

# INTRODUCING

**NEW**

## MaxCut Premium Solid Carbide End Mills



General Purpose 30° Helix 10% micrograin carbide. All tools honed to improve tool life. Available Uncoated & TiALN Coated.

**MaxCut GP**

Shank Tolerance: +0.0000"/-0.00004"  
Diameter Tolerance: +0.0000"/-0.0020"

High Performance Variable Pitch to reduce chatter. General Purpose 10% micrograin carbide. All tools honed to improve tool life. TiALN Coated with a unique post coating polishing process to reduce built up edge. Special core & heal design to enhance rigidity.

**MaxCut HP**

Shank Tolerance: +0.0000"/-0.00004"  
Diameter Tolerance: +0.0000"/-0.0015"

Extreme Production Variable Pitch to reduce chatter. Ultra Premium 10% micrograin carbide. All tools honed to improve tool life. TiALN Coated with a unique post coating polishing to reduce built up edge. Special core & heal design to enhance rigidity. Experience the highest performance & tool life.

**MaxCut HP Ultra**

Shank Tolerance: +0.0000"/-0.00004"  
Diameter Tolerance: +0.0000"/-0.0015"

Specifically designed for high performance Aluminum machining. Specially blended 45° helix for medium to finishing applications. Unique variable pitch & variable helix combined with a polished surface, chipbreaking geometry & cylindrical margin. Available Uncoated, ZrN Coated & DLC Coated.

**AlumiMax**

Shank Tolerance: +0.0000"/-0.00004"  
Diameter Tolerance: +0.0000"/-0.0004"

**COMING SOON**

**AlumiMax Aluminum Rougher Series**

# MaxCut-GP

Shank Tolerance: +0.0000"/-0.0004"  
Diameter Tolerance: +0.0000"/-0.0020"

General Purpose 30 Degree Helix 10% micrograin carbide. All tools honed to improve tool life. Available Uncoated & TiALN Coated.

## GENERAL PURPOSE

Square End 2, 3 & 4 Flute - Fractional .....	3-5
Square End 2, 3 & 4 Flute - Metric .....	6
Ball Nose 2, 3 & 4 Flute - Fractional .....	7-9
Ball Nose 2 & 4 Flute - Metric .....	10
90 Degree Drill/Mills 2 & 4 Flute - Fractional .....	10
Double Ended Square End 2 & 4 Flute - Fractional .....	11
Double Ended Ball Nose End 2 & 4 Flute - Fractional .....	11

# MaxCut-HP

Shank Tolerance: +0.0000"/-0.0004"  
Diameter Tolerance: +0.0000"/-0.0015"

High Performance Variable Pitch to reduce chatter. General Purpose 10% micrograin carbide. All tools honed to improve tool life. TiALN Coated with a unique post coating polishing process to reduce built up edge. Special core & heal design to enhance rigidity.

## HP Variable Pitch

Square End & Corner Radius 4 Flute - Fractional .....	13-14
Ball Nose 4 Flute - Fractional .....	15
Long Reach Neck Relief Square & Corner Radius 4 Flute - Fractional .....	15-16
Long Reach Neck Relief Ball Nose 4 Flute - Fractional .....	15-16

# MaxCut-HP-Ultra

Shank Tolerance: +0.0000"/-0.0004"  
Diameter Tolerance: +0.0000"/-0.0015"

Extreme Production Variable Pitch to reduce chatter. Ultra Premium 10% micrograin carbide. All tools honed to improve tool life. TiALN Coated with a unique post coating polishing process to reduce built up edge. Special core & heal design to enhance rigidity. Experience the highest performance & tool life.

## HP Ultra Variable Pitch - EXTREME PRODUCTION

Square End & Corner Radius 4 & 5 Flute - Fractional .....	17-18
Ball Nose 4 Flute - Fractional .....	19
Square & Corner Radius 6 & 7 Flute - Fractional .....	20

# AlumiMax

Shank Tolerance: +0.0000"/-0.0004"  
Diameter Tolerance: +0.0000"/-0.0004"

Specifically designed for high performance Aluminum machining. Specially blended 45 degree helix for medium to finishing applications. Unique variable pitch & variable helix combined with a polished surface, chipbreaking geometry & cylindrical margin. Available Uncoated, ZrN Coated & DLC Coated.

## HP Ultra Variable Pitch for Aluminum - EXTREME PRODUCTION

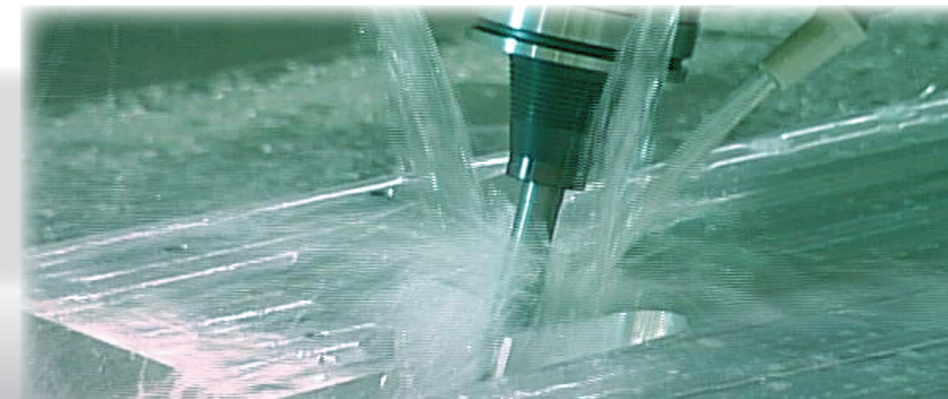
Square End & Corner Radius - Fractional .....	21
Ball Nose - Fractional .....	22

