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END MILLS
DRILL MILLS
THREAD MILLS
MICRO END MILLS
CHAMFER MILLS

BURS
DRILLS
REAMERS
TAPS & DIES
COUNTERSINKS

2019
PRODUCT CATALOG



Made Right. Made Here.

We believe in American manufacturing and the American workforce. That's why great care is taken to ensure that every step of production from grinding to coating; on every one of the over 13,000 tools in this catalog is done right here in the USA.

The result is a premium, industrial quality tool that you can be as proud to run in your facility, as we are to offer it.





Our Commitment

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

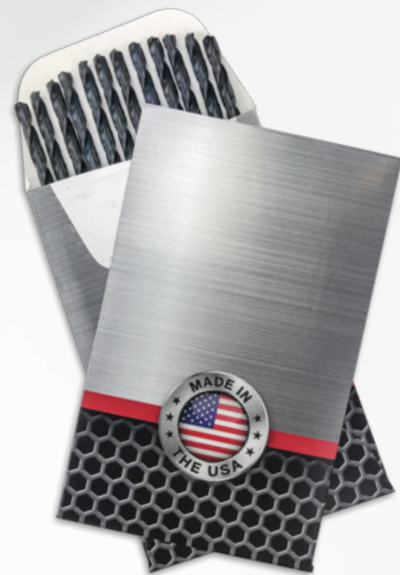
95% Order Fulfillment

Our top-notch warehouse and distribution facility is an industry leader in fast accurate order fulfillment. We work hard to maintain an on-shelf, ready-to-ship inventory of all 13,000 plus tools offered in this catalog.



Exceptional Quality Control

Orders are barcoded upon receipt, and tracked at every step through the fulfillment center. Before boxing, all orders are subject to the scrutiny of our quality control personnel.



Our Commitment

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Same Day Shipping

Inspected orders are processed and shipped the same day, so whether you're across the street or across the country, your tools will reach you quickly.



No minimum order requirements.

We appreciate your business and treat every order - large and small - with the same top level integrity.



MADE IN THE USA



PVD Coatings

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

Why coated tools?

A PVD coating is the best way to customize a cutting tool to the material it's machining. The right coating will let the tool run faster and extend its life. This combination of longer life and greater production will typically more than offset the cost of the coated tool and can contribute significant cost savings on the project at hand.



Physical Vapor Deposition - PVD

There are several methods of PVD, all the coated tools in this offering will achieve their coating by cathodic arc deposition or Arc-PVD. In this process, an electric arc is used to vaporize material from a solid cathode target. The vaporized material then condenses on the tools, forming the even, uniform coatings that you see in the following pages.



The microscopically precise control of the coating thickness on our cutting tools ensures the tools gain the properties of the coating material, without negatively impacting the cutting edge. PVD coatings are harder and more corrosion resistant than other coating and plating processes and also have higher heat tolerances and abrasion resistance.



ALCRO-MAX

ALCRO-MAX is a high performance Coating from the PLATIT coatings family. It is based on AlCrN with a titanium addition. Triple coatings are deposited with 3 sections freely programmed in one batch. ALCRO-MAX has been engineered to give an optimum balance between the toughness of the core layer and the abrasion resistance of the top nano-layer. Titanium's addition reduces the adhesive wear compared to conventional AlCrN coatings, also increasing the micro-hardness up to 3500Hv and stops the crack propagation through the coating. After the coating is applied, it receives a post-polish treatment to smooth out the coating to maximize chip evacuation at even higher speeds and feeds.

Our case histories have shown ALCRO-MAX out performs ALTIN in multiple applications. ALCRO-MAX is recommended for a wider range of materials and exotics including high temp alloys, stainless steels, alloy steels, cast iron, high temp nickel base alloys, titanium alloys, hardened tool steel up to 54 HRC, and inconel. This coating has an excellent thermal and chemical stability. Which means it keeps its mechanical properties at very high temperatures up to 950°C. ALCRO-MAX has the best overall properties of any coating we offer and outperforms all generic coatings available on the market.



Post Polish Treatment

We've adapted a post-coating polish system that buffs our premium ALCRO-MAX coating to a microscopically smooth finish to allow cooler temperatures at higher speeds with better chip evacuation. What does all this mean? A longer lasting, better cutting tool.



Applicable Materials

- Stainless Steels
- Hardened Tool Steels
- Alloyed Steels
- Superalloys
- High Temp Alloys
- Nickel Base Alloys
- Titanium Alloys
- Cast Iron
- Inconel



PVD Coatings

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

ALTIN

ALTIN is a high performance coating for milling, drilling, and tapping. This coating works well in a wide range of materials and exoctics including high temp alloys, stainless steels, alloy steels, cast iron, high temp nickel base alloys, titanium alloys, and inconel. ALTIN is extremely heat resistant and can be used with or without coolant. It is exceptional in difficult to machine materials where adhesive wear is particularly high.

TICN

TICN is a general purpose coating used for milling, drilling, and tapping in all stainless steels, as well as a wide variety of other materials. This would be an option when ALTIN cannot be used, as in applications that cannot generate the speeds and feeds required for higher cutting temperatures.



Applicable Materials

- Stainless Steels
- Alloyed Steels
- Superalloys
- High Temp Alloys
- Nickel Base Alloys
- Titanium Alloys
- Cast Iron
- Inconel



Applicable Materials

- Steels
- Alloyed Steels
- Superalloys
- Cast Iron
- Aluminium
- Copper
- Bronze
- Brass
- Plastics



ZRN

ZRN is a high performance coating for milling, tapping, and drilling non-ferrous materials such as aluminum, brass, and bronze applications. It prevents edge build up that is typical in soft and sticky materials. This coating allows for higher speed and feed rates as well as prolonged tool life. ZRN does not have an affinity for aluminum.

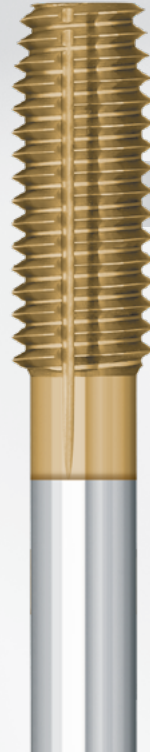
TIN

TIN is a general purpose coating for drilling and tapping in a wide variety of materials. This coating is generally used in applications with lower cutting speeds.



Applicable Materials

- Aluminium
- Copper
- Bronze
- Brass
- Plastics



Applicable Materials

- Steels
- Cast Iron
- Copper
- Bronze
- Brass
- Plastics



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VI-PRO

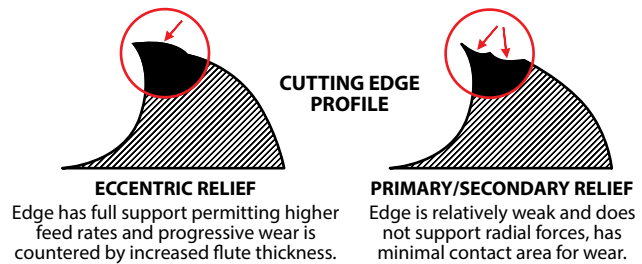
VARIABLE INDEX GEOMETRY

VI-PRO is a High Performance, carbide end mill, that incorporates the ultimate in variable index geometry. Our flute configuration produces a harmonics shift, resulting in minimal chatter and an exceptional finish.

- Post polished ALCRO-MAX coating covers a wide range of materials
- Made in the USA from premium micrograin carbide
- Used in all slotting, roughing, profiling and finishing applications
- High Performance, chatter free machining provides versatility in use for all ferrous materials
- Designed for use in Alloy Steels, Inconel, Cast Iron, Titanium, Stainless Steel, High Temp and all other exotic materials up to 50HRc
- Enables higher SFM and heavier chip loads
- Eccentric Relief on the cutting edge provides enhanced edge strength
- Available in 4, 5 & 6 Flute - Stub, Regular, Long & Extra Long Lengths
- Available in Square End, Ball Nose and various  Corner Radius sizes
- Recommended for slotting up to 1 x Diameter

High-Performance VI-PRO carbide end mill utilizes an Eccentric Relief on the cutting edge that provides enhanced edge strength and a smoother cutting action.

Eccentric Relief vs Primary/Secondary Relief



Why use VI-PRO Corner Radius tools?

- The tools improve productivity and reduce costs.
- A sharp corner of an end mill is its weakest point. The corner radius design strengthens the end mill by reducing chipping and providing longer tool life.
- Extensive offering of Corner Radius tools: Stub, Regular, Long and Extra Long Lengths, with radius starting at 0.010 up to 0.250.

Benefits of Post polishing

ALCRO-MAX by nature of the coating process leaves tiny “droplets” of the coating on the surface of the tool. Proven results have shown that the removal of these droplets provide a smoother tool surface which results in a better cut. Perhaps the most important benefit, is that the tool is able to run at faster feed rates due to the smoothness of the flute area. This results in better chip evacuation and cooler temperatures resulting in longer tool life.





Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - STUB LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	4	257338	28.36	-	-
3/16	3/16	3/8	2	4	257349	36.49	-	-
1/4	1/4	3/8	2	4	245942	41.29	-	-
5/16	5/16	7/16	2	4	245953	60.06	-	-
3/8	3/8	1/2	2	4	245964	66.58	-	-
7/16	7/16	5/8	2-1/2	4	257360	86.73	-	-
1/2	1/2	5/8	2-1/2	4	245975	99.55	246008	105.22
5/8	5/8	3/4	3	4	245986	195.99	246019	201.66
3/4	3/4	1	3	4	245997	258.49	246030	264.15

4 FLUTE - REGULAR LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/8	1/8	1/2	2	4	257426	33.88	-	-
3/16	3/16	9/16	2	4	257437	38.73	-	-
1/4	1/4	3/4	2-1/2	4	246426	49.16	-	-
5/16	5/16	13/16	2-1/2	4	246437	65.10	-	-
3/8	3/8	1	2-1/2	4	246448	76.27	-	-
7/16	7/16	1	2-3/4	4	257448	94.58	-	-
1/2	1/2	1	3	4	246459	114.40	246514	120.06
1/2	1/2	1-1/4	3	4	246470	114.40	246525	120.06
5/8	5/8	1-5/8	3-1/2	4	246481	207.09	246536	212.76
3/4	3/4	1-5/8	4	4	246492	286.14	246547	291.80
1	1	2	4	4	246503	534.14	246558	539.81

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229-231.

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6
5/8" - 1"	+ .000, -.003	-.0001, -.0004 ISO H6

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - LONG LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/4	1/4	1-1/8	3	4	247944	55.99	-	-
5/16	5/16	1-1/8	3	4	247955	77.46	-	-
3/8	3/8	1-1/4	3	4	247966	104.03	-	-
7/16	7/16	2	4	4	257602	131.96	-	-
1/2	1/2	1-1/2	4	4	247977	143.63	248032	149.30
1/2	1/2	2	4	4	247988	159.27	248043	164.94
5/8	5/8	2-1/4	5	4	247999	296.22	248054	301.89
3/4	3/4	2-1/4	5	4	248010	358.44	248065	364.10
1	1	2-1/4	5	4	248021	590.74	248076	596.41

4 FLUTE - EXTRA LONG LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	248813	66.88	-	-
3/8	3/8	2	4	4	248824	117.23	-	-
7/16	7/16	3	6	4	257668	192.22	-	-
1/2	1/2	3	6	4	248835	224.60	248901	230.27
5/8	5/8	3	6	4	248846	319.45	248912	325.12
3/4	3/4	3	6	4	248857	421.67	248923	427.33
3/4	3/4	4	7	4	248868	692.45	248934	698.12
1	1	3	6	4	248879	687.46	248945	693.13
1	1	4-1/4	7	4	248890	1014.83	248956	1020.91

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229-231.

TOLERANCES	DIAMETER	SHANK
1/4" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6
5/8" - 1"	+ .000, -.003	-.0001, -.0004 ISO H6

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO

VARIABLE INDEX GEOMETRY

4 FLUTE - STUB LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	4	0.010	257382	32.68	-	-
3/16	3/16	3/8	2	4	0.010	257393	40.82	-	-
1/4	1/4	3/8	2	4	0.015	246162	48.11	-	-
5/16	5/16	7/16	2	4	0.015	246173	64.76	-	-
3/8	3/8	1/2	2	4	0.015	246184	71.28	-	-
7/16	7/16	5/8	2-1/2	4	0.030	257404	91.34	-	-
1/2	1/2	5/8	2-1/2	4	0.030	246195	108.96	246228	114.62
5/8	5/8	3/4	3	4	0.030	246206	205.39	246239	211.06
3/4	3/4	1	3	4	0.030	246217	267.89	246250	273.56



All our tools are 100% Made in the USA

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229-231.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6	+ .001, -.001
5/8" - 3/4"	+ .000, -.003	-.0001, -.0004 ISO H6	+ .001, -.001

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - REGULAR LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/8	1/8	1/2	2	4	0.010	257492	38.21	-	-
1/8	1/8	1/2	2	4	0.020	257503	38.21	-	-
1/8	1/8	1/2	2	4	0.030	257514	38.21	-	-
3/16	3/16	9/16	2	4	0.010	257525	43.06	-	-
3/16	3/16	9/16	2	4	0.020	257536	43.06	-	-
3/16	3/16	9/16	2	4	0.030	257547	43.06	-	-
1/4	1/4	3/4	2-1/2	4	0.015	247218	53.48	-	-
1/4	1/4	3/4	2-1/2	4	0.030	247229	53.48	-	-
1/4	1/4	3/4	2-1/2	4	0.060	247240	53.48	-	-
5/16	5/16	13/16	2-1/2	4	0.015	247251	68.90	-	-
5/16	5/16	13/16	2-1/2	4	0.030	247262	68.90	-	-
5/16	5/16	13/16	2-1/2	4	0.060	247273	68.90	-	-
3/8	3/8	1	2-1/2	4	0.015	247284	80.46	-	-
3/8	3/8	1	2-1/2	4	0.030	247295	80.46	-	-
3/8	3/8	1	2-1/2	4	0.060	247306	80.46	-	-
7/16	7/16	1	2-3/4	4	0.015	257558	105.00	-	-
7/16	7/16	1	2-3/4	4	0.030	257569	105.00	-	-
7/16	7/16	1	2-3/4	4	0.060	257580	105.00	-	-
1/2	1/2	1	3	4	0.015	247317	128.54	247559	134.97
1/2	1/2	1	3	4	0.030	247328	128.54	247570	134.97
1/2	1/2	1	3	4	0.060	247339	128.54	247581	134.97
1/2	1/2	1	3	4	0.090	247350	128.54	247592	134.97
1/2	1/2	1	3	4	0.120	247361	128.54	247603	134.97
1/2	1/2	1-1/4	3	4	0.015	247372	128.54	247614	134.97
1/2	1/2	1-1/4	3	4	0.030	247383	128.54	247625	134.97
1/2	1/2	1-1/4	3	4	0.060	247394	128.54	247636	134.97
1/2	1/2	1-1/4	3	4	0.090	247405	128.54	247647	134.97
1/2	1/2	1-1/4	3	4	0.120	247416	128.54	247658	134.97
5/8	5/8	1-5/8	3-1/2	4	0.030	247427	216.56	247669	222.22
5/8	5/8	1-5/8	3-1/2	4	0.060	247438	216.56	247680	222.22
5/8	5/8	1-5/8	3-1/2	4	0.090	247449	216.56	247691	222.22
5/8	5/8	1-5/8	3-1/2	4	0.120	247460	216.56	247702	222.22
3/4	3/4	1-5/8	4	4	0.030	247471	300.30	247713	305.97
3/4	3/4	1-5/8	4	4	0.060	247482	300.30	247724	305.97
3/4	3/4	1-5/8	4	4	0.090	247493	300.30	247735	305.97
3/4	3/4	1-5/8	4	4	0.120	247504	300.30	247746	305.97
3/4	3/4	1-5/8	4	4	0.190	262070	300.30	262114	305.97
3/4	3/4	1-5/8	4	4	0.250	262081	300.30	262125	305.97
1	1	2	4	4	0.030	247515	548.31	247757	553.97
1	1	2	4	4	0.060	247526	548.31	247768	553.97
1	1	2	4	4	0.090	247537	548.31	247779	553.97
1	1	2	4	4	0.120	247548	548.31	247790	553.97
1	1	2	4	4	0.190	262092	548.31	262136	553.97
1	1	2	4	4	0.250	262103	548.31	262147	553.97

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

For coating information see page 6. For VI-PRO technical information, please see pages 229-231.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.001, -0.002	-0.0001, -0.0004 ISO H6	+0.001, -0.001
5/8" - 3/4"	+0.001, -0.003	-0.0001, -0.0004 ISO H6	+0.001, -0.001

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO

VARIABLE INDEX GEOMETRY

4 FLUTE - LONG LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/4	1/4	1-1/8	3	4	0.015	248373	60.31	-	-
1/4	1/4	1-1/8	3	4	0.030	248384	60.31	-	-
5/16	5/16	1-1/8	3	4	0.015	248395	82.16	-	-
5/16	5/16	1-1/8	3	4	0.030	248406	82.16	-	-
3/8	3/8	1-1/4	3	4	0.030	248417	108.73	-	-
3/8	3/8	1-1/4	3	4	0.060	248428	108.73	-	-
7/16	7/16	2	4	4	0.030	257635	139.65	-	-
7/16	7/16	2	4	4	0.060	257646	139.65	-	-
1/2	1/2	1-1/2	4	4	0.030	248439	153.04	248549	158.71
1/2	1/2	1-1/2	4	4	0.060	248450	153.04	248560	158.71
1/2	1/2	2	4	4	0.030	248461	168.68	248571	174.34
1/2	1/2	2	4	4	0.060	248472	168.68	248582	174.34
5/8	5/8	2-1/4	5	4	0.030	248483	305.63	248593	311.29
5/8	5/8	2-1/4	5	4	0.060	248494	305.63	248604	311.29
3/4	3/4	2-1/4	5	4	0.030	248505	384.87	248615	392.23
3/4	3/4	2-1/4	5	4	0.060	248516	384.87	248626	392.23
1	1	2-1/4	5	4	0.030	248527	600.15	248637	605.82
1	1	2-1/4	5	4	0.060	248538	600.15	248648	605.82



PVD coatings increase cutting tool performance

The VI-PRO performs very well in a wide range of materials including:
 HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
 CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229-231.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.01, -.001
5/8" - 1"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.01, -.001

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS


Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO

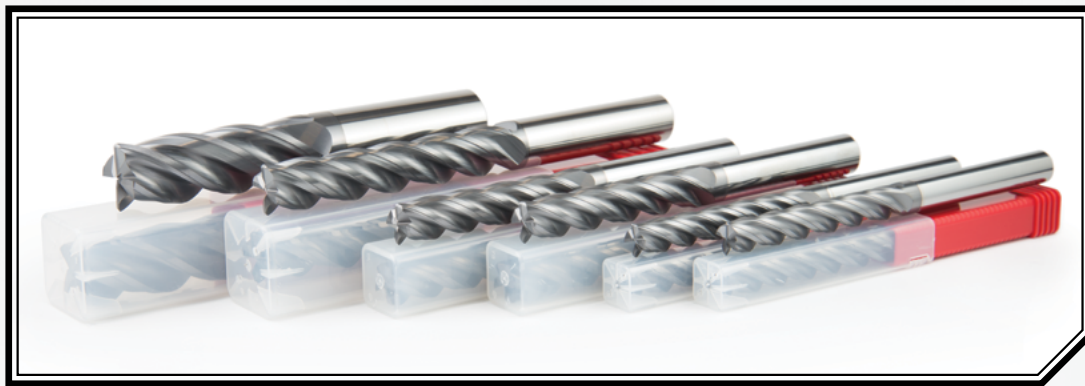
VARIABLE INDEX GEOMETRY

4 FLUTE - EXTRA LONG LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/4	1/4	1-1/2	4	4	0.015	249275	73.40	-	-
1/4	1/4	1-1/2	4	4	0.030	249286	73.40	-	-
3/8	3/8	2	4	4	0.030	249297	124.31	-	-
3/8	3/8	2	4	4	0.060	249308	124.31	-	-
7/16	7/16	3	6	4	0.030	257701	196.89	-	-
7/16	7/16	3	6	4	0.060	257712	196.89	-	-
1/2	1/2	3	6	4	0.030	249319	231.69	249451	237.35
1/2	1/2	3	6	4	0.060	249330	231.69	249462	237.35
5/8	5/8	3	6	4	0.030	249341	326.48	249473	332.14
5/8	5/8	3	6	4	0.060	249352	326.48	249484	332.14
3/4	3/4	3	6	4	0.030	249363	431.07	249495	436.74
3/4	3/4	3	6	4	0.060	249374	431.07	249506	436.74
3/4	3/4	4	7	4	0.030	249385	701.86	249517	707.52
3/4	3/4	4	7	4	0.060	249396	701.86	249528	707.52
1	1	3	6	4	0.030	249407	705.60	249539	711.26
1	1	3	6	4	0.060	249418	705.60	249550	711.26
1	1	4-1/4	7	4	0.030	249429	1024.56	249561	1030.63
1	1	4-1/4	7	4	0.060	249440	1024.56	249572	1030.63



High performance tools come in premium packaging

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229-231.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6	+ .001, -.001
5/8" - 1"	+ .000, -.003	-.0001, -.0004 ISO H6	+ .001, -.001

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO VARIABLE INDEX GEOMETRY

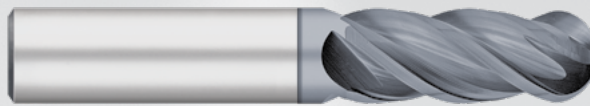
4 FLUTE - STUB LENGTH - BALL NOSE



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	4	257734	32.72	-	-
3/16	3/16	3/8	2	4	257745	46.75	-	-
1/4	1/4	3/8	2	4	254918	53.13	-	-
5/16	5/16	7/16	2	4	254929	69.30	-	-
3/8	3/8	1/2	2	4	254940	76.82	-	-
7/16	7/16	5/8	2-1/2	4	257756	103.42	-	-
1/2	1/2	5/8	2-1/2	4	254951	114.87	254984	121.40
5/8	5/8	3/4	3	4	254962	226.14	254995	232.68
3/4	3/4	1	3	4	254973	298.25	255006	304.79

4 FLUTE - REGULAR LENGTH - BALL NOSE



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/8	1/8	1/2	2	4	257778	46.54	-	-
3/16	3/16	9/16	2	4	257789	51.44	-	-
1/4	1/4	3/4	2-1/2	4	255182	62.08	-	-
5/16	5/16	13/16	2-1/2	4	255193	75.12	-	-
3/8	3/8	1	2-1/2	4	255204	88.00	-	-
7/16	7/16	1	2-3/4	4	257800	120.37	-	-
1/2	1/2	1	3	4	255215	132.00	255270	138.54
1/2	1/2	1-1/4	3	4	255226	132.00	255281	138.54
5/8	5/8	1-5/8	3-1/2	4	255237	238.96	255292	245.50
3/4	3/4	1-5/8	4	4	255248	330.16	255303	336.69
1	1	2	4	4	255259	616.32	255314	622.85

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229-231.

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.00, -0.02	-0.001, -.0004 ISO H6
5/8" - 1"	+0.00, -0.03	-0.001, -.0004 ISO H6

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

VI-PRO VARIABLE INDEX GEOMETRY

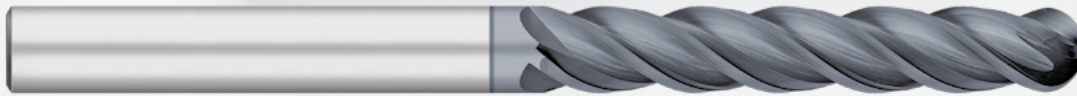
4 FLUTE - LONG LENGTH - BALL NOSE



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/4	1/4	1-1/8	3	4	255468	64.59	-	-
5/16	5/16	1-1/8	3	4	255479	89.37	-	-
3/8	3/8	1-1/4	3	4	255490	120.03	-	-
7/16	7/16	2	4	4	257822	149.58	-	-
1/2	1/2	1-1/2	4	4	255501	165.73	255556	172.26
1/2	1/2	2	4	4	255512	183.78	255567	190.31
5/8	5/8	2-1/4	5	4	255523	341.80	255578	348.33
3/4	3/4	2-1/4	5	4	255534	413.58	255589	420.12
1	1	2-1/4	5	4	255545	681.63	255600	688.16

4 FLUTE - EXTRA LONG LENGTH - BALL NOSE



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	255765	93.33	-	-
3/8	3/8	2	4	4	255776	135.27	-	-
7/16	7/16	3	6	4	257844	221.81	-	-
1/2	1/2	3	6	4	255787	259.15	255853	265.69
5/8	5/8	3	6	4	255798	368.59	255864	375.14
3/4	3/4	3	6	4	255809	486.55	255875	493.08
3/4	3/4	4	7	4	255820	798.98	255886	805.52
1	1	3	6	4	255831	793.23	255897	799.76
1	1	4-1/4	7	4	255842	1170.96	255908	1177.97

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229-231.

