/2		0165152	0165153	0165154	0185152	0185153	0185154
17/32	9/16	1-1/4	3-1/2		0165312	0165313	0165314	0185312	0185313	0185314
35/64	9/16	1-1/4	3-1/2		0165462	0165463	0165464	0185462	0185463	0185464
9/16	9/16	1-1/4	3-1/2		0165622	0165623	0165624	0185622	0185623	0185624
37/64	5/8	1-1/4	3-1/2		0165782	0165783	0165784	0185782	0185783	0185784
19/32	5/8	1-1/4	3-1/2		0165932	0165933	0165934	0185932	0185933	0185934
39/64	5/8	1-1/4	3-1/2		0166092	0166093	0166094	0186092	0186093	0186094



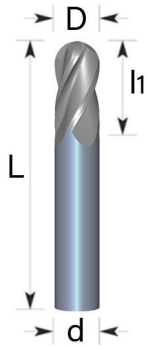
GENERAL PURPOSE SOLID CARBIDE - BALL NOSE



Cutter Diam. D	Shank Diam. d	Length Overall of Cut Length		Uncoated			TiAlN Coated		
		l	L	2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
5/8	5/8	3/4	3	0136252	0136253	0136254	0156252	0156253	0156254
		1-1/4	3-1/2	0166252	0166253	0166254	0186252	0186253	0186254
		2-1/4	5	0196252	--	0196254	0216252	--	0216254
		3	6	0226252	--	0226254	0246252	--	0246254
41/64	3/4	1-1/2	4	0166402	0166403	0166404	0186402	0186403	0186404
21/32	3/4	1-1/2	4	0166562	0166563	0166564	0186562	0186563	0186564
43/64	3/4	1-1/2	4	0166712	0166713	0166714	0186712	0186713	0186714
11/16	3/4	1-1/2	4	0166872	0166873	0166874	0186872	0186873	0186874
45/64	3/4	1-1/2	4	0167032	0167033	0167034	0187032	0187033	0187034
23/32	3/4	1-1/2	4	0167182	0167183	0167184	0187182	0187183	0187184
47/64	3/4	1-1/2	4	0167342	0167343	0167344	0187342	0187343	0187344
3/4	3/4	1	3	0137502	0137503	0137504	0157502	0157503	0157504
		1-1/2	4	0167502	0167503	0167504	0187502	0187503	0187504
		2-1/4	5	0197502	--	0197504	0217502	--	0217504
49/64	7/8	1-1/2	4	0167652	0167653	0167654	0187652	0187653	0187654
25/32	7/8	1-1/2	4	0167812	0167813	0167814	0187812	0187813	0187814
51/64	7/8	1-1/2	4	0167962	0167963	0167964	0187962	0187963	0187964
13/16	7/8	1-1/2	4	0168122	0168123	0168124	0188122	0188123	0188124
53/64	7/8	1-1/2	4	0168282	0168283	0168284	0188282	0188283	0188284
27/32	7/8	1-1/2	4	0168432	0168433	0168434	0188432	0188433	0188434
55/64	7/8	1-1/2	4	0168592	0168593	0168594	0188592	0188593	0188594
7/8	7/8	1-1/2	4	0168752	0168753	0168754	0188752	0188753	0188754
57/64	1	1-1/2	4	0168902	0168903	0168904	0188902	0188903	0188904
29/32	1	1-1/2	4	0169062	0169063	0169064	0189062	0189063	0189064
59/64	1	1-1/2	4	0169212	0169213	0169214	0189212	0189213	0189214
15/16	1	1-1/2	4	0169372	0169373	0169374	0189372	0189373	0189374
61/64	1	1-1/2	4	0169532	0169533	0169534	0189532	0189533	0189534
31/32	1	1-1/2	4	0169682	0169683	0169684	0189682	0189683	0189684
63/64	1	1-1/2	4	0169842	0169843	0169844	0189842	0189843	0189844
1	1	1	3	0131002	0131003	0131004	0151002	0151003	0151004
		1-1/2	4	0161002	0161003	0161004	0181002	0181003	0181004
		2-1/4	5	0191002	--	0191004	0211002	--	0211004
		3	6	0221002	--	0221004	0241002	--	0241004



GENERAL PURPOSE - METRIC SOLID CARBIDE - BALL NOSE

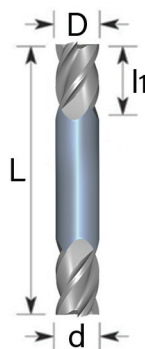


Cutter Diam.	Shank Diam.	Length of Cut	O.A.L.	Uncoated			TiAlN Coated					
				D	d	l1	L	2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #
1	1	3	38				0430102	--	0430104	0440102	--	0440104
1.5	2	5	38				0430152	--	0430154	0440152	--	0440154
2	2	6	38				0430202	--	0430204	0440202	--	0440204
3	3	12	38				0430302	--	0430304	0440302	--	0440304
3.5	4	12	50				0430352	--	0430354	0440352	--	0440354
4	4	14	50				0430402	--	0430404	0440402	--	0440404
4.5	5	14	50				0430452	--	0430454	0440452	--	0440454
5	5	16	50				0430502	--	0430504	0440502	--	0440504
6	6	19	63				0430602	--	0430604	0440602	--	0440604
7	8	19	63				0430702	--	0430704	0440702	--	0440704
8	8	19	63				0430802	--	0430804	0440802	--	0440804
9	9	22	70				0430902	--	0430904	0440902	--	0440904
10	10	22	70				0431002	--	0431004	0441002	--	0441004
11	11	25	70				0431102	--	0431104	0441102	--	0441104
12	12	25	75				0431202	--	0431204	0441202	--	0441204
14	14	30	88				0431402	--	0431404	0441402	--	0441404
16	16	32	88				0431602	--	0431604	0441602	--	0441604
18	18	36	100				0431802	--	0431804	0441802	--	0441804
20	20	38	100				0432002	--	0432004	0442002	--	0442004
22	25	38	100				0432202	--	0432204	0442202	--	0442204
25	25	38	100				0432502	--	0432504	0442502	--	0442504



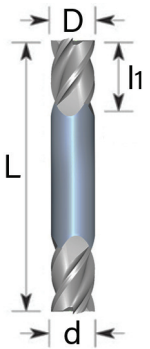
GENERAL PURPOSE - DOUBLE ENDED SOLID CARBIDE - SQUARE END

Cutter Diam.	Shank Diam.	Length of Cut	O.A.L.	Uncoated			TiAlN Coated					
				D	d	l1	L	2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #
1/32	1/8	1/16	1-1/2				0250312	--	0250314	0270312	--	0270314
3/64	1/8	3/32	1-1/2				0250462	--	0250464	0270462	--	0270464
1/16	1/8	1/8	1-1/2				0250622	--	0250624	0270622	--	0270624
3/32	1/8	3/16	1-1/2				0250932	--	0250934	0270932	--	0270934
		5/16	3				0310932	--	0310934	0320932	--	0320934
7/64	1/8	7/32	1-1/2				0251092	--	0251094	0271092	--	0271094
1/8	1/8	1/4	1-1/2				0251252	--	0251254	0271252	--	0271254
		3/8	3-1/16				0311252	--	0311254	0321252	--	0321254
5/32	3/16	5/16	2				0251562	--	0251564	0271562	--	0271564
		7/16	3-1/8				0311562	--	0311564	0321562	--	0321564
3/16	3/16	5/16	2				0251872	--	0251874	0271872	--	0271874
		1/2	3-1/4				0311872	--	0311874	0321872	--	0321874
7/32	1/4	3/8	2-1/2				0252182	--	0252184	0272182	--	0272184
		9/16	3-1/2				0312182	--	0312184	0322182	--	0322184



* Double Ended tools under 1/4" Diameter have Round Shanks. 1/4" diameter & larger have Weldon Shanks.