Material Classification	Speed (SFM)		Feed Per Tooth By End Mill Diameter (IPT)								
	Uncoated	TiALN	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"	
Aluminum Alloys & Aluminum	600-1200	900-1800	.0020	.0025	.0030	.0035	.0040	.0050	.0060	.0080	
Copper Alloys & Copper	350-850	525-1275	.0020	.0025	.0025	.0030	.0030	.0035	.0040	.0060	
Bronze & Brass	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	
Softer Cast Iron	250-450	375-650	.0020	.0022	.0025	.0027	.0030	.0045	.0060	.0080	
Harder Cast Iron	100-250	100-375	.0008	.0010	.0015	.0017	.0020	.0025	.0030	.0040	
Ductile Iron	80-400	100-600	.0010	.0012	.0015	.0017	.0020	.0030	.0040	.0060	
Malleable Iron	150-500	225-650	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0070	
Low Carbon Steels (1020 & Under)	200-400	300-600	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0070	
Medium Carbon Steels (1030-1060)	100-250	150-375	.0015	.0016	.0017	.0018	.0020	.0030	.0040	.0050	
Alloy Steels Hardened to 35 Rc	130-230	130-345	.0010	.0011	.0012	.0013	.0015	.0017	.0020	.0030	
Alloy Steels Hardened to 50 Rc	70-130	70-160	.0007	.0007	.0008	.0009	.0010	.0015	.0020	.0030	
Die Steels Hardened to 60 Rc	30-70	30-90	.0005	.0006	.0007	.0009	.0010	.0012	.0015	.0020	
Tool Steels	100-250	150-375	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040	
Mold Steels	200-350	300-525	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040	
Softer Stainless Steels	200-350	300-450	.0010	.0012	.0015	.0012	.0020	.0030	.0040	.0060	
Harder Stainless Steels	100-200	150-300	.0005	.0006	.0007	.0008	.0010	.0020	.0030	.0050	
Monel & High Nickel Steel	75-175	75-200	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040	
Softer Titanium	125-300	125-375	.0010	.0012	.0015	.0017	.0020	.0030	.0040	.0060	
Harder Titanium	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	

**Note: These are guidelines only & the following points are important to consider:**

- For MaxCut-HP-Ultra & AlumiMax High Performance tools, above feed per tooth can be multiplied by up to 1.5 to 2 times these values.
- Higher Feed Per Tooth should be used to start for radial depths of cut less than 25% of the tool diameter. Lower Feed Per Tooth should be used to start for radial depths of cut greater than 25% of the tool diameter.
- The above recommendations are for axial lengths of cut not to exceed 1 times the tool diameter for profiling and .5 times the diameter for full slotting.
- The above parameters 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.
- For Light Radial Depths of cut, make certain to increase the feed rate to compensate for Radial Chip Thinning Factor (RCTF). Consult a formula or app to calculate.
- For Plunging or Ramping the feed rate should be reduced by about 50%.
- Climb Milling is preferred to Conventional Milling.

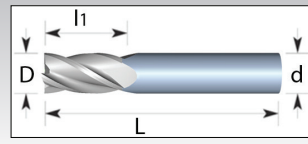
MaxCut  
Premium Carbide





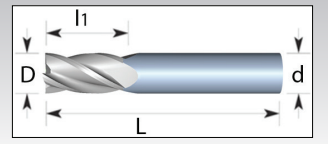
P	●	Steel
M	⊖	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel
		● GOOD ⊖ OK ○ NOT OPTIMAL

- Square End
- 2, 3, 4 Flute
- Single End
- Round Shanks
- Center Cutting
- Fractional & Metric
- General Purpose
- Micrograin Carbide
- Uncoated & TiALN Coated
- Plunging, Pocketing
- Slotting, Ramping
- Profiling



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Square End - Fractional									
Cutter D	Shank d	LOC l1	Overall L	Uncoated			TiALN		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
3/4	3/4	1	3	991045	991046	991047	991141	991142	991143
		1-1/2	4	991299	991300	991301	991694	991695	991696
		2-1/4	5	991764	--	991765	991808	--	991809
		3	6	991839	--	991840	991903	--	991904
49/64	7/8	1-1/2	4	991303	991304	991305	991698	991699	991700
25/32	7/8	1-1/2	4	991306	991307	991308	991701	991702	991703
51/64	7/8	1-1/2	4	991309	991310	991311	991704	991705	991706
13/16	7/8	1-1/2	4	991312	991313	991314	991707	991708	991709
53/64	7/8	1-1/2	4	991315	991316	991317	991710	991711	991712
27/32	7/8	1-1/2	4	991318	991319	991320	991713	991714	991715
55/64	7/8	1-1/2	4	991321	991322	991323	991716	991717	991718
7/8	7/8	1-1/2	4	991324	991325	991326	991719	991720	991721
57/64	1	1-1/2	4	991328	991329	991330	991723	991724	991725
29/32	1	1-1/2	4	991331	991332	991333	991726	991727	991728
59/64	1	1-1/2	4	991334	991335	991336	991729	991730	991731
15/16	1	1-1/2	4	991337	991338	991339	991732	991733	991734
61/64	1	1-1/2	4	991340	991341	991342	991735	991736	991737
31/32	1	1-1/2	4	991343	991344	991345	991738	991739	991740
63/64	1	1-1/2	4	991346	991347	991348	991741	991742	991743
1	1	1	3	991012	991013	991014	991108	991109	991110
		1-1/2	4	991162	991163	991164	991558	991559	991560
		2-1/4	5	991744	--	991745	991788	--	991789
		3	6	991810	--	991812	991875	--	991876

Square End - Metric									
Cutter D	Shank d	LOC l1	Overall L	Uncoated			TiALN		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
3	3	12	38	993256	993257	993258	993322	993323	993324
		25	75	993464	--	993465	993488	--	993489
		25	100	993512	--	993513	993528	--	993529
3.5	4	12	50	993259	993260	993261	993325	993326	993327
		14	50	993262	993263	993264	993328	993329	993330
4	4	25	75	993466	--	993467	993490	--	993491
		50	100	993514	--	993515	993530	--	993531
4.5	5	14	50	993265	993266	993267	993331	993332	993333
		16	50	993268	993269	993270	993334	993335	993336
5	5	25	75	993468	--	993469	993492	--	993493
		30	100	993516	--	993517	993532	--	993533
6	6	19	63	993271	993272	993273	993337	993338	993339
		25	75	993470	--	993471	993494	--	993495
7	7	50	100	993518	--	993519	993534	--	993535
		19	63	993274	993275	993276	993340	993341	993342
8	8	19	63	993277	993278	993279	993343	993344	993345
		30	100	993472	--	993473	993496	--	993497
9	10	50	150	993520	--	993521	993536	--	993537
		22	70	993280	993281	993282	993346	993347	993348
10	10	22	70	993283	993284	993285	993349	993350	993351
		38	100	993474	--	993475	993498	--	993499
11	12	75	150	993522	--	993523	993538	--	993539
		25	70	993286	993287	993288	993352	993353	993354
12	12	25	75	993289	993290	993291	993355	993356	993357
		50	100	993476	--	993477	993500	--	993501
14	14	75	150	993524	--	993525	993540	--	993541
		30	88	993292	993293	993294	993358	993359	993360
16	16	50	125	993478	--	993479	993502	--	993503
		75	150	993526	--	993527	993542	--	993543
18	18	32	88	993295	993296	993297	993361	993362	993363
		75	150	993480	--	993481	993504	--	993505
20	20	36	100	993298	993299	993300	993364	993365	993366
		75	150	993482	--	993483	993506	--	993507
22	25	38	100	993301	993302	993303	993367	993368	993369
		75	150	993484	--	993485	993508	--	993509
25	25	38	100	993304	993305	993306	993370	993371	993372
		75	150	993307	993308	993309	993373	993374	993375
25	25	75	150	993486	--	993487	993510	--	993511



Precision Grinding with high quality surface finishes for maximum tool life!