TOLERANCES	DIAMETER	SHANK
1/4" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6
5/8" - 1"	+ .000, -.003	-.0001, -.0004 ISO H6

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



5 FLUTE - STUB LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/8	1/8	1/4	1-1/2	5	257855	31.19	-	-
3/16	3/16	3/8	2	5	257866	40.13	-	-
1/4	1/4	3/8	2	5	256040	45.41	-	-
5/16	5/16	7/16	2	5	256051	66.07	-	-
3/8	3/8	1/2	2	5	256062	73.24	-	-
1/2	1/2	5/8	2-1/2	5	256073	109.51	256106	115.74
5/8	5/8	3/4	3	5	256084	215.59	256117	221.82
3/4	3/4	1	3	5	256095	284.33	256128	290.56

5 FLUTE - REGULAR LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/8	1/8	1/2	2	5	257877	37.27	-	-
3/16	3/16	9/16	2	5	257888	42.61	-	-
1/4	1/4	3/4	2-1/2	5	256304	54.08	-	-
5/16	5/16	13/16	2-1/2	5	256315	71.62	-	-
3/8	3/8	1	2-1/2	5	256326	83.90	-	-
1/2	1/2	1	3	5	256337	125.84	256392	132.07
1/2	1/2	1-1/4	3	5	256348	125.84	256403	132.07
5/8	5/8	1-5/8	3-1/2	5	256359	227.81	256414	234.04
3/4	3/4	1-5/8	4	5	256370	314.74	256425	320.98
1	1	2	4	5	256381	587.56	256436	593.79

The VI-PRO performs very well in a wide range of materials including:
 HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
 CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229, 232, 233.

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.000, -0.002	-0.0001, -.0004 ISO H6
5/8" - 1"	+0.000, -0.003	-0.0001, -.0004 ISO H6

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO VARIABLE INDEX GEOMETRY

5 FLUTE - LONG LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	*** TOOL ATTRIBUTES ***				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/4	1/4	1-1/8	3	5	256590	61.58	-	-
5/16	5/16	1-1/8	3	5	256601	85.20	-	-
3/8	3/8	1-1/4	3	5	256612	114.43	-	-
1/2	1/2	1-1/2	4	5	256623	158.00	256678	164.22
1/2	1/2	2	4	5	256634	175.21	256689	181.43
5/8	5/8	2-1/4	5	5	256645	325.84	256700	332.08
3/4	3/4	2-1/4	5	5	256656	394.28	256711	400.51
1	1	2-1/4	5	5	256667	649.82	256722	656.04

5 FLUTE - EXTRA LONG LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	*** TOOL ATTRIBUTES ***				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	5	256887	73.57	-	-
3/8	3/8	2	4	5	256898	128.96	-	-
1/2	1/2	3	6	5	256909	247.06	256975	253.30
5/8	5/8	3	6	5	256920	351.39	256986	357.63
3/4	3/4	3	6	5	256931	463.85	256997	470.07
3/4	3/4	4	7	5	256942	761.68	257008	767.93
1	1	3	6	5	256953	756.20	257019	762.44
1	1	4-1/4	7	5	256964	1116.32	257030	1123.00

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229, 232, 233.

TOLERANCES	DIAMETER	SHANK
1/4" - 1/2"	+0.000, -0.002	-0.0001, -.0004 ISO H6
5/8" - 1"	+0.000, -0.003	-0.0001, -.0004 ISO H6

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills

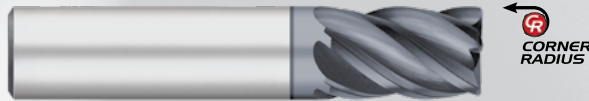
PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO

VARIABLE INDEX GEOMETRY

5 FLUTE - STUB LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/8	1/8	1/4	1-1/2	5	0.010	257899	35.95	-	-
3/16	3/16	3/8	2	5	0.010	257910	44.89	-	-
1/4	1/4	3/8	2	5	0.015	257162	52.93	-	-
5/16	5/16	7/16	2	5	0.015	257173	71.24	-	-
3/8	3/8	1/2	2	5	0.015	257184	78.41	-	-
1/2	1/2	5/8	2-1/2	5	0.030	257195	119.85	257228	126.08
5/8	5/8	3/4	3	5	0.030	257206	225.94	257239	232.17
3/4	3/4	1	3	5	0.030	257217	294.68	257250	300.91



The VI-PRO 5 Flute Stub Length is stocked in 3 radius sizes; 0.010, 0.015, 0.030

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229, 232, 233.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.01, -.001
5/8" - 3/4"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.01, -.001

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



5 FLUTE - REGULAR LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/8	1/8	1/2	2	5	0.010	250154	42.96	-	-
1/8	1/8	1/2	2	5	0.020	250156	42.96	-	-
1/8	1/8	1/2	2	5	0.030	250158	42.96	-	-
3/16	3/16	9/16	2	5	0.010	250160	50.91	-	-
3/16	3/16	9/16	2	5	0.020	250162	50.91	-	-
3/16	3/16	9/16	2	5	0.030	250164	50.91	-	-
1/4	1/4	3/4	2-1/2	5	0.015	250166	58.83	-	-
1/4	1/4	3/4	2-1/2	5	0.030	250177	58.83	-	-
1/4	1/4	3/4	2-1/2	5	0.060	250188	58.83	-	-
5/16	5/16	13/16	2-1/2	5	0.015	250199	75.79	-	-
5/16	5/16	13/16	2-1/2	5	0.030	250210	75.79	-	-
5/16	5/16	13/16	2-1/2	5	0.060	250221	75.79	-	-
3/8	3/8	1	2-1/2	5	0.015	250232	88.50	-	-
3/8	3/8	1	2-1/2	5	0.030	250243	88.50	-	-
3/8	3/8	1	2-1/2	5	0.060	250254	88.50	-	-
1/2	1/2	1	3	5	0.015	250265	141.39	250507	148.46
1/2	1/2	1	3	5	0.030	250276	141.39	250518	148.46
1/2	1/2	1	3	5	0.060	250287	141.39	250529	148.46
1/2	1/2	1	3	5	0.090	250298	141.39	250540	148.46
1/2	1/2	1	3	5	0.120	250309	141.39	250551	148.46
1/2	1/2	1-1/4	3	5	0.015	250320	141.39	250562	148.46
1/2	1/2	1-1/4	3	5	0.030	250331	141.39	250573	148.46
1/2	1/2	1-1/4	3	5	0.060	250342	141.39	250584	148.46
1/2	1/2	1-1/4	3	5	0.090	250353	141.39	250595	148.46
1/2	1/2	1-1/4	3	5	0.120	250364	141.39	250606	148.46
5/8	5/8	1-5/8	3-1/2	5	0.030	250375	238.21	250617	244.45
5/8	5/8	1-5/8	3-1/2	5	0.060	250386	238.21	250628	244.45
5/8	5/8	1-5/8	3-1/2	5	0.090	250397	238.21	250639	244.45
5/8	5/8	1-5/8	3-1/2	5	0.120	250408	238.21	250650	244.45
3/4	3/4	1-5/8	4	5	0.030	250419	330.33	250661	336.56
3/4	3/4	1-5/8	4	5	0.060	250430	330.33	250672	336.56
3/4	3/4	1-5/8	4	5	0.090	250441	330.33	250683	336.56
3/4	3/4	1-5/8	4	5	0.120	250452	330.33	250694	336.56
3/4	3/4	1-5/8	4	5	0.190	264512	330.33	264556	336.56
3/4	3/4	1-5/8	4	5	0.250	264523	330.33	264567	336.56
1	1	2	4	5	0.030	250463	603.14	250705	609.37
1	1	2	4	5	0.060	250474	603.14	250716	609.37
1	1	2	4	5	0.090	250485	603.14	250727	609.37
1	1	2	4	5	0.120	250496	603.14	250738	609.37
1	1	2	4	5	0.190	264534	603.14	264578	609.37
1	1	2	4	5	0.250	264545	603.14	264589	609.37

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229, 232, 233.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.01, -.001
5/8" - 1"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.01, -.001

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

VI-PRO

VARIABLE INDEX GEOMETRY

5 FLUTE - LONG LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

VI-PRO DIAMETER	*** TOOL ATTRIBUTES ***					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/4	1/4	1-1/8	3	5	0.015	250991	66.34	-	-
1/4	1/4	1-1/8	3	5	0.030	251002	66.34	-	-
5/16	5/16	1-1/8	3	5	0.015	251013	90.37	-	-
5/16	5/16	1-1/8	3	5	0.030	251024	90.37	-	-
3/8	3/8	1-1/4	3	5	0.030	251035	119.61	-	-
3/8	3/8	1-1/4	3	5	0.060	251046	119.61	-	-
1/2	1/2	2	4	5	0.030	251057	185.55	251145	191.78
1/2	1/2	2	4	5	0.060	251068	185.55	251156	191.78
5/8	5/8	2-1/4	5	5	0.030	251079	336.19	251167	342.42
5/8	5/8	2-1/4	5	5	0.060	251090	336.19	251178	342.42
3/4	3/4	2-1/4	5	5	0.030	251101	423.35	251189	431.46
3/4	3/4	2-1/4	5	5	0.060	251112	423.35	251200	431.46
1	1	2-1/4	5	5	0.030	251123	660.16	251211	666.40
1	1	2-1/4	5	5	0.060	251134	660.16	251222	666.40



Prepared tools in a state-of-the-art PVD Coating Center

For coating information see page 6. For VI-PRO technical information, please see pages 229, 232, 233.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.01, -.001
5/8" - 1"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.01, -.001

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO

VARIABLE INDEX GEOMETRY

5 FLUTE - EXTRA LONG LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/4	1/4	1-1/2	4	5	0.015	251541	80.74	-	-
1/4	1/4	1-1/2	4	5	0.030	251552	80.74	-	-
3/8	3/8	2	4	5	0.030	251563	136.74	-	-
3/8	3/8	2	4	5	0.060	251574	136.74	-	-
1/2	1/2	3	6	5	0.030	251585	254.85	251717	261.09
1/2	1/2	3	6	5	0.060	251596	254.85	251728	261.09
5/8	5/8	3	6	5	0.030	251607	359.13	251739	365.36
5/8	5/8	3	6	5	0.060	251618	359.13	251750	365.36
3/4	3/4	3	6	5	0.030	251629	474.18	251761	480.41
3/4	3/4	3	6	5	0.060	251640	474.18	251772	480.41
3/4	3/4	4	7	5	0.030	251651	772.04	251783	778.27
3/4	3/4	4	7	5	0.060	251662	772.04	251794	778.27
1	1	3	6	5	0.030	251673	776.15	251805	782.39
1	1	3	6	5	0.060	251684	776.15	251816	782.39
1	1	4-1/4	7	5	0.030	251695	1127.01	251827	1133.70
1	1	4-1/4	7	5	0.060	251706	1127.01	251838	1133.70



Over 13,000 items in stock and ready to ship

For coating information see page 6. For VI-PRO technical information, please see pages 229, 232, 233.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.01, -.001
5/8" - 1"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.01, -.001

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS



VI-PRO - 4 FLUTE

High Efficiency Milling and High Speed Machining are machining techniques aimed at maximizing metal removal rates (MRR) with the use of technology advancements in machines, software and end mill geometries. Both methods have the simple principle of increasing the metal removal rates (MRR).

HIGH SPEED MACHINING • HSM

High Speed Machining is based on a very light axial depth of cut, while allowing for maximum radial engagement of the end mill. This combination, along with very high spindle speed, allows for an extremely high feed rate and greatly increased metal removal rates (MRR). HSM can be used in a wide range of applications and has many benefits.

- Used in applications ranging from simple slotting to complex 5 axis contouring
- Final result is achieved with quick light cuts, which allows for an extremely smooth finish in a roughing application
- Flexibility to use higher flute counts to achieve the best finish with the least production time

High Speed Machining is a high demand application where the VI Pro End Mill and Alcro-Max coating excel to give the absolute best results in High Performance applications.



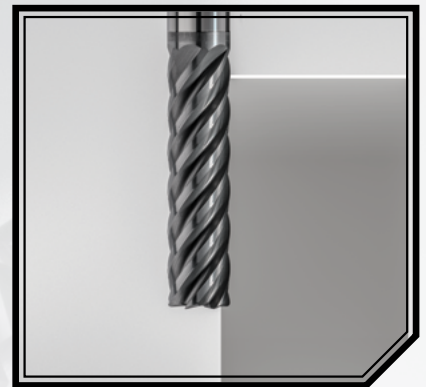
VI-PRO - 5 FLUTE

HIGH EFFICIENCY MILLING • HEM

High Efficiency Milling is based on radial chip thinning with the basic idea of keeping the end mill cutting at an ideal chip load. The stepover is substantially reduced from the typical 50% of tool diameter, while the feed rate is greatly increased to maintain the correct chip load. There are multiple benefits to the process in the correct applications.

- Reduced spindle load due to low percentage of tool diameter being engaged in the work material.
- Allows for increased axial depth of cuts using the entire LOC on extra length end mills allowing for even tool wear and increased tool life.
- HEM tool paths allow for high flute count tools with heavier core, such as our 6 flute VI Pro, to be used which also means increased tool life as well as better finish on parts.

Today's advancements in CAM software technology have paved the way for HEM to be incorporated in many applications. In combination with a High Performance VI Pro 6 flute End Mill High Efficiency Machining can increase metal removal rates by 50% or more versus conventional roughing applications, all while extending tool life and machine life together.



VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO VARIABLE INDEX GEOMETRY

6 FLUTE - STUB LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE	ITEM#	LIST PRICE
1/4	1/4	3/8	2	6	251954	48.43	-	-
5/16	5/16	7/16	2	6	251956	72.06	-	-
3/8	3/8	1/2	2	6	251958	79.88	-	-
1/2	1/2	5/8	2-1/2	6	251960	118.45	251966	126.24
5/8	5/8	3/4	3	6	251962	227.23	251968	235.47
3/4	3/4	1	3	6	251964	296.15	251970	302.87

6 FLUTE - STUB LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★						ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM#	LIST PRICE	ITEM#	LIST PRICE	
1/4	1/4	3/8	2	6	0.015	251984	58.24	-	-	
5/16	5/16	7/16	2	6	0.015	251986	77.72	-	-	
3/8	3/8	1/2	2	6	0.015	251988	85.55	-	-	
1/2	1/2	5/8	2-1/2	6	0.030	251990	130.74	251996	137.53	
5/8	5/8	3/4	3	6	0.030	251992	240.47	251998	246.26	
3/4	3/4	1	3	6	0.030	251994	311.58	252000	317.24	

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229, 234, 235.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.000, -.002	-.0001, -.0004 ISO H6	+0.001, -.001
5/8" - 1"	+0.000, -.003	-.0001, -.0004 ISO H6	+0.001, -.001

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO

VARIABLE INDEX GEOMETRY

6 FLUTE - REGULAR LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★				ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/4	1/4	3/4	2-1/2	6	252267	96.11	-	-
5/16	5/16	13/16	2-1/2	6	252278	114.15	-	-
3/8	3/8	1	2-1/2	6	252289	123.01	-	-
1/2	1/2	1-1/4	3	6	252300	164.47	252344	172.69
5/8	5/8	1-5/8	3-1/2	6	252311	274.09	252355	282.30
3/4	3/4	1-5/8	4	6	252322	344.05	252366	354.36
1	1	2	4	6	252333	526.95	252377	537.48

6 FLUTE - REGULAR LENGTH  CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★						ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD	ITEM #	LIST PRICE	ITEM #	LIST PRICE	
1/4	1/4	3/4	2-1/2	6	0.015	252388	107.28	-	-	
5/16	5/16	13/16	2-1/2	6	0.015	252399	127.46	-	-	
3/8	3/8	1	2-1/2	6	0.015	252410	137.38	-	-	
1/2	1/2	1-1/4	3	6	0.030	252421	183.64	252465	192.81	
5/8	5/8	1-5/8	3-1/2	6	0.030	252432	292.72	252476	301.49	
3/4	3/4	1-5/8	4	6	0.060	252443	367.44	252487	378.45	
1	1	2	4	6	0.060	252454	562.75	252498	579.63	

The VI-PRO performs very well in a wide range of materials including:

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CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229, 234, 235.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.000, -.002	-.0001, -.0004 ISO H6	+0.001, -.001
5/8" - 1"	+0.000, -.003	-.0001, -.0004 ISO H6	+0.001, -.001

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO VARIABLE INDEX GEOMETRY

6 FLUTE - LONG LENGTH - SQUARE END



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★					ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES		ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/4	1/4	1-1/8	3	6		252146	105.95	-	-
5/16	5/16	1-1/8	3	6		252157	123.64	-	-
3/8	3/8	1-1/4	3	6		252168	140.50	-	-
1/2	1/2	2	4	6		252179	218.54	252223	229.46
5/8	5/8	2-1/4	5	6		252190	339.48	252234	349.68
3/4	3/4	2-1/4	5	6		252201	423.97	252245	436.69
1	1	3	6	6		252212	859.29	252256	876.47

6 FLUTE - LONG LENGTH CORNER RADIUS



ALCRO-MAX COATED

VI-PRO DIAMETER	★★★ TOOL ATTRIBUTES ★★★						ROUND SHANK		WELDON FLAT	
	SHANK	LOC	OAL	# OF FLUTES	RAD		ITEM #	LIST PRICE	ITEM #	LIST PRICE
1/4	1/4	1-1/8	3	6	0.015		252025	118.33	-	-
5/16	5/16	1-1/8	3	6	0.015		252036	138.04	-	-
3/8	3/8	1-1/4	3	6	0.015		252047	156.90	-	-
1/2	1/2	2	4	6	0.030		252058	243.99	252102	256.17
5/8	5/8	2-1/4	5	6	0.030		252069	362.56	252113	373.45
3/4	3/4	2-1/4	5	6	0.060		252080	452.78	252124	466.37
1	1	3	6	6	0.060		252091	917.66	252135	936.03

The VI-PRO performs very well in a wide range of materials including:

HIGH TEMP ALLOYS • STAINLESS STEELS • ALLOY STEELS • INCONEL
CAST IRON • HIGH TEMP NICKEL BASE ALLOYS • TITANIUM ALLOYS • EXOTICS

For coating information see page 6. For VI-PRO technical information, please see pages 229, 234, 235.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.01, -.001
5/8" - 1"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.01, -.001

Carbide Thread Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

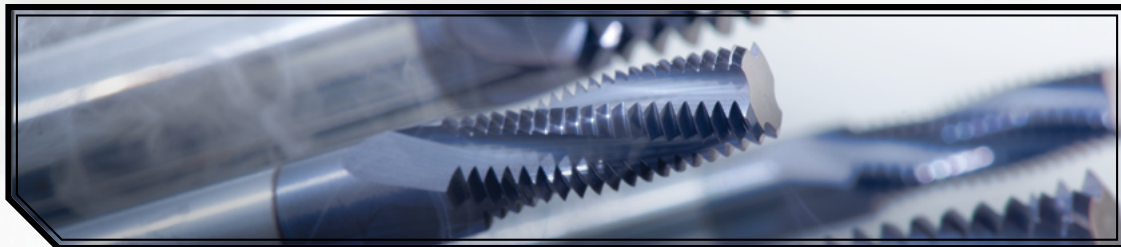


INTERNAL • EXTERNAL - UN THREADS



ALTIM COATED

DIAMETER	SHANK	CUTTING DIA	THREAD LENGTH	OAL	# OF FLUTES	ITEM#	LIST PRICE
2-56	1/8	0.065	0.125	2	3	273343	172.89
4-40	1/8	0.085	0.180	2	3	273354	172.89
6-32	1/8	0.100	0.218	2	3	156253	185.28
8-32	1/8	0.115	0.250	2	3	156264	185.28
8-36	1/8	0.115	0.250	2	3	156275	185.28
10-24	3/16	0.120	0.312	2	3	156286	185.28
10-32	3/16	0.120	0.312	2	3	156297	185.28
1/4-20	3/16	0.180	0.500	2-1/2	3	156308	209.56
1/4-28	3/16	0.180	0.500	2-1/2	3	156319	209.56
5/16-18	1/4	0.240	0.625	2-1/2	3	156330	246.61
5/16-24	1/4	0.240	0.625	2-1/2	3	156341	246.61
3/8-16	5/16	0.290	0.750	3	4	156352	293.85
3/8-24	5/16	0.290	0.750	3	4	156363	293.85
7/16-14	3/8	0.340	0.875	3	4	156374	316.88
7/16-20	3/8	0.340	0.875	3	4	156385	316.88
1/2-13	3/8	0.350	0.875	3-1/2	4	156396	316.88
1/2-20	3/8	0.350	0.875	3-1/2	4	156407	316.88
9/16-12	1/2	0.370	0.875	3-1/2	4	156418	316.88
9/16-18	1/2	0.370	0.875	3-1/2	4	156429	316.88
5/8-11	1/2	0.470	1.250	3-1/2	5	156440	396.09
5/8-18	1/2	0.470	1.250	3-1/2	5	156451	396.09
3/4-10	1/2	0.495	1.250	3-1/2	5	156462	396.09
3/4-16	1/2	0.495	1.250	3-1/2	5	156473	396.09
7/8-9	5/8	0.620	1.250	3-1/2	5	156484	495.76
7/8-14	5/8	0.620	1.250	3-1/2	5	156495	495.76
1-8	3/4	0.620	1.375	4	5	156506	495.76
1-12	3/4	0.620	1.375	4	5	156517	495.76



Wide assortment of thread mill styles stocked and ready to ship

For coating information see page 6. For technical information please see page 236.

THREAD MILL CUTTING DIAMETER TOLERANCE

+ .000, -.002

VI-PRO - 4 FLUTE

VI-PRO - 5 FLUTE

VI-PRO - 6 FLUTE

THREAD MILLS

Carbide Thread Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



INTERNAL • EXTERNAL - UN THREADS
COOLANT END FED



ALTiN COATED

END VIEW

DIAMETER	SHANK	CUTTING DIA	THREAD LENGTH	OAL	# OF FLUTES	ITEM#	LIST PRICE
10 - 32	3/16	0.120	0.312	2	3	262521	215.03
1/4 - 20	3/16	0.180	0.500	2-1/2	3	262532	226.92
1/4 - 28	3/16	0.180	0.500	2-1/2	3	262543	226.92
5/16 - 18	1/4	0.240	0.625	2-1/2	3	262554	280.95
5/16 - 24	1/4	0.240	0.625	2-1/2	3	262565	280.95
3/8 - 16	5/16	0.290	0.750	3	4	262576	347.94
3/8 - 24	5/16	0.290	0.750	3	4	262587	347.94
7/16 - 14	3/8	0.340	0.875	3	4	262598	405.21
7/16 - 20	3/8	0.340	0.875	3	4	262609	405.21
1/2 - 13	3/8	0.350	0.875	3-1/2	4	262620	420.34
1/2 - 20	3/8	0.350	0.875	3-1/2	4	262631	420.34
3/4 - 10	1/2	0.495	1.250	3-1/2	4	262642	539.20
3/4 - 16	1/2	0.495	1.250	3-1/2	4	262653	539.20



High performance packaging holds tools tight to prevent damage

For coating information see page 6. For technical information please see page 236.

THREAD MILL CUTTING DIAMETER TOLERANCE

+ .000, -.002

Carbide Thread Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



VI-PRO - 4 FLUTE

INTERNAL • EXTERNAL - NPT PIPE THREADS



ALTIM COATED

DIAMETER	SHANK	CUTTING DIA	THREAD LENGTH	OAL	# OF FLUTES	ITEM#	LIST PRICE
1/16 - 27	1/4	0.245	0.437	2-1/2	3	156528	246.61
1/8 - 27	5/16	0.310	0.437	2-1/2	4	156539	246.61
1/4 - 18	3/8	0.370	0.625	3	4	156550	281.08
3/8 - 18	3/8	0.370	0.625	3	4	156561	281.08
1/2 - 14	1/2	0.495	0.875	3-1/2	4	156572	396.09
3/4 - 14	1/2	0.495	0.875	3-1/2	4	156583	396.09
1 - 11-1/2	3/4	0.620	1.125	4	5	156594	495.76

VI-PRO - 5 FLUTE

INTERNAL • EXTERNAL - NPTF PIPE THREADS



ALTIM COATED

DIAMETER	SHANK	CUTTING DIA	THREAD LENGTH	OAL	# OF FLUTES	ITEM#	LIST PRICE
1/16 - 27	1/4	0.245	0.437	2-1/2	3	156605	246.61
1/8 - 27	5/16	0.310	0.437	2-1/2	4	156616	246.61
1/4 - 18	3/8	0.370	0.625	3	4	156627	281.08
3/8 - 18	3/8	0.370	0.625	3	4	156638	281.08
1/2 - 14	1/2	0.495	0.875	3-1/2	4	156649	396.09
3/4 - 14	1/2	0.495	0.875	3-1/2	4	156660	396.09
1 - 11-1/2	3/4	0.620	1.125	4	5	156671	495.76

VI-PRO - 6 FLUTE

THREAD MILLS

For coating information see page 6. For technical information please see page 236.