GENERAL PURPOSE - DOUBLE ENDED SOLID CARBIDE - SQUARE END

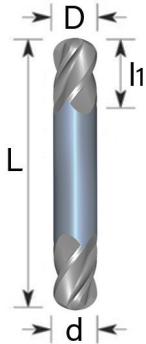


Cutter Diam. D	Shank Diam. d	Length of Cut l	Overall Length L	Uncoated			TiALN Coated		
				2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
1/4	1/4	1/2	2-1/2	0252502	--	0252504	0272502	--	0272504
		5/8	3-1/2	0312502	--	0312504	0322502	--	0322504
9/32	5/16	1/2	2-1/2	0252812	--	0252814	0272812	--	0272814
5/16	5/16	1/2	2-1/2	0253122	--	0253124	0273122	--	0273124
		3/4	3-1/2	0313122	--	0313124	0323122	--	0323124
3/8	3/8	9/16	2-1/2	0253752	--	0253754	0273752	--	0273754
		3/4	3-1/2	0313752	--	0313754	0323752	--	0323754
7/16	1/2	9/16	2-3/4	0254372	--	0254374	0274372	--	0274374
		7/8	4	0314372	--	0314374	0324372	--	0324374
1/2	1/2	5/8	3	0255002	--	0255004	0275002	--	0275004
		1	4	0315002	--	0315004	0325002	--	0325004
9/16	5/8	11/16	3-1/2	0255622	--	0255624	0275622	--	0275624
5/8	5/8	11/16	3-1/2	0256252	--	0256254	0276252	--	0276254
		1-1/2	6	0316252	--	0316254	0326252	--	0326254
3/4	3/4	7/8	4	0257502	--	0257504	0277502	--	0277504
		1-1/2	6	0317502	--	0317504	0327502	--	0327504

* Double Ended tools under 1/4" Diamater have Round Shanks. 1/4" diameter & larger have Weldon Shanks.



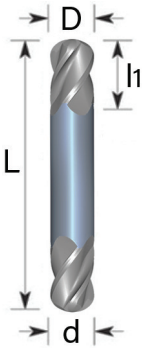
GENERAL PURPOSE - DOUBLE ENDED SOLID CARBIDE - BALL NOSE



Cutter Diam. D	Shank Diam. d	Length of Cut l	Overall Length L	Uncoated			TiALN Coated		
				2 Flute Part #	3 Flute Part #	4 Flute Part #	2 Flute Part #	3 Flute Part #	4 Flute Part #
1/32	1/8	1/16	1-1/2	0280312	--	0280314	0300312	--	0300314
3/64	1/8	3/32	1-1/2	0280462	--	0280464	0300462	--	0300464
1/16	1/8	1/8	1-1/2	0280622	--	0280624	0300622	--	0300624
3/32	1/8	3/16	1-1/2	0280932	--	0280934	0300932	--	0300934
		5/16	3	0330932	--	0330934	0340932	--	0340934
7/64	1/8	7/32	1-1/2	0281092	--	0281094	0301092	--	0301094
1/8	1/8	1/4	1-1/2	0281252	--	0281254	0301252	--	0301254
		3/8	3-1/16	0331252	--	0331254	0341252	--	0341254
5/32	3/16	5/16	2	0281562	--	0281564	0301562	--	0301564
		7/16	3-1/8	0331562	--	0331564	0341562	--	0341564
3/16	3/16	5/16	2	0281872	--	0281874	0301872	--	0301874
		1/2	3-1/4	0331872	--	0331874	0341872	--	0341874
7/32	1/4	3/8	2-1/2	0282182	--	0282184	0302182	--	0302184
		9/16	3-1/2	0332182	--	0332184	0342182	--	0342184
1/4	1/4	1/2	2-1/2	0282502	--	0282504	0302502	--	0302504
		5/8	3-1/2	0332502	--	0332504	0342502	--	0342504
9/32	5/16	1/2	2-1/2	0282812	--	0282814	0302812	--	0302814
5/16	5/16	1/2	2-1/2	0283122	--	0283124	0303122	--	0303124
		3/4	3-1/2	0333122	--	0333124	0343122	--	0343124

* Double Ended tools under 1/4" Diamater have Round Shanks. 1/4" diameter & larger have Weldon Shanks.

GENERAL PURPOSE - DOUBLE ENDED SOLID CARBIDE - BALL NOSE



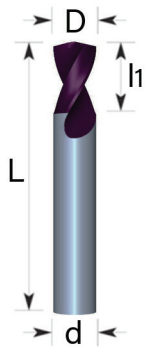
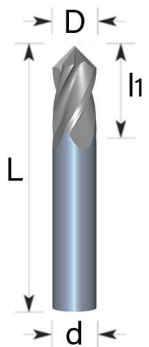
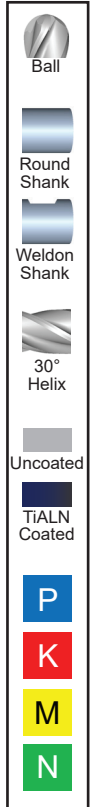
Cutter Diam.	Shank Diam.	Length of Cut	O.A.L.	Uncoated			TiALN Coated		
				D	d	l1	L	2 Flute Part #	3 Flute Part #
3/8	3/8	9/16	2-1/2	0283752	--	0283754	0303752	--	0303754
		3/4	3-1/2	0333752	--	0333754	0343752	--	0343754
7/16	1/2	9/16	2-3/4	0284372	--	0284374	0304372	--	0304374
		7/8	4	0334372	--	0334374	0344372	--	0344374
1/2	1/2	5/8	3	0285002	--	0285004	0305002	--	0305004
		1	4	0335002	--	0335004	0345002	--	0345004
9/16	5/8	11/16	3-1/2	0285622	--	0285624	0305622	--	0305624
5/8	5/8	11/16	3-1/2	0286252	--	0286254	0306252	--	0306254
		1-1/2	6	0336252	--	0336254	0346252	--	0346254
3/4	3/4	7/8	4	0287502	--	0287504	0307502	--	0307504
		1-1/2	6	0337502	--	0337504	0347502	--	0347504

GENERAL PURPOSE - DRILL/MILL SOLID CARBIDE - 90 DEGREE

Cutter Diam.	Shank Diam.	Length of Cut	O.A.L.	Uncoated			TiALN Coated		
				D	d	l1	L	2 Flute Part #	3 Flute Part #
1/8	1/8	1/2	1-1/2	1041252	--	1041254	1061252	--	1061254
3/16	3/16	5/8	2	1041872	--	1041874	1061872	--	1061874
1/4	1/4	3/4	2-1/2	1042502	--	1042504	1062502	--	1062504
5/16	5/16	7/8	2-1/2	1043122	--	1043124	1063122	--	1063124
3/8	3/8	1	2-1/2	1043752	--	1043754	1063752	--	1063754
7/16	7/16	1	2-3/4	1044372	--	1044374	1064372	--	1064374
1/2	1/2	1	3	1045002	--	1045004	1065002	--	1065004
5/8	5/8	1-1/4	3-1/2	1046252	--	1046254	1066252	--	1066254
3/4	3/4	1-1/2	4	1047502	--	1047504	1067502	--	1067504

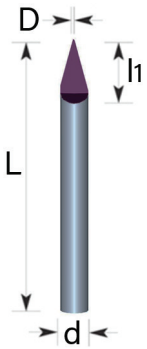
GENERAL PURPOSE - SPOT DRILL SOLID CARBIDE - 145 DEGREE

Drill Diam.	Shank Diam.	Length of Cut	Overall Length	Uncoated	TiALN Coated
				D	d
1/4	1/4	1/2	3	--	1102502
3/8	3/8	3/4	3	--	1103752
1/2	1/2	1	4	--	1105002
5/8	5/8	1	4	--	1106252
3/4	3/4	1-1/8	4	--	1107502



GENERAL PURPOSE - ENGRAVERS SOLID CARBIDE - 30 DEGREE, 1 FLUTE

Tip Diam.	Shank Diam.	Length of Cut	Overall Length	Uncoated	TiALN Coated
D	d	l1	L	1 Flute Part #	1 Flute Part #
.005	1/4	1/2	2-1/2	--	108250005
.010	1/4	1/2	2-1/2	--	108250010
.020	1/4	1/2	2-1/2	--	108250020



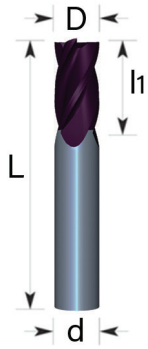
- Engraving Tools With 30 Degree Angle
- 10% Micro Grain Carbide
- 3 Tip Sizes To Choose From
- Diameter Tolerances: +0.0000"/-0.0020"