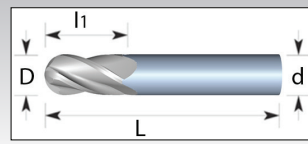
Square End - Metric									
Cutter D	Shank d	LOC l1	Overall L	Uncoated			TiALN		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
1	1	3	38	993244	993245	993246	993310	993311	993312
1.5	2	5	38	993247	993248	993249	993313	993314	993315
2	2	6	38	993250	993251	993252	993316	993317	993318



P	●	Steel
M	○	Stainless Steel
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H	○	Hardened Steel

● GOOD ○ OK ○ NOT OPTIMAL

- Ball Nose End
- 2, 3, 4 Flute
- Single End
- Round Shanks
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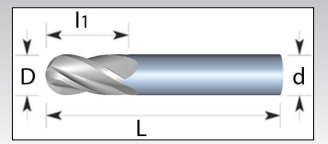


Ball Nose - Fractional									
Cutter	Shank	LOC	Overall	Uncoated			TiALN		
D	d	l <sub>1</sub>	L	2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
3/4	3/4	1	3	991952	991953	991954	992047	992048	992049
		1-1/2	4	992193	992194	992195	992578	992579	992580
		2-1/4	5	992646	--	992647	992690	--	992691
		3	6	992720	--	992721	992784	--	992785
49/64	7/8	1-1/2	4	992196	992197	992198	992581	992582	992583
25/32	7/8	1-1/2	4	992199	992200	992201	992584	992585	992586
51/64	7/8	1-1/2	4	992202	992203	992204	992587	992588	992589
13/16	7/8	1-1/2	4	992205	992206	992207	992590	992591	992592
53/64	7/8	1-1/2	4	992208	992209	992210	992593	992594	992595
27/32	7/8	1-1/2	4	992211	992212	992213	992596	992597	992598
55/64	7/8	1-1/2	4	992214	992215	992216	992599	992600	992601
7/8	7/8	1-1/2	4	992217	992218	992219	992602	992603	992604
57/64	1	1-1/2	4	992220	992221	992222	992605	992606	992607
29/32	1	1-1/2	4	992223	992224	992225	992608	992609	992610
59/64	1	1-1/2	4	992226	992227	992228	992611	992612	992613
15/16	1	1-1/2	4	992229	992230	992231	992614	992615	992616
61/64	1	1-1/2	4	992232	992233	992234	992617	992618	992619
31/32	1	1-1/2	4	992235	992236	992237	992620	992621	992622
63/64	1	1-1/2	4	992238	992239	992240	992623	992624	992625
1	1	1	3	991919	991920	991921	992014	992015	992016
		1-1/2	4	992068	992069	992070	992451	992452	992453
		2-1/4	5	992626	--	992627	992670	--	992671
		3	6	992692	--	992693	992756	--	992757

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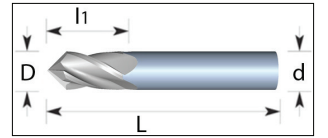
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Ball Nose - Metric									
Cutter	Shank	LOC	Overall	Uncoated			TiALN		
D	d	l <sub>1</sub>	L	2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
1	1	3	38	993376	--	993377	993420	--	993421
1.5	2	5	38	993378	--	993379	993422	--	993423
2	2	6	38	993380	--	993381	993424	--	993425
3	3	12	38	993384	--	993385	993428	--	993429
3.5	4	12	50	993386	--	993387	993430	--	993431
4	4	14	50	993388	--	993389	993432	--	993433
4.5	5	14	50	993390	--	993391	993434	--	993435
5	5	16	50	993392	--	993393	993436	--	993437
6	6	19	63	993394	--	993395	993438	--	993439
7	7	19	63	993396	--	993397	993440	--	993441
8	8	19	63	993398	--	993399	993442	--	993443
9	9	22	70	993400	--	993401	993444	--	993445
10	10	22	70	993402	--	993403	993446	--	993447
11	11	25	70	993404	--	993405	993448	--	993449
12	12	25	75	993406	--	993407	993450	--	993451
14	14	30	88	993408	--	993409	993452	--	993453
16	16	32	88	993410	--	993411	993454	--	993455
18	18	36	100	993412	--	993413	993456	--	993457
20	20	38	100	993414	--	993415	993458	--	993459
22	25	38	100	993416	--	993417	993460	--	993461
25	25	38	100	993418	--	993419	993462	--	993463

- 90 Degree End
- 2 & 4 Flute
- Single End
- Round Shanks
- Center Cutting
- Fractional Sizes
- General Purpose
- Micrograin Carbide
- Uncoated & TiALN Coated
- Milling, Drilling
- Countersinking
- Chamfering, De-burring



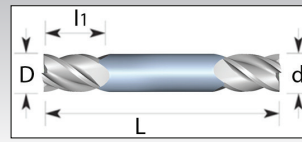
Drill/Mill 90 Degree - Fractional									
Cutter	Shank	LOC	Overall	Uncoated			TiALN		
D	d	l <sub>1</sub>	L	2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
1/8	1/8	1/2	1-1/2	993544	--	993545	993562	--	993563
3/16	3/16	5/8	2	993546	--	993547	993564	--	993565
1/4	1/4	3/4	2-1/2	993548	--	993549	993566	--	993567
5/16	5/16	7/8	2-1/2	993550	--	993551	993568	--	993569
3/8	3/8	1	2-1/2	993552	--	993553	993570	--	993571
7/16	7/16	1	2-3/4	993554	--	993555	993572	--	993573
1/2	1/2	1	3	993556	--	993557	993574	--	993575
5/8	5/8	1-1/4	3-1/2	993558	--	993559	993576	--	993577
3/4	3/4	1-1/2	4	993560	--	993561	993578	--	993579



“Lights-Out” automated loader production on world class 5 Axis CNC Grinding Machines!