THREAD MILL CUTTING DIAMETER TOLERANCE

+.000, -.002

Carbide Thread Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

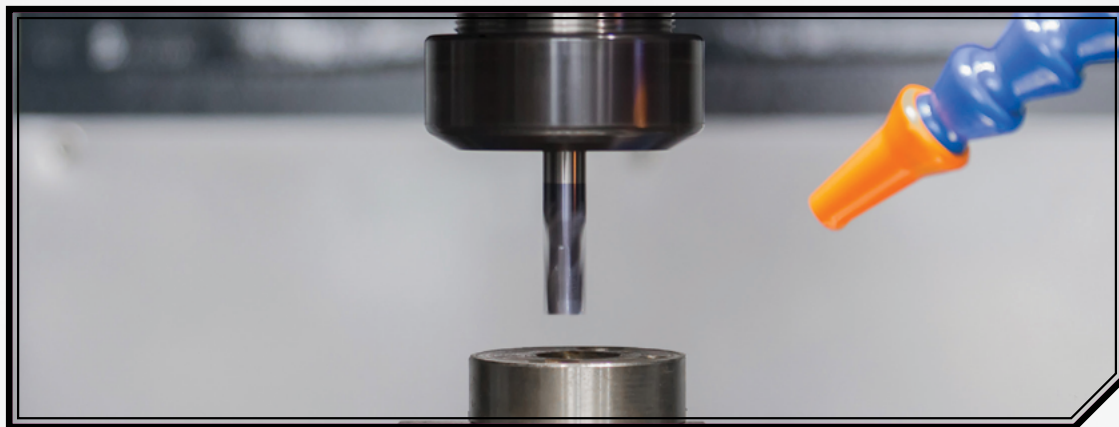


INTERNAL•EXTERNAL - METRIC THREADS



ALTiN COATED

DIAMETER	SHANK	CUTTING DIA	THREAD LENGTH	OAL	# OF FLUTES	ITEM#	LIST PRICE
M4 x 0.70	1/8	0.115	0.250	2	3	156682	189.11
M4.5 x 0.75	1/8	0.120	0.250	2	3	156693	189.11
M5 x 0.80	3/16	0.120	0.312	2	3	156704	189.11
M6 x 1.00	3/16	0.170	0.500	2-1/2	3	156715	208.27
M8 x 0.75	1/4	0.235	0.625	2-1/2	3	156726	246.61
M8 x 1.00	1/4	0.235	0.625	2-1/2	3	156737	246.61
M8 x 1.25	1/4	0.235	0.625	2-1/2	3	156748	246.61
M10 x 1.25	5/16	0.300	0.750	3	4	156759	293.85
M10 x 1.50	5/16	0.300	0.750	3	4	156770	293.85
M12 x 1.00	3/8	0.360	0.875	3-1/2	4	156781	318.13
M12 x 1.25	3/8	0.360	0.875	3-1/2	4	156792	318.13
M12 x 1.75	3/8	0.360	0.875	3-1/2	4	156803	318.13
M14 x 1.50	3/8	0.360	0.875	3-1/2	4	156814	318.13
M16 x 2.00	1/2	0.470	1.250	3-1/2	5	156825	396.09
M18 x 2.50	1/2	0.470	1.250	3-1/2	5	156836	396.09
M20 x 3.00	5/8	0.470	1.250	3-1/2	5	156847	396.09



A single thread mill can produce internal or external, left or right hand threads

For coating information see page 6. For technical information please see page 236.

THREAD MILL CUTTING DIAMETER TOLERANCE

+ .000, -.002



Aluminum End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - STUB LENGTH - SQUARE END - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	149000	20.31
3/16	3/16	3/8	2	149002	30.06
1/4	1/4	1/2	2	149004	43.12
5/16	5/16	1/2	2	149006	52.09
3/8	3/8	5/8	2	149008	57.15
1/2	1/2	5/8	2-1/2	149010	96.35
5/8	5/8	3/4	3	149012	194.05
3/4	3/4	1	3	149014	292.66
1	1	1-1/4	3-1/2	149016	490.78

2 FLUTE - STUB LENGTH CORNER RADIUS - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	0.010	149400	24.98
3/16	3/16	3/8	2	0.010	149402	36.14
1/4	1/4	1/2	2	0.020	149404	50.77
5/16	5/16	1/2	2	0.020	149406	59.16
3/8	3/8	5/8	2	0.020	149408	63.40
1/2	1/2	5/8	2-1/2	0.040	149410	102.73
5/8	5/8	3/4	3	0.040	149412	204.30
3/4	3/4	1	3	0.040	149414	302.28
1	1	1-1/4	3-1/2	0.040	149416	505.36

These 2 flute end mills are designed specifically for high speed machining in Aluminum. This tool will plunge, slot and profile in all non-ferrous materials. Our ZRN coating allows for higher speed rates and prolonged tool life and does not have an affinity for Aluminum.

WORKS WELL IN ALL NON-FERROUS MATERIALS APPLICATIONS

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -.002	-.0001, -.0004 ISO H6	+0.001, -.001
5/8" - 1"	+0.000, -.003	-.0001, -.0004 ISO H6	+0.001, -.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Aluminum End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



2 FLUTE - REGULAR LENGTH - SQUARE END - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	149638	28.19
3/16	3/16	5/8	2	149640	39.30
1/4	1/4	3/4	2-1/2	149642	54.84
5/16	5/16	13/16	2-1/2	149653	64.77
3/8	3/8	1	2-1/2	149664	68.54
1/2	1/2	1-1/4	3	149675	108.85
5/8	5/8	1-5/8	3-1/2	149686	217.56
3/4	3/4	1-3/4	4	149697	312.46
1	1	1-3/4	4	149708	514.35

2 FLUTE - REGULAR LENGTH CORNER RADIUS - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.010	150430	33.70
3/16	3/16	5/8	2	0.010	150432	46.21
1/4	1/4	3/4	2-1/2	0.020	150434	61.20
5/16	5/16	13/16	2-1/2	0.020	150445	72.32
3/8	3/8	1	2-1/2	0.020	150456	76.52
1/2	1/2	1-1/4	3	0.040	150467	121.51
5/8	5/8	1-5/8	3-1/2	0.040	150478	232.34
3/4	3/4	1-3/4	4	0.040	150489	333.71
1	1	1-3/4	4	0.040	150500	549.30

These 2 flute end mills are designed specifically for high speed machining in Aluminum. This tool will plunge, slot and profile in all non-ferrous materials. Our ZRN coating allows for higher speed rates and prolonged tool life and does not have an affinity for Aluminum.

WORKS WELL IN ALL NON-FERROUS MATERIALS APPLICATIONS

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -.002	-.0001, -.0004 ISO H6	+0.001, -.001
5/8" - 1"	+0.000, -.003	-.0001, -.0004 ISO H6	+0.001, -.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Aluminum End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - LONG LENGTH - SQUARE END - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	149946	47.86
3/16	3/16	3/4	2-1/2	149948	55.20
1/4	1/4	1-1/4	3	149950	75.23
5/16	5/16	1-3/8	3	149961	102.34
3/8	3/8	1-1/2	4	149972	122.09
1/2	1/2	2	4	149983	171.50
5/8	5/8	2-3/8	5	149994	373.24
3/4	3/4	2-1/2	5	150005	403.37
1	1	2-1/4	5	150016	635.17

2 FLUTE - LONG LENGTH CORNER RADIUS - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.010	150584	57.43
3/16	3/16	3/4	2-1/2	0.010	150586	66.24
1/4	1/4	1-1/4	3	0.020	150588	84.00
5/16	5/16	1-3/8	3	0.020	150599	114.25
3/8	3/8	1-1/2	4	0.020	150610	136.33
1/2	1/2	2	4	0.040	150621	191.49
5/8	5/8	2-3/8	5	0.040	150632	398.59
3/4	3/4	2-1/2	5	0.040	150643	430.77
1	1	2-1/4	5	0.040	150654	678.36

These 2 flute end mills are designed specifically for high speed machining in Aluminum. This tool will plunge, slot and profile in all non-ferrous materials. Our ZRN coating allows for higher speed rates and prolonged tool life and does not have an affinity for Aluminum.

WORKS WELL IN ALL NON-FERROUS MATERIALS APPLICATIONS

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -.002	-.0001, -.0004 ISO H6	+0.001, -.001
5/8" - 1"	+0.000, -.003	-.0001, -.0004 ISO H6	+0.001, -.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Aluminum End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - STUB LENGTH - SQUARE END - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	149436	20.31
3/16	3/16	3/8	2	149438	30.06
1/4	1/4	1/2	2	149440	43.12
5/16	5/16	1/2	2	149442	52.09
3/8	3/8	5/8	2	149444	57.15
1/2	1/2	5/8	2-1/2	149446	96.35
5/8	5/8	3/4	3	149448	194.05
3/4	3/4	1	3	149450	292.66
1	1	1-1/4	3-1/2	149452	490.78

3 FLUTE - STUB LENGTH CORNER RADIUS - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	0.010	149454	24.98
3/16	3/16	3/8	2	0.010	149456	36.14
1/4	1/4	1/2	2	0.020	149458	50.77
5/16	5/16	1/2	2	0.020	149460	59.16
3/8	3/8	5/8	2	0.020	149462	63.40
1/2	1/2	5/8	2-1/2	0.040	149464	102.73
5/8	5/8	3/4	3	0.040	149466	204.30
3/4	3/4	1	3	0.040	149468	302.28
1	1	1-1/4	3-1/2	0.040	149470	505.36

These 3 flute end mills are designed specifically for high speed machining in Aluminum. This tool will plunge, slot and profile in all non-ferrous materials. Our ZRN coating allows for higher speed rates and prolonged tool life and does not have an affinity for Aluminum.

WORKS WELL IN ALL NON-FERROUS MATERIALS APPLICATIONS

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.01, -.001
5/8" - 1"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.01, -.001

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Aluminum End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - REGULAR LENGTH - SQUARE END - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	149792	28.19
3/16	3/16	5/8	2	149794	39.30
1/4	1/4	3/4	2-1/2	149796	54.84
5/16	5/16	13/16	2-1/2	149807	64.77
3/8	3/8	1	2-1/2	149818	68.54
1/2	1/2	1-1/4	3	149829	108.85
5/8	5/8	1-5/8	3-1/2	149840	217.56
3/4	3/4	1-3/4	4	149851	312.46
1	1	1-3/4	4	149862	514.35

3 FLUTE - REGULAR LENGTH CORNER RADIUS - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.010	150738	33.70
3/16	3/16	5/8	2	0.010	150740	46.21
1/4	1/4	3/4	2-1/2	0.020	150742	61.20
5/16	5/16	13/16	2-1/2	0.020	150753	72.32
3/8	3/8	1	2-1/2	0.020	150764	76.52
1/2	1/2	1-1/4	3	0.040	150775	121.51
5/8	5/8	1-5/8	3-1/2	0.040	150786	232.34
3/4	3/4	1-3/4	4	0.040	150797	333.71
1	1	1-3/4	4	0.040	150808	549.30

These 3 flute end mills are designed specifically for high speed machining in Aluminum. This tool will plunge, slot and profile in all non-ferrous materials. Our ZRN coating allows for higher speed rates and prolonged tool life and does not have an affinity for Aluminum.

WORKS WELL IN ALL NON-FERROUS MATERIALS APPLICATIONS

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+.001, -.001
5/8" - 1"	+0.00, -.003	-.0001, -.0004 ISO H6	+.001, -.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Aluminum End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - LONG LENGTH - SQUARE END - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	150100	47.76
3/16	3/16	3/4	2-1/2	150102	55.20
1/4	1/4	1-1/4	3	150104	75.23
5/16	5/16	1-3/8	3	150115	102.34
3/8	3/8	1-1/2	4	150126	122.09
1/2	1/2	2	4	150137	171.50
5/8	5/8	2-3/8	5	150148	373.24
3/4	3/4	2-1/2	5	150159	403.37
1	1	2-1/4	5	150170	635.17

3 FLUTE - LONG LENGTH CORNER RADIUS - 45° HELIX



ZRN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.010	150892	57.43
3/16	3/16	3/4	2-1/2	0.010	150894	66.24
1/4	1/4	1-1/4	3	0.020	150896	84.00
5/16	5/16	1-3/8	3	0.020	150907	114.25
3/8	3/8	1-1/2	4	0.020	150918	136.33
1/2	1/2	2	4	0.040	150929	191.49
5/8	5/8	2-3/8	5	0.040	150940	398.59
3/4	3/4	2-1/2	5	0.040	150951	430.77
1	1	2-1/4	5	0.040	150962	678.36

These 3 flute end mills are designed specifically for high speed machining in Aluminum. This tool will plunge, slot and profile in all non-ferrous materials. Our ZRN coating allows for higher speed rates and prolonged tool life and does not have an affinity for Aluminum.

WORKS WELL IN ALL NON-FERROUS MATERIALS APPLICATIONS

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -.002	-.0001, -.0004 ISO H6	+0.001, -.001
5/8" - 1"	+0.000, -.003	-.0001, -.0004 ISO H6	+0.001, -.001

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

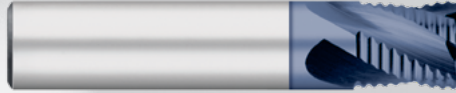
BURS



Roughing End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - STUB LENGTH - FINE PITCH - 30° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/4	1/4	3/8	2	257921	59.21
5/16	5/16	1/2	2	257932	83.14
3/8	3/8	9/16	2	257943	96.98
1/2	1/2	5/8	2-1/2	257954	121.20
5/8	5/8	3/4	3	257965	261.85
3/4	3/4	1	3	257976	314.26



ALTIN coating extends tool life and improves performance

Our fine pitch rougher is designed to remove maximum material with minimum vibration or chatter, while milling faster than conventional finishing end mills. Excellent for:

HARDENED STEELS • TITANIUM • INCONEL • SPACE AGE MATERIALS

For coating information see page 6. For technical information, please see page 239.

TOLERANCES	DIAMETER	SHANK
1/4" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6
5/8" - 3/4"	+ .000, -.003	-.0001, -.0004 ISO H6

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Roughing End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - REGULAR LENGTH - FINE PITCH - 30° HELIX



ALTIM COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	142833	66.41
5/16	5/16	13/16	2-1/2	142844	92.38
3/8	3/8	7/8	2-1/2	142855	107.75
1/2	1/2	1-1/4	3	142866	135.96
5/8	5/8	1-5/8	3-1/2	142877	290.93
3/4	3/4	1-5/8	4	142888	352.50
1	1	2	4	142899	648.35

4 FLUTE - LONG LENGTH - FINE PITCH - 30° HELIX



ALTIM COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	218645	95.10
5/16	5/16	1-1/2	4	218656	121.94
3/8	3/8	1-3/4	4	218667	152.44
1/2	1/2	2	4	218678	176.18
5/8	5/8	2-1/2	5	218689	414.49
3/4	3/4	2-1/2	5	218700	497.84
1	1	2-1/2	5	218711	849.49

Our fine pitch rougher is designed to remove maximum material with minimum vibration or chatter, while milling faster than conventional finishing end mills. Excellent for:

HARDENED STEELS • TITANIUM • INCONEL • SPACE AGE MATERIALS

For coating information see page 6. For technical information, please see page 239.

TOLERANCES	DIAMETER	SHANK
1/4" - 1/2"	+0.00, -0.002	-0.0001, -.0004 ISO H6
5/8" - 3/4"	+0.00, -0.003	-0.0001, -.0004 ISO H6

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Roughing End Mills

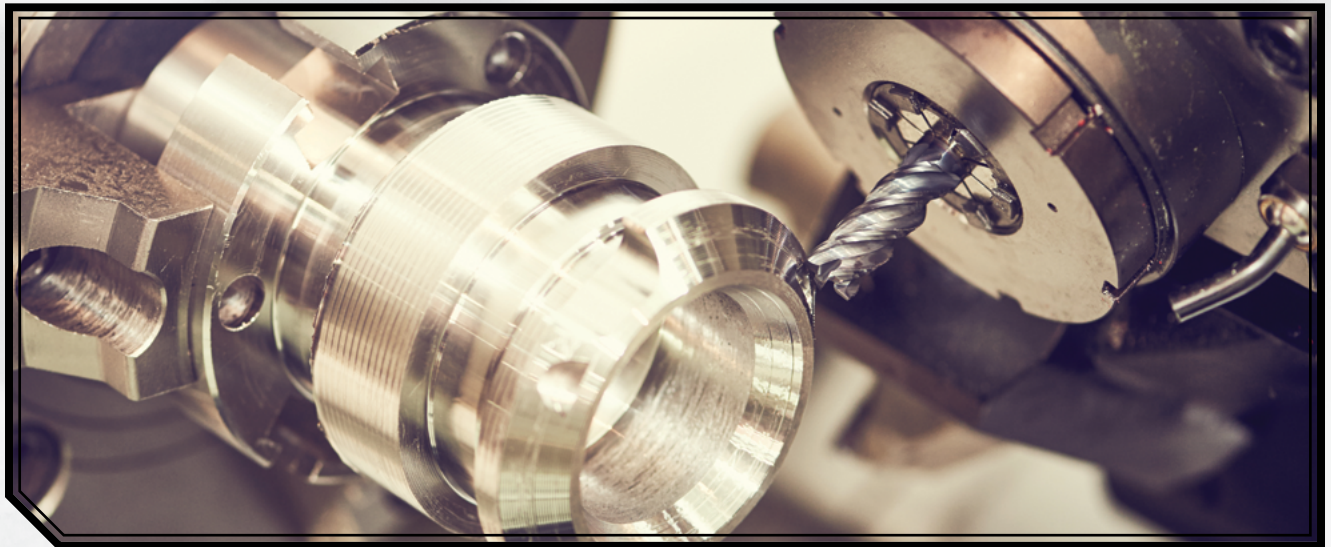
PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - REGULAR LENGTH - FINE PITCH - BALL NOSE - 30° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	262158	83.20
5/16	5/16	7/8	2-1/2	262169	106.98
3/8	3/8	1	2-1/2	262180	136.69
1/2	1/2	1-1/4	3	262191	187.80
5/8	5/8	1-5/8	3-1/2	262202	328.06
3/4	3/4	1-5/8	4	262213	457.62
1	1	2	4	262224	742.89



Huge inventory over 99% in-stock and ready to ship same day

Our fine pitch rougher is designed to remove maximum material with minimum vibration or chatter, while milling faster than conventional finishing end mills. Excellent for:

HARDENED STEELS • TITANIUM • INCONEL • SPACE AGE MATERIALS

For coating information see page 6. For technical information, please see page 239.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6	+.001, -.001
5/8" - 3/4"	+ .000, -.003	-.0001, -.0004 ISO H6	+.001, -.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Rougher•Finisher End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



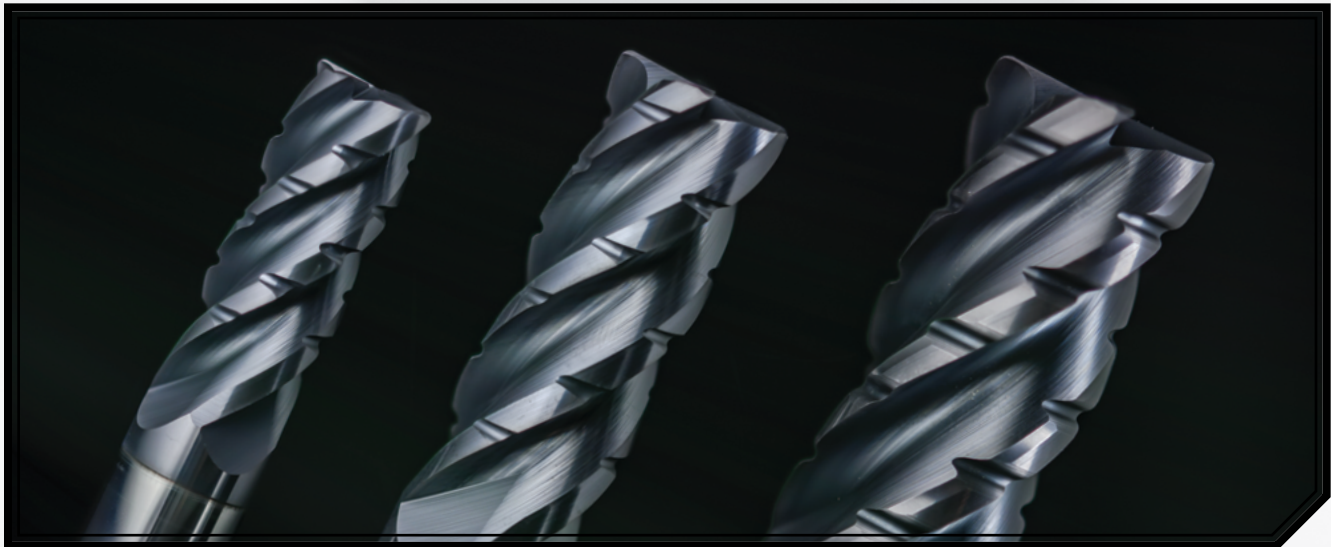
4 FLUTE - REGULAR LENGTH  CORNER RADIUS - 40° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	0.020	142987	115.04
5/16	5/16	13/16	2-1/2	0.020	142998	124.58
3/8	3/8	7/8	2-1/2	0.020	143009	135.38
1/2	1/2	1-1/4	3	0.040	143020	156.50
* 5/8	5/8	1-5/8	3-1/2	0.040	143031	311.58
* 3/4	3/4	1-5/8	4	0.040	143042	416.30
* 1	1	1-5/8	4	0.040	143053	679.37

* WELDON FLATS



High material removal rate (MRR) with excellent surface finish

The radius chipbreakers in this high performance tool allow for higher feed rates than a finishing end mill yet does not appreciably degrade the finish that the tool produces.

WORKS WELL IN HARD TO MACHINE MATERIALS SUCH AS STAINLESS STEEL AND TITANIUM.

For coating information see page 6. For technical information, please see pages 242, 243.

TOLERANCES	DIAMETER	SHANK	RADIUS
ALL SIZES	+0.000, -0.002	-0.0001, -0.0004 ISO H6	+0.001, -0.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

MADE IN THE USA



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

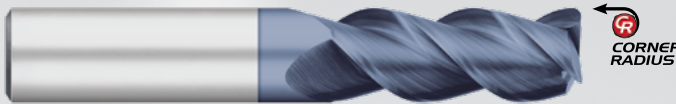
3 FLUTE - REGULAR LENGTH - SQUARE END - 45° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	143592	30.86
3/16	3/16	5/8	2	143603	36.97
1/4	1/4	3/4	2-1/2	143614	39.63
5/16	5/16	13/16	2-1/2	143625	47.95
3/8	3/8	1	2-1/2	143636	64.19
1/2	1/2	1-1/4	3	143647	109.51
5/8	5/8	1-5/8	3-1/2	143658	217.93
3/4	3/4	1-5/8	4	143669	305.82

3 FLUTE - REGULAR LENGTH CORNER RADIUS - 45° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.010	143680	34.45
3/16	3/16	5/8	2	0.010	143691	41.26
1/4	1/4	3/4	2-1/2	0.020	143702	44.24
5/16	5/16	13/16	2-1/2	0.020	143713	53.52
3/8	3/8	1	2-1/2	0.020	143724	71.69
1/2	1/2	1-1/4	3	0.040	143735	122.23
5/8	5/8	1-5/8	3-1/2	0.040	143746	232.74
3/4	3/4	1-5/8	4	0.040	143757	326.62

These 3 flute 45° tools are designed to slot and profile at higher speeds and feeds while providing a shearing action that produces excellent finishes.

WORKS WELL IN STAINLESS STEELS AND OTHER SIMILAR ALLOYS

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.001, -.001
5/8" - 3/4"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.001, -.001

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - REGULAR LENGTH - SQUARE END - 60° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	ITEM #	LIST PRICE
1/8	1/8	1/2	1-1/2	143240	30.86
3/16	3/16	5/8	2	143251	36.97
1/4	1/4	3/4	2-1/2	143262	39.63
5/16	5/16	13/16	2-1/2	143273	47.95
3/8	3/8	1	2-1/2	143284	64.19
1/2	1/2	1-1/4	3	143295	109.51
5/8	5/8	1-5/8	3-1/2	143306	217.93
3/4	3/4	1-5/8	4	143317	305.82

3 FLUTE - REGULAR LENGTH CORNER RADIUS - 60° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.010	143328	34.45
3/16	3/16	5/8	2	0.010	143339	41.26
1/4	1/4	3/4	2-1/2	0.020	143350	44.24
5/16	5/16	13/16	2-1/2	0.020	143361	53.52
3/8	3/8	1	2-1/2	0.020	143372	71.69
1/2	1/2	1-1/4	3	0.040	143383	122.23
5/8	5/8	1-5/8	3-1/2	0.040	143394	232.74
3/4	3/4	1-5/8	4	0.040	143405	326.62

These 3 flute 60° tools are designed to machine all high temperature alloys. This high shear design geometry will slot and profile while giving excellent surface finishes.

WORKS WELL IN HIGH TEMPERATURE ALLOYS SUCH AS INCONELS, HASTALLOY, WASPALLOY AND TITANIUM.

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004 ISO H6	+0.001, -0.001
5/8" - 3/4"	+0.000, -0.003	-0.0001, -0.0004 ISO H6	+0.001, -0.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

5 FLUTE - STUB LENGTH - SQUARE END - 45° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	149092	16.89
3/16	3/16	3/8	2	149103	25.37
1/4	1/4	1/2	2	149114	30.35
5/16	5/16	1/2	2	149125	38.36
3/8	3/8	5/8	2	149136	60.09
7/16	7/16	5/8	2-1/2	149147	68.71
1/2	1/2	5/8	2-1/2	149158	79.42
5/8	5/8	3/4	3	149169	143.34
3/4	3/4	1	3	149180	196.93

5 FLUTE - STUB LENGTH CORNER RADIUS - 45° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	0.010	149290	18.74
3/16	3/16	3/8	2	0.010	149301	28.34
1/4	1/4	1/2	2	0.020	149312	33.91
5/16	5/16	1/2	2	0.020	149323	42.80
3/8	3/8	5/8	2	0.020	149334	67.09
7/16	7/16	5/8	2-1/2	0.020	149345	76.75
1/2	1/2	5/8	2-1/2	0.040	149356	88.66
5/8	5/8	3/4	3	0.040	149367	153.05
3/4	3/4	1	3	0.040	149378	210.31

Designed for profiling and finishing, the 5 flute 45° geometry to this tool allows it to be run 20 - 40% faster than general purpose end mills while providing an excellent finish.

WORKS WELL IN EXOTIC MATERIALS, STAINLESS STEEL, CARBON STEELS AND OTHER SIMILAR MATERIALS.