GENERAL PURPOSE SPEEDS & FEEDS

Material Group		Speed (SFM)		Feed Per Tooth By Diameter							
		Uncoated	TiALN	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
Aluminum & Aluminum Alloys	N	600-1200	900-1800	.0020	.0025	.0030	.0035	.0040	.0050	.0060	.0080
Copper & Copper Alloys		350-850	525-1275	.0020	.0025	.0025	.0030	.0030	.0035	.0040	.0060
Brass & Bronze		250-400	375-600	.0020	.0025	.0025	.0030	.0030	.0035	.0040	.0050
Graphite		500-800	500-1200	.0030	.0035	.0025	.0030	.0030	.0040	.0050	.0070
Plastics		600-1100	600-1650	.0030	.0035	.0040	.0050	.0060	.0080	.0100	.0150
Iron, Cast (soft)	K	250-450	375-650	.0020	.0022	.0025	.0027	.0030	.0045	.0060	.0080
Iron, Cast (hard)		100-250	100-375	.0008	.0010	.0015	.0017	.0020	.0025	.0030	.0040
Iron, Ductile		80-400	100-600	.0010	.0012	.0015	.0017	.0020	.0030	.0040	.0060
Iron, Malleable		150-500	225-650	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0070
Carbon Steels, Low	P	200-400	300-600	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0070
Carbon Steels, Medium		100-250	150-375	.0015	.0016	.0017	.0018	.0020	.0030	.0040	.0050
Carbon Steels Hardened to 35 Rc		130-230	130-345	.0010	.0011	.0012	.0013	.0015	.0017	.0020	.0030
Carbon Steels Hardened to 50 Rc		70-130	70-160	.0007	.0007	.0008	.0009	.0010	.0015	.0020	.0030
Carbon Steels Hardened to 60 Rc		30-70	30-90	.0005	.0006	.0007	.0009	.0010	.0012	.0015	.0020
Steels, Mold		200-350	300-525	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040
Steels, Tool		100-250	150-375	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040
Stainless Steels, Soft	M	200-350	300-450	.0010	.0012	.0015	.0012	.0020	.0030	.0040	.0060
Stainless Steels, Hard		100-200	150-300	.0005	.0006	.0007	.0008	.0010	.0020	.0030	.0050
Monel & High Nickel Steel	S	75-175	75-200	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040
Titanium, Soft		125-300	125-375	.0010	.0012	.0015	.0017	.0020	.0030	.0040	.0060
Titanium, Hard		50-150	50-175	.0005	.0006	.0007	.0008	.0010	.0015	.0020	.0020
Nickel Based High Temp Alloys		50-100	50-125	.0008	.0008	.0009	.0009	.0010	.0012	.0015	.0020

- Speeds & Feeds recommendations are for depths of cut not to exceed 1 times the tool diameter for profiling and .5 times the diameter for full slotting.
- Speeds & Feeds are recommended starting points only. If the tool is working well, without vibrations or significant noise, increase the SFM and/or Feed Per Tooth in 5-10% increments.
- Optimum speeds & feeds will depend upon material, setup, machine conditions & tool deflection. Higher or lower parameters may be required to achieve optimum machining conditions.

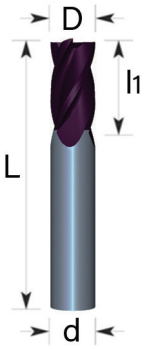
HIGH PERFORMANCE VARIABLE PITCH SOLID CARBIDE - SQUARE & RADIUS



Cutter Diam. Shank Diam.		Length of Cut	Overall Length	TiAlN Coated		
D	d	l1	L	End Face	4 Flute Round Shk	4 Flute Weldon Shk
3/16	3/16	3/8	2	SQ	1901884	--
		3/8	2	.015"R	1901884015R	--
		5/8	2	SQ	0901884	--
		5/8	2	.015"R	0901884015R	--
		3/4	2-1/2	SQ	0921884	--
		3/4	2-1/2	.015"R	0921884015R	--
		1-1/8	3	SQ	0981884	--
1/4	1/4	3/8	2	SQ	1902504	--
		3/8	2	.015"R	1902504015R	--
		3/4	2-1/2	SQ	0902504	0912504
		3/4	2-1/2	.020"R	0902504020R	0912504020R
		1-1/8	3	SQ	0922504	0932504
		1-1/8	3	.020"R	0922504020R	0932504020R
		1-1/2	4	SQ	0982504	--
5/16	5/16	3/8	2	SQ	1903124	--
		3/8	2	.020"R	1903124020R	--
		13/16	2-1/2	SQ	0903124	0913124
		13/16	2-1/2	.020"R	0903124020R	0913124020R
		1-1/8	3	SQ	0923124	0933124
		1-1/8	3	.020"R	0923124020R	0933124020R
		1-5/8	4	SQ	0983124	--
3/8	3/8	1/2	2	SQ	1903754	--
		1/2	2	.020"R	1903754020R	--
		7/8	2-1/2	SQ	0903754	0913754
		7/8	2-1/2	.020"R	0903754020R	0913754020R
		1-1/8	3	SQ	0923754	0933754
		1-1/8	3	.020"R	0923754020R	0933754020R
		1-3/4	4	SQ	0983754	--
7/16	7/16	1	2-3/4	SQ	0904374	0914374
		2	4	SQ	0924374	0934374
1/2	1/2	5/8	2-1/2	SQ	1905004	1915004
		5/8	2-1/2	.030"R	1905004030R	1915004030R
		1-1/4	3	SQ	0905004	0915004
		1-1/4	3	.015"R	0905004015R	0915004015R
		1-1/4	3	.030"R	0905004030R	0915004030R
		1-1/4	3	.060"R	0905004060R	0915004060R
		2	4	SQ	0925004	0935004
		2	4	.015"R	0925004015R	0935004015R
		2	4	.030"R	0925004030R	0935004030R
		2	4	.060"R	0925004060R	0935004060R
5/8	5/8	3/4	3	SQ	1906254	1916254
		3/4	3	.030"R	1906254030R	1916254030R
		1-1/4	3-1/2	SQ	0906254	0916254
		1-1/4	3-1/2	.030"R	0906254030R	0916254030R
		1-1/4	3-1/2	.060"R	0906254060R	0916254060R



HIGH PERFORMANCE VARIABLE PITCH SOLID CARBIDE - SQUARE & RADIUS

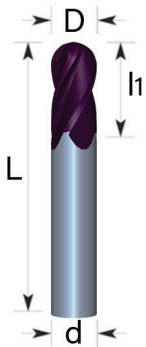


Cutter Diam. D	Shank Diam. d	Length of Cut l1	Overall Length L	End Face	TiAlN Coated	
					4 Flute Round Shk	4 Flute Weldon Shk
5/8	5/8	1-1/4	3-1/2	.125"R	0906254125R	0916254125R
		2-1/4	5	SQ	0926254	0936254
		2-1/4	5	.030"R	0926254030R	0936254030R
		2-1/4	5	.060"R	0926254060R	0936254060R
		2-1/4	5	.125"R	0926254125R	0936254125R
		3	6	SQ	0986254	--
3/4	3/4	1	3	SQ	1907504	1917504
		1	3	.030"R	1907504030R	1917504030R
		1-1/2	4	SQ	0907504	0917504
		1-1/2	4	.030"R	0907504030R	0917504030R
		1-1/2	4	.060"R	0907504060R	0917504060R
		1-1/2	4	.125"R	0907504125R	0917504125R
		2-1/4	5	SQ	0927504	0937504
		2-1/4	5	.030"R	0927504030R	0937504030R
		2-1/4	5	.060"R	0927504060R	0937504060R
		2-1/4	5	.125"R	0927504125R	0937504125R
1	1	3	6	SQ	0987504	--
		1-1/2	4	SQ	0901004	0911004
		1-1/2	4	.030"R	0901004030R	0911004030R
		1-1/2	4	.060"R	0901004060R	0911004060R
		1-1/2	4	.125"R	0901004125R	0911004125R
		2-1/4	5	SQ	0921004	0931004
		2-1/4	5	.030"R	0921004	0931004030R
		2-1/4	5	.060"R	0921004060R	0931004060R
		2-1/4	5	.125"R	0921004125R	0931004125R
		3	6	SQ	0981004	--

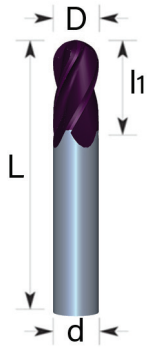
- Ball
- Square
- Corner Radius
- Round Shank
- Weldon Shank
- 38° Helix
- TiAlN Coated
- P
- K
- M
- N

