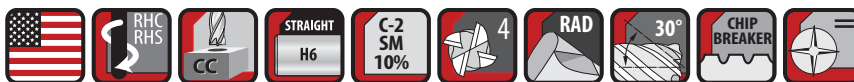
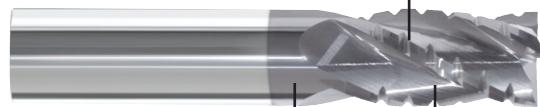


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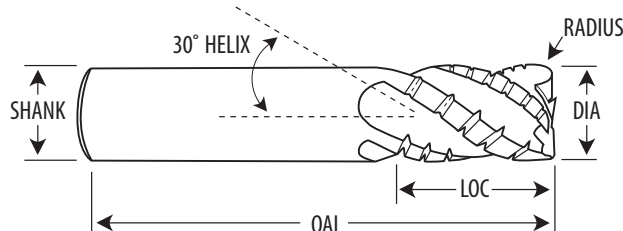
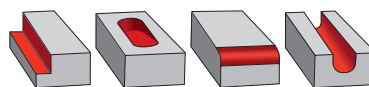


Chipbreaker profile creates smaller chips for less edge build up and lower power usage



Optional AlTiN coating excels in both wet and dry machining environments

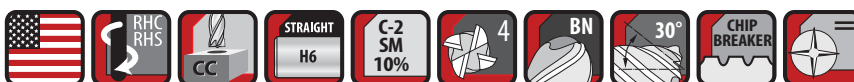
Designed for heavy material removal applications where cycle times are critical



DIA TOLERANCE: +0.000 / -0.002" SHANK TOLERANCE: +0.0000 / -0.0004"

DIA	DEC IN	LOC	SHANK	OAL	LENGTH	RADIUS	BRIGHT	ALTiN
1/8	0.1250	1/2	1/8	1-1/2	Regular	0.010	257-125500	257-125503
3/16	0.1875	5/8	3/16	2	Regular	0.010	257-187625	257-187628
1/4	0.2500	3/4	1/4	2-1/2	Regular	0.010	257-250750	257-250753
5/16	0.3125	13/16	5/16	2-1/2	Regular	0.010	257-312812	257-312815
3/8	0.3750	1	3/8	2-1/2	Regular	0.015	257-375875	257-375878
7/16	0.4375	1	7/16	2-3/4	Regular	0.015	257-437100	257-437103
1/2	0.5000	1	1/2	3	Regular	0.015	257-500100	257-500103
5/8	0.6250	1-1/4	5/8	3-1/2	Regular	0.020	257-625114	257-625117
3/4	0.7500	1-1/2	3/4	4	Regular	0.020	257-750112	257-750115
1	1.0000	1-1/2	1	4	Regular	0.020	257-100112	257-100115

ATTACKER^{4BN}

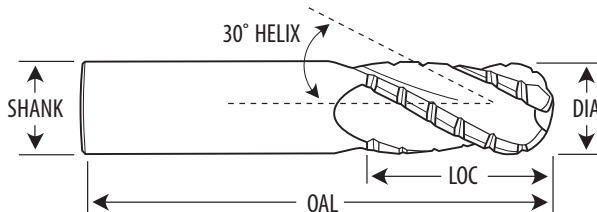
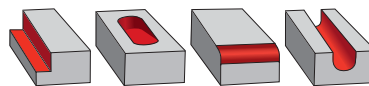


Designed for heavy material removal applications where cycle times are critical



Virtually perfect ball radius end

Chipbreaker profile creates smaller chips for less edge build up and lower power usage



DIA TOLERANCE: +0.000 / -0.002" SHANK TOLERANCE: +0.0000 / -0.0004"

DIA	DEC IN	LOC	SHANK	OAL	LENGTH	BRIGHT	ALTiN
1/8	0.1250	1/2	1/8	1-1/2	Regular	258-125500	258-125503
3/16	0.1875	5/8	3/16	2	Regular	258-187625	258-187628
1/4	0.2500	3/4	1/4	2-1/2	Regular	258-250750	258-250753
5/16	0.3125	13/16	5/16	2-1/2	Regular	258-312812	258-312815
3/8	0.3750	1	3/8	2-1/2	Regular	258-375875	258-375878
7/16	0.4375	1	7/16	2-3/4	Regular	258-437100	258-437103
1/2	0.5000	1	1/2	3	Regular	258-500100	258-500103
5/8	0.6250	1-1/4	5/8	3-1/2	Regular	258-625114	258-625117
3/4	0.7500	1-1/2	3/4	4	Regular	258-750112	258-750115
1	1.0000	1-1/2	1	4	Regular	258-100112	258-100115