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.01, -.001
5/8" - 3/4"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.01, -.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



5 FLUTE - REGULAR LENGTH - SQUARE END - 45° HELIX



ALTIM COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	149477	32.21
3/16	3/16	3/4	2	149488	38.63
1/4	1/4	3/4	2-1/2	149499	41.57
5/16	5/16	7/8	2-1/2	149510	50.04
3/8	3/8	1	2-1/2	149521	67.13
1/2	1/2	1-1/4	3	149532	130.85
5/8	5/8	1-5/8	3-1/2	149543	253.00
3/4	3/4	1-5/8	4	149554	343.98

5 FLUTE - REGULAR LENGTH CORNER RADIUS - 45° HELIX



ALTIM COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.010	150269	35.96
3/16	3/16	3/4	2	0.010	150280	43.11
1/4	1/4	3/4	2-1/2	0.020	150291	46.36
5/16	5/16	7/8	2-1/2	0.020	150302	55.87
3/8	3/8	1	2-1/2	0.020	150313	74.94
1/2	1/2	1-1/4	3	0.040	150324	146.09
5/8	5/8	1-5/8	3-1/2	0.040	150335	270.21
3/4	3/4	1-5/8	4	0.040	150346	367.34

Designed for profiling and finishing, the 5 flute 45° geometry to this tool allows it to be run 20 - 40% faster than general purpose end mills while providing an excellent finish.

WORKS WELL IN EXOTIC MATERIALS, STAINLESS STEEL, CARBON STEELS AND OTHER SIMILAR MATERIALS.

For coating information see page 6. For technical information, please see pages 240, 241.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004 ISO H6	+0.001, -0.001
5/8" - 3/4"	+0.000, -0.003	-0.0001, -0.0004 ISO H6	+0.001, -0.001

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

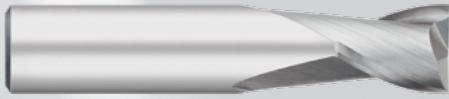
BURS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - STUB LENGTH - SQUARE END - 30° HELIX



UNCOATED



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/64	1/8	0.023	1-1/2	216577	25.32
1/32	1/8	1/16	1-1/2	130381	15.59
3/64	1/8	3/32	1-1/2	130392	15.59
1/16	1/8	1/8	1-1/2	130403	11.67
5/64	1/8	1/8	1-1/2	216588	19.73
3/32	1/8	3/16	1-1/2	130414	11.67
1/8	1/8	1/4	1-1/2	130425	11.14
5/32	3/16	5/16	2	130436	18.55
3/16	3/16	3/8	2	130447	17.42
7/32	1/4	7/16	2	130458	23.41
1/4	1/4	1/2	2	130469	20.54
5/16	5/16	1/2	2	130480	27.75
3/8	3/8	5/8	2	130491	35.81
7/16	7/16	5/8	2-1/2	130502	44.68
1/2	1/2	5/8	2-1/2	130513	56.42
5/8	5/8	3/4	3	130524	119.45
3/4	3/4	1	3	130535	167.20

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/64	1/8	0.023	1-1/2	216687	31.63
1/32	1/8	1/16	1-1/2	132449	20.21
3/64	1/8	3/32	1-1/2	132460	20.21
1/16	1/8	1/8	1-1/2	132471	15.23
5/64	1/8	1/8	1-1/2	216698	24.67
3/32	1/8	3/16	1-1/2	132482	15.23
1/8	1/8	1/4	1-1/2	132493	14.54
5/32	3/16	5/16	2	132504	22.93
3/16	3/16	3/8	2	132515	21.59
7/32	1/4	7/16	2	132526	29.04
1/4	1/4	1/2	2	132537	25.52
5/16	5/16	1/2	2	132548	36.09
3/8	3/8	5/8	2	132559	44.35
7/16	7/16	5/8	2-1/2	132570	55.45
1/2	1/2	5/8	2-1/2	132581	70.07
5/8	5/8	3/4	3	132592	141.12
3/4	3/4	1	3	132603	206.90

2 FLUTE - STUB LENGTH - BALL NOSE - 30° HELIX



UNCOATED



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/64	1/8	0.023	1-1/2	216599	31.59
1/32	1/8	1/16	1-1/2	130546	20.29
3/64	1/8	3/32	1-1/2	130557	20.29
1/16	1/8	1/8	1-1/2	130568	15.27
5/64	1/8	1/8	1-1/2	216610	24.71
3/32	1/8	3/16	1-1/2	130579	15.27
1/8	1/8	1/4	1-1/2	130590	14.46
5/32	3/16	5/16	2	130601	24.10
3/16	3/16	3/8	2	130612	22.60
7/32	1/4	7/16	2	130623	30.38
1/4	1/4	1/2	2	130634	26.61
5/16	5/16	1/2	2	130645	36.01
3/8	3/8	5/8	2	130656	46.50
7/16	7/16	5/8	2-1/2	130667	58.17
1/2	1/2	5/8	2-1/2	130678	73.27
5/8	5/8	3/4	3	130689	139.94
3/4	3/4	1	3	130700	212.77

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/64	1/8	0.023	1-1/2	216709	39.49
1/32	1/8	1/16	1-1/2	132614	25.96
3/64	1/8	3/32	1-1/2	132625	25.96
1/16	1/8	1/8	1-1/2	132636	19.52
5/64	1/8	1/8	1-1/2	216720	30.86
3/32	1/8	3/16	1-1/2	132647	19.52
1/8	1/8	1/4	1-1/2	132658	18.55
5/32	3/16	5/16	2	132669	30.86
3/16	3/16	3/8	2	132680	28.92
7/32	1/4	7/16	2	132691	38.88
1/4	1/4	1/2	2	132702	34.06
5/16	5/16	1/2	2	132713	46.09
3/8	3/8	5/8	2	132724	56.71
7/16	7/16	5/8	2-1/2	132735	70.92
1/2	1/2	5/8	2-1/2	132746	93.77
5/8	5/8	3/4	3	132757	171.34
3/4	3/4	1	3	132768	272.36

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/64" - 1/2"	+0.000, -0.002	-0.0001, -.0004 ISO H6
5/8" - 1"	+0.000, -0.003	-0.0001, -.0004 ISO H6

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

MADE IN THE USA

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - STUB LENGTH - SQUARE END - 30° HELIX



UNCOATED



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/64	1/8	0.023	1-1/2	216621	25.32
1/32	1/8	1/16	1-1/2	131140	15.59
3/64	1/8	3/32	1-1/2	131151	15.59
1/16	1/8	1/8	1-1/2	131162	11.67
5/64	1/8	1/8	1-1/2	216632	19.73
3/32	1/8	3/16	1-1/2	131173	11.67
1/8	1/8	1/4	1-1/2	131184	11.14
5/32	3/16	5/16	2	131195	18.55
3/16	3/16	3/8	2	131206	17.42
7/32	1/4	7/16	2	131217	23.41
1/4	1/4	1/2	2	131228	20.54
5/16	5/16	1/2	2	131239	27.75
3/8	3/8	5/8	2	131250	35.81
7/16	7/16	5/8	2-1/2	131261	44.68
1/2	1/2	5/8	2-1/2	131272	56.42
5/8	5/8	3/4	3	131283	119.45
3/4	3/4	1	3	131294	167.20
1	1	1-1/4	3-1/2	259505	275.54

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/64	1/8	0.023	1-1/2	216665	31.63
1/32	1/8	1/16	1-1/2	131470	20.21
3/64	1/8	3/32	1-1/2	131481	20.21
1/16	1/8	1/8	1-1/2	131492	15.23
5/64	1/8	1/8	1-1/2	216676	24.67
3/32	1/8	3/16	1-1/2	131503	15.23
1/8	1/8	1/4	1-1/2	131514	14.54
5/32	3/16	5/16	2	131525	22.93
3/16	3/16	3/8	2	131536	21.59
7/32	1/4	7/16	2	131547	29.04
1/4	1/4	1/2	2	131558	25.52
5/16	5/16	1/2	2	131569	36.09
3/8	3/8	5/8	2	131580	44.35
7/16	7/16	5/8	2-1/2	131591	55.45
1/2	1/2	5/8	2-1/2	131602	70.28
5/8	5/8	3/4	3	131613	141.16
3/4	3/4	1	3	131624	206.90
1	1	1-1/4	3-1/2	259527	343.62

4 FLUTE - STUB LENGTH - BALL NOSE - 30° HELIX



UNCOATED



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/64	1/8	0.023	1-1/2	216643	31.59
1/32	1/8	1/16	1-1/2	131305	20.29
3/64	1/8	3/32	1-1/2	131316	20.29
1/16	1/8	1/8	1-1/2	131327	15.27
5/64	1/8	1/8	1-1/2	216654	24.71
3/32	1/8	3/16	1-1/2	131338	15.27
1/8	1/8	1/4	1-1/2	131349	14.46
5/32	3/16	5/16	2	131360	24.10
3/16	3/16	3/8	2	131371	22.60
7/32	1/4	7/16	2	131382	30.38
1/4	1/4	1/2	2	131393	28.88
5/16	5/16	1/2	2	131404	36.01
3/8	3/8	5/8	2	131415	46.50
7/16	7/16	5/8	2-1/2	131426	58.17
1/2	1/2	5/8	2-1/2	131437	73.27
5/8	5/8	3/4	3	131448	139.94
3/4	3/4	1	3	131459	212.77
1	1	1-1/4	3-1/2	259516	329.57

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/64	1/8	0.023	1-1/2	216731	39.49
1/32	1/8	1/16	1-1/2	133593	25.96
3/64	1/8	3/32	1-1/2	133604	25.96
1/16	1/8	1/8	1-1/2	133615	19.52
5/64	1/8	1/8	1-1/2	216742	30.86
3/32	1/8	3/16	1-1/2	133626	19.52
1/8	1/8	1/4	1-1/2	133637	18.55
5/32	3/16	5/16	2	133648	30.86
3/16	3/16	3/8	2	133659	28.92
7/32	1/4	7/16	2	133670	38.88
1/4	1/4	1/2	2	133681	37.47
5/16	5/16	1/2	2	133692	46.09
3/8	3/8	5/8	2	133703	56.71
7/16	7/16	5/8	2-1/2	133714	70.92
1/2	1/2	5/8	2-1/2	133725	93.77
5/8	5/8	3/4	3	133736	171.34
3/4	3/4	1	3	133747	272.36
1	1	1-1/4	3-1/2	259538	405.21

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/64" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6
5/8" - 1"	+ .000, -.003	-.0001, -.0004 ISO H6

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - REGULAR LENGTH - SQUARE END - 30° HELIX

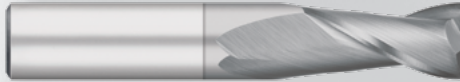
UNCOATED



ALTIN COATED



TICN COATED



END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/64	1/8	1/32	1-1/2	129567	27.15	129974	36.38	163447	36.38
1/32	1/8	1/8	1-1/2	129578	18.19	129985	24.59	163458	24.59
3/64	1/8	1/8	1-1/2	129589	15.55	129996	20.95	163469	20.95
1/16	1/8	1/4	1-1/2	129600	15.51	130007	17.81	163480	17.81
5/64	1/8	1/4	1-1/2	129611	16.01	130018	21.60	163491	21.60
3/32	1/8	3/8	1-1/2	129622	14.09	130029	17.81	163502	17.81
7/64	1/8	3/8	1-1/2	129633	14.71	130040	19.84	163513	19.84
1/8	1/8	1/2	1-1/2	129644	13.52	130051	16.54	163524	16.54
9/64	3/16	9/16	2	129655	19.80	130062	26.73	163535	26.73
5/32	3/16	9/16	2	129666	19.91	130073	23.09	163546	23.09
11/64	3/16	5/8	2	129677	18.92	130084	25.58	163557	25.58
3/16	3/16	5/8	2	129688	18.42	130095	23.09	163568	23.09
13/64	1/4	5/8	2-1/2	129699	26.88	130106	35.23	163579	35.23
7/32	1/4	5/8	2-1/2	129710	27.46	130117	31.90	163590	31.90
15/64	1/4	3/4	2-1/2	129721	31.02	130128	39.98	163601	39.98
1/4	1/4	3/4	2-1/2	129732	22.75	130139	31.90	163612	31.90
17/64	5/16	3/4	2-1/2	129743	41.01	130150	52.69	163623	52.69
9/32	5/16	3/4	2-1/2	129754	41.01	130161	52.69	163634	52.69
19/64	5/16	13/16	2-1/2	129765	41.01	130172	52.69	163645	52.69
5/16	5/16	13/16	2-1/2	129776	29.60	130183	38.18	163656	38.18
21/64	3/8	1	2-1/2	129787	45.99	130194	59.13	163667	59.13
11/32	3/8	1	2-1/2	129798	45.99	130205	59.13	163678	59.13
23/64	3/8	1	2-1/2	129809	45.99	130216	59.13	163689	59.13
3/8	3/8	1	2-1/2	129820	35.31	130227	43.66	163700	43.66
25/64	7/16	1	2-3/4	129831	60.20	130238	77.70	163711	77.70
13/32	7/16	1	2-3/4	129842	60.20	130249	77.70	163722	77.70
27/64	7/16	1	2-3/4	129853	62.15	130260	80.27	163733	80.27
7/16	7/16	1	2-3/4	129864	54.19	130271	66.71	163744	66.71
29/64	1/2	1	3	129875	89.46	130282	114.50	163755	114.50
15/32	1/2	1	3	129886	89.46	130293	114.50	163766	114.50
31/64	1/2	1	3	129897	89.46	130304	114.50	163777	114.50
1/2	1/2	1	3	129908	65.06	130315	81.19	163788	81.19
9/16	9/16	1-1/4	3-1/2	129919	122.97	130326	162.37	163799	162.37
5/8	5/8	1-1/4	3-1/2	129930	124.38	130337	158.58	163810	158.58
3/4	3/4	1-1/2	4	129941	174.70	130348	225.02	163821	225.02
7/8	7/8	1-1/2	4	129952	319.54	130359	404.44	163832	404.44
1	1	1-1/2	4	129963	285.80	130370	365.57	163843	365.57

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+ .000, -.001	-.0001, -.0004 ISO H6
1/8" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6
9/16" - 1"	+ .000, -.003	-.0001, -.0004 ISO H6

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

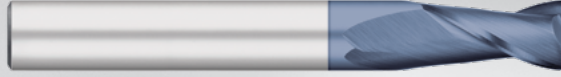


2 FLUTE - LONG LENGTH - SQUARE END - 30° HELIX

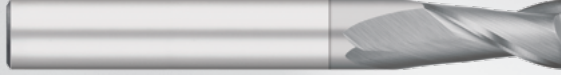
UNCOATED



ALTIN COATED



TICN COATED



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	136134	21.83	136288	28.07	165097	28.07
3/16	3/16	3/4	2-1/2	136145	25.62	136299	32.93	165108	32.93
1/4	1/4	1-1/8	3	136156	36.69	136310	47.30	165119	47.30
1/4	1/4	1	4	136167	38.64	136321	49.82	165130	49.82
5/16	5/16	1-1/8	3	136178	41.40	136332	55.87	165141	55.87
3/8	3/8	1-1/8	3	136189	47.49	136343	64.11	165152	64.11
3/8	3/8	1	4	136200	55.45	136354	71.34	165163	71.34
7/16	7/16	2	4	136211	74.83	136365	97.31	165174	97.31
1/2	1/2	1	4	136222	81.03	136376	104.36	165185	104.36
1/2	1/2	2	4	136233	85.82	136387	110.14	165196	110.14
5/8	5/8	2-1/4	5	136244	191.82	136398	237.39	165207	237.39
3/4	3/4	2-1/4	5	136255	264.93	136409	341.83	165218	341.83
7/8	7/8	2-1/4	5	136266	502.13	136420	593.43	165229	593.43
1	1	2-1/4	5	136277	362.70	136431	468.13	165240	468.13

2 FLUTE - EXTRA LONG LENGTH - SQUARE END - 30° HELIX

UNCOATED



ALTIN COATED



TICN COATED



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	137366	24.39	137520	32.93	165713	32.93
3/16	3/16	1-1/8	3	137377	26.54	137531	34.08	165724	34.08
1/4	1/4	1-1/2	4	137388	39.74	137542	51.19	165735	51.19
1/4	1/4	1-1/2	6	137399	50.70	137553	65.22	165746	65.22
5/16	5/16	1-5/8	4	137410	51.16	137564	66.02	165757	66.02
3/8	3/8	1-3/4	4	137421	58.09	137575	74.41	165768	74.41
3/8	3/8	1-1/2	6	137432	87.97	137586	113.39	165779	113.39
7/16	7/16	3	6	137443	118.49	137597	151.92	165790	151.92
1/2	1/2	1-1/2	6	137454	133.88	137608	166.16	165801	166.16
1/2	1/2	3	6	137465	140.54	137619	172.83	165812	172.83
5/8	5/8	3	6	137476	206.99	137630	254.47	165823	254.47
3/4	3/4	3	6	137487	307.63	137641	377.90	165834	377.90
7/8	7/8	3	6	137498	547.78	137652	684.76	165845	684.76
1	1	3	6	137509	522.24	137663	641.76	165856	641.76

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+.000, -.002	-.0001, -.0004 ISO H6
5/8" - 1"	+.000, -.003	-.0001, -.0004 ISO H6

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

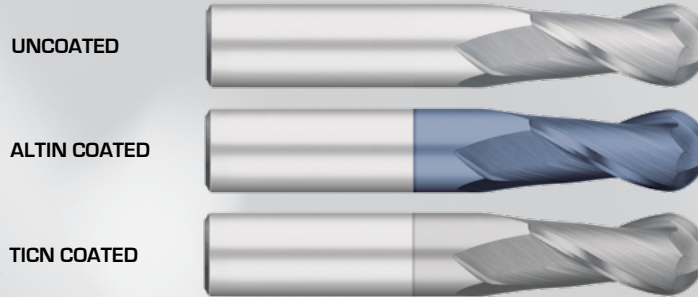
BURS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - REGULAR LENGTH - BALL NOSE - 30° HELIX



END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/64	1/8	1/32	1-1/2	131635	30.41	132042	40.75	164283	40.75
1/32	1/8	1/8	1-1/2	131646	19.45	132053	25.28	164294	25.28
3/64	1/8	1/8	1-1/2	131657	19.45	132064	25.28	164305	25.28
1/16	1/8	1/4	1-1/2	131668	18.04	132075	24.36	164316	24.36
5/64	1/8	1/4	1-1/2	131679	18.04	132086	24.36	164327	24.36
3/32	1/8	3/8	1-1/2	131690	18.92	132097	25.58	164338	25.58
7/64	1/8	3/8	1-1/2	131701	18.92	132108	25.58	164349	25.58
1/8	1/8	1/2	1-1/2	131712	17.35	132119	23.44	164360	23.44
9/64	3/16	9/16	2	131723	25.43	132130	34.35	164371	34.35
5/32	3/16	9/16	2	131734	25.43	132141	34.35	164382	34.35
11/64	3/16	5/8	2	131745	25.43	132152	34.35	164393	34.35
3/16	3/16	5/8	2	131756	22.86	132163	30.87	164404	30.87
13/64	1/4	5/8	2-1/2	131767	33.28	132174	42.01	164415	42.01
7/32	1/4	5/8	2-1/2	131778	33.28	132185	42.01	164426	42.01
15/64	1/4	3/4	2-1/2	131789	33.28	132196	42.01	164437	42.01
1/4	1/4	3/4	2-1/2	131800	32.16	132207	40.02	164448	40.02
17/64	5/16	3/4	2-1/2	131811	42.01	132218	54.04	164459	54.04
9/32	5/16	3/4	2-1/2	131822	42.09	132229	54.11	164470	54.11
19/64	5/16	13/16	2-1/2	131833	45.72	132240	60.01	164481	60.01
5/16	5/16	13/16	2-1/2	131844	38.72	132251	49.78	164492	49.78
21/64	3/8	1	2-1/2	131855	53.19	132262	71.80	164503	71.80
11/32	3/8	1	2-1/2	131866	55.83	132273	71.80	164514	71.80
23/64	3/8	1	2-1/2	131877	53.19	132284	71.80	164525	71.80
3/8	3/8	1	2-1/2	131888	41.44	132295	58.55	164536	58.55
25/64	7/16	1	2-3/4	131899	72.03	132306	92.83	164547	92.83
13/32	7/16	1	2-3/4	131910	72.03	132317	92.83	164558	92.83
27/64	7/16	1	2-3/4	131921	72.03	132328	92.83	164569	92.83
7/16	7/16	1	2-3/4	131932	61.31	132339	79.04	164580	79.04
29/64	1/2	1	3	131943	94.97	132350	122.47	164591	122.47
15/32	1/2	1	3	131954	94.97	132361	122.47	164602	122.47
31/64	1/2	1	3	131965	94.97	132372	122.47	164613	122.47
1/2	1/2	1	3	131976	84.10	132383	108.38	164624	108.38
9/16	9/16	1-1/4	3-1/2	131987	128.18	132394	157.74	164635	157.74
5/8	5/8	1-1/4	3-1/2	131998	135.99	132405	175.28	164646	175.28
3/4	3/4	1-1/2	4	132009	200.36	132416	261.10	164657	261.10
7/8	7/8	1-1/2	4	132020	388.01	132427	493.02	164668	493.02
1	1	1-1/2	4	132031	357.87	132438	461.16	164679	461.16

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK	RA1
1/64" - 7/64"	+0.000, -0.001	-0.0001, -0.0004 ISO H6	
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004 ISO H6	
9/16" - 1"	+0.000, -0.003	-0.0001, -0.0004 ISO H6	

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



2 FLUTE - LONG LENGTH - BALL NOSE - 30° HELIX



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	136750	25.96	136904	33.39	165405	33.39
3/16	3/16	3/4	2-1/2	136761	29.87	136915	38.37	165416	38.37
1/4	1/4	1-1/8	3	136772	42.01	136926	54.07	165427	54.07
1/4	1/4	1	4	136783	46.38	136937	59.78	165438	59.78
5/16	5/16	1-1/8	3	136794	49.40	136948	66.67	165449	66.67
3/8	3/8	1-1/8	3	136805	57.02	136959	77.01	165460	77.01
3/8	3/8	1	4	136816	69.85	136970	90.76	165471	90.76
7/16	7/16	2	4	136827	95.51	136981	124.19	165482	124.19
1/2	1/2	1	4	136838	97.81	136992	124.38	165493	124.38
1/2	1/2	2	4	136849	98.76	137003	125.34	165504	125.34
5/8	5/8	2-1/4	5	136860	225.02	137014	285.80	165515	285.80
3/4	3/4	2-1/4	5	136871	313.33	137025	396.90	165526	396.90
7/8	7/8	2-1/4	5	136882	538.67	137036	661.94	165537	661.94
1	1	2-1/4	5	136893	620.01	137047	762.46	165548	762.46

2 FLUTE - EXTRA LONG LENGTH - BALL NOSE - 30° HELIX



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	138026	29.07	138180	39.21	166021	39.21
3/16	3/16	1-1/8	3	138037	34.84	138191	40.94	166032	40.94
1/4	1/4	1-1/2	4	138048	51.08	138202	56.83	166043	56.83
1/4	1/4	1-1/2	6	138059	58.70	138213	66.75	166054	66.75
5/16	5/16	1-5/8	4	138070	61.73	138224	79.69	166065	79.69
3/8	3/8	1-3/4	4	138081	66.44	138235	84.94	166076	84.94
3/8	3/8	1-1/2	6	138092	93.63	138246	114.93	166087	114.93
7/16	7/16	3	6	138103	140.54	138257	180.41	166098	180.41
1/2	1/2	1-1/2	6	138114	149.08	138268	190.87	166109	190.87
1/2	1/2	3	6	138125	150.00	138279	191.82	166120	191.82
5/8	5/8	3	6	138136	236.44	138290	290.55	166131	290.55
3/4	3/4	3	6	138147	335.28	138301	452.62	166142	452.62
7/8	7/8	3	6	138158	593.43	138312	739.53	166153	739.53
1	1	3	6	138169	598.18	138323	770.12	166164	770.12

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.000, -0.002	-0.0001, -.0004 ISO H6
5/8" - 1"	+0.000, -0.003	-0.0001, -.0004 ISO H6

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

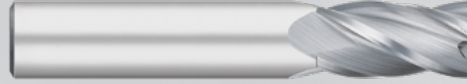


Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - REGULAR LENGTH - SQUARE END - 30° HELIX