HIGH PERFORMANCE VARIABLE PITCH SOLID CARBIDE - BALL NOSE

Cutter Diam. D	Shank Diam. d	Length of Cut l1	Overall Length L	End Face	TiAlN Coated	
					4 Flute Round Shk	4 Flute Weldon Shk
3/16	3/16	5/8	2	BN	0941884	--
		3/4	2-1/2	BN	0961884	--
		1-1/8	3	BN	0991884	--
1/4	1/4	3/4	2-1/2	BN	0942504	0952504
		1-1/8	3	BN	0962504	0972504
5/16	5/16	1-1/2	4	BN	0992504	--
		13/16	2-1/2	BN	0943124	0953124
		1-1/8	3	BN	0963124	0973124
3/8	3/8	1-5/8	4	BN	0993124	--
		7/8	2-1/2	BN	0943754	0953754
		1-1/8	3	BN	0963754	0973754
		1-3/4	4	BN	0993754	--



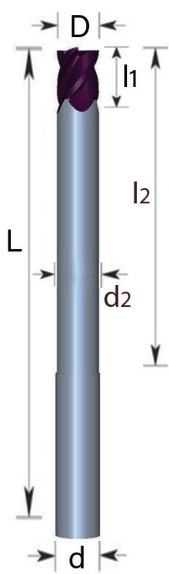
HIGH PERFORMANCE VARIABLE PITCH SOLID CARBIDE - BALL NOSE



Cutter Diam. Shank Diam.		Length of Cut	Overall Length	TiAlN Coated		
D	d	l1	L	End Face	4 Flute Round Shk	4 Flute Weldon Shk
7/16	7/16	1	2-3/4	BN	0944374	0954374
		2	4	BN	0964374	0974374
1/2	1/2	1	3	BN	0945004	0955004
		2	4	BN	0965004	0975004
		3	6	BN	0995004	--
5/8	5/8	1-1/4	3-1/2	BN	0946254	0956254
		2-1/4	5	BN	0966254	0976254
		3	6	BN	0996254	--
3/4	3/4	1-1/2	4	BN	0947504	0957504
		2-1/4	5	BN	0967504	0977504
		3	6	BN	0997504	--
1	1	1-1/2	4	BN	0941004	0951004
		2-1/4	5	BN	0961004	0971004
		3	6	BN	0991004	--

HIGH PERFORMANCE VARIABLE PITCH LONG REACH - SQUARE, RADIUS & BALL

Cutter Diam.	Shank Diam.	Neck	Length of Cut	Length Below Shank	Overall Length	End Face	TiAlN Coated
D	d	d2	l1	l2	L		4 Flute Round Shk
3/16	3/16	.1775	3/8	2-1/2	4	SQUARE	2901884
		.1775	3/8	2-1/2	4	.015"R	2901884015R
		.1775	3/8	2-1/2	4	BALL NOSE	2901884015R
1/4	1/4	.2400	3/8	2-1/2	4	SQUARE	2902504
		.2400	3/8	2-1/2	4	.015"R	2902504015R
		.2400	3/8	2-1/2	4	BALL NOSE	2942504
5/16	5/16	.3025	7/16	2-1/2	4	SQUARE	2903124
		.3025	7/16	2-1/2	4	.015"R	2903124015R
		.3025	7/16	2-1/2	4	BALL NOSE	2943124
3/8	3/8	.3650	1/2	2-1/2	4	SQUARE	2903754
		.3650	1/2	2-1/2	4	.015"R	2903754015R
		.3650	1/2	2-1/2	4	BALL NOSE	2943754
1/2	1/2	.4800	5/8	3	5	SQUARE	2905004
		.4800	5/8	3	5	.020"R	2905004020R
		.4800	5/8	3	5	BALL NOSE	2945004
		.4800	5/8	4	6	SQUARE	2905004L
		.4800	5/8	4	6	.020"R	2905004020RL
		.4800	5/8	4	6	BALL NOSE	2945004L
5/8	5/8	.6050	3/4	3	5	SQUARE	2906254
		.6050	3/4	3	5	.020"R	2906254020R
		.6050	3/4	3	5	BALL NOSE	2946254

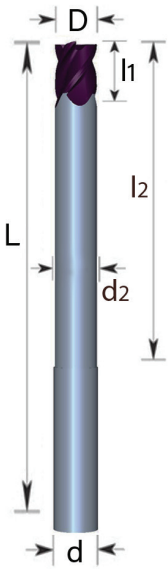


- Ball
- Square
- Corner Radius
- Round Shank
- Weldon Shank
- 38° Helix
- TiAlN Coated
- P
- K
- M
- N

HIGH PERFORMANCE VARIABLE PITCH LONG REACH - SQUARE, RADIUS & BALL



Cutter Diam.	Shank Diam.	Neck	Length of Cut	Length Below Shank	Overall Length	End Face	TiAlN Coated
D	d	d2	l1	l2	L		4 Flute Round Shk
5/8	5/8	.6050	3/4	4	6	SQUARE	2906254L
		.6050	3/4	4	6	.020"R	2906254020RL
		.6050	3/4	4	6	BALL NOSE	2946254L
3/4	3/4	.7300	1	3	5	SQUARE	2907504
		.7300	1	3	5	.020"R	2907504020R
		.7300	1	3	5	BALL NOSE	2947504
		.7300	1	4	6	SQUARE	2907504L
		.7300	1	4	6	.020"R	2907504020RL
		.7300	1	4	6	BALL NOSE	2947504L
		.7300	1	5	7	SQUARE	2907504LL
		.7300	1	5	7	.020"R	2907504020RLL
		.7300	1	5	7	BALL NOSE	2947504LL
1	1	.9800	1-1/4	3	5	SQUARE	2901004
		.9800	1-1/4	3	5	.020"R	2901004020R
		.9800	1-1/4	3	5	BALL NOSE	2941004
		.9800	1-1/4	4	6	SQUARE	2901004L
		.9800	1-1/4	4	6	.020"R	2901004020RL
		.9800	1-1/4	4	6	BALL NOSE	2941004L
		.9800	1-1/4	5	7	SQUARE	2901004LL
		.9800	1-1/4	5	7	.020"R	2901004020RLL
		.9800	1-1/4	5	7	BALL NOSE	2941004LL

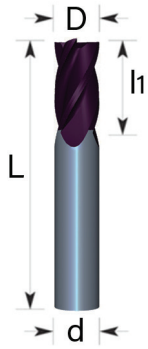


HIGH PERFORMANCE VARIABLE PITCH SPEEDS & FEEDS

Material Group		SFM	Feed Per Tooth By Diameter							
		TiAlN Coated	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
Aluminum & Aluminum Alloys		900-1800	0.0025	0.0030	0.0035	0.004	0.0045	0.0055	0.0065	0.0085
Copper & Copper Alloys		525-1275	0.0025	0.0030	0.0030	0.0035	0.0035	0.0040	0.0045	0.0065
Brass & Bronze	N	375-600	0.0025	0.0030	0.0030	0.0035	0.0035	0.0040	0.0045	0.0055
Iron, Cast (soft)	K	375-650	0.0025	0.0027	0.0030	0.0032	0.0035	0.0040	0.0065	0.0085
Iron, Cast (hard)		100-375	0.0013	0.0015	0.0020	0.0022	0.0025	0.0030	0.0035	0.0045
Iron, Ductile		100-600	0.0015	0.0017	0.0020	0.0022	0.0025	0.0035	0.0045	0.0065
Iron, Malleable		225-650	0.0015	0.0020	0.0025	0.0030	0.0035	0.0045	0.0055	0.0075
Carbon Steels, Low	P	300-600	0.0015	0.0020	0.0025	0.0030	0.0035	0.0045	0.0055	0.0075
Carbon Steels, Medium		150-375	0.0020	0.0021	0.0022	0.0023	0.0025	0.0035	0.0045	0.0055
Carbon Steels Hardened to 35 Rc		130-345	0.0015	0.0016	0.0017	0.0018	0.0020	0.0022	0.0025	0.0035
Carbon Steels Hardened to 50 Rc		70-160	0.0012	0.0012	0.0013	0.0014	0.0015	0.0020	0.0025	0.0035
Steels, Mold		300-525	0.0015	0.0017	0.0020	0.0022	0.0025	0.0030	0.0035	0.0045
Steels, Tool	150-375	0.0015	0.0017	0.0020	0.0022	0.0025	0.0030	0.0035	0.0045	
Stainless Steels, Soft	M	300-450	0.0015	0.0017	0.0020	0.0017	0.0025	0.0035	0.0045	0.0065
Stainless Steels, Hard		150-300	0.0010	0.0011	0.0012	0.0013	0.0015	0.0025	0.0035	0.0055
Monel & High Nickel Steel	S	75-200	0.0015	0.0017	0.0020	0.0021	0.0025	0.003	0.0035	0.0045
Titanium, Soft		125-375	0.0015	0.0017	0.0020	0.0021	0.0025	0.0035	0.0045	0.0065
Titanium, Hard		50-175	0.0010	0.0011	0.0012	0.0012	0.0014	0.0017	0.0022	0.0023
Nickel Based High Temp Alloys		50-125	0.0013	0.0012	0.0011	0.0011	0.0014	0.0015	0.0017	0.0023

- Speeds & Feeds recommendations are for depths of cut not to exceed 1.25 times the tool diameter for profiling and .75 times the diameter for full slotting.
- Speeds & Feeds are recommended starting points only. If the tool is working well, without vibrations or significant noise, increase the SFM and/or Feed Per Tooth in 5-10% increments.
- Optimum speeds & feeds will depend upon material, setup, machine conditions & tool deflection. Higher or lower parameters may be required to achieve optimum machining conditions.