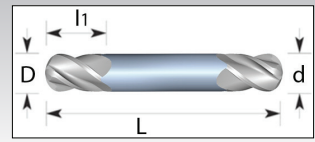
P	●	Steel
M	◻	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel
●		GOOD
◻		OK
○		NOT OPTIMAL

- Square End
- 2 & 4 Flute
- Double End
- Round & Weldon Shanks
- Center Cutting
- Fractional Sizes
- General Purpose
- Micrograin Carbide
- Uncoated & TiALN Coated
- Plunging, Pocketing
- Slotting, Ramping
- Profiling



P	●	Steel
M	◻	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel
●		GOOD
◻		OK
○		NOT OPTIMAL

- Ball Nose End
- 2 & 4 Flute
- Double End
- Round & Weldon Shanks
- Center Cutting
- Fractional Sizes
- General Purpose
- Micrograin Carbide
- Uncoated & TiALN Coated
- Plunging, Pocketing
- Slotting, Ramping
- Profiling



Square Double End - Fractional

Cutter	Shank	LOC	Overall	Uncoated			TiALN		
				D	d	li	L	2 Flute	3 Flute
1/32	1/8	1/16	1-1/2	992788	--	992789	992860	--	992861
3/64	1/8	3/32	1-1/2	992790	--	992791	992862	--	992863
1/16	1/8	1/8	1-1/2	992792	--	992793	992864	--	992865
3/32	1/8	3/16	1-1/2	992794	--	992795	992866	--	992867
		5/16	3	993004	--	993005	993032	--	993033
7/64	1/8	7/32	1-1/2	992796	--	992797	992868	--	992869
1/8	1/8	1/4	1-1/2	992798	--	992799	992870	--	992871
		3/8	3-1/16	993006	--	993007	993034	--	993035
5/32	3/16	5/16	2	992800	--	992801	992872	--	992873
		7/16	3-1/8	993008	--	993009	993036	--	993037
3/16	3/16	5/16	2	992802	--	992803	992874	--	992875
		1/2	3-1/4	993010	--	993011	993038	--	993039
7/32	1/4	3/8	2-1/2	992804	--	992805	992876	--	992877
		9/16	3-1/2	993012	--	993013	993040	--	993041
1/4	1/4	1/2	2-1/2	992806	--	992807	992878	--	992879
		5/8	3-1/2	993014	--	993015	993042	--	993043
9/32	5/16	1/2	2-1/2	992808	--	992809	992880	--	992881
5/16	5/16	1/2	2-1/2	992810	--	992811	992882	--	992883
		3/4	3-1/2	993016	--	993017	993044	--	993045
3/8	3/8	9/16	2-1/2	992812	--	992813	992884	--	992885
		3/4	3-1/2	993020	--	993021	993048	--	993049
7/16	1/2	9/16	2-3/4	992814	--	992815	992886	--	992887
		7/8	4	993022	--	993023	993050	--	993051
1/2	1/2	5/8	3	992816	--	992817	992888	--	992889
		1	4	993024	--	993025	993052	--	993053
9/16	5/8	11/16	3-1/2	992818	--	992819	992890	--	992891
5/8	5/8	11/16	3-1/2	992820	--	992821	992892	--	992893
		1-1/2	6	993028	--	993029	993056	--	993057
3/4	3/4	7/8	4	992822	--	992823	992894	--	992895
		1-1/2	6	993030	--	993031	993058	--	993059

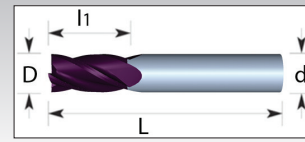
Ball Nose Double End - Fractional

Cutter	Shank	LOC	Overall	Uncoated			TiALN		
				D	d	li	L	2 Flute	3 Flute
1/32	1/8	1/16	1-1/2	992896	--	992897	992968	--	992969
3/64	1/8	3/32	1-1/2	992898	--	992899	992970	--	992971
1/16	1/8	1/8	1-1/2	992900	--	992901	992972	--	992973
3/32	1/8	3/16	1-1/2	992902	--	992903	992974	--	992975
		5/16	3	993060	--	993061	993088	--	993089
7/64	1/8	7/32	1-1/2	992904	--	992905	992976	--	992977
1/8	1/8	1/4	1-1/2	992906	--	992907	992978	--	992979
		3/8	3-1/16	993062	--	993063	993090	--	993091
5/32	3/16	5/16	2	992908	--	992909	992980	--	992981
		7/16	3-1/8	993064	--	993065	993092	--	993093
3/16	3/16	5/16	2	992910	--	992911	992982	--	992983
		1/2	3-1/4	993066	--	993067	993094	--	993095
7/32	1/4	3/8	2-1/2	992912	--	992913	992984	--	992985
		9/16	3-1/2	993068	--	993069	993096	--	993097
1/4	1/4	1/2	2-1/2	992914	--	992915	992986	--	992987
		5/8	3-1/2	993070	--	993071	993098	--	993099
9/32	5/16	1/2	2-1/2	992916	--	992917	992988	--	992989
5/16	5/16	1/2	2-1/2	992918	--	992919	992990	--	992991
		3/4	3-1/2	993072	--	993073	993100	--	993101
3/8	3/8	9/16	2-1/2	992920	--	992921	992992	--	992993
		3/4	3-1/2	993076	--	993077	993104	--	993105
7/16	1/2	9/16	2-3/4	992922	--	992923	992994	--	992995
		7/8	4	993078	--	993079	993106	--	993107
1/2	1/2	5/8	3	992924	--	992925	992996	--	992997
		1	4	993080	--	993081	993108	--	993109
9/16	5/8	11/16	3-1/2	992926	--	992927	992998	--	992999
5/8	5/8	11/16	3-1/2	992928	--	992929	993000	--	993001
		1-1/2	6	993084	--	993085	993112	--	993113
3/4	3/4	7/8	4	992930	--	992931	993002	--	993003
		1-1/2	6	993086	--	993087	993114	--	993115

P	●	Steel
M	◐	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H		Hardened Steel

● BETTER ◐ OK ○ NOT OPTIMAL

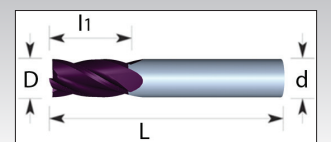
- Square & Corner Radius End
- 4 Flute TiALN Coated
- Variable Pitch, Reduces Chatter
- Round & Weldon Shanks
- Center Cutting
- Fractional Sizes
- High Performance
- Micrograin Carbide
- Unique Honing Process
- Plunging, Pocketing
- Slotting, Ramping
- Profiling