UNCOATED



ALTIN COATED



TICN COATED



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/64	1/8	1/32	1-1/2	130711	27.15	166329	36.38	163854	36.38
1/32	1/8	1/8	1-1/2	130722	18.19	166340	24.59	163865	24.59
3/64	1/8	1/8	1-1/2	130733	15.55	166351	20.95	163876	20.95
1/16	1/8	1/4	1-1/2	130744	15.51	166362	17.81	163887	17.81
5/64	1/8	1/4	1-1/2	130755	16.01	166373	21.60	163898	21.60
3/32	1/8	3/8	1-1/2	130766	14.09	166384	17.81	163909	17.81
7/64	1/8	3/8	1-1/2	130777	14.71	166395	19.84	163920	19.84
1/8	1/8	1/2	1-1/2	130788	13.52	166406	16.54	163931	16.54
9/64	3/16	9/16	2	130799	19.80	166417	26.73	163942	26.73
5/32	3/16	9/16	2	130810	19.91	166428	23.09	163953	23.09
11/64	3/16	5/8	2	130821	18.92	166439	25.58	163964	25.58
3/16	3/16	5/8	2	130832	18.42	166450	23.09	163975	23.09
13/64	1/4	5/8	2-1/2	130843	26.88	166461	35.23	163986	35.23
7/32	1/4	5/8	2-1/2	130854	27.46	166472	31.90	163997	31.90
15/64	1/4	3/4	2-1/2	130865	31.02	166483	39.98	164008	39.98
1/4	1/4	3/4	2-1/2	130876	22.75	166494	31.90	164019	31.90
17/64	5/16	3/4	2-1/2	130887	41.01	166505	52.69	164030	52.69
9/32	5/16	3/4	2-1/2	130898	41.01	166516	52.69	164041	52.69
19/64	5/16	13/16	2-1/2	130909	41.01	166527	52.69	164052	52.69
5/16	5/16	13/16	2-1/2	130920	29.60	166538	38.18	164063	38.18
21/64	3/8	1	2-1/2	130931	45.99	166549	59.13	164074	59.13
11/32	3/8	1	2-1/2	130942	45.99	166560	59.13	164085	59.13
23/64	3/8	1	2-1/2	130953	45.99	166571	59.13	164096	59.13
3/8	3/8	1	2-1/2	130964	35.31	166582	43.66	164107	43.66
25/64	7/16	1	2-3/4	130975	60.20	166593	77.70	164118	77.70
13/32	7/16	1	2-3/4	130986	60.20	166604	77.70	164129	77.70
27/64	7/16	1	2-3/4	130997	62.15	166615	80.27	164140	80.27
7/16	7/16	1	2-3/4	131008	54.19	166626	66.71	164151	66.71
29/64	1/2	1	3	131019	89.46	166637	114.50	164162	114.50
15/32	1/2	1	3	131030	89.46	166648	114.50	164173	114.50
31/64	1/2	1	3	131041	89.46	166659	114.50	164184	114.50
1/2	1/2	1	3	131052	65.06	166670	81.19	164195	81.19
1/2	1/2	1-1/4	3	131063	65.06	166681	81.19	164206	81.19
9/16	9/16	1-1/4	3-1/2	131074	122.97	166692	162.37	164217	162.37
5/8	5/8	1-1/4	3-1/2	131085	124.38	166703	158.58	164228	158.58
3/4	3/4	1-1/2	4	131096	174.70	166714	225.02	164239	225.02
7/8	7/8	1-1/2	4	131107	319.54	166725	404.44	164250	404.44
1	1	1-1/2	4	131118	294.12	166736	376.22	164261	376.22
1-1/4	1-1/4	2	4-1/2	131129	1004.30	166747	1141.25	164272	1141.25

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-.0001, -.0004 ISO H6
1/8" - 1/2"	+0.00, -0.02	-.0001, -.0004 ISO H6
9/16" - 1-1/4"	+0.00, -0.03	-.0001, -.0004 ISO H6

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - LONG LENGTH - SQUARE END - 30° HELIX



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	136442	21.83	136596	28.07	165251	28.07
3/16	3/16	3/4	2-1/2	136453	27.39	136607	32.93	165262	32.93
1/4	1/4	1-1/8	3	136464	36.69	136618	47.30	165273	47.30
1/4	1/4	1	4	136475	38.64	136629	49.82	165284	49.82
5/16	5/16	1-1/8	3	136486	41.40	136640	55.87	165295	55.87
3/8	3/8	1-1/8	3	136497	47.49	136651	64.11	165306	64.11
3/8	3/8	1	4	136508	55.45	136662	71.34	165317	71.34
7/16	7/16	2	4	136519	74.83	136673	97.31	165328	97.31
1/2	1/2	1	4	136530	83.39	136684	107.39	165339	107.39
1/2	1/2	2	4	136541	88.32	136695	113.35	165350	113.35
5/8	5/8	2-1/4	5	136552	191.82	136706	237.39	165361	237.39
3/4	3/4	2-1/4	5	136563	264.93	136717	320.71	165372	320.71
7/8	7/8	2-1/4	5	136574	502.13	136728	593.43	165383	593.43
1	1	2-1/4	5	136585	362.70	136739	468.13	165394	468.13

4 FLUTE - EXTRA LONG LENGTH - SQUARE END - 30° HELIX



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	137674	24.39	137850	32.93	165867	32.93
3/16	3/16	1-1/8	3	137685	26.54	137861	34.08	165878	34.08
1/4	1/4	1-1/2	4	137696	37.49	137872	48.29	165889	48.29
1/4	1/4	1-1/2	6	137707	50.70	137883	65.22	165900	65.22
5/16	5/16	1-5/8	4	137718	51.16	137894	66.02	165911	66.02
3/8	3/8	1-3/4	4	137729	58.09	137905	74.41	165922	74.41
3/8	3/8	1-1/2	6	137740	87.97	137916	113.39	165933	113.39
7/16	7/16	3	6	137751	118.49	137927	151.92	165944	151.92
1/2	1/2	1-1/2	6	137762	133.88	137938	166.16	165955	166.16
1/2	1/2	3	6	137773	140.54	137949	172.83	165966	172.83
5/8	5/8	3	6	137784	206.99	137960	254.47	165977	254.47
3/4	3/4	3	6	137795	307.63	137971	361.24	165988	361.24
3/4	3/4	4	7	137806	527.94	137982	598.49	165993	598.49
7/8	7/8	3	6	137817	547.78	137993	684.76	165999	684.76
1	1	3	6	137828	522.24	138004	583.00	166010	583.00
1	1	4	7	137839	684.61	138015	840.32	166013	840.32

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.00, -0.002	-0.0001, -0.0004 ISO H6
5/8" - 1"	+0.00, -0.003	-0.0001, -0.0004 ISO H6

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - REGULAR LENGTH - BALL NOSE - 30° HELIX



END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/64	1/8	1/32	1-1/2	132779	30.41	133186	40.75	164690	40.75
1/32	1/8	1/8	1-1/2	132790	19.45	133197	25.28	164701	25.28
3/64	1/8	1/8	1-1/2	132801	19.45	133208	25.28	164712	25.28
1/16	1/8	1/4	1-1/2	132812	18.04	133219	24.36	164723	24.36
5/64	1/8	1/4	1-1/2	132823	18.04	133230	24.36	164734	24.36
3/32	1/8	3/8	1-1/2	132834	18.92	133241	25.58	164745	25.58
7/64	1/8	3/8	1-1/2	132845	18.92	133252	25.58	164756	25.58
1/8	1/8	1/2	1-1/2	132856	17.35	133263	23.44	164767	23.44
9/64	3/16	9/16	2	132867	25.43	133274	34.35	164778	34.35
5/32	3/16	9/16	2	132878	25.43	133285	34.35	164789	34.35
11/64	3/16	5/8	2	132889	25.43	133296	34.35	164800	34.35
3/16	3/16	5/8	2	132900	22.86	133307	30.87	164811	30.87
13/64	1/4	5/8	2-1/2	132911	32.98	133318	42.01	164822	42.01
7/32	1/4	5/8	2-1/2	132922	32.98	133329	42.01	164833	42.01
15/64	1/4	3/4	2-1/2	132933	32.98	133340	42.01	164844	42.01
1/4	1/4	3/4	2-1/2	132944	31.06	133351	40.02	164855	40.02
17/64	5/16	3/4	2-1/2	132955	42.01	133362	54.04	164866	54.04
9/32	5/16	3/4	2-1/2	132966	42.09	133373	54.11	164877	54.11
19/64	5/16	13/16	2-1/2	132977	45.72	133384	60.01	164888	60.01
5/16	5/16	13/16	2-1/2	132988	38.72	133395	49.78	164899	49.78
21/64	3/8	1	2-1/2	132999	53.19	133406	71.80	164910	71.80
11/32	3/8	1	2-1/2	133010	55.83	133417	71.80	164921	71.80
23/64	3/8	1	2-1/2	133021	53.19	133428	71.80	164932	71.80
3/8	3/8	1	2-1/2	133032	41.44	133439	58.55	164943	58.55
25/64	7/16	1	2-3/4	133043	72.03	133450	92.83	164954	92.83
13/32	7/16	1	2-3/4	133054	72.03	133461	92.83	164965	92.83
27/64	7/16	1	2-3/4	133065	72.03	133472	92.83	164976	92.83
7/16	7/16	1	2-3/4	133076	61.31	133483	79.04	164987	79.04
29/64	1/2	1	3	133087	94.97	133494	122.47	164998	122.47
15/32	1/2	1	3	133098	94.97	133505	122.47	165009	122.47
31/64	1/2	1	3	133109	94.97	133516	122.47	165020	122.47
1/2	1/2	1	3	133120	84.10	133527	108.38	165031	108.38
9/16	9/16	1-1/4	3-1/2	133131	128.18	133538	157.74	165042	157.74
5/8	5/8	1-1/4	3-1/2	133142	135.99	133549	175.28	165053	175.28
3/4	3/4	1-1/2	4	133153	200.36	133560	261.10	165064	261.10
7/8	7/8	1-1/2	4	133164	388.01	133571	493.02	165075	493.02
1	1	1-1/2	4	133175	357.87	133582	461.16	165086	461.16

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-.0001, -.0004 ISO H6
1/8" - 1/2"	+0.00, -0.02	-.0001, -.0004 ISO H6
9/16" - 1"	+0.00, -0.03	-.0001, -.0004 ISO H6

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - LONG LENGTH - BALL NOSE - 30° HELIX



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	137058	25.96	137212	33.39	165559	33.39
3/16	3/16	3/4	2-1/2	137069	29.87	137223	38.37	165570	38.37
1/4	1/4	1-1/8	3	137080	42.01	137234	54.07	165581	54.07
1/4	1/4	1	4	137091	46.38	137245	59.78	165592	59.78
5/16	5/16	1-1/8	3	137102	49.40	137256	66.67	165603	66.67
3/8	3/8	1-1/8	3	137113	57.02	137267	77.01	165614	77.01
3/8	3/8	1	4	137124	69.85	137278	90.76	165625	90.76
7/16	7/16	2	4	137135	95.51	137289	124.19	165636	124.19
1/2	1/2	1	4	137146	97.81	137300	124.38	165647	124.38
1/2	1/2	2	4	137157	98.76	137311	125.34	165658	125.34
5/8	5/8	2-1/4	5	137168	225.02	137322	285.80	165669	285.80
3/4	3/4	2-1/4	5	137179	313.33	137333	396.90	165680	396.90
7/8	7/8	2-1/4	5	137190	538.67	137344	661.94	165691	661.94
1	1	2-1/4	5	137201	620.01	137355	762.46	165702	762.46

4 FLUTE - EXTRA LONG LENGTH - BALL NOSE - 30° HELIX



DIA	SHANK	LOC	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	138334	29.07	138510	39.21	166175	39.21
3/16	3/16	1-1/8	3	138345	35.01	138521	40.94	166186	40.94
1/4	1/4	1-1/2	4	138356	51.06	138532	56.83	166197	56.83
1/4	1/4	1-1/2	6	138367	60.04	138543	70.67	166208	70.67
5/16	5/16	1-5/8	4	138378	61.73	138554	79.69	166219	79.69
3/8	3/8	1-3/4	4	138389	66.44	138565	84.94	166230	84.94
3/8	3/8	1-1/2	6	138400	93.63	138576	116.80	166241	116.80
7/16	7/16	3	6	138411	140.54	138587	180.41	166252	180.41
1/2	1/2	1-1/2	6	138422	149.08	138598	190.87	166263	190.87
1/2	1/2	3	6	138433	150.00	138609	193.70	166274	193.70
5/8	5/8	3	6	138444	236.44	138620	290.55	166285	290.55
3/4	3/4	3	6	138455	335.28	138631	452.62	166296	452.62
3/4	3/4	4	7	138466	552.07	138642	698.20	166307	698.20
7/8	7/8	3	6	138477	593.43	138653	739.53	166307	739.53
1	1	3	6	138488	598.18	138664	770.12	166318	770.12
1	1	4	7	138499	723.52	138675	861.69	166323	861.69

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.00, -0.002	-.0001, -.0004 ISO H6
5/8" - 1"	+0.00, -0.003	-.0001, -.0004 ISO H6

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - REGULAR LENGTH - SQUARE END - 30° HELIX - METRIC



UNCOATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1.0	3	3	38	216753	22.84
1.5	3	4.5	38	133758	22.84
2.0	3	6.3	38	133769	22.84
2.5	3	9.5	38	133780	22.84
3.0	3	12	38	133791	22.84
3.5	4	12	50	133802	28.14
4.0	4	14	50	133813	28.14
4.5	6	16	50	133824	34.41
5.0	6	16	50	133835	34.41
5.5	6	16	50	259549	34.41
6.0	6	19	50	133846	35.96
6.5	8	19	63	259560	39.12

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
7.0	8	19	63	133857	39.12
7.5	8	19	63	259571	40.67
8.0	8	20	63	133868	40.67
9.0	10	22	75	133879	59.43
10.0	10	22	75	133890	75.08
11.0	12	25	75	133901	82.91
12.0	12	25	75	133912	86.02
14.0	14	32	89	133923	145.50
16.0	16	32	89	133934	165.81
18.0	18	38	100	133945	226.84
20.0	20	38	100	133956	359.81
25.0	25	38	100	133967	469.29

4 FLUTE - REGULAR LENGTH - SQUARE END - 30° HELIX - METRIC



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1.0	3	3	38	216764	28.52
1.5	3	4.5	38	133978	28.52
2.0	3	6.3	38	133989	28.52
2.5	3	9.5	38	134000	28.52
3.0	3	12	38	134011	28.52
3.5	4	12	50	134022	35.21
4.0	4	14	50	134033	35.21
4.5	6	16	50	134044	43.03
5.0	6	16	50	134055	43.03
5.5	6	16	50	259582	43.03
6.0	6	19	50	134066	44.97
6.5	8	19	63	259593	48.88

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
7.0	8	19	63	134077	48.88
7.5	8	19	63	259604	50.85
8.0	8	20	63	134088	50.85
9.0	10	22	75	134099	74.28
10.0	10	22	75	134110	93.84
11.0	12	25	75	134121	103.64
12.0	12	25	75	134132	107.55
14.0	14	32	89	134143	181.88
16.0	16	32	89	134154	207.29
18.0	18	38	100	134165	283.55
20.0	20	38	100	134176	449.74
25.0	25	38	100	134187	586.65

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.00, -.05	-.0025, -.01

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - REGULAR LENGTH - BALL NOSE - 30° HELIX - METRIC



UNCOATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1.0	3.0	3.0	38	249700	25.94
1.5	3	4.5	38	249702	25.94
2.0	3	6.3	38	249704	25.94
2.5	3	9.5	38	249706	25.94
3.0	3	12	38	249708	25.94
3.5	4	12	50	249710	31.96
4.0	4	14	50	249712	31.96
4.5	6	16	50	249714	39.08
5.0	6	16	50	249716	39.08
5.5	6	16	50	249718	39.08
6.0	6	19	50	249720	40.84
6.5	8	19	63	249722	46.43

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
7.0	8	19	63	249724	46.43
7.5	8	19	63	249726	48.19
8.0	8	20	63	249728	48.19
9.0	10	22	75	249730	67.50
10.0	10	22	75	249732	88.27
11.0	12	25	75	249734	94.16
12.0	12	25	75	249736	97.69
14.0	14	32	89	249738	165.24
16.0	16	32	89	249740	188.31
18.0	18	38	100	249742	257.63
20.0	20	38	100	249744	408.63
25.0	25	38	100	249746	532.98

4 FLUTE - REGULAR LENGTH - BALL NOSE - 30° HELIX - METRIC



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1.0	3	3	38	259879	33.02
1.5	3	4.5	38	259890	33.02
2.0	3	6.3	38	259901	33.02
2.5	3	9.5	38	259912	33.02
3.0	3	12	38	259923	33.02
3.5	4	12	50	259934	40.76
4.0	4	14	50	259945	40.76
4.5	6	16	50	259956	49.82
5.0	6	16	50	259967	49.82
5.5	6	16	50	259978	49.82
6.0	6	19	50	259989	52.06
6.5	8	19	63	260000	56.59

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
7.0	8	19	63	260011	56.59
7.5	8	19	63	260022	58.87
8.0	8	20	63	260033	58.88
9.0	10	22	75	260044	86.00
10.0	10	22	75	260055	108.64
11.0	12	25	75	260066	119.99
12.0	12	25	75	260077	124.52
14.0	14	32	89	260088	210.57
16.0	16	32	89	260099	239.98
18.0	18	38	100	260110	328.27
20.0	20	38	100	260121	520.68
25.0	25	38	100	260132	679.19

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.00, -.05	-.0025, -.01

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - STUB LENGTH  CORNER RADIUS - 30° HELIX



ALTIN COATED

END MILLS

DRILL MILLS

CHAMFER MILLS

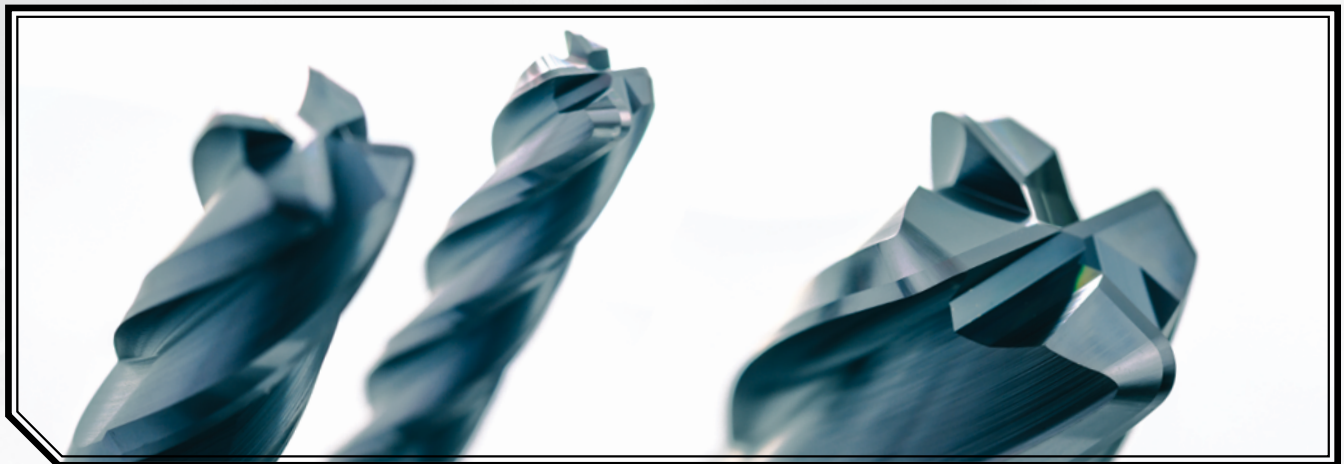
DRILLS

REAMERS

BURS

DIA	SHANK	LOC	OAL	RAD	ITEM #	LIST PRICE
1/8	1/8	1/4	1-1/2	0.015	152450	27.06
1/8	1/8	1/4	1-1/2	0.020	152452	27.06
1/8	1/8	1/4	1-1/2	0.030	152454	27.06
3/16	3/16	3/8	2	0.015	152456	32.88
3/16	3/16	3/8	2	0.020	152458	32.88
3/16	3/16	3/8	2	0.030	152460	32.88
1/4	1/4	1/2	2	0.015	152462	38.41
1/4	1/4	1/2	2	0.020	152464	38.41
1/4	1/4	1/2	2	0.030	152466	38.41
1/4	1/4	1/2	2	0.045	152468	38.41
1/4	1/4	1/2	2	0.060	152470	38.41
5/16	5/16	1/2	2	0.015	152472	53.41
5/16	5/16	1/2	2	0.020	152474	53.41
5/16	5/16	1/2	2	0.030	152476	53.41
5/16	5/16	1/2	2	0.045	152478	53.41
5/16	5/16	1/2	2	0.060	152480	53.41
3/8	3/8	5/8	2	0.015	152482	66.44
3/8	3/8	5/8	2	0.020	152484	66.44
3/8	3/8	5/8	2	0.030	152486	66.44
3/8	3/8	5/8	2	0.045	152488	66.44
3/8	3/8	5/8	2	0.060	152490	66.44
1/2	1/2	5/8	2-1/2	0.015	152492	102.78
1/2	1/2	5/8	2-1/2	0.020	152494	102.78
1/2	1/2	5/8	2-1/2	0.030	152496	102.78

DIA	SHANK	LOC	OAL	RAD	ITEM #	LIST PRICE
1/2	1/2	5/8	2-1/2	0.045	152498	102.78
1/2	1/2	5/8	2-1/2	0.060	152500	102.78
1/2	1/2	5/8	2-1/2	0.090	152502	102.78
1/2	1/2	5/8	2-1/2	0.125	152504	102.78
5/8	5/8	3/4	3	0.015	152506	168.08
5/8	5/8	3/4	3	0.020	152508	168.08
5/8	5/8	3/4	3	0.030	152510	168.08
5/8	5/8	3/4	3	0.045	152512	168.08
5/8	5/8	3/4	3	0.060	152514	168.08
5/8	5/8	3/4	3	0.090	152516	168.08
3/4	3/4	1	3	0.015	152518	234.89
3/4	3/4	1	3	0.020	152520	234.89
3/4	3/4	1	3	0.030	152522	234.89
3/4	3/4	1	3	0.045	152524	234.89
3/4	3/4	1	3	0.060	152526	234.89
3/4	3/4	1	3	0.090	152528	234.89
3/4	3/4	1	3	0.125	152530	234.89
1	1	1-1/4	3-1/2	0.015	152532	452.21
1	1	1-1/4	3-1/2	0.020	152534	452.21
1	1	1-1/4	3-1/2	0.030	152536	452.21
1	1	1-1/4	3-1/2	0.045	152538	452.21
1	1	1-1/4	3-1/2	0.060	152540	452.21
1	1	1-1/4	3-1/2	0.090	152542	452.21
1	1	1-1/4	3-1/2	0.125	152544	452.21



Radius tools stocked in Stub, Regular, Long, and Extra Long lengths

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.0001, -0.0004 ISO H6	+0.001, -0.001
5/8" - 1"	+0.00, -0.03	-0.0001, -0.0004 ISO H6	+0.001, -0.001

MADE IN THE USA

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



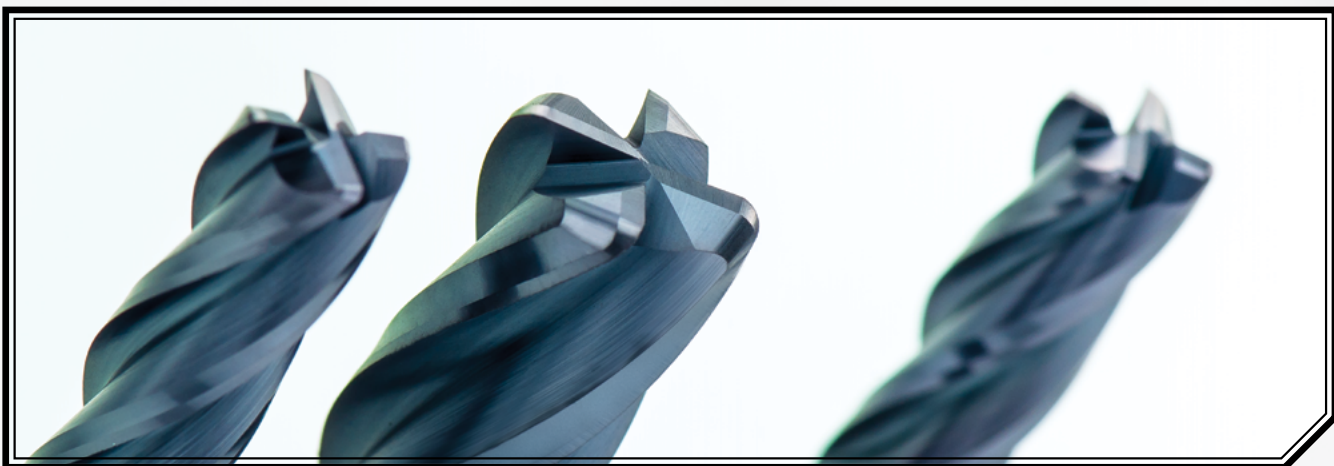
4 FLUTE - REGULAR LENGTH  CORNER RADIUS - 30° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.015	152557	31.29
1/8	1/8	1/2	1-1/2	0.020	152568	31.29
1/8	1/8	1/2	1-1/2	0.030	152579	31.29
3/16	3/16	5/8	2	0.015	152590	36.79
3/16	3/16	5/8	2	0.020	152601	36.79
3/16	3/16	5/8	2	0.030	152612	36.79
1/4	1/4	3/4	2-1/2	0.015	152623	43.00
1/4	1/4	3/4	2-1/2	0.020	152634	43.00
1/4	1/4	3/4	2-1/2	0.030	152645	43.00
1/4	1/4	3/4	2-1/2	0.045	152656	43.00
1/4	1/4	3/4	2-1/2	0.060	152667	43.00
5/16	5/16	13/16	2-1/2	0.015	152678	57.67
5/16	5/16	13/16	2-1/2	0.020	152689	57.67
5/16	5/16	13/16	2-1/2	0.030	152700	57.67
5/16	5/16	13/16	2-1/2	0.045	152711	57.67
5/16	5/16	13/16	2-1/2	0.060	152722	57.67
3/8	3/8	1	2-1/2	0.015	152733	72.39
3/8	3/8	1	2-1/2	0.020	152744	72.39
3/8	3/8	1	2-1/2	0.030	152755	72.39
3/8	3/8	1	2-1/2	0.045	152766	72.39
3/8	3/8	1	2-1/2	0.060	152777	72.39
1/2	1/2	1	3	0.015	152788	109.20
1/2	1/2	1	3	0.020	152799	109.20
1/2	1/2	1	3	0.030	152810	109.20