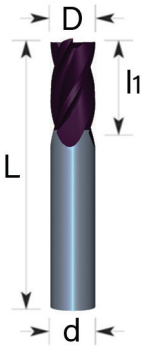
ULTRA HIGH PERFORMANCE VARIABLE PITCH SOLID CARBIDE - SQUARE & RADIUS



Cutter Diam.	Shank Diam.	Length of Cut	Overall Length	TiAlN Coated			
				End Face	4 Flute Round Shk	4 Flute Weldon Shk	5 Flute Round Shk
D	d	l1	L				
1/8	1/8	1/2	1-1/2	.010"R	0801254010R	--	--
		3/8	2	SQ	1801884	--	--
		3/8	2	.015"R	1801884015R	--	--
		5/8	2	SQ	0801884	--	--
		5/8	2	.015"R	0801884015R	--	--
3/16	3/16	3/4	2-1/2	SQ	0821884	--	--
		3/4	2-1/2	.015"R	0821884015R	--	--
		1-1/8	3	SQ	0881884	--	--
		3/8	2	SQ	1802504	--	--
		3/8	2	.015"R	1802504015R	--	--
1/4	1/4	3/4	2-1/2	SQ	0802504	0812504	0802505
		3/4	2-1/2	.020"R	0802504020R	0812504020R	0802505020R
		1-1/8	3	SQ	0822504	0832504	--
		1-1/8	3	.020"R	0822504020R	0832504020R	--
		1-1/2	4	SQ	0882504	--	--
5/16	5/16	3/8	2	SQ	1803124	--	--
		3/8	2	.020"R	1803124020R	--	--
		13/16	2-1/2	SQ	0803124	0813124	0803125
		13/16	2-1/2	.020"R	0803124020R	0813124020R	0803125020R
		1-1/8	3	SQ	0823124	0833124	--
3/8	3/8	1-1/8	3	.020"R	0823124020R	0833124020R	--
		1-5/8	4	SQ	0883124	--	--
		1/2	2	SQ	1803754	--	--
		1/2	2	.020"R	1803754020R	--	--
		7/8	2-1/2	SQ	0803754	0813754	0803755
7/16	7/16	7/8	2-1/2	.020"R	0803754020R	0813754020R	0803755020R
		7/8	2-1/2	.030"R	0803754030R	0813754030R	0803755030R
		1-1/8	3	SQ	0823754	0833754	--
		1-1/8	3	.020"R	0823754020R	0833754020R	--
		1-3/4	4	SQ	0883754	--	--
1/2	1/2	1	2-3/4	SQ	0804374	0814374	--
		2	4	SQ	0824374	0834374	--
		5/8	2-1/2	SQ	1805004	1815004	--
		5/8	2-1/2	.030"R	1805004030R	1815004030R	--
		1	3	SQ	0805004S	0815004S	--
		1	3	.030"R	0805004030RS	0815004030RS	--
		1-1/4	3	SQ	0805004	0815004	0805005
		1-1/4	3	.015"R	0805004015R	0815004015R	--
		1-1/4	3	.030"R	0805004030R	0815004030R	0805005030R
		1-1/4	3	.060"R	0805004060R	0815004060R	--
		2	4	SQ	0825004	0835004	--
		2	4	.015"R	0825004015R	0835004015R	--
		2	4	.030"R	0825004030R	0835004030R	--
2	4	.060"R	0825004060R	0835004060R	--		
3	6	SQ	0885004	--	--		



ULTRA HIGH PERFORMANCE VARIABLE PITCH SOLID CARBIDE - SQUARE & RADIUS

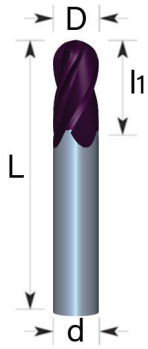


				TiAlN Coated			
Cutter Diam.	Shank Diam.	Length of Cut	Overall Length	End Face	4 Flute Round Shk	4 Flute Weldon Shk	5 Flute Round Shk
D	d	l1	L				
5/8	5/8	3/4	3	SQ	1806254	1816254	--
		3/4	3	.030"R	1806254030R	1816254030R	--
		1-1/4	3-1/2	SQ	0806254	0816254	0806255
		1-1/4	3-1/2	.030"R	0806254030R	0816254030R	0806255030R
		1-1/4	3-1/2	.060"R	0806254060R	0816254060R	--
		1-1/4	3-1/2	.125"R	0806254125R	0816254125R	--
		2-1/4	5	SQ	0826254	0836254	--
		2-1/4	5	.030"R	0826254030R	0836254030R	--
		2-1/4	5	.060"R	0826254060R	0836254060R	--
		2-1/4	5	.125"R	0826254125R	0836254125R	--
3/4	3/4	3	6	SQ	0886254	--	--
		1	3	SQ	1807504	1817504	--
		1	3	.030"R	1807504030R	1817504030R	--
		1-1/2	4	SQ	0807504	0817504	0807505
		1-1/2	4	.030"R	0807504030R	0817504030R	0807505030R
		1-1/2	4	.060"R	0807504060R	0817504060R	--
		1-1/2	4	.125"R	0807504125R	0817504125R	--
		2-1/4	5	SQ	0827504	0837504	--
		2-1/4	5	.030"R	0827504030R	0837504030R	--
		2-1/4	5	.060"R	0827504060R	0837504060R	--
1	1	2-1/4	5	.125"R	0827504125R	0837504125R	--
		3	6	SQ	0887504	--	--
		1-1/2	4	SQ	0801004	0811004	0801005
		1-1/2	4	.030"R	0801004030R	0811004030R	0801005030R
		1-1/2	4	.060"R	0801004060R	0811004060R	--
		1-1/2	4	.125"R	0801004125R	0811004125R	--
		2-1/4	5	SQ	0821004	0831004	--
		2-1/4	5	.030"R	0821004030R	0831004030R	--
		2-1/4	5	.060"R	0821004060R	0831004060R	--
		2-1/4	5	.125"R	0821004125R	0831004125R	--
3	6	SQ	0881004	--	--		

-  Square
-  Corner Radius
-  Round Shank
-  Weldon Shank
-  38° Helix
-  TiAlN Coated
-  P
-  K
-  M
-  S
-  N



ULTRA HIGH PERFORMANCE VARIABLE PITCH SOLID CARBIDE - BALL NOSE



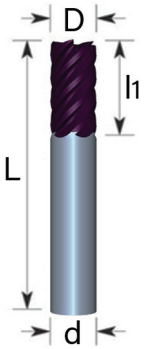
					TiAlN Coated	
Cutter Diam.	Shank Diam.	Length of Cut	Overall Length	End Face	4 Flute Round Shk	4 Flute Weldon Shk
D	d	l	L			
3/16	3/16	5/8	2	BN	0841884	--
		3/4	2-1/2	BN	0861884	--
		1-1/8	3	BN	0891884	--
1/4	1/4	3/4	2-1/2	BN	0842504	0852504
		1-1/8	3	BN	0862504	0872504
		1-1/2	4	BN	0892504	--
5/16	5/16	13/16	2-1/2	BN	0843124	0853124
		1-1/8	3	BN	0863124	0873124
		1-5/8	4	BN	0893124	--
3/8	3/8	7/8	2-1/2	BN	0843754	0853754
		1-1/8	3	BN	0863754	0873754
		1-3/4	4	BN	0893754	--
7/16	7/16	1	2-3/4	BN	0844374	0854374
		2	4	BN	0864374	0874374
1/2	1/2	1	3	BN	0845004	0855004
		2	4	BN	0865004	0875004
		3	6	BN	0895004	--
5/8	5/8	1-1/4	3-1/2	BN	0846254	0856254
		2-1/4	5	BN	0866254	0876254
		3	6	BN	0896254	--
3/4	3/4	1-1/2	4	BN	0847504	0857504
		2-1/4	5	BN	0867504	0877504
		3	6	BN	0897504	--
1	1	1-1/2	4	BN	0841004	0851004
		2-1/4	5	BN	0861004	0871004
		3	6	BN	0891004	--