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H		Hardened Steel

● BETTER ◐ OK ○ NOT OPTIMAL

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### Square & Corner Radius End - Fractional

Cutter D	Shank d	LOC l1	Overall L	End Face	TiALN	
					4 Flute Round Shank	4 Flute Weldon Shank
3/16	3/16	3/8	2	SQ	881147	--
		3/8	2	.015"R	881148	--
		5/8	2	SQ	881004	--
		5/8	2	.015"R	881005	--
		3/4	2-1/2	SQ	881053	--
		3/4	2-1/2	.015"R	881054	--
		1-1/8	3	SQ	881132	--
1/4	1/4	3/8	2	SQ	881149	--
		3/8	2	.015"R	881150	--
		3/4	2-1/2	SQ	881006	881030
		3/4	2-1/2	.020"R	881007	881031
		1-1/8	3	SQ	881055	881078
		1-1/8	3	.020"R	881056	881079
		1-1/2	4	SQ	881133	--
5/16	5/16	3/8	2	SQ	881151	--
		3/8	2	.020"R	881152	--
		13/16	2-1/2	SQ	881008	881032
		13/16	2-1/2	.020"R	881009	881033
		1-1/8	3	SQ	881057	881080
		1-1/8	3	.020"R	881058	881081
		1-5/8	4	SQ	881134	--
3/8	3/8	1/2	2	SQ	881153	--
		1/2	2	.020"R	881154	--
		7/8	2-1/2	SQ	881010	881034
		7/8	2-1/2	.020"R	881011	881035
		1-1/8	3	SQ	881059	881082
		1-1/8	3	.020"R	881060	881083
		1-3/4	4	SQ	881135	--
7/16	7/16	1	2-3/4	SQ	881013	881036
		2	4	SQ	881061	881084
1/2	1/2	5/8	2-1/2	SQ	881155	881161
		5/8	2-1/2	.030"R	881156	881162
		1-1/4	3	SQ	881014	881037
		1-1/4	3	.015"R	881015	881038
		1-1/4	3	.030"R	881016	881039
		1-1/4	3	.060"R	881017	881040

### Square & Corner Radius End - Fractional

Cutter D	Shank d	LOC l1	Overall L	End Face	TiALN	
					4 Flute Round Shank	4 Flute Weldon Shank
1/2	1/2	2	4	SQ	881062	881085
		2	4	.015"R	881063	881086
		2	4	.030"R	881064	881087
		2	4	.060"R	881065	881088
		3	6	SQ	881136	--
5/8	5/8	3/4	3	SQ	881157	881163
		3/4	3	.030"R	881158	881164
		1-1/4	3-1/2	SQ	881018	881041
		1-1/4	3-1/2	.030"R	881019	881042
		1-1/4	3-1/2	.060"R	881020	881043
		1-1/4	3-1/2	.125"R	881021	881044
		2-1/4	5	SQ	881066	881089
		2-1/4	5	.030"R	881067	881090
		2-1/4	5	.060"R	881068	881091
2-1/4	5	.125"R	881069	881092		
3/4	3/4	3	6	SQ	881137	--
		1	3	SQ	881159	881165
		1	3	.030"R	881160	881166
		1-1/2	4	SQ	881022	881045
		1-1/2	4	.030"R	881023	881046
		1-1/2	4	.060"R	881024	881047
		1-1/2	4	.125"R	881025	881048
		2-1/4	5	SQ	881070	881093
		2-1/4	5	.030"R	881071	881094
		2-1/4	5	.060"R	881072	881095
2-1/4	5	.125"R	881073	881096		
1	1	3	6	SQ	881138	--
		1-1/2	4	SQ	881000	881026
		1-1/2	4	.030"R	881001	881027
		1-1/2	4	.060"R	881002	881028
		1-1/2	4	.125"R	881003	881029
		2-1/4	5	SQ	881049	881074
		2-1/4	5	.030"R	881049	881075
		2-1/4	5	.060"R	881051	881076
		2-1/4	5	.125"R	881052	881077
		3	6	SQ	881131	--

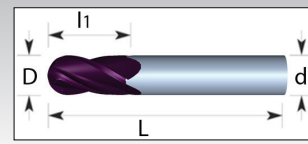


P	●	Steel
M	◐	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H		Hardened Steel

● BETTER ◐ OK ○ NOT OPTIMAL

- Ball Nose End
- 4 Flute TiALN Coated
- Variable Pitch, Reduces Chatter
- Round & Weldon Shanks
- Center Cutting
- Fractional Sizes

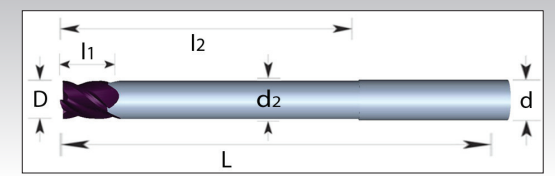
- High Performance
- Micrograin Carbide
- Unique Honing Process
- Plunging, Pocketing
- Slotting, Ramping
- Profiling



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M	◐	Stainless Steel
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N	○	Non-Ferrous
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H		Hardened Steel

● BETTER ◐ OK ○ NOT OPTIMAL

- Long Reach & Neck Relieved
- Same design features as all MaxCut-HP End Mills
- Square, Corner Radius & Ball Nose
- 4 Flute TiALN Coated
- Center Cutting, Fractional Sizes
- Long Reach with side wall clearance



Ball Nose - Fractional							
Cutter D	Shank d	LOC l1	Overall L	End Face	TiALN		
					4 Flute Round Shank	4 Flute Weldon Shank	
3/16	3/16	5/8	2	BN	881098	--	
		3/4	2-1/2	BN	881115	--	
		1-1/8	3	BN	881140	--	
1/4	1/4	3/4	2-1/2	BN	881099	881107	
		1-1/8	3	BN	881116	881124	
		1-1/2	4	BN	881141	--	
5/16	5/16	13/16	2-1/2	BN	881100	881108	
		1-1/8	3	BN	881117	881125	
		1-5/8	4	BN	881142	--	
3/8	3/8	7/8	2-1/2	BN	881101	881109	
		1-1/8	3	BN	881118	881126	
		1-3/4	4	BN	881143	--	
7/16	7/16	1	2-3/4	BN	881102	881110	
		2	4	BN	881119	881127	
1/2	1/2	1	3	BN	881103	881111	
		2	4	BN	881120	881128	
		3	6	BN	881144	--	
5/8	5/8	1-1/4	3-1/2	BN	881104	881112	
		2-1/4	5	BN	881121	881129	
		3	6	BN	881145	--	
3/4	3/4	1-1/2	4	BN	881105	881113	
		2-1/4	5	BN	881122	881130	
		3	6	BN	881146	--	
1	1	1-1/2	4	BN	881097	881106	
		2-1/4	5	BN	881114	881123	
		3	6	BN	881139	--	