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/2	1/2	1	3	0.045	152821	109.20
1/2	1/2	1	3	0.060	152832	109.20
1/2	1/2	1	3	0.090	152843	109.20
1/2	1/2	1	3	0.125	152854	109.20
5/8	5/8	1-1/4	3-1/2	0.015	152865	177.91
5/8	5/8	1-1/4	3-1/2	0.020	152876	177.91
5/8	5/8	1-1/4	3-1/2	0.030	152887	177.91
5/8	5/8	1-1/4	3-1/2	0.045	152898	177.91
5/8	5/8	1-1/4	3-1/2	0.060	152909	177.91
5/8	5/8	1-1/4	3-1/2	0.090	152920	177.91
3/4	3/4	1-1/2	4	0.015	152931	244.16
3/4	3/4	1-1/2	4	0.020	152942	244.16
3/4	3/4	1-1/2	4	0.030	152953	244.16
3/4	3/4	1-1/2	4	0.045	152964	244.16
3/4	3/4	1-1/2	4	0.060	152975	244.16
3/4	3/4	1-1/2	4	0.090	152986	244.16
3/4	3/4	1-1/2	4	0.125	152997	244.16
1	1	1-1/2	4	0.015	153008	473.21
1	1	1-1/2	4	0.020	153019	473.21
1	1	1-1/2	4	0.030	153030	473.21
1	1	1-1/2	4	0.045	153041	473.21
1	1	1-1/2	4	0.060	153052	473.21
1	1	1-1/2	4	0.090	153063	473.21
1	1	1-1/2	4	0.125	153074	473.21



Radius options stocked from 0.015" through 0.125"

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+ .000, -.002	-.0001, -.0004 ISO H6	+ .001, -.001
5/8" - 1"	+ .000, -.003	-.0001, -.0004 ISO H6	+ .001, -.001

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - LONG LENGTH  CORNER RADIUS - 30° HELIX



ALTiN COATED

END MILLS

DRILL MILLS

CHAMFER MILLS

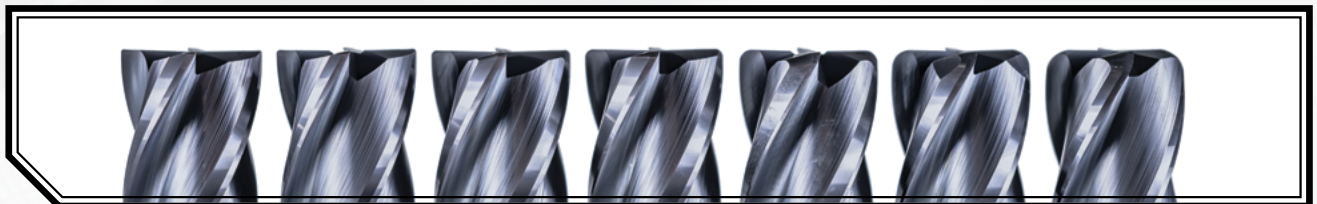
DRILLS

REAMERS

BURS

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.015	153800	34.39
1/8	1/8	3/4	2-1/4	0.020	153811	34.39
1/8	1/8	3/4	2-1/4	0.030	153822	34.39
3/16	3/16	3/4	2-1/2	0.015	153833	39.97
3/16	3/16	3/4	2-1/2	0.020	153844	39.97
3/16	3/16	3/4	2-1/2	0.030	153855	39.97
1/4	1/4	1-1/8	3	0.015	153866	55.77
1/4	1/4	1-1/8	3	0.020	153877	55.77
1/4	1/4	1-1/8	3	0.030	153888	55.77
1/4	1/4	1-1/8	3	0.045	153899	55.77
1/4	1/4	1-1/8	3	0.060	153910	55.77
1/4	1/4	1	4	0.015	153921	58.56
1/4	1/4	1	4	0.020	153932	58.56
1/4	1/4	1	4	0.030	153943	58.56
1/4	1/4	1	4	0.045	153954	58.56
1/4	1/4	1	4	0.060	153965	58.56
5/16	5/16	1-1/8	3	0.015	153976	63.21
5/16	5/16	1-1/8	3	0.020	153987	63.21
5/16	5/16	1-1/8	3	0.030	153998	63.21
5/16	5/16	1-1/8	3	0.045	154009	63.21
5/16	5/16	1-1/8	3	0.060	154020	63.21
3/8	3/8	1-1/8	3	0.015	154031	79.75
3/8	3/8	1-1/8	3	0.020	154042	79.75
3/8	3/8	1-1/8	3	0.030	154053	79.75
3/8	3/8	1-1/8	3	0.045	154064	79.75
3/8	3/8	1-1/8	3	0.060	154075	79.75
3/8	3/8	1	4	0.015	154086	99.38
3/8	3/8	1	4	0.020	154097	99.38
3/8	3/8	1	4	0.030	154108	99.38
3/8	3/8	1	4	0.045	154119	99.38
3/8	3/8	1	4	0.060	154130	99.38
1/2	1/2	1	4	0.015	154141	137.42
1/2	1/2	1	4	0.020	154152	137.42

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/2	1/2	1	4	0.030	154163	137.42
1/2	1/2	1	4	0.045	154174	137.42
1/2	1/2	1	4	0.060	154185	137.42
1/2	1/2	1	4	0.090	154196	137.42
1/2	1/2	1	4	0.125	154207	137.42
1/2	1/2	2	4	0.015	154218	146.01
1/2	1/2	2	4	0.020	154229	146.01
1/2	1/2	2	4	0.030	154240	146.01
1/2	1/2	2	4	0.045	154251	146.01
1/2	1/2	2	4	0.060	154262	146.01
1/2	1/2	2	4	0.090	154273	146.01
1/2	1/2	2	4	0.125	154284	146.01
5/8	5/8	2-1/4	5	0.015	154295	263.98
5/8	5/8	2-1/4	5	0.020	154306	263.98
5/8	5/8	2-1/4	5	0.030	154317	263.98
5/8	5/8	2-1/4	5	0.045	154328	263.98
5/8	5/8	2-1/4	5	0.060	154339	263.98
5/8	5/8	2-1/4	5	0.090	154350	263.98
3/4	3/4	2-1/4	5	0.015	154361	343.54
3/4	3/4	2-1/4	5	0.020	154372	343.54
3/4	3/4	2-1/4	5	0.030	154383	343.54
3/4	3/4	2-1/4	5	0.045	154394	343.54
3/4	3/4	2-1/4	5	0.060	154405	343.54
3/4	3/4	2-1/4	5	0.090	154416	343.54
3/4	3/4	2-1/4	5	0.125	154427	343.54
1	1	2-1/4	5	0.015	154438	539.86
1	1	2-1/4	5	0.020	154449	539.86
1	1	2-1/4	5	0.030	154460	539.86
1	1	2-1/4	5	0.045	154471	539.86
1	1	2-1/4	5	0.060	154482	539.86
1	1	2-1/4	5	0.090	154493	539.86
1	1	2-1/4	5	0.125	154504	539.86



For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -.002	-.0001, -.0004 ISO H6	+0.001, -.001
5/8" - 1"	+0.00, -.003	-.0001, -.0004 ISO H6	+0.001, -.001

MADE IN THE USA

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - EXTRA LONG LENGTH  CORNER RADIUS - 30° HELIX



ALTIM COATED

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/8	1/8	1	3	0.015	155384	39.04
1/8	1/8	1	3	0.020	155395	39.04
1/8	1/8	1	3	0.030	155406	39.04
3/16	3/16	1-1/8	3	0.015	155417	42.76
3/16	3/16	1-1/8	3	0.020	155428	42.76
3/16	3/16	1-1/8	3	0.030	155439	42.76
1/4	1/4	1-1/2	4	0.015	155450	59.49
1/4	1/4	1-1/2	4	0.020	155461	59.49
1/4	1/4	1-1/2	4	0.030	155472	59.49
1/4	1/4	1-1/2	4	0.045	155483	59.49
1/4	1/4	1-1/2	4	0.060	155494	59.49
1/4	1/4	1-1/2	6	0.015	155505	79.94
1/4	1/4	1-1/2	6	0.020	155516	79.94
1/4	1/4	1-1/2	6	0.030	155527	79.94
1/4	1/4	1-1/2	6	0.045	155538	79.94
1/4	1/4	1-1/2	6	0.060	155549	79.94
5/16	5/16	1-5/8	4	0.015	155560	81.80
5/16	5/16	1-5/8	4	0.020	155571	81.80
5/16	5/16	1-5/8	4	0.030	155582	81.80
5/16	5/16	1-5/8	4	0.045	155593	81.80
5/16	5/16	1-5/8	4	0.060	155604	81.80
3/8	3/8	1-3/4	4	0.015	155615	89.23
3/8	3/8	1-3/4	4	0.020	155626	89.23
3/8	3/8	1-3/4	4	0.030	155637	89.23
3/8	3/8	1-3/4	4	0.045	155648	89.23
3/8	3/8	1-3/4	4	0.060	155659	89.23
3/8	3/8	1-1/2	6	0.015	155670	126.41
3/8	3/8	1-1/2	6	0.020	155681	126.41
3/8	3/8	1-1/2	6	0.030	155692	126.41
3/8	3/8	1-1/2	6	0.045	155703	126.41
3/8	3/8	1-1/2	6	0.060	155714	126.41
1/2	1/2	1-1/2	6	0.015	155725	191.48
1/2	1/2	1-1/2	6	0.020	155736	191.48
1/2	1/2	1-1/2	6	0.030	155747	191.48
1/2	1/2	1-1/2	6	0.045	155758	191.48
1/2	1/2	1-1/2	6	0.060	155769	191.48
1/2	1/2	1-1/2	6	0.090	155780	191.48
1/2	1/2	1-1/2	6	0.125	155791	191.48
1/2	1/2	3	6	0.015	155802	200.77
1/2	1/2	3	6	0.020	155813	200.77

DIA	SHANK	LOC	OAL	RAD	ITEM#	LIST PRICE
1/2	1/2	3	6	0.030	155824	200.77
1/2	1/2	3	6	0.045	155835	200.77
1/2	1/2	3	6	0.060	155846	200.77
1/2	1/2	3	6	0.090	155857	200.77
1/2	1/2	3	6	0.125	155868	200.77
5/8	5/8	3	6	0.015	155879	282.57
5/8	5/8	3	6	0.020	155890	282.57
5/8	5/8	3	6	0.030	155901	282.57
5/8	5/8	3	6	0.045	155912	282.57
5/8	5/8	3	6	0.060	155923	282.57
5/8	5/8	3	6	0.090	155934	282.57
3/4	3/4	3	6	0.015	155945	387.71
3/4	3/4	3	6	0.020	155956	387.71
3/4	3/4	3	6	0.030	155967	387.71
3/4	3/4	3	6	0.045	155978	387.71
3/4	3/4	3	6	0.060	155989	387.71
3/4	3/4	3	6	0.090	156000	387.71
3/4	3/4	3	6	0.125	156011	387.71
3/4	3/4	4	7	0.015	156022	636.78
3/4	3/4	4	7	0.020	156033	636.78
3/4	3/4	4	7	0.030	156044	636.78
3/4	3/4	4	7	0.045	156055	636.78
3/4	3/4	4	7	0.060	156066	636.78
3/4	3/4	4	7	0.090	156077	636.78
3/4	3/4	4	7	0.125	156088	636.78
1	1	3	6	0.015	156099	631.88
1	1	3	6	0.020	156110	631.88
1	1	3	6	0.030	156121	631.88
1	1	3	6	0.045	156132	631.88
1	1	3	6	0.060	156143	631.88
1	1	3	6	0.090	156154	631.88
1	1	3	6	0.125	156165	631.88
1	1	4	7	0.015	156176	910.91
1	1	4	7	0.020	156187	910.91
1	1	4	7	0.030	156198	910.91
1	1	4	7	0.045	156209	910.91
1	1	4	7	0.060	156220	910.91
1	1	4	7	0.090	156231	910.91
1	1	4	7	0.125	156242	910.91

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.0001, -0.0004 ISO H6	+0.001, -0.001
5/8" - 1"	+0.00, -0.03	-0.0001, -0.0004 ISO H6	+0.001, -0.001

MADE IN THE USA



Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - STUB LENGTH - DOUBLE END - SQUARE END - 30° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	136013	32.15
3/32	1/8	3/16	1-1/2	136024	33.13
1/8	1/8	1/4	1-1/2	136035	26.71
5/32	3/16	5/16	2	136046	35.94
3/16	3/16	3/8	2	136057	35.94
7/32	1/4	1/2	2-1/2	136068	49.32
1/4	1/4	1/2	2-1/2	136079	49.32
5/16	5/16	1/2	2-1/2	136090	60.60
3/8	3/8	9/16	2-1/2	136101	66.85
7/16	7/16	9/16	2-3/4	136112	94.50
1/2	1/2	5/8	3	136123	127.18

4 FLUTE - STUB LENGTH - DOUBLE END - BALL NOSE - 30° HELIX



ALTIN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	135771	40.22
3/32	1/8	3/16	1-1/2	135782	41.38
1/8	1/8	1/4	1-1/2	135793	33.40
5/32	3/16	5/16	2	135804	44.91
3/16	3/16	3/8	2	135815	44.91
7/32	1/4	1/2	2-1/2	135826	61.63
1/4	1/4	1/2	2-1/2	135837	61.63
5/16	5/16	1/2	2-1/2	135848	75.72
3/8	3/8	9/16	2-1/2	135859	83.57
7/16	7/16	9/16	2-3/4	135870	118.13
1/2	1/2	5/8	3	135881	159.02

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .000, -.002	-.0001, -.0004 ISO H6

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

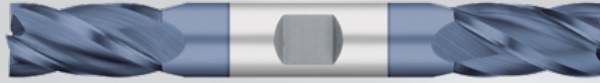
BURS

Carbide End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - REGULAR LENGTH - DOUBLE END - SQUARE END - 30° HELIX

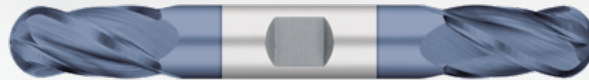


ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	134561	110.81
5/32	3/8	7/16	3-1/4	134572	110.82
3/16	3/8	1/2	3-1/4	134583	110.82
7/32	3/8	9/16	3-1/2	134594	113.36
1/4	3/8	5/8	3-1/2	134605	113.36
9/32	3/8	11/16	3-1/2	134616	121.65
5/16	3/8	3/4	3-1/2	134627	121.65
11/32	3/8	3/4	3-1/2	134638	121.65
3/8	3/8	3/4	3-1/2	134649	121.65
7/16	1/2	7/8	4	134660	181.00
1/2	1/2	1	4	134671	203.34

NOTE: ALL TOOLS * WELDON FLATS

4 FLUTE - REGULAR LENGTH - DOUBLE END - BALL NOSE - 30° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	135045	131.79
5/32	3/8	7/16	3-1/4	135056	131.79
3/16	3/8	1/2	3-1/4	135067	131.79
7/32	3/8	9/16	3-1/2	135078	136.15
1/4	3/8	5/8	3-1/2	135089	136.15
9/32	3/8	11/16	3-1/2	135100	151.35
5/16	3/8	3/4	3-1/2	135111	151.35
11/32	3/8	3/4	3-1/2	135122	151.35
3/8	3/8	3/4	3-1/2	135133	151.35
7/16	1/2	7/8	4	135144	205.98
1/2	1/2	1	4	135155	223.89

NOTE: ALL TOOLS * WELDON FLATS

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .000, -.002	-.0001, -.0004 ISO H6

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

MADE IN THE USA



Carbide Drill Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - 60° POINT - 30° HELIX



UNCOATED



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	242034	25.67
1/16	1/8	3/16	1-1/2	242045	25.67
3/32	1/8	3/8	1-1/2	242056	25.67
1/8	1/8	1/2	1-1/2	242067	24.62
3/16	3/16	5/8	2	242078	34.67
1/4	1/4	3/4	2-1/2	242089	43.38
5/16	5/16	13/16	2-1/2	242100	53.87
3/8	3/8	1	2-1/2	242111	67.68
7/16	7/16	1	2-3/4	242122	91.50
1/2	1/2	1	3	242133	112.19
5/8	5/8	1-1/4	3-1/2	242144	214.22
3/4	3/4	1-1/2	4	242155	315.53

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	242166	32.09
1/16	1/8	3/16	1-1/2	242177	32.09
3/32	1/8	3/8	1-1/2	242188	32.09
1/8	1/8	1/2	1-1/2	242199	30.81
3/16	3/16	5/8	2	242210	43.34
1/4	1/4	3/4	2-1/2	242221	54.23
5/16	5/16	13/16	2-1/2	242232	67.32
3/8	3/8	1	2-1/2	242243	84.64
7/16	7/16	1	2-3/4	242254	114.40
1/2	1/2	1	3	242265	140.27
5/8	5/8	1-1/4	3-1/2	242276	267.81
3/4	3/4	1-1/2	4	242287	394.42

2 FLUTE - 90° POINT - 30° HELIX



UNCOATED



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	241545	25.67
1/16	1/8	3/16	1-1/2	241550	25.67
3/32	1/8	3/8	1-1/2	241561	25.67
1/8	1/8	1/2	1-1/2	241572	24.62
3/16	3/16	5/8	2	241583	34.67
1/4	1/4	3/4	2-1/2	241594	43.38
5/16	5/16	13/16	2-1/2	241605	53.87
3/8	3/8	1	2-1/2	241616	67.68
7/16	7/16	1	2-3/4	241627	91.50
1/2	1/2	1	3	241638	112.19
5/8	5/8	1-1/4	3-1/2	241649	214.22
3/4	3/4	1-1/2	4	241660	315.53

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	241668	32.09
1/16	1/8	3/16	1-1/2	241671	32.09
3/32	1/8	3/8	1-1/2	241682	32.09
1/8	1/8	1/2	1-1/2	241693	30.81
3/16	3/16	5/8	2	241704	43.34
1/4	1/4	3/4	2-1/2	241715	54.23
5/16	5/16	13/16	2-1/2	241726	67.32
3/8	3/8	1	2-1/2	241737	84.64
7/16	7/16	1	2-3/4	241748	114.40
1/2	1/2	1	3	241759	140.27
5/8	5/8	1-1/4	3-1/2	241770	267.81
3/4	3/4	1-1/2	4	241781	394.42

Drill mills are very popular in job shop environments because of their versatility in performing a wide range of machining operations:

**THE FOLLOWING APPLICATIONS CAN BE PERFORMED WITH DRILL MILLS:
DRILLING • CHAMFERING • COUNTERSINKING • SPOTTING • PROFILE MILLING**

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/32" - 3/32"	+0.000, -0.001	-0.0001, -.0004 ISO H6
1/8" - 1/2"	+0.000, -0.002	-0.0001, -.0004 ISO H6
5/8" - 3/4"	+0.000, -0.003	-0.0001, -.0004 ISO H6

MADE IN THE USA

Carbide Drill Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - 60° POINT - 30° HELIX



UNCOATED



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	242628	25.67
1/16	1/8	3/16	1-1/2	242639	25.67
3/32	1/8	3/8	1-1/2	242650	25.67
1/8	1/8	1/2	1-1/2	242661	24.62
3/16	3/16	5/8	2	242672	34.67
1/4	1/4	3/4	2-1/2	242683	43.38
5/16	5/16	13/16	2-1/2	242694	53.87
3/8	3/8	1	2-1/2	242705	67.68
7/16	7/16	1	2-3/4	242716	91.50
1/2	1/2	1	3	242727	112.19
5/8	5/8	1-1/4	3-1/2	242738	214.22
3/4	3/4	1-1/2	4	242749	315.53

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	242760	32.09
1/16	1/8	3/16	1-1/2	242771	32.09
3/32	1/8	3/8	1-1/2	242782	32.09
1/8	1/8	1/2	1-1/2	242793	30.81
3/16	3/16	5/8	2	242804	43.34
1/4	1/4	3/4	2-1/2	242815	54.23
5/16	5/16	13/16	2-1/2	242826	67.32
3/8	3/8	1	2-1/2	242837	84.64
7/16	7/16	1	2-3/4	242848	114.40
1/2	1/2	1	3	242859	140.27
5/8	5/8	1-1/4	3-1/2	242870	267.81
3/4	3/4	1-1/2	4	242881	394.42

4 FLUTE - 90° POINT - 30° HELIX



UNCOATED



ALTiN COATED

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	241785	25.67
1/16	1/8	3/16	1-1/2	241792	25.67
3/32	1/8	3/8	1-1/2	241803	25.67
1/8	1/8	1/2	1-1/2	241814	24.62
3/16	3/16	5/8	2	241825	34.67
1/4	1/4	3/4	2-1/2	241836	43.38
5/16	5/16	13/16	2-1/2	241847	53.87
3/8	3/8	1	2-1/2	241858	67.68
7/16	7/16	1	2-3/4	241869	91.50
1/2	1/2	1	3	241880	112.19
5/8	5/8	1-1/4	3-1/2	241891	214.22
3/4	3/4	1-1/2	4	241902	315.53

DIA	SHANK	LOC	OAL	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	241908	32.09
1/16	1/8	3/16	1-1/2	241913	32.09
3/32	1/8	3/8	1-1/2	241924	32.09
1/8	1/8	1/2	1-1/2	241935	30.81
3/16	3/16	5/8	2	241946	43.34
1/4	1/4	3/4	2-1/2	241957	54.23
5/16	5/16	13/16	2-1/2	241968	67.32
3/8	3/8	1	2-1/2	241979	84.64
7/16	7/16	1	2-3/4	241990	114.40
1/2	1/2	1	3	242001	140.27
5/8	5/8	1-1/4	3-1/2	242012	267.81
3/4	3/4	1-1/2	4	242023	394.42

Drill mills are very popular in job shop environments because of their versatility in performing a wide range of machining operations:

**THE FOLLOWING APPLICATIONS CAN BE PERFORMED WITH DRILL MILLS:
DRILLING • CHAMFERING • COUNTERSINKING • SPOTTING • PROFILE MILLING**

For coating information see page 6. For technical information, please see pages 238, 242, 243.

TOLERANCES	DIAMETER	SHANK
1/32" - 3/32"	+0.000, -0.001	-0.0001, -.0004 ISO H6
1/8" - 1/2"	+0.000, -0.002	-0.0001, -.0004 ISO H6
5/8" - 3/4"	+0.000, -0.003	-0.0001, -.0004 ISO H6

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide Chamfer Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

END MILLS



2 FLUTE - SINGLE END
60° • 82° • 90° • 100° • 120°
UNCOATED

DIA	SHANK	OAL	PKG. QTY.	60°- ITEM#	82°- ITEM#	90°- ITEM#	100°- ITEM#	120°- ITEM#	LIST PRICE
1/8	1/8	1-1/2	1	252509	252553	252597	252641	252685	21.98
1/4	1/4	2-1/2	1	252520	252564	252608	252652	252696	38.70
3/8	3/8	2-1/2	1	252531	252575	252619	252663	252707	60.38
1/2	1/2	3	1	252542	252586	252630	252674	252718	99.95

DRILL MILLS



2 FLUTE - SINGLE END
60° • 82° • 90° • 100° • 120°
ALTIN COATED

DIA	SHANK	OAL	PKG. QTY.	60°- ITEM#	82°- ITEM#	90°- ITEM#	100°- ITEM#	120°- ITEM#	LIST PRICE
1/8	1/8	1-1/2	1	252729	252773	252817	252861	252905	27.50
1/4	1/4	2-1/2	1	252740	252784	252828	252872	252916	48.30
3/8	3/8	2-1/2	1	252751	252795	252839	252883	252927	75.49
1/2	1/2	3	1	252762	252806	252850	252894	252938	125.03

CHAMFER MILLS



2 FLUTE - DOUBLE END
60° • 82° • 90° • 100° • 120°
UNCOATED

DIA	SHANK	OAL	PKG. QTY.	60°- ITEM#	82°- ITEM#	90°- ITEM#	100°- ITEM#	120°- ITEM#	LIST PRICE
1/8	1/8	2	1	253389	253455	253521	253587	253653	39.57
3/16	3/16	2-1/2	1	253400	253466	253532	253598	253664	54.49
1/4	1/4	2-1/2	1	253411	253477	253543	253609	253675	69.67
5/16	5/16	2-1/2	1	253422	253488	253554	253620	253686	89.17
3/8	3/8	2-1/2	1	253433	253499	253565	253631	253697	108.68
1/2	1/2	3	1	253444	253510	253576	253642	253708	179.91

DRILLS



2 FLUTE - DOUBLE END
60° • 82° • 90° • 100° • 120°
ALTIN COATED

DIA	SHANK	OAL	PKG. QTY.	60°- ITEM#	82°- ITEM#	90°- ITEM#	100°- ITEM#	120°- ITEM#	LIST PRICE
1/8	1/8	2	1	253719	253785	253851	253917	253983	49.49
3/16	3/16	2-1/2	1	253730	253796	253862	253928	253994	68.12
1/4	1/4	2-1/2	1	253741	253807	253873	253939	254005	86.94
5/16	5/16	2-1/2	1	253752	253818	253884	253950	254016	111.40
3/8	3/8	2-1/2	1	253763	253829	253895	253961	254027	135.99
1/2	1/2	3	1	253774	253840	253906	253972	254038	225.10

REAMERS

BURS

TOLERANCES	SHANK
ALL SIZES	-.0001, -.0004 ISO H6

For coating information see page 6. For technical information, please see pages 238, 244.