ULTRA HIGH PERFORMANCE VARIABLE PITCH SOLID CARBIDE - SQUARE & RADIUS



Cutter Diam.		Shank Diam.	Length of Cut	Overall Length	End Face	TiAlN Coated	
D	d		l1	L		6 Flute Round Shk	7 Flute Round Shk
1/4	1/4	3/4	3/4	2-1/2	SQ	3802506	--
			3/4	2-1/2	.030"R	3802506030R	--
3/8	3/8	7/8	7/8	2-1/2	SQ	3803756	--
			7/8	2-1/2	.030"R	3803756030R	--
1/2	1/2	1-1/4	1-1/4	3	SQ	3805006	--
			1-1/4	3	.030"R	3805006030R	3805007030R
5/8	5/8	1-1/4	1-1/4	3-1/2	SQ	3806256	--
			1-1/4	3-1/2	.030"R	3806256030R	3806257030R
3/4	3/4	1-1/2	1-1/2	4	SQ	3807506	--
			1-1/2	4	.030"R	3807506030R	3807507030R
1	1	1-1/2	1-1/2	4	SQ	3801006	--
			1-1/2	4	.030"R	3801006030R	3801007030R



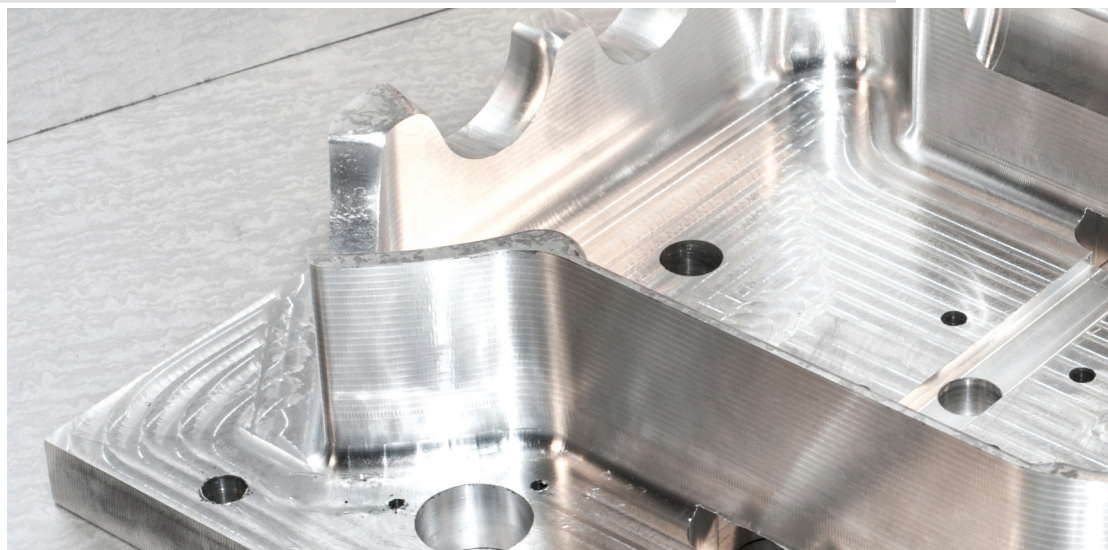
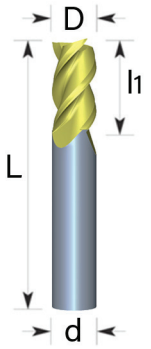
ULTRA HIGH PERFORMANCE VARIABLE PITCH SPEEDS & FEEDS

Material Group	SFM	Feed Per Tooth By Diameter								
		TiAlN Coated	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
Aluminum & Aluminum Alloys	900-1800		0.0025	0.0030	0.0035	0.004	0.0045	0.0055	0.0065	0.0085
Copper & Copper Alloys	525-1275		0.0025	0.0030	0.0030	0.0035	0.0035	0.0040	0.0045	0.0065
Brass & Bronze	N 375-600		0.0025	0.0030	0.0030	0.0035	0.0035	0.0040	0.0045	0.0055
Iron, Cast (soft)	K 375-650		0.0030	0.0032	0.0035	0.0037	0.0040	0.0045	0.0070	0.0090
Iron, Cast (hard)		100-375	0.0018	0.0020	0.0025	0.0027	0.0030	0.0035	0.0040	0.0050
Iron, Ductile		100-600	0.0020	0.0022	0.0025	0.0027	0.0030	0.0040	0.0050	0.0070
Iron, Malleable		225-650	0.0020	0.0025	0.0030	0.0035	0.0040	0.0050	0.0060	0.0080
Carbon Steels, Low	P 300-600		0.0020	0.0025	0.0030	0.0035	0.0040	0.0050	0.0060	0.0080
Carbon Steels, Medium		150-375	0.0025	0.0026	0.0027	0.0028	0.0030	0.0040	0.0050	0.0060
Carbon Steels Hardened to 35 Rc		130-345	0.0020	0.0021	0.0022	0.0023	0.0025	0.0027	0.0030	0.0040
Carbon Steels Hardened to 50 Rc		70-160	0.0012	0.0012	0.0013	0.0014	0.0015	0.0026	0.0030	0.0035
Steels, Mold		300-525	0.0020	0.0022	0.0025	0.0027	0.0030	0.0035	0.0040	0.0050
Steels, Tool	150-375	0.0020	0.0022	0.0025	0.0027	0.0030	0.0035	0.0040	0.0050	
Stainless Steels, Soft	M 300-450		0.0020	0.0022	0.0025	0.0022	0.0030	0.0040	0.0050	0.0070
Stainless Steels, Hard		150-300	0.0015	0.0016	0.0017	0.0018	0.0020	0.0030	0.0040	0.0060
Monel & High Nickel Steel	S 75-200		0.0015	0.0022	0.0025	0.0027	0.0030	0.0035	0.0040	0.0050
Titanium, Soft		125-375	0.0015	0.0022	0.0025	0.0027	0.0030	0.0040	0.0050	0.0070
Titanium, Hard		50-175	0.0010	0.0016	0.0017	0.0018	0.0020	0.0022	0.0026	0.0030
Nickel Based High Temp Alloys		50-125	0.0014	0.0014	0.0015	0.0016	0.0017	0.0018	0.0020	0.0023

- Speeds & Feeds recommendations are for depths of cut not to exceed 1.25 times the tool diameter for profiling and .75 times the diameter for full slotting.
- Speeds & Feeds are recommended starting points only. If the tool is working well, without vibrations or significant noise, increase the SFM and/or Feed Per Tooth in 5-10% increments.
- Optimum speeds & feeds will depend upon material, setup, machine conditions & tool deflection. Higher or lower parameters may be required to achieve optimum machining conditions.