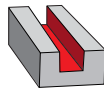
MILLING RECOMMENDATIONS



PROFILING

Workpiece Material Group		Hardness	Surface Feet Per Minute (SFM)					Inches Per Tooth (IPT)						*CHIP THINNING Adjustments	
			Radial Depth of Cut (RDOC)					IPT* (BASELINE)							
			SFM based on RDOC					IPT* (BASELINE)							
			Cutting Diameter Engaged					Cutting Diameter						RDOC	Increase IPT
			5%	10%	20%	30%	50%	5/16	3/8	1/2	5/8	3/4	1	50%	None
Steels	Free Machining & Low Carbon: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	≤ 28 Rc	1050	700	385	375	350								
	Medium Carbon, High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	28 - 38 Rc	630	420	320	250	210	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090		
Tool & Die Steels	A2, H13, L6, P20, S7	28 - 44 Rc	525	350	300	275	250	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090		
Stainless Steel	Easy to Machine, 430F, 301, 303, 410, 416 Annealed, 420F, 430, 430F	≤ 28 Rc	650	600	550	500	450								
	Moderately Difficult to Machine, Nitronic 50, Nitronic 60, 301, 303, 304, 304L Incoloy 27-7MO, 316, 316L, 321, 347	≤ 28 Rc	525	400	350	300	250	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090		
	Difficult to Machine, 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	> 28 Rc	525	400	350	300	250								
Super Alloys	High Temp, Nimonic, Inconel, Monel, Hastelloy	≤ 42 Rc	265	200	175	150	100	0.0014	0.0016	0.0023	0.0027	0.0032	0.0045		
	Titanium: Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al	≤ 42 Rc	230	200	175	150	125								
Hardened Materials		45-55 Rc	250	240	230	210	200	0.0018	0.0021	0.0030	0.0036	0.0042	0.0060		
		55-65 Rc	200	180	160	150	100	0.0013	0.0014	0.0021	0.0024	0.0029	0.0041		
Cast-Iron	Gray: SAE J431, ASTM A48	≤ 240 HB	425	400	375	350	300								
	Ductile & Malleable: ASTM A536, ASTM 897, ASTM A47, ASTM A220 ASTM A602	> 240 HB	320	300	250	225	200	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090		
Non-Ferrous	Aluminum, Brass, Bronze, Copper, Plastics, Graphite		1000	960	920	880	840	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090		

†1/4" AND SMALLER DIAMETERS: Use caution when Profiling more than 50% or Slotting more than 25%



SLOTTING

Workpiece Material Group		Hardness	Surface Feet Per Minute (SFM)			Inches Per Tooth (IPT)					
			Radial Depth of Cut (RDOC)			IPT* (BASELINE)					
			SFM			IPT* (BASELINE)					
			25%	50%	100%	5/16	3/8	1/2	5/8	3/4	1
Steels	Free Machining & Low Carbon: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	≤ 28 Rc	385	370	350						
	Medium Carbon, High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	28 - 38 Rc	245	230	2210	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
Tool & Die Steels	A2, H13, L6, P20, S7	28 - 44 Rc	210	195	175	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
Stainless Steel	Easy to Machine, 430F, 301, 303, 410, 416 Annealed, 420F, 430, 430F	≤ 28 Rc	385	370	350						
	Moderately Difficult to Machine, Nitronic 50, Nitronic 60, 301, 303, 304, 304L Incoloy 27-7MO, 316, 316L, 321, 347	≤ 28 Rc	245	210	175	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
	Difficult to Machine, 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	> 28 Rc	210	195	175						
Super Alloys	High Temp, Nimonic, Inconel, Monel, Hastelloy	≤ 42 Rc	125	105	90	0.0008	0.0010	0.0013	0.0016	0.0017	0.0026
	Titanium: Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al	≤ 42 Rc	100	90	80						
Hardened Materials		34-45 Rc	245	230	210	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
		45-55 Rc	175	160	140	0.0008	0.0010	0.0013	0.0016	0.0020	0.0025
		55-65 Rc	150	125	100	0.0004	0.0005	0.0008	0.0008	0.0010	0.0012
Cast-Iron	Gray: SAE J431, ASTM A48	≤ 240 HB	450	400	350						
	Ductile & Malleable: ASTM A536, ASTM 897, ASTM A47, ASTM A220 ASTM A602	> 240 HB	300	250	225	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
Non-Ferrous	Aluminum, Brass, Bronze, Copper, Plastics, Graphite		750	600	450	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050