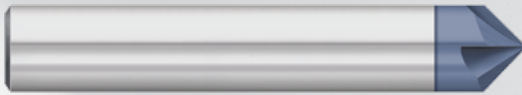
Carbide Chamfer Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - SINGLE END
60° • 82° • 90° • 100° • 120°
UNCOATED

DIA	SHANK	OAL	PKG. QTY.	60°- ITEM#	82°- ITEM#	90°- ITEM#	100°- ITEM#	120°- ITEM#	LIST PRICE
1/8	1/8	1-1/2	1	252949	252993	253037	253081	253125	21.98
1/4	1/4	2-1/2	1	252960	253004	253048	253092	253136	38.70
3/8	3/8	2-1/2	1	252971	253015	253059	253103	253147	60.38
1/2	1/2	3	1	252982	253026	253070	253114	253158	99.95



4 FLUTE - SINGLE END
60° • 82° • 90° • 100° • 120°
ALTIN COATED

DIA	SHANK	OAL	PKG. QTY.	60°- ITEM#	82°- ITEM#	90°- ITEM#	100°- ITEM#	120°- ITEM#	LIST PRICE
1/8	1/8	1-1/2	1	253169	253213	253257	253301	253345	27.50
1/4	1/4	2-1/2	1	253180	253224	253268	253312	253356	48.30
3/8	3/8	2-1/2	1	253191	253235	253279	253323	253367	75.49
1/2	1/2	3	1	253202	253246	253290	253334	253378	125.03



4 FLUTE - DOUBLE END
60° • 82° • 90° • 100° • 120°
UNCOATED

DIA	SHANK	OAL	PKG. QTY.	60°- ITEM#	82°- ITEM#	90°- ITEM#	100°- ITEM#	120°- ITEM#	LIST PRICE
1/8	1/8	2	1	254049	254115	254181	254247	254313	39.57
3/16	3/16	2-1/2	1	254060	254126	254192	254258	254324	54.49
1/4	1/4	2-1/2	1	254071	254137	254203	254269	254335	69.67
5/16	5/16	2-1/2	1	254082	254148	254214	254280	254346	89.17
3/8	3/8	2-1/2	1	254093	254159	254225	254291	254357	108.68
1/2	1/2	3	1	254104	254170	254236	254302	254368	179.91



4 FLUTE - DOUBLE END
60° • 82° • 90° • 100° • 120°
ALTIN COATED

DIA	SHANK	OAL	PKG. QTY.	60°- ITEM#	82°- ITEM#	90°- ITEM#	100°- ITEM#	120°- ITEM#	LIST PRICE
1/8	1/8	2	1	254379	254445	254511	254577	254643	49.49
3/16	3/16	2-1/2	1	254390	254456	254522	254588	254654	68.12
1/4	1/4	2-1/2	1	254401	254467	254533	254599	254665	86.94
5/16	5/16	2-1/2	1	254412	254478	254544	254610	254676	111.40
3/8	3/8	2-1/2	1	254423	254489	254555	254621	254687	135.99
1/2	1/2	3	1	254434	254500	254566	254632	254698	225.10

TOLERANCES	SHANK
ALL SIZES	-.0001, -.0004 ISO H6

For coating information see page 6. For technical information, please see pages 238, 244.

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

MADE IN THE USA



Carbide Spot Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



**90° POINT
UNCOATED**

DIA	SHANK	FL LENGTH	OAL	ITEM#	LIST PRICE
1/8	1/8	5/8	2	138686	30.79
3/16	3/16	3/4	2	138697	36.64
1/4	1/4	3/4	2-1/2	138708	44.50
3/8	3/8	1	3	138719	72.82
1/2	1/2	1	3	138730	118.24
5/8	5/8	1-1/4	3	138741	210.48
3/4	3/4	1-3/4	4	138752	282.62



**120° POINT
UNCOATED**

DIA	SHANK	FL LENGTH	OAL	ITEM#	LIST PRICE
1/8	1/8	5/8	2	138763	30.79
3/16	3/16	3/4	2	138774	36.64
1/4	1/4	3/4	2-1/2	138785	44.50
3/8	3/8	1	3	138796	72.82
1/2	1/2	1	3	138807	118.24
5/8	5/8	1-1/4	3	138818	210.48
3/4	3/4	1-3/4	4	138829	282.62



**142° POINT
UNCOATED**

DIA	SHANK	FL LENGTH	OAL	ITEM#	LIST PRICE
1/8	1/8	5/8	2	138840	30.79
3/16	3/16	3/4	2	138851	36.64
1/4	1/4	3/4	2-1/2	138862	44.50
3/8	3/8	1	3	138873	72.82
1/2	1/2	1	3	138884	118.24
5/8	5/8	1-1/4	3	138895	210.48
3/4	3/4	1-3/4	4	138906	282.62

TOLERANCES	SHANK
ALL SIZES	-.0001, -.0004 ISO H6

For technical information, please see page 245.

Carbide Spot Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



90° POINT
ALTiN COATED

DIA	SHANK	FL LENGTH	OAL	ITEM#	LIST PRICE
1/8	1/8	5/8	2	138753	38.48
3/16	3/16	3/4	2	138754	45.81
1/4	1/4	3/4	2-1/2	138755	55.89
3/8	3/8	1	3	138756	88.43
1/2	1/2	1	3	138757	153.94
5/8	5/8	1-1/4	3	138758	269.11
3/4	3/4	1-3/4	4	138759	353.28



120° POINT
ALTiN COATED

DIA	SHANK	FL LENGTH	OAL	ITEM#	LIST PRICE
1/8	1/8	5/8	2	138830	38.48
3/16	3/16	3/4	2	138831	45.81
1/4	1/4	3/4	2-1/2	138832	55.89
3/8	3/8	1	3	138833	88.43
1/2	1/2	1	3	138834	153.94
5/8	5/8	1-1/4	3	138835	269.11
3/4	3/4	1-3/4	4	138836	353.28



142° POINT
ALTiN COATED

DIA	SHANK	FL LENGTH	OAL	ITEM#	LIST PRICE
1/8	1/8	5/8	2	138907	38.48
3/16	3/16	3/4	2	138908	45.81
1/4	1/4	3/4	2-1/2	138909	55.89
3/8	3/8	1	3	138910	88.43
1/2	1/2	1	3	138911	153.94
5/8	5/8	1-1/4	3	138912	269.11
3/4	3/4	1-3/4	4	138913	353.28

TOLERANCES	SHANK
ALL SIZES	-.0001, -.0004 ISO H6

For coating information see page 6. For technical information, please see page 245.

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

MADE IN THE USA

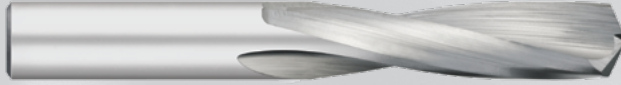


Carbide Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

STUB LENGTH - 135° SPLIT POINT - 15° HELIX

UNCOATED



ALTIM COATED



FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	UNCOATED LIST PRICE	ALTIM LIST PRICE
1/32	3/8	1-1/2	141469 18.45	217358 23.07
3/64	3/8	1-1/2	141480 18.45	217369 23.07
1/16	13/32	1-1/2	141491 17.42	217380 21.76
5/64	7/16	1-1/2	141502 18.45	217391 23.07
3/32	1/2	1-1/2	141513 20.33	217402 25.40
7/64	5/8	2	141524 23.07	217413 28.83
1/8	3/4	2	141535 24.62	217424 30.76
9/64	3/4	2	141546 27.28	217435 34.07
5/32	7/8	2	141557 30.55	217446 38.16
11/64	7/8	2	141568 36.07	217457 45.11
3/16	7/8	2	141579 37.09	217468 46.38
13/64	1-1/8	2-1/2	141590 42.86	217479 53.58
7/32	1-1/8	2-1/2	141601 47.56	217490 59.47
15/64	1-1/4	2-1/2	141612 53.82	217501 67.28
1/4	1-1/4	2-1/2	141623 56.56	217512 70.71
17/64	1-1/4	2-1/2	141634 63.76	217523 79.67

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	UNCOATED LIST PRICE	ALTIM LIST PRICE
9/32	1-1/4	2-1/2	141645 66.42	217534 83.02
19/64	1-1/4	2-1/2	141656 74.60	217545 93.29
5/16	1-1/4	2-1/2	141667 78.57	217556 98.16
21/64	1-3/8	3	141678 85.68	217567 107.11
11/32	1-3/8	3	141689 93.70	217578 117.09
23/64	1-3/8	3	141700 104.74	217589 130.92
3/8	1-3/8	3	141711 111.08	217600 138.85
25/64	1-3/8	3	141722 130.10	217611 162.61
13/32	1-3/8	3	141733 142.49	217622 178.11
27/64	1-3/8	3	141744 155.00	217633 193.73
7/16	1-3/8	3	141755 162.12	217644 202.65
29/64	1-3/8	3	141766 188.09	217655 235.12
15/32	1-3/8	3	141777 195.98	217666 244.98
31/64	1-3/8	3	141788 201.51	217677 251.89
1/2	1-3/8	3	141799 201.96	217688 252.42

NOTE: SIZES 7/64" AND UNDER ARE NOT SPLIT.

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	UNCOATED LIST PRICE	ALTIM LIST PRICE
A	1-1/4	2-1/2	141810 54.31	217699 67.89
B	1-1/4	2-1/2	141821 56.56	217710 70.71
C	1-1/4	2-1/2	141832 56.97	217721 71.24
D	1-1/4	2-1/2	141843 57.71	217732 72.10
E	1-1/4	2-1/2	141854 56.56	217743 70.71
F	1-1/4	2-1/2	141865 62.94	217754 78.65
G	1-1/4	2-1/2	141876 66.71	217765 83.39
H	1-1/4	2-1/2	141887 68.14	217776 85.19
I	1-1/4	2-1/2	141898 69.28	217787 86.62
J	1-1/4	2-1/2	141909 71.12	217798 88.91
K	1-1/4	2-1/2	141920 71.78	217809 89.69
L	1-1/4	2-1/2	141931 75.87	217820 94.80
M	1-1/4	2-1/2	141942 77.38	217831 96.77

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	UNCOATED LIST PRICE	ALTIM LIST PRICE
N	1-1/4	2-1/2	141953 82.25	217842 102.78
O	1-3/8	3	141964 86.70	217853 108.38
P	1-3/8	3	141975 90.02	217864 112.51
Q	1-3/8	3	141986 93.29	217875 116.60
R	1-3/8	3	141997 97.38	217886 121.71
S	1-3/8	3	142008 103.72	217897 129.69
T	1-3/8	3	142019 107.44	217908 134.31
U	1-3/8	3	142030 112.76	217919 140.94
V	1-3/8	3	142041 124.86	217930 156.07
W	1-3/8	3	142052 134.47	217941 168.09
X	1-3/8	3	142063 146.78	217952 183.47
Y	1-3/8	3	142074 151.69	217963 189.60
Z	1-3/8	3	142085 164.41	217974 205.47

For coating information see page 6. For technical information, please see page 245.

DIAMETER TOLERANCE +.0000, -.0005

MADE IN THE USA

Carbide Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



STUB LENGTH - 135° SPLIT POINT - 15° HELIX

UNCOATED



ALTIM COATED



WIRE SIZES					WIRE SIZES								
SIZE	FLUTE LENGTH	OAL	UNCOATED LIST PRICE	ALTIM LIST PRICE	SIZE	FLUTE LENGTH	OAL	UNCOATED LIST PRICE	ALTIM LIST PRICE				
#1	1-1/4	2-1/2	142096	49.20	217985	61.51	#31	3/4	2	142426	24.01	218315	29.98
#2	1-1/4	2-1/2	142107	49.20	217996	61.51	#32	3/4	2	142437	24.01	218326	29.98
#3	1-1/8	2-1/2	142118	49.20	218007	61.51	#33	3/4	2	142448	23.76	218337	29.73
#4	1-1/8	2-1/2	142129	48.67	218018	60.86	#34	3/4	2	142459	23.56	218348	29.45
#5	1-1/8	2-1/2	142140	43.47	218029	54.31	#35	3/4	2	142470	23.56	218359	29.45
#6	1-1/8	2-1/2	142151	43.47	218040	54.31	#36	5/8	2	142481	23.56	218370	29.45
#7	1-1/8	2-1/2	142162	42.21	218051	52.76	#37	5/8	2	142492	22.33	218381	27.93
#8	1-1/8	2-1/2	142173	42.04	218062	52.55	#38	5/8	2	142503	21.92	218392	27.40
#9	1-1/8	2-1/2	142184	42.04	218073	52.55	#39	5/8	2	142514	21.92	218403	27.40
#10	1-1/8	2-1/2	142195	42.04	218084	52.55	#40	5/8	2	142525	21.10	218414	26.42
#11	1-1/8	2-1/2	142206	40.98	218095	51.25	#41	5/8	2	142536	21.10	218425	26.42
#12	1-1/8	2-1/2	142217	40.98	218106	51.25	#42	1/2	1-1/2	142547	20.53	218436	25.64
#13	7/8	2	142228	39.55	218117	49.45	#43	1/2	1-1/2	142558	20.53	218447	25.64
#14	7/8	2	142239	38.57	218128	48.22	#44	1/2	1-1/2	142569	19.47	218458	24.33
#15	7/8	2	142250	37.95	218139	47.40	#45	1/2	1-1/2	142580	18.85	218469	23.56
#16	7/8	2	142261	37.95	218150	47.40	#46	1/2	1-1/2	142591	18.85	218480	23.56
#17	7/8	2	142272	36.07	218161	45.11	#47	1/2	1-1/2	142602	18.85	218491	23.56
#18	7/8	2	142283	33.90	218172	42.41	#48	7/16	1-1/2	142613	18.85	218502	23.56
#19	7/8	2	142294	33.21	218183	41.51	#49	7/16	1-1/2	142624	18.04	218513	22.54
#20	7/8	2	142305	31.78	218194	39.75	#50	7/16	1-1/2	142635	18.04	218524	22.54
#21	7/8	2	142316	31.78	218205	39.75	#51	7/16	1-1/2	142646	17.42	218535	21.76
#22	7/8	2	142327	30.55	218216	38.16	#52	7/16	1-1/2	142657	17.42	218546	21.76
#23	7/8	2	142338	30.55	218227	38.16	#53	13/32	1-1/2	142668	18.45	218557	23.07
#24	7/8	2	142349	30.35	218238	37.95	#54	13/32	1-1/2	142679	18.45	218568	23.07
#25	7/8	2	142360	28.71	218249	35.87	#55	13/32	1-1/2	142690	18.45	218579	23.07
#26	7/8	2	142371	28.71	218260	35.87	#56	3/8	1-1/2	142701	18.45	218590	23.07
#27	7/8	2	142382	28.71	218271	35.87	#57	3/8	1-1/2	142712	18.45	218601	23.07
#28	3/4	2	142393	27.28	218282	34.07	#58	3/8	1-1/2	142723	18.45	218612	23.07
#29	3/4	2	142404	27.28	218293	34.07	#59	3/8	1-1/2	142734	18.45	218623	23.07
#30	3/4	2	142415	25.81	218304	32.27	#60	3/8	1-1/2	142745	18.45	218634	23.07

NOTE: SIZES 31 - 60 ARE NOT SPLIT.

For coating information see page 6. For technical information, please see page 245.

DIAMETER TOLERANCE +.0000, -.0005

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

JOBBER LENGTH - 118° SPLIT POINT - 25° HELIX

UNCOATED



ALTIM COATED



END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

FRACTIONAL SIZES						FRACTIONAL SIZES							
SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
1/32	5/16	1-1/4	138917	17.34	227324	21.68	9/32	2-1/8	3-1/2	139093	62.53	227500	78.20
3/64	3/4	1-1/2	138928	17.34	227335	21.68	19/64	2-3/8	3-3/4	139104	70.26	227511	87.81
1/16	3/4	1-1/2	138939	16.40	227346	20.49	5/16	2-3/8	3-3/4	139115	73.90	227522	92.35
5/64	7/8	1-3/4	138950	17.34	227357	21.68	21/64	2-1/2	4	139126	80.65	227533	100.81
3/32	1	2	138961	19.10	227368	23.88	11/32	2-1/2	4	139137	88.18	227544	110.22
7/64	1-1/4	2-1/4	138972	21.72	227379	27.16	23/64	2-3/4	4-1/4	139148	98.61	227555	123.27
1/8	1-1/4	2-1/4	138983	23.15	227390	28.96	3/8	2-3/4	4-1/4	139159	104.58	227566	130.71
9/64	1-3/8	2-1/2	138994	25.64	227401	32.06	25/64	2-7/8	4-1/2	139170	122.45	227577	153.04
5/32	1-3/8	2-1/2	139005	28.75	227412	35.95	13/32	2-7/8	4-1/2	139181	134.11	227588	167.64
11/64	1-5/8	2-3/4	139016	33.95	227423	42.45	27/64	2-7/8	4-1/2	139192	145.84	227599	182.28
3/16	1-5/8	2-3/4	139027	34.93	227434	43.64	7/16	2-7/8	4-1/2	139203	152.59	227610	190.79
13/64	1-3/4	3	139038	40.33	227445	50.43	29/64	3	4-3/4	139214	177.05	227621	221.30
7/32	1-3/4	3	139049	44.74	227456	55.95	15/32	3	4-3/4	139225	184.45	227632	230.54
15/64	2	3-1/4	139060	50.67	227467	63.31	31/64	3	4-3/4	139236	189.64	227643	237.09
1/4	2	3-1/4	139071	53.25	227478	66.54	1/2	3	4-3/4	139247	190.05	227654	237.58
17/64	2-1/8	3-1/2	139082	59.96	227489	74.97							

NOTE: SIZES 7/64" AND UNDER ARE NOT SPLIT.

METRIC SIZES						METRIC SIZES							
SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
0.7	12	31	216775	21.55	228611	26.95	3.0	32	57	217028	29.69	228864	37.09
0.8	12	31	216786	21.55	228622	26.95	3.1	32	57	217039	29.69	228875	37.09
0.9	16	38	216797	21.55	228633	26.95	3.2	32	57	217050	29.69	228886	37.09
1.0	16	38	216808	21.55	228644	26.95	3.3	32	57	217061	29.69	228897	37.09
1.1	19	38	216819	21.55	228655	26.95	3.4	35	63	217072	32.23	228908	40.33
1.2	19	38	216830	21.55	228666	26.95	3.5	35	63	217083	32.23	228919	40.33
1.3	19	38	216841	21.55	228677	26.95	4.0	35	63	217094	39.67	228930	49.57
1.4	19	38	216852	21.55	228688	26.95	4.5	41	70	217105	42.49	228941	53.13
1.5	19	38	216863	21.72	228699	27.16	5.0	44	75	217116	46.99	228952	58.77
1.6	19	38	216874	21.72	228710	27.16	5.5	44	75	217127	55.66	228963	69.57
1.7	19	38	216885	21.72	228721	27.16	6.0	50	82	217138	58.85	228974	73.54
1.8	22	38	216896	21.72	228732	27.16	6.5	50	82	217149	93.74	228985	117.17
1.9	22	38	216907	21.72	228743	27.16	7.0	54	89	217160	102.65	228996	128.34
2.0	22	44	216918	23.07	228754	28.83	7.5	60	95	217171	106.01	229007	132.51
2.1	22	44	216929	23.07	228765	28.83	8.0	60	95	217182	112.14	229018	140.16
2.2	25	50	216940	23.07	228776	28.83	8.5	63	100	217193	138.44	229029	173.04
2.3	25	50	216951	23.07	228787	28.83	9.0	70	100	217204	157.17	229040	196.47
2.4	25	50	216962	23.07	228798	28.83	9.5	70	108	217215	179.34	229051	224.20
2.5	25	50	216973	26.50	228809	33.13	10.0	73	114	217226	205.96	229062	257.45
2.6	32	57	216984	26.50	228820	33.13	10.5	73	114	217237	230.34	229073	287.92
2.7	32	57	216995	26.50	228831	33.13	11.0	73	114	217248	274.06	229084	342.60
2.8	32	57	217006	26.50	228842	33.13	11.5	76	120	217259	282.28	229095	352.87
2.9	32	57	217017	26.50	228853	33.13	12.0	76	120	217270	313.28	229106	391.64

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC ()

NOTE: SIZES 3.1 AND UNDER ARE NOT SPLIT.

For coating information see page 6. For technical information, please see page 245.

DIAMETER TOLERANCE +.0000, -.0005

Carbide Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



JOBBER LENGTH - 118° SPLIT POINT - 25° HELIX

UNCOATED



ALTiN COATED



LETTER SIZES						LETTER SIZES							
SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
A	2	3-1/4	139258	51.12	227665	63.88	N	2-3/8	3-3/4	139401	84.49	227808	96.77
B	2	3-1/4	139269	53.25	227676	66.54	O	2-3/8	3-3/4	139412	89.36	227819	102.00
C	2	3-1/4	139280	53.66	227687	67.07	P	2-3/8	3-3/4	139423	92.35	227830	105.89
D	2	3-1/4	139291	54.31	227698	67.89	Q	2-1/2	4	139434	98.07	227841	109.73
E	2	3-1/4	139302	53.25	227709	66.54	R	2-1/2	4	139445	101.08	227852	114.56
F	2	3-1/4	139313	63.22	227720	74.03	S	2-1/2	4	139456	107.90	227863	122.04
G	2-1/8	3-1/2	139324	68.37	227731	78.48	T	2-3/4	4-1/4	139467	111.68	227874	126.38
H	2-1/8	3-1/2	139335	70.18	227742	80.20	U	2-3/4	4-1/4	139478	117.07	227885	132.63
I	2-1/8	3-1/2	139346	71.53	227753	81.51	V	2-3/4	4-1/4	139489	126.87	227896	146.91
J	2-1/8	3-1/2	139357	76.04	227764	83.72	W	2-7/8	4-1/2	139500	133.26	227907	158.24
K	2-1/8	3-1/2	139368	76.21	227775	84.41	X	2-7/8	4-1/2	139511	145.60	227918	172.67
L	2-1/8	3-1/2	139379	76.54	227786	89.24	Y	2-7/8	4-1/2	139522	150.33	227929	178.48
M	2-3/8	3-3/4	139390	76.99	227797	91.04	Z	2-7/8	4-1/2	139533	186.57	227940	193.41

WIRE SIZES						WIRE SIZES							
SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
#1	1-3/4	3	139544	46.34	227951	57.91	#31	1-1/4	2-1/4	139874	22.58	228281	28.22
#2	1-3/4	3	139555	46.34	227962	57.91	#32	1-1/4	2-1/4	139885	22.58	228292	28.22
#3	1-3/4	3	139566	46.34	227973	57.91	#33	1-1/4	2-1/4	139896	22.37	228303	27.97
#4	1-3/4	3	139577	45.85	227984	57.30	#34	1-1/4	2-1/4	139907	22.21	228314	27.73
#5	1-3/4	3	139588	40.90	227995	51.16	#35	1-1/4	2-1/4	139918	22.21	228325	27.73
#6	1-3/4	3	139599	40.90	228006	51.16	#36	1-1/4	2-1/4	139929	22.21	228336	27.73
#7	1-3/4	3	139610	39.75	228017	49.69	#37	1-1/4	2-1/4	139940	21.02	228347	26.30
#8	1-3/4	3	139621	39.55	228028	49.45	#38	1-1/4	2-1/4	139951	20.65	228358	25.81
#9	1-3/4	3	139632	39.55	228039	49.45	#39	1-1/4	2-1/4	139962	20.65	228369	25.81
#10	1-5/8	2-3/4	139643	39.55	228050	49.45	#40	1	2	139973	19.88	228380	24.83
#11	1-5/8	2-3/4	139654	38.61	228061	48.22	#41	1	2	139984	19.88	228391	24.83
#12	1-5/8	2-3/4	139665	38.61	228072	48.22	#42	1	2	139995	19.30	228402	24.13
#13	1-5/8	2-3/4	139676	37.22	228083	46.54	#43	1	2	140006	19.30	228413	24.13
#14	1-5/8	2-3/4	139687	36.28	228094	45.36	#44	1	2	140017	18.32	228424	22.90
#15	1-5/8	2-3/4	139698	35.70	228105	44.62	#45	7/8	1-3/4	140028	17.79	228435	22.21
#16	1-5/8	2-3/4	139709	35.70	228116	44.62	#46	7/8	1-3/4	140039	17.79	228446	22.21
#17	1-5/8	2-3/4	139720	33.95	228127	42.45	#47	7/8	1-3/4	140050	17.79	228457	22.21
#18	1-5/8	2-3/4	139731	31.94	228138	39.92	#48	7/8	1-3/4	140061	17.79	228468	22.21
#19	1-5/8	2-3/4	139742	31.25	228149	39.06	#49	7/8	1-3/4	140072	16.97	228479	21.23
#20	1-3/8	2-1/2	139753	29.90	228160	37.38	#50	7/8	1-3/4	140083	16.97	228490	21.23
#21	1-3/8	2-1/2	139764	29.90	228171	37.38	#51	3/4	1-1/2	140094	16.40	228501	20.49
#22	1-3/8	2-1/2	139775	28.75	228182	35.95	#52	3/4	1-1/2	140105	16.40	228512	20.49
#23	1-3/8	2-1/2	139786	28.75	228193	35.95	#53	3/4	1-1/2	140116	17.34	228523	21.68
#24	1-3/8	2-1/2	139797	28.55	228204	35.70	#54	3/4	1-1/2	140127	17.34	228534	21.68
#25	1-3/8	2-1/2	139808	26.99	228215	33.78	#55	3/4	1-1/2	140138	17.34	228545	21.68
#26	1-3/8	2-1/2	139819	26.99	228226	33.78	#56	3/4	1-1/2	140149	17.34	228556	21.68
#27	1-3/8	2-1/2	139830	26.99	228237	33.78	#57	3/4	1-1/2	140160	17.34	228567	21.68
#28	1-3/8	2-1/2	139841	25.64	228248	32.06	#58	3/4	1-1/2	140171	17.34	228578	21.68
#29	1-3/8	2-1/2	139852	25.64	228259	32.06	#59	3/4	1-1/2	140182	17.34	228589	21.68
#30	1-1/4	2-1/4	139863	24.29	228270	30.39	#60	3/4	1-1/2	140193	17.34	228600	21.68

NOTE: SIZES 31-60 ARE NOT SPLIT.

For coating information see page 6. For technical information, please see page 245.