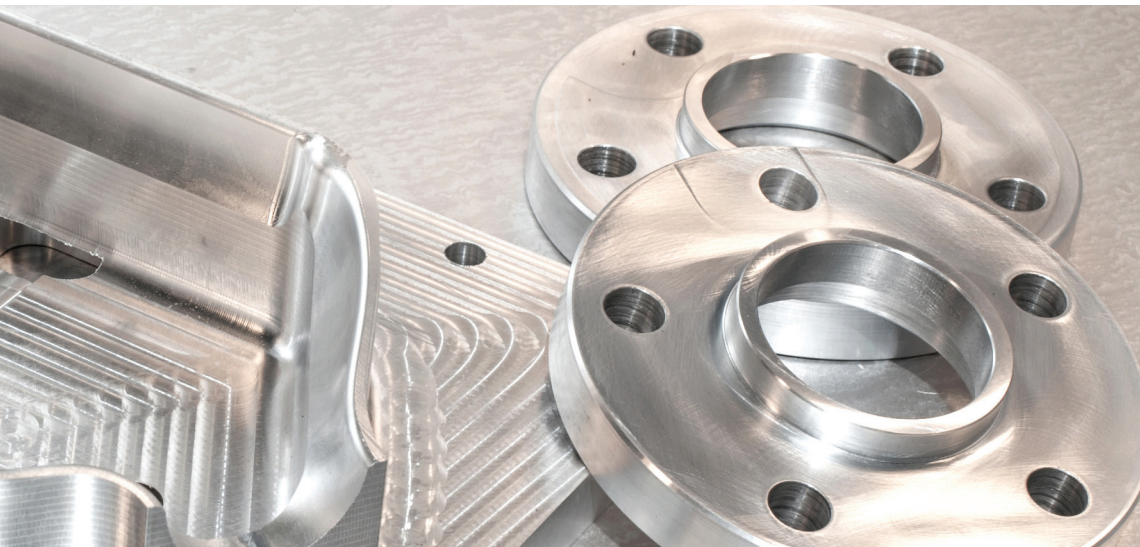
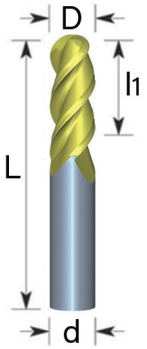
ALUMINUM MEDIUM/FINISHING SOLID CARBIDE - SQUARE & RADIUS

Cutter Diam. D	Shank Diam. d	Length Overall of Cut		End Face	Uncoated		ZrN Coated	
		l1	L		3 Flute Part #	3 Flute Part #	2 Flute Part #	3 Flute Part #
1/8	1/8	1/2	1-1/2	SQ	1701252	1701253	--	--
3/16	3/16	5/8	2	SQ	1701882	1701883	0701882	0701883
		3/4	2-1/2	SQ	1721882	1721883	0721882	0721883
1/4	1/4	1-1/8	3	SQ	1781882	1781883	0781882	0781883
		3/4	2-1/2	SQ	1702502	1702503	0702502	0702503
		3/4	2-1/2	.020"R	1702502020R	1702503020R	0702502020R	0702503020R
		1-1/8	3	SQ	1722502	1722503	0722502	0722503
5/16	5/16	1-1/2	4	SQ	1782502	1782503	0782502	0782503
		13/16	2-1/2	SQ	1703122	1703123	0703122	0703123
		13/16	2-1/2	.020"R	1703122020R	1703123020R	0703122020R	0703123020R
3/8	3/8	1-5/8	4	SQ	1723122	1723123	0723122	0723123
		1	2-1/2	SQ	1783122	1783123	0783122	0783123
		1	2-1/2	.020"R	1703752	1703753	0703752	0703753
1/2	1/2	1-1/8	3	SQ	1703752020R	1703753020R	0703752020R	0703753020R
		1-3/4	4	SQ	1723752	1723753	0723752	0723753
		1-3/4	4	SQ	1783752	1783753	0783752	0783753
5/8	5/8	1-1/4	3	SQ	1705002	1705003	0705002	0705003
		1-1/4	3	.030"R	1705002030R	1705003030R	0705002030R	0705003030R
		2	4	SQ	1725002	1725003	0725002	0725003
3/4	3/4	3	6	SQ	1785002	1785003	0785002	0785003
		1-1/4	3-1/2	SQ	1706252	1706253	0706252	0706253
		1-1/4	3-1/2	.030"R	1706252030R	1706253030R	0706252030R	0706253030R
1	1	2-1/4	5	SQ	1726252	1726253	0726252	0726253
		3	6	SQ	1786252	1786253	0786252	0786253
		1-1/2	4	SQ	1707502	1707503	0707502	0707503
1	1	1-1/2	4	.030"R	1707502030R	1707503030R	0707502030R	0707503030R
		2-1/4	5	SQ	1727502	1727503	0727502	0727503
		3	6	SQ	1787502	1787503	0787502	0787503
1	1	1-1/2	4	SQ	1701002	1701003	0701002	0701003
		1-1/2	4	.030"R	1701002030R	1701003030R	0701002030R	0701003030R
		2-1/4	5	SQ	1721002	1721003	0721002	0721003
1	1	3	6	SQ	1781002	1781003	0781002	0781003



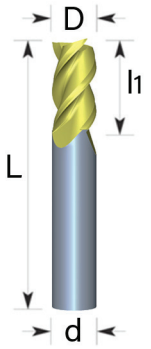
ALUMINUM MEDIUM/FINISHING SOLID CARBIDE - BALL NOSE

Cutter Diam. D	Shank Diam. d	Length Overall of Cut		End Face	Uncoated		ZrN Coated	
		l1	L		3 Flute Part #	3 Flute Part #	2 Flute Part #	3 Flute Part #
3/16	3/16	5/8	2	BN	1741882	1741883	0741882	0741883
		3/4	2-1/2	BN	1761882	1761883	0761882	0761883
		1-1/8	3	BN	1791882	1791883	0791882	0791883
1/4	1/4	3/4	2-1/2	BN	1742502	1742503	0742502	0742503
		1-1/8	3	BN	1762502	1762503	0762502	0762503
		1-1/2	4	BN	1792502	1792503	0792502	0792503
5/16	5/16	13/16	2-1/2	BN	1743122	1743123	0743122	0743123
		1-1/8	3	BN	1763122	1763123	0763122	0763123
		1-5/8	4	BN	1793122	1793123	0793122	0793123
3/8	3/8	1	2-1/2	BN	1743752	1743753	0743752	0743753
		1-1/8	3	BN	1763752	1763753	0763752	0763753
		1-3/4	4	BN	1793752	1793753	0793752	0793753
1/2	1/2	1-1/4	3	BN	1745002	1745003	0745002	0745003
		2	4	BN	1765002	1765003	0765002	0765003
		3	6	BN	1795002	1795003	0795002	0795003
5/8	5/8	1-1/4	3-1/2	BN	1746252	1746253	0746252	0746253
		2-1/4	5	BN	1766252	1766253	0766252	0766253
		3	6	BN	1796252	1796253	0796252	0796253
3/4	3/4	1-1/2	4	BN	1747502	1747503	0747502	0747503
		2-1/4	5	BN	1767502	1767503	0767502	0767503
		3	6	BN	1797502	1797503	0797502	0797503
1	1	1-1/2	4	BN	1741002	1741003	0741002	0741003
		2-1/4	5	BN	1761002	1761003	0761002	0761003
		3	6	BN	1791002	1791003	0791002	0791003



ALUMINUM ROUGHING/MEDIUM SOLID CARBIDE - SQUARE & RADIUS

Cutter Diam. D	Shank Diam. d	Length Overall of Cut		End Face	Uncoated		ZrN Coated	
		l1	L		3 Flute Part #	3 Flute Rougher	2 Flute Part #	3 Flute Rougher
1/4	1/4	3/4	2-1/2	SQ	3702503	--	4702503	--
				.015CR	3702503015R	--	4702503015R	--
				.030CR	3702503030R	--	--	--
5/16	5/16	13/16	2-1/2	SQ	3703123	--	4703123	--
				.030CR	3703123030R	--	4703123030R	--
				.060CR	3703123060R	--	--	--
3/8	3/8	1	2-1/2	SQ	3703753	--	4703753	--
				.030CR	3703753030R	5703753030R	4703753030R	6703753030R
		1-1/8	3	SQ	3723753	--	4723753	--
				.030CR	3723753030R	5723753030R	4723753030R	6723753030R
1/2	1/2	1-1/4	3	SQ	3705003	--	4705003	--
				.030CR	3705003030R	5705003030R	4705003030R	6705003030R
		1-1/4	3	.060CR	3705003060R	--	--	--
				.090CR	3705003090R	--	--	--
		1-1/4	3	.120CR	3705003120R	--	--	--
				SQ	3725003	--	4725003	--
.030CR	3725003030R	5725003030R	4725003030R	6725003030R				
5/8	5/8	1-1/4	3-1/2	SQ	3706253	--	4706253	--
				.030CR	3706253030R	5706253030R	4706253030R	6706253030R
		1-1/4	3-1/2	.060CR	3706253060R	--	--	--
				.090CR	3706253090R	--	--	--
		1-1/4	3-1/2	.120CR	3706253120R	--	--	--
				SQ	3726253	--	4726253	--
.030CR	3726253030R	5726253030R	4726253030R	6726253030R				
3/4	3/4	1-5/8	4	SQ	3707503	--	4707503	--
				.030CR	3707503030R	5707503030R	4707503030R	6707503030R
		1-5/8	4	.060CR	3707503060R	--	--	--
				.090CR	3707503090R	--	--	--
		1-5/8	4	.120CR	3707503120R	--	--	--
				SQ	3727503	--	4727503	--
.030CR	3727503030R	5727503030R	4727503030R	6727503030R				
1	1	1-1/2	4	SQ	3701003	--	4701003	--
				.030CR	3701003030R	5701003030R	4701003030R	6701003030R
		1-1/2	4	.060CR	3701003060R	--	--	--
				.120CR	3701003120R	--	--	--
		2-1/4	5	SQ	3721003	--	4721003	--
				.030CR	3721003030R	5721003030R	4721003030R	6721003030R