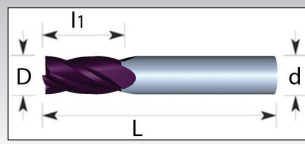
Long Reach Neck Relief - Fractional							
Cutter D	Shank d	Neck d2	LOC l1	L.B.S l2	Overall L	End Face	TiALN
							4 Flute Round Shank
3/16	3/16	.1775	3/8	2-1/2	4	SQ	881173
		.1775	3/8	2-1/2	4	.015CR	881174
		.1775	3/8	2-1/2	4	BN	881174
1/4	1/4	.2400	3/8	2-1/2	4	SQ	881175
		.2400	3/8	2-1/2	4	.015CR	881176
		.2400	3/8	2-1/2	4	BN	881199

Long Reach Neck Relief - Fractional									
Cutter D	Shank d	Neck d2	LOC l1	L.B.S l2	Overall L	End Face	TiALN		
							4 Flute Round Shank		
5/16	5/16	.3025	7/16	2-1/2	4	SQ	881177		
		.3025	7/16	2-1/2	4	.015CR	881178		
		.3025	7/16	2-1/2	4	BN	881200		
3/8	3/8	.3650	1/2	2-1/2	4	SQ	881179		
		.3650	1/2	2-1/2	4	.015CR	881180		
		.3650	1/2	2-1/2	4	BN	881201		
1/2	1/2	.4800	5/8	3	5	SQ	881181		
		.4800	5/8	3	5	.020CR	881182		
		.4800	5/8	3	5	BN	881202		
		.4800	5/8	4	6	SQ	881184		
		.4800	5/8	4	6	.020CR	881183		
		.4800	5/8	4	6	BN	881203		
5/8	5/8	.6050	3/4	3	5	SQ	881185		
		.6050	3/4	3	5	.020CR	881186		
		.6050	3/4	3	5	BN	881204		
		.6050	3/4	4	6	SQ	881188		
		.6050	3/4	4	6	.020CR	881187		
		.6050	3/4	4	6	BN	881205		
3/4	3/4	.7300	1	3	5	SQ	881189		
		.7300	1	3	5	.020CR	881190		
		.7300	1	3	5	BN	881206		
		.7300	1	4	6	SQ	881193		
		.7300	1	4	6	.020CR	881191		
		.7300	1	4	6	BN	881207		
		.7300	1	5	7	SQ	881194		
		.7300	1	5	7	.020CR	881192		
		.7300	1	5	7	BN	881208		
		1	1	.9800	1-1/4	3	5	SQ	881167
				.9800	1-1/4	3	5	.020CR	881168
				.9800	1-1/4	3	5	BN	881195
.9800	1-1/4			4	6	SQ	881171		
.9800	1-1/4			4	6	.020CR	881169		
.9800	1-1/4			4	6	BN	881196		
1	1	.9800	1-1/4	5	7	SQ	881172		
		.9800	1-1/4	5	7	.020CR	881170		
		.9800	1-1/4	5	7	BN	881197		



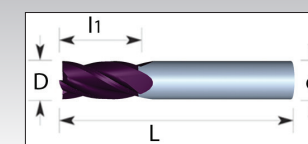
P	●	Steel
M	○	Stainless Steel
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N	○	Non-Ferrous
S	○	High Temp. Alloys
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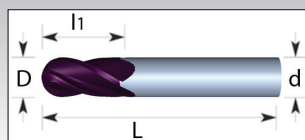
Square & Corner Radius End - Fractional								
Cutter D	Shank d	LOC l1	Overall L	End Face	TiALN			
					4 Flute Round Shank	4 Flute Weldon Shank	5 Flute Round Shank	
1/8	1/8	1/2	1-1/2	.010CR	771007	--	--	
3/16	3/16	3/8	2	SQ	771175	--	--	
		3/8	2	.015CR	771176	--	--	
		5/8	2	SQ	771008	--	--	
		5/8	2	.015CR	771009	--	--	
		3/4	2-1/2	SQ	771079	--	--	
		3/4	2-1/2	.015CR	771080	--	--	
		1-1/8	3	SQ	771159	--	--	
1/4	1/4	3/8	2	SQ	771177	--	--	
		3/8	2	.015CR	771178	--	--	
		3/4	2-1/2	SQ	771010	771051	771013	
		3/4	2-1/2	.020CR	771012	771053	771014	
		1-1/8	3	SQ	771081	771104	--	
		1-1/8	3	.020CR	771082	771105	--	
		1-1/2	4	SQ	771160	--	--	
5/16	5/16	3/8	2	SQ	771179	--	--	
		3/8	2	.020CR	771180	--	--	
		13/16	2-1/2	SQ	771015	771054	771017	
		13/16	2-1/2	.020CR	771016	771055	771018	
		1-1/8	3	SQ	771083	771106	--	
		1-1/8	3	.020CR	771084	771107	--	
		1-5/8	4	SQ	771161	--	--	
3/8	3/8	1/2	2	SQ	771181	--	--	
		1/2	2	.020CR	771182	--	--	
		7/8	2-1/2	SQ	771019	771056	771023	
		7/8	2-1/2	.020CR	771021	771058	771024	
		7/8	2-1/2	.030CR	771022	771059	771025	
		1-1/8	3	SQ	771085	771108	--	
		1-1/8	3	.020CR	771086	771109	--	
7/16	7/16	1	2-3/4	SQ	771026	771060	--	
		2	4	SQ	771087	771110	--	
		5/8	2-1/2	SQ	771183	771189	--	
1/2	1/2	5/8	2-1/2	.030CR	771184	771190	--	
		1-1/4	3	SQ	771027	771061	771031	
		1-1/4	3	.015CR	771028	771062	--	
		1-1/4	3	.030CR	771029	771063	771032	
		1-1/4	3	.060CR	771030	771064	--	
		1-1/4	3	.060CR	771030	771064	--	