ALUMINUM SPEEDS & FEEDS

Material Group	SFM	Feed Per Tooth By Diameter								
		ZRN Coated	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
Aluminum & Aluminum Alloys	N	900-1800	0.003	0.0035	0.004	0.0045	0.005	0.006	0.007	0.009
Copper & Copper Alloys		525-1275	0.003	0.0035	0.0035	0.004	0.004	0.0045	0.005	0.007
Brass & Bronze		375-600	0.003	0.0035	0.0035	0.004	0.004	0.0045	0.005	0.006
Graphite		500-1200	0.004	0.0045	0.0045	0.0045	0.0045	0.005	0.006	0.008
Plastics		600-1650	0.004	0.0045	0.005	0.006	0.007	0.009	0.011	0.016
Iron, Cast (soft)	K	--	--	--	--	--	--	--	--	--
Iron, Cast (hard)		--	--	--	--	--	--	--	--	--
Iron, Ductile		--	--	--	--	--	--	--	--	--
Iron, Malleable		--	--	--	--	--	--	--	--	--
Carbon Steels, Low	P	--	--	--	--	--	--	--	--	--
Carbon Steels, Medium		--	--	--	--	--	--	--	--	--
Carbon Steels Hardened to 35 Rc		--	--	--	--	--	--	--	--	--
Carbon Steels Hardened to 50 Rc		--	--	--	--	--	--	--	--	--
Carbon Steels Hardened to 60 Rc		--	--	--	--	--	--	--	--	--
Steels, Mold		--	--	--	--	--	--	--	--	--
Steels, Tool		--	--	--	--	--	--	--	--	--
Stainless Steels, Soft		M	--	--	--	--	--	--	--	--
Stainless Steels, Hard	--		--	--	--	--	--	--	--	--
Monel & High Nickel Steel	S	--	--	--	--	--	--	--	--	--
Titanium, Soft		--	--	--	--	--	--	--	--	--
Titanium, Hard		--	--	--	--	--	--	--	--	--
Nickel Based High Temp Alloys		--	--	--	--	--	--	--	--	--

- Speeds & Feeds recommendations are for depths of cut not to exceed 1.5 times the tool diameter for profiling and 1 times the diameter for full slotting.
- Speeds & Feeds are recommended starting points only. If the tool is working well, without vibrations or significant noise, increase the SFM and/or Feed Per Tooth in 5-10% increments.
- Optimum speeds & feeds will depend upon material, setup, machine conditions & tool deflection. Higher or lower parameters may be required to achieve optimum machining conditions.





CARBIDE
END MILL SERIES



CUSTOM END MILL FORM

Tool Series:

- GENERAL PURPOSE**
- HIGH PERFORMANCE**
VARIABLE PITCH
- ULTRA HIGH**
PERFORMANCE
VARIABLE PITCH
- ALUMINUM**

End Face:

- Square
- Ball Nose
- Corner Radius _____
- Chamfer _____

Coating:

- Uncoated
- TiALN
- ZrN
- DLC

Dimensions:

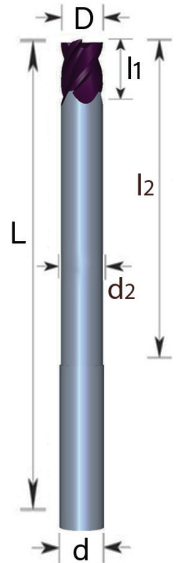
- L (Overall Length) _____
- d (Shank Diameter) _____
- l_1 (Length of Cut) _____
- l_2 (Length Below Shank) _____
- d_2 (Undercut Diameter) _____
- D (Tool Diameter) _____
- Flutes _____

Shank Style:

- Cylindrical
- Weldon Flat

Tapered:

- No
- Yes
- Taper Angle Per Side _____
- D (Tip Diameter) _____

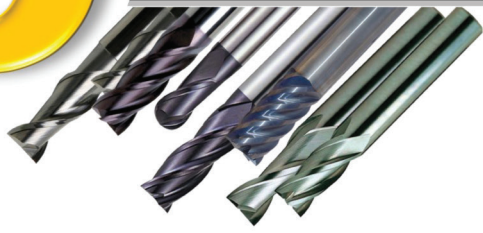


Minimum Order Quantities

Tool Diameter Range	Minimum Order Quantity
1/8" & Smaller (3mm)	Not Available
3/16"-1/4" (4mm-6mm)	20
5/16"-3/8" (7mm-10mm)	15
7/16"-1/2" (11mm-12mm)	10
9/16"-3/4" (13mm-20mm)	5
7/8"-1" (25mm)	3

BST

CARBIDE
END MILL SERIES



REGRIND PROGRAM

- **Solid Carbide End Mills Square, Corner Radius & Ball Nose**
- **HSS End Mills Square End & Ball Nose**
- **HSS Drills & Carbide High Performance Drills**
- **Spot Drills**
- **Countersinks**
- **Drill/Mills**
- **Complete In House Coating Service**



- BST UHP/VP ULTRA High Performance Vari - Pitch Series

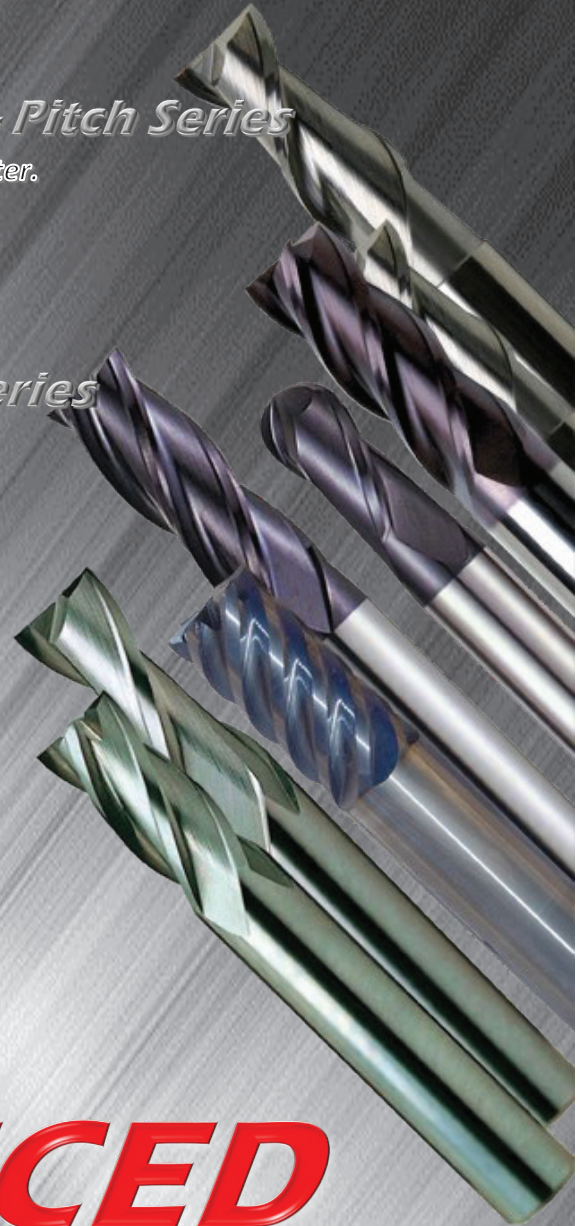
- Special Helix Design / Variable Pitch to Reduce Chatter.
- 10% Extra Fine Sub-Micro Grain Carbide with Extremely High Transverse Rupture Strength.
- Diameter Tolerance: +0.0000" / -0.0015"

- BST HP/VP HIGH Performance Vari - Pitch Series

- Special Helix Design / Variable Pitch to Reduce Chatter.
- 10% Micro Grain Carbide
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