Square & Corner Radius End - Fractional								
Cutter D	Shank d	LOC l1	Overall L	End Face	TiALN			
					4 Flute Round Shank	4 Flute Weldon Shank	5 Flute Round Shank	
1/2	1/2	2	4	SQ	771088	771111	--	
		2	4	.015CR	771089	771112	--	
		2	4	.030CR	771090	771113	--	
		2	4	.060CR	771091	771114	--	
		3	6	SQ	771163	--	--	
		3/4	3	SQ	771185	771191	--	
		3/4	3	.030CR	771186	771192	--	
5/8	5/8	1-1/4	3-1/2	SQ	771033	771065	771037	
		1-1/4	3-1/2	.030CR	771034	771066	771038	
		1-1/4	3-1/2	.060CR	771035	771067	--	
		1-1/4	3-1/2	.125CR	771036	771068	--	
		2-1/4	5	SQ	771092	771115	--	
		2-1/4	5	.030CR	771093	771116	--	
		2-1/4	5	.060CR	771094	771117	--	
		2-1/4	5	.125CR	771095	771118	--	
		3	6	SQ	771164	--	--	
		1	3	SQ	771187	771193	--	
		1	3	.030CR	771188	771194	--	
3/4	3/4	1-1/2	4	SQ	771039	771069	771043	
		1-1/2	4	.030CR	771040	771071	771044	
		1-1/2	4	.060CR	771041	771072	--	
		1-1/2	4	.125CR	771042	771073	--	
		2-1/4	5	SQ	771096	771119	--	
		2-1/4	5	.030CR	771097	771120	--	
		2-1/4	5	.060CR	771098	771121	--	
1	1	2-1/4	5	.125CR	771099	771122	--	
		3	6	SQ	771165	--	--	
		1-1/2	4	SQ	771000	771045	771004	
		1-1/2	4	.030CR	771001	771046	771005	
		1-1/2	4	.060CR	771002	771047	--	
		1-1/2	4	.125CR	771003	771048	--	
		2-1/4	5	SQ	771074	771100	--	
		2-1/4	5	.030CR	771075	771101	--	
		2-1/4	5	.060CR	771076	771102	--	
		2-1/4	5	.125CR	771077	771103	--	
		3	6	SQ	771158	--	--	

P	●	Steel
M	○	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H	○	Hardened Steel

- Ball Nose End
- 4 Flute TiALN Coated
- Variable Pitch, Reduces Chatter
- Round & Weldon Shanks
- Center Cutting
- Fractional Sizes

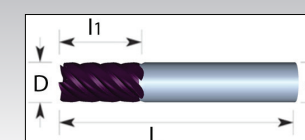
- Extreme Production
- Unique Polishing Process
- Unique Honing Process
- Plunging, Pocketing
- Slotting, Ramping, Profiling
- Ultra Premium Micrograin Carbide



P	●	Steel
M	○	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H	○	Hardened Steel

- Square & Corner Radius End
- 6 & 7 Flute TiALN Coated
- Variable Pitch, Reduces Chatter
- Round & Weldon Shanks
- Center Cutting, Fractional Sizes
- Trochoidal & Finish Milling

- Extreme Production
- Unique Polishing Process
- Unique Honing Process
- Plunging, Pocketing
- Slotting, Ramping, Profiling
- Ultra Premium Micrograin Carbide



Ball Nose - Fractional							
Cutter D	Shank d	LOC li	Overall L	End Face	TiALN		
					4 Flute Round Shank	4 Flute Weldon Shank	
3/16	3/16	5/8	2	BN	771125	--	
		3/4	2-1/2	BN	771142	--	
		1-1/8	3	BN	771168	--	
1/4	1/4	3/4	2-1/2	BN	771126	771134	
		1-1/8	3	BN	771143	771151	
		1-1/2	4	BN	771169	--	
		13/16	2-1/2	BN	771127	771135	
5/16	5/16	1-1/8	3	BN	771144	771152	
		1-5/8	4	BN	771170	--	
		7/8	2-1/2	BN	771128	771136	
3/8	3/8	1-1/8	3	BN	771145	771153	
		1-3/4	4	BN	771171	--	
		1	2-3/4	BN	771129	771137	
7/16	7/16	2	4	BN	771146	771154	
		1	3	BN	771130	771138	
1/2	1/2	2	4	BN	771147	771155	
		3	6	BN	771172	--	
		1-1/4	3-1/2	BN	771131	771139	
5/8	5/8	2-1/4	5	BN	771148	771156	
		3	6	BN	771173	--	
		1-1/2	4	BN	771132	771140	
3/4	3/4	2-1/4	5	BN	771149	771157	
		3	6	BN	771174	--	
		1-1/2	4	BN	771123	771133	
1	1	2-1/4	5	BN	771141	771150	
		3	6	BN	771166	--	

Square & Corner Radius End - Fractional							
Cutter D	Shank d	LOC li	Overall L	End Face	TiALN		
					6 Flute Round Shank	7 Flute Round Shank	
1/4	1/4	3/4	2-1/2	SQ	771198	--	
		3/4	2-1/2	.030CR	771199	--	
3/8	3/8	7/8	2-1/2	SQ	771200	--	
		7/8	2-1/2	.030CR	771201	--	
1/2	1/2	1	3	SQ	771202	--	
		1	3	.030CR	771203	771204	
5/8	5/8	1-1/4	3-1/2	SQ	771205	--	
		1-1/4	3-1/2	.030CR	771206	771207	
3/4	3/4	1-1/2	4	SQ	771208	--	
		1-1/2	4	.030CR	771209	771210	
1	1	1-1/2	4	SQ	771195	--	
		1-1/2	4	.030CR	771196	771197	

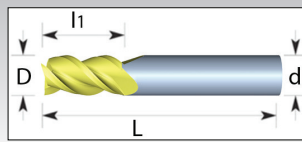


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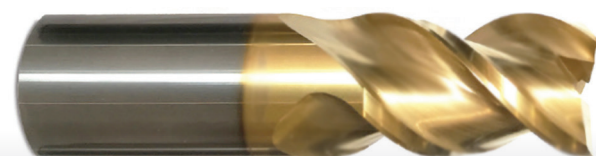
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High Temp. Alloys
H	Hardened Steel
● BEST	

- Square & Corner Radius End
- 2 & 3 Flute TiAlN Coated
- Variable Pitch, Reduces Chatter
- Round Shanks
- Center Cutting
- Fractional Sizes
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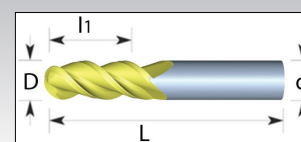
## Square & Corner Radius End - Fractional

Cutter D	Shank d	LOC li	Overall L	End Face	Uncoated		ZrN		DLC	
					2 Flute	3 Flute	2 Flute	3 Flute	2 Flute	3 Flute
1/8	1/8	1/2	1-1/2	SQ	661118	661119	--	--	--	--
3/16	3/16	5/8	2	SQ	661120	661122	661004	661006	661234	661236
		3/4	2-1/2	SQ	661152	661153	661036	661037	661266	661267
		1-1/8	3	SQ	661200	661201	661084	661085	661314	661315
1/4	1/4	3/4	2-1/2	SQ	661123	661125	661007	661009	661237	661239
		3/4	2-1/2	.020CR	661124	661126	661008	661010	661238	661240
		1-1/8	3	SQ	661154	661155	661038	661039	661268	661269
		1-1/2	4	SQ	661202	661203	661086	661087	661316	661317
5/16	5/16	13/16	2-1/2	SQ	661128	661130	661012	661014	661242	661244
		13/16	2-1/2	.020CR	661129	661132	661013	661016	661243	661246
		1-1/8	3	SQ	661156	661157	661040	661041	661270	661271
		1-5/8	4	SQ	661204	661205	661088	661089	661318	661319
3/8	3/8	1	2-1/2	SQ	661134	661136	661018	661020	661248	661250
		1	2-1/2	.020CR	661135	661137	661019	661021	661249	661251
		1-1/8	3	SQ	661158	661159	661042	661043	661272	661273
		1-3/4	4	SQ	661206	661207	661090	661091	661320	661321
1/2	1/2	1-1/4	3	SQ	661138	661140	661022	661024	661252	661254
		1-1/4	3	.030CR	661139	661141	661023	661025	661253	661255
		2	4	SQ	661160	661161	661044	661045	661274	661275
5/8	5/8	3	6	SQ	661208	661209	661092	661093	661322	661323
		1-1/4	3-1/2	SQ	661142	661144	661026	661028	661256	661258
		1-1/4	3-1/2	.030CR	661143	661145	661027	661029	661257	661259
		2-1/4	5	SQ	661162	661163	661046	661047	661276	661277
3/4	3/4	3	6	SQ	661210	661211	661094	661095	661324	661325
		1-1/2	4	SQ	661146	661148	661030	661032	661260	661262
		1-1/2	4	.030CR	661147	661149	661031	661033	661261	661263
1	1	2-1/4	5	SQ	661164	661165	661048	661049	661278	661279
		3	6	SQ	661212	661213	661096	661097	661326	661327
		1-1/2	4	SQ	661114	661116	661000	661002	661230	661232
		1-1/2	4	.030CR	661115	661117	661001	661003	661231	661233
1	1	2-1/4	5	SQ	661150	661151	661034	661035	661264	661265
		3	6	SQ	661198	661199	661082	661083	661312	661313



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M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High Temp. Alloys
H	Hardened Steel
● BEST	

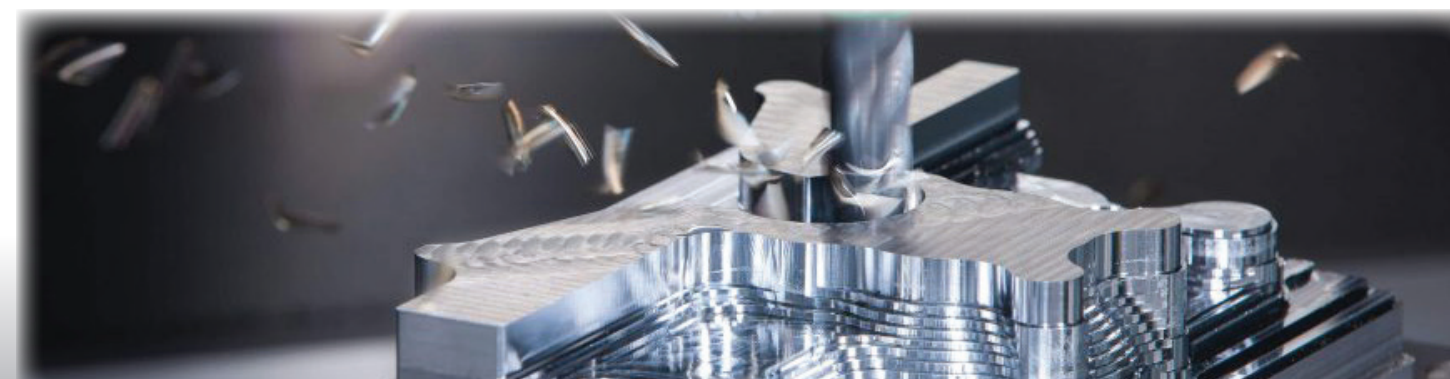
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## Ball Nose - Fractional

Cutter D	Shank d	LOC li	Overall L	End Face	Uncoated		ZrN		DLC	
					2 Flute	3 Flute	2 Flute	3 Flute	2 Flute	3 Flute
3/16	3/16	5/8	2	BN	661168	661169	661052	661053	661282	661283
		3/4	2-1/2	BN	661184	661185	661068	661069	661298	661299
1/4	1/4	1-1/8	3	BN	661216	661217	661100	661101	661330	661331
		3/4	2-1/2	BN	661170	661171	661054	661055	661284	661285
		1-1/8	3	BN	661186	661187	661070	661071	661300	661301
5/16	5/16	1-1/2	4	BN	661218	661219	661102	661103	661332	661333
		13/16	2-1/2	BN	661172	661173	661056	661057	661286	661287
		1-1/8	3	BN	661188	661189	661072	661073	661302	661303
		1-5/8	4	BN	661220	661221	661104	661105	661334	661335
3/8	3/8	1	2-1/2	BN	661174	661175	661058	661059	661288	661289
		1-1/8	3	BN	661190	661191	661074	661075	661304	661305
		1-3/4	4	BN	661222	661223	661106	661107	661336	661337
1/2	1/2	1-1/4	3	BN	661176	661177	661060	661061	661290	661291
		2	4	BN	661192	661193	661076	661077	661306	661307
		3	6	BN	661224	661225	661108	661109	661338	661339
5/8	5/8	1-1/4	3-1/2	BN	661178	661179	661062	661063	661292	661293
		2-1/4	5	BN	661194	661195	661078	661079	661308	661309
		3	6	BN	661226	661227	661110	661111	661340	661341
3/4	3/4	1-1/2	4	BN	661180	661181	661064	661065	661294	661295
		2-1/4	5	BN	661196	661197	661080	661081	661310	661311
		3	6	BN	661228	661229	661112	661113	661342	661343
1	1	1-1/2	4	BN	661166	661167	661050	661051	661280	661281
		2-1/4	5	BN	661182	661183	661066	661067	661296	661297
		3	6	BN	661214	661215	661098	661099	661328	661329

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