DIAMETER TOLERANCE +.0000, -.0005

MADE IN THE USA

END MILLS

DRILL MILLS

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Carbide Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

STRAIGHT FLUTE - 140° FOUR FACET

UNCOATED



ALTIM COATED



FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
1/8	3/4	2	140270	26.99	229183	33.74
9/64	3/4	2	140281	30.88	229194	38.57
5/32	7/8	2	140292	34.56	229205	43.23
11/64	7/8	2	140303	38.36	229216	47.93
3/16	7/8	2	140314	35.42	229227	44.25
13/64	1-1/8	2-1/2	140325	46.05	229238	57.63
7/32	1-1/8	2-1/2	140336	51.74	229249	64.70
15/64	1-1/4	2-1/2	140347	54.60	229260	68.26
1/4	1-1/4	2-1/2	140358	51.65	229271	64.58
17/64	1-1/4	2-1/2	140369	71.82	229282	89.73
9/32	1-1/4	2-1/2	140380	74.64	229293	93.33
19/64	1-1/4	2-1/2	140391	79.02	229304	98.77

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
5/16	1-1/4	2-1/2	140402	81.84	229315	102.29
21/64	1-3/8	3	140413	87.97	229326	109.93
11/32	1-3/8	3	140424	97.58	229337	121.96
23/64	1-3/8	3	140435	106.74	229348	133.45
3/8	1-3/8	3	140446	105.84	229359	132.31
25/64	1-3/8	3	140457	130.92	229370	163.63
13/32	1-3/8	3	140468	125.27	229381	156.60
27/64	1-3/8	3	140479	158.85	229392	198.52
7/16	1-3/8	3	140490	154.92	229403	193.65
15/32	1-3/8	3	140501	172.39	229414	215.49
1/2	1-3/8	3	140512	186.78	229425	233.49

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
A	1-1/4	2-1/2	140523	54.60	229436	68.26
B	1-1/4	2-1/2	140534	54.60	229447	68.26
C	1-1/4	2-1/2	140545	54.60	229458	68.26
D	1-1/4	2-1/2	140556	54.60	229469	68.26
E	1-1/4	2-1/2	140567	51.65	229480	64.58
F	1-1/4	2-1/2	140578	71.82	229491	89.73
G	1-1/4	2-1/2	140589	71.82	229502	89.73
H	1-1/4	2-1/2	140600	71.82	229513	89.73
I	1-1/4	2-1/2	140611	74.64	229524	93.33
J	1-1/4	2-1/2	140622	74.64	229535	93.33
K	1-1/4	2-1/2	140633	74.64	229546	93.33
L	1-1/4	2-1/2	140644	79.02	229557	98.77
M	1-1/4	2-1/2	140655	79.02	229568	98.77

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
N	1-1/4	2-1/2	140666	81.84	229579	102.29
O	1-3/8	3	140677	81.84	229590	102.29
P	1-3/8	3	140688	87.97	229601	109.98
Q	1-3/8	3	140699	97.58	229612	121.96
R	1-3/8	3	140710	97.58	229623	121.96
S	1-3/8	3	140721	106.74	229634	133.45
T	1-3/8	3	140732	106.74	229645	133.45
U	1-3/8	3	140743	118.40	229656	147.97
V	1-3/8	3	140754	118.40	229667	147.97
W	1-3/8	3	140765	130.92	229678	163.63
X	1-3/8	3	140776	144.86	229689	181.10
Y	1-3/8	3	140787	151.85	229700	189.81
Z	1-3/8	3	140798	158.85	229711	198.52

For coating information see page 6. For technical information, please see page 245.

DIAMETER TOLERANCE +.0000, -.0005

END MILLS

DRILL MILLS

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Carbide Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



STRAIGHT FLUTE - 140° FOUR FACET

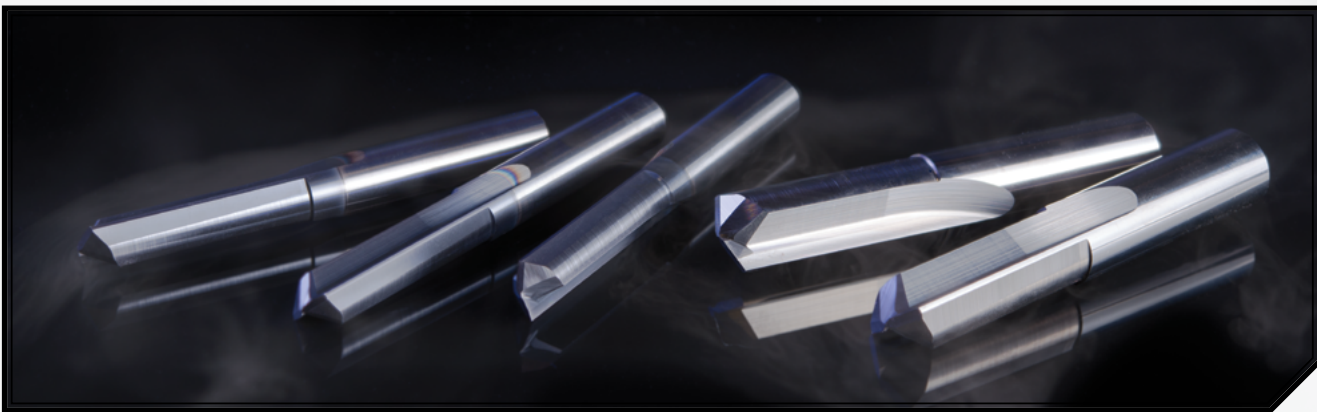
UNCOATED



ALTIN COATED



WIRE SIZES						WIRE SIZES							
SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	SIZE	FLUTE LENGTH	OAL	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
#1	1-1/4	2-1/2	140809	53.13	229722	66.42	#16	7/8	2	140974	39.71	229887	49.65
#2	1-1/4	2-1/2	140820	52.19	229733	65.23	#17	7/8	2	140985	38.77	229898	48.46
#3	1-1/8	2-1/2	140831	50.10	229744	62.62	#18	7/8	2	140996	37.67	229909	47.07
#4	1-1/8	2-1/2	140842	47.32	229755	59.14	#19	7/8	2	141007	37.42	229920	46.79
#5	1-1/8	2-1/2	140853	47.85	229766	59.79	#20	7/8	2	141018	36.15	229931	45.19
#6	1-1/8	2-1/2	140864	47.16	229777	58.93	#21	7/8	2	141029	35.91	229942	44.91
#7	1-1/8	2-1/2	140875	45.40	229788	56.77	#22	7/8	2	141040	35.21	229953	44.05
#8	1-1/8	2-1/2	140886	44.74	229799	55.91	#23	7/8	2	141051	33.74	229964	42.17
#9	1-1/8	2-1/2	140897	43.39	229810	54.23	#24	7/8	2	141062	32.80	229975	41.02
#10	1-1/8	2-1/2	140908	42.74	229821	53.45	#25	7/8	2	141073	31.82	229986	39.79
#11	1-1/8	2-1/2	140919	42.00	229832	52.47	#26	7/8	2	141084	31.45	229997	39.30
#12	1-1/8	2-1/2	140930	41.23	229843	51.53	#27	7/8	2	141095	30.84	230008	38.57
#13	7/8	2	140941	40.53	229854	50.63	#28	3/4	2	141106	29.81	230019	37.22
#14	7/8	2	140952	40.24	229865	50.35	#29	3/4	2	141117	29.16	230030	36.44
#15	7/8	2	140963	39.88	229876	49.81	#30	3/4	2	141128	28.71	230041	35.91



Straight flute drills excel in high rockwell and hard to machine materials

For coating information see page 6. For technical information, please see page 245.

DIAMETER TOLERANCE	+.0000, -.0005
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MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

STOCKED INTERMEDIATE & STANDARD SIZES



END MILLS

DRILL MILLS

CHAMFER MILLS

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REAMERS

BURS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0400	#60	.0400	1-1/2	1/4	4	157353	46.01
.0410	#59	.0410	1-1/2	3/8	4	157364	46.01
.0420	#58	.0420	1-1/2	3/8	4	157375	46.01
.0430	#57	.0430	1-1/2	3/8	4	157386	46.01
.0440		.0440	1-1/2	3/8	4	157397	48.61
.0450		.0450	1-1/2	3/8	4	157408	48.61
.0460		.0460	1-1/2	3/8	4	157419	48.61
.0465	#56	.0465	1-1/2	3/8	4	157430	46.01
.0469	3/64	.0469	1-1/2	3/8	4	157441	43.72
.0470		.0470	1-1/2	3/8	4	157452	48.61
.0480		.0480	1-1/2	3/8	4	157463	48.61
.0490		.0490	1-1/2	3/8	4	157474	48.61
.0500		.0500	1-1/2	3/8	4	157485	48.61
.0510		.0510	1-1/2	3/8	4	157496	48.61
.0520	#55	.0520	1-1/2	3/8	4	157507	46.01
.0530		.0530	1-1/2	3/8	4	157518	48.61
.0540		.0540	1-1/2	3/8	4	157529	48.61
.0550	#54	.0550	1-1/2	3/8	4	157540	46.01
.0560		.0560	1-1/2	3/8	4	157551	48.61
.0570		.0570	1-1/2	3/8	4	157562	48.61
.0580		.0580	1-1/2	3/8	4	157573	48.61
.0590		.0590	1-1/2	3/8	4	157584	48.61
.0591	1.5mm	.0591	1-1/2	3/8	4	157595	48.61
.0595	#53	.0595	1-1/2	3/8	4	157606	46.01
.0600		.0600	1-1/2	3/8	4	157617	48.61
.0605		.0605	1-1/2	3/8	4	157628	64.64
.0610		.0610	1-1/2	3/8	4	157639	48.61
.0615		.0615	1-1/2	3/8	4	157650	53.77
.0620		.0620	1-1/2	3/8	4	157661	48.61
.0625	1/16	.0625	1-1/2	3/8	4	157672	43.72
.0630		.0630	1-1/2	3/8	4	157683	48.61
.0635	#52	.0635	1-1/2	3/8	4	157694	46.01
.0640		.0640	1-1/2	3/8	4	157705	48.61
.0645		.0645	1-1/2	3/8	4	157716	64.64
.0650		.0650	1-1/2	3/8	4	157727	48.61
.0660		.0660	1-3/4	1/2	4	157738	48.61
.0670	#51	.0670	1-3/4	1/2	4	157749	46.01
.0680		.0680	1-3/4	1/2	4	157760	48.61
.0690		.0690	1-3/4	1/2	4	157771	48.61
.0700	#50	.0700	1-3/4	1/2	4	157782	46.01

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0710		.0710	1-3/4	1/2	4	157793	48.61
.0720		.0720	1-3/4	1/2	4	157804	48.61
.0730	#49	.0730	1-3/4	1/2	4	157815	46.01
.0740		.0740	1-3/4	1/2	4	157826	48.61
.0750		.0750	1-3/4	1/2	4	157837	48.61
.0760	#48	.0760	1-3/4	1/2	4	157848	46.01
.0770		.0770	1-3/4	1/2	4	157859	48.61
.0780		.0780	1-3/4	1/2	4	157870	48.61
.0781	5/64	.0781	1-3/4	1/2	4	157881	43.72
.0785	#47	.0785	1-3/4	1/2	4	157892	46.01
.0787	2mm	.0787	1-3/4	1/2	4	157903	48.61
.0790		.0790	1-3/4	1/2	4	157914	48.61
.0800		.0800	1-3/4	1/2	4	157925	48.61
.0810	#46	.0810	2	1/2	4	157936	46.01
.0820	#45	.0820	2	1/2	4	157947	46.01
.0830		.0830	2	1/2	4	157958	48.61
.0840		.0840	2	1/2	4	157969	48.61
.0850		.0850	2	1/2	4	157980	48.61
.0860	#44	.0860	2	1/2	4	157991	46.01
.0870		.0870	2	1/2	4	158002	48.61
.0880		.0880	2	1/2	4	158013	48.61
.0890	#43	.0890	2	1/2	4	158024	46.01
.0900		.0900	2	1/2	4	158035	48.61
.0910		.0910	2	1/2	4	158046	48.61
.0915		.0915	2	1/2	4	158057	64.12
.0920		.0920	2	1/2	4	158068	48.61
.0925		.0925	2	1/2	4	158079	53.77
.0930		.0930	2	1/2	4	158090	48.61
.0935	#42	.0935	2	1/2	4	158101	46.01
.0938	3/32	.0938	2	1/2	4	158112	43.72
.0940		.0940	2	1/2	4	158123	48.61
.0945		.0945	2	1/2	4	158134	53.77
.0950		.0950	2	1/2	4	158145	48.61
.0960	#41	.0960	2	5/8	4	158156	46.01
.0970		.0970	2	5/8	4	158167	48.61
.0980	#40	.0980	2	5/8	4	158178	46.01
.0984	2.5mm	.0984	2	5/8	4	158189	48.61
.0990		.0990	2-1/4	5/8	4	158200	48.61
.0995	#39	.0995	2-1/4	5/8	4	158211	46.01
.1000		.1000	2-1/4	5/8	4	158222	48.61

For technical information, please see page 256.

DIAMETER TOLERANCE +.0003, -.0000

MADE IN THE USA

Carbide Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



STOCKED INTERMEDIATE & STANDARD SIZES



DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.1010		.1010	2-1/4	5/8	4	158233	48.61
.1015	#38	.1015	2-1/4	5/8	4	158244	46.01
.1020		.1020	2-1/4	5/8	4	158255	48.61
.1030		.1030	2-1/4	5/8	4	158266	48.61
.1040	#37	.1040	2-1/4	5/8	4	158277	46.01
.1050		.1050	2-1/4	5/8	4	158288	48.61
.1060		.1060	2-1/4	5/8	4	158299	48.61
.1065	#36	.1065	2-1/4	5/8	4	158310	46.01
.1070		.1070	2-1/4	5/8	4	158321	48.61
.1080		.1080	2-1/4	5/8	4	158332	48.61
.1090		.1090	2-1/4	5/8	4	158343	50.65
.1094	7/64	.1094	2-1/4	5/8	4	158354	43.72
.1100	#35	.1100	2-1/4	5/8	4	158365	46.01
.1110	#34	.1110	2-1/4	5/8	4	158376	46.01
.1120		.1120	2-1/4	5/8	4	158387	48.61
.1130	#33	.1130	2-1/4	5/8	4	158398	46.01
.1140		.1140	2-1/4	5/8	4	158409	48.61
.1150		.1150	2-1/4	5/8	4	158420	48.61
.1160	#32	.1160	2-1/4	5/8	4	158431	48.40
.1170		.1170	2-1/4	5/8	4	158442	51.47
.1180		.1180	2-1/4	5/8	4	158453	51.47
.1181	3mm	.1181	2-1/4	5/8	4	158464	47.31
.1190		.1190	2-1/4	5/8	4	158475	51.47
.1200	#31	.1200	2-1/4	5/8	4	158486	48.40
.1210		.1210	2-1/4	5/8	4	158497	51.47
.1220		.1220	2-1/4	5/8	4	158508	51.47
.1230		.1230	2-1/4	5/8	4	158519	51.47
.1235		.1235	2-1/4	5/8	4	158530	68.54
.1240		.1240	2-1/4	5/8	4	158541	51.47
.1245		.1245	2-1/4	5/8	4	158552	56.89
.1250	1/8	.1250	2-1/4	5/8	4	158563	46.53
.1255		.1255	2-1/4	5/8	4	158574	56.89
.1260		.1260	2-1/4	5/8	4	158585	51.47
.1265		.1265	2-1/4	5/8	4	158596	68.54
.1270		.1270	2-1/4	5/8	4	158607	51.47
.1275		.1275	2-1/4	5/8	4	158618	68.54
.1280		.1280	2-1/4	5/8	4	158629	51.47
.1285	#30	.1285	2-1/4	5/8	4	158640	51.47
.1290		.1290	2-1/4	5/8	4	158651	51.47
.1300		.1300	2-1/2	5/8	4	158662	51.47

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.1310		.1310	2-1/2	3/4	4	158673	58.92
.1320		.1320	2-1/2	3/4	4	158684	58.92
.1330		.1330	2-1/2	3/4	4	158695	58.92
.1340		.1340	2-1/2	3/4	4	158706	58.92
.1350		.1350	2-1/2	3/4	4	158717	58.92
.1360	#29	.1360	2-1/2	3/4	4	158728	55.11
.1370		.1370	2-1/2	3/4	4	158739	58.92
.1378	3.5mm	.1378	2-1/2	3/4	4	158750	58.92
.1380		.1380	2-1/2	3/4	4	158761	58.92
.1390		.1390	2-1/2	3/4	4	158772	58.92
.1400		.1400	2-1/2	3/4	4	158783	58.92
.1405	#28	.1405	2-1/2	3/4	4	158794	55.11
.1406	9/64	.1406	2-1/2	3/4	4	158805	53.03
.1410		.1410	2-1/2	3/4	4	158816	58.92
.1420		.1420	2-1/2	3/4	4	158827	58.92
.1430		.1430	2-1/2	3/4	4	158838	58.92
.1440	#27	.1440	2-1/2	3/4	4	158849	55.11
.1450		.1450	2-1/2	3/4	4	158860	58.92
.1460		.1460	2-1/2	3/4	4	158871	61.52
.1470	#26	.1470	2-1/2	3/4	4	158882	57.41
.1480		.1480	2-1/2	3/4	4	158893	61.52
.1490		.1490	2-1/2	3/4	4	158904	61.52
.1495	#25	.1495	2-1/2	3/4	4	158915	57.41
.1500		.1500	2-1/2	3/4	4	158926	61.52
.1510		.1510	2-1/2	3/4	4	158937	61.52
.1520	#24	.1520	2-1/2	3/4	4	158948	57.41
.1530		.1530	2-1/2	3/4	4	158959	61.52
.1540	#23	.1540	2-1/2	3/4	4	158970	57.41
.1545		.1545	2-1/2	3/4	4	158981	71.14
.1550		.1550	2-1/2	3/4	4	158992	61.52
.1555		.1555	2-1/2	3/4	4	159003	71.14
.1560		.1560	2-1/2	3/4	4	159014	61.52
.1562	5/32	.1562	2-1/2	3/4	4	159025	55.63
.1565		.1565	2-1/2	3/4	4	159036	71.14
.1570	#22	.1570	2-1/2	3/4	4	159047	57.41
.1575	4mm	.1575	2-1/2	3/4	4	159058	61.52
.1580		.1580	2-1/2	3/4	4	159069	61.52
.1590	#21	.1590	2-1/2	3/4	4	159080	57.41
.1600		.1600	2-1/2	3/4	4	159091	61.52
.1610	#20	.1610	2-1/2	7/8	4	159102	64.64

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

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MADE IN THE USA



Carbide Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

STOCKED INTERMEDIATE & STANDARD SIZES



END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1620		.1620	2-3/4	7/8	4	159113	69.28
.1630		.1630	2-3/4	7/8	4	159124	69.28
.1640		.1640	2-3/4	7/8	4	159135	69.28
.1650		.1650	2-3/4	7/8	4	159146	64.64
.1660	#19	.1660	2-3/4	7/8	4	159157	64.64
.1670		.1670	2-3/4	7/8	4	159168	69.28
.1680		.1680	2-3/4	7/8	4	159179	69.28
.1690		.1690	2-3/4	7/8	4	159190	69.28
.1695	#18	.1695	2-3/4	7/8	4	159201	64.64
.1700		.1700	2-3/4	7/8	4	159212	69.28
.1710		.1710	2-3/4	7/8	4	159223	69.28
.1719	11/64	.1719	2-3/4	7/8	4	159234	62.30
.1720		.1720	2-3/4	7/8	4	159245	69.28
.1730	#17	.1730	2-3/4	7/8	4	159256	64.64
.1740		.1740	2-3/4	7/8	4	159267	69.28
.1750		.1750	2-3/4	7/8	4	159278	69.28
.1760		.1760	2-3/4	7/8	4	159289	69.28
.1770	#16	.1770	2-3/4	7/8	4	159300	64.64
.1772	4.5mm	.1772	2-3/4	7/8	4	159311	72.14
.1780		.1780	2-3/4	7/8	4	159322	69.28
.1790		.1790	2-3/4	7/8	4	159333	69.28
.1800	#15	.1800	2-3/4	7/8	4	159344	64.64
.1810		.1810	2-3/4	7/8	4	159355	69.28
.1820	#14	.1820	2-3/4	7/8	4	159366	64.64
.1830		.1830	2-3/4	7/8	4	159377	69.28
.1840		.1840	2-3/4	7/8	4	159388	69.28
.1850	#13	.1850	2-3/4	7/8	4	159399	64.64
.1855		.1855	2-3/4	7/8	4	159410	83.27
.1860		.1860	2-3/4	7/8	4	159421	69.28
.1865		.1865	2-3/4	7/8	4	159432	74.48
.1870		.1870	2-3/4	7/8	4	159443	69.28
.1875	3/16	.1875	2-3/4	7/8	4	159454	62.30
.1880		.1880	2-3/4	7/8	4	159465	69.28
.1885		.1885	2-3/4	7/8	4	159476	74.48
.1890	#12	.1890	2-3/4	7/8	4	159487	64.64
.1900		.1900	2-3/4	7/8	4	159498	69.28
.1910	#11	.1910	2-3/4	7/8	4	159509	78.59
.1920		.1920	2-3/4	7/8	4	159520	84.05
.1930		.1930	2-3/4	7/8	4	159531	84.05
.1935	#10	.1935	2-3/4	7/8	4	159542	78.59

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1940		.1940	2-3/4	7/8	4	159553	84.05
.1950		.1950	2-3/4	7/8	4	159564	84.05
.1960	#9	.1960	3	1	4	159575	78.59
.1969	5mm	.1969	3	1	4	159586	84.05
.1970		.1970	3	1	4	159597	84.05
.1980		.1980	3	1	4	159608	84.05
.1990	#8	.1990	3	1	4	159619	78.59
.2000		.2000	3	1	4	159630	84.05
.2010	#7	.2010	3	1	4	159641	78.59
.2020		.2020	3	1	4	159652	84.05
.2030		.2030	3	1	4	159663	84.05
.2031	13/64	.2031	3	1	4	159674	75.47
.2040	#6	.2040	3	1	4	159685	78.59
.2050		.2050	3	1	4	159696	84.05
.2055	#5	.2055	3	1	4	159707	78.59
.2060		.2060	3	1	4	159718	84.05
.2070		.2070	3	1	4	159729	84.05
.2080		.2080	3	1	4	159740	84.05
.2090	#4	.2090	3	1	4	159751	78.59
.2100		.2100	3	1	4	159762	84.05
.2110		.2110	3	1	4	159773	84.05
.2120		.2120	3	1	4	159784	84.05
.2130	#3	.2130	3	1	4	159795	78.59
.2140		.2140	3	1	4	159806	84.05
.2150		.2150	3	1	4	159817	84.05
.2160		.2160	3	1	4	159828	84.05
.2165	5.5mm	.2165	3	1	4	159839	88.69
.2170		.2170	3	1	4	159850	84.05
.2180		.2180	3	1	4	159861	84.05
.2188	7/32	.2188	3	1	4	159872	75.47
.2190		.2190	3	1	4	159883	84.05
.2200		.2200	3	1	4	159894	84.05
.2210	#2	.2210	3	1	4	159905	78.59
.2220		.2220	3	1	4	159916	84.05
.2230		.2230	3	1	4	159927	84.05
.2240		.2240	3	1	4	159938	84.05
.2250		.2250	3	1	4	159949	84.05
.2260		.2260	3	1	4	159960	92.33
.2270		.2270	3	1	4	159971	92.33
.2280	#1	.2280	3	1	4	159982	86.13

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PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



STOCKED INTERMEDIATE & STANDARD SIZES



DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.2290		.2290	3	1	4	159993	86.13
.2300		.2300	3	1	4	160004	92.33
.2310		.2310	3	1	4	160015	92.33
.2320		.2320	3	1	4	160026	92.33
.2330		.2330	3	1	4	160037	92.33
.2340	A	.2340	3	1	4	160048	92.33
.2344	15/64	.2344	3	1	4	160059	83.01
.2350		.2350	3	1	4	160070	92.33
.2360		.2360	3	1	4	160081	92.33
.2362	6mm	.2362	3	1	4	160092	87.91
.2370		.2370	3	1	4	160103	92.33
.2380	B	.2380	3	1	4	160114	92.33
.2390		.2390	3	1	4	160125	92.33
.2400		.2400	3	1	4	160136	92.33
.2410		.2410	3	1	4	160147	92.33
.2420	C	.2420	3	1	4	160158	92.33
.2430		.2430	3	1	4	160169	92.33
.2440		.2440	3	1	4	160180	92.33
.2450		.2450	3	1	4	160191	92.33
.2460	D	.2460	3	1	4	160202	92.33
.2470		.2470	3	1	4	160213	92.33
.2480		.2480	3	1	4	160224	92.33
.2485		.2485	3	1	4	160235	103.16
.2490		.2490	3	1	4	160246	92.33
.2495		.2495	3	1	4	160257	98.00
.2500	1/4	.2500	3	1	4	160268	83.01
.2505		.2505	3	1	4	160279	98.00
.2510		.2510	3	1	4	160290	92.33
.2515		.2515	3	1	4	160301	114.81
.2520		.2520	3	1	4	160312	92.33
.2530		.2530	3	1	4	160323	92.33
.2540		.2540	3	1	4	160334	92.33
.2550		.2550	3	1	6	160345	92.33
.2559	6.5mm	.2559	3-1/4	1-1/8	6	160356	97.74
.2560		.2560	3-1/4	1-1/8	6	160367	111.69
.2570	F	.2570	3-1/4	1-1/8	6	160378	111.69
.2580		.2580	3-1/4	1-1/8	6	160389	111.69
.2590		.2590	3-1/4	1-1/8	6	160400	111.69
.2600		.2600	3-1/4	1-1/8	6	160411	111.69
.2610	G	.2610	3-1/4	1-1/8	6	160422	111.69

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.2620		.2620	3-1/4	1-1/8	6	160433	111.69
.2630		.2630	3-1/4	1-1/8	6	160444	111.69
.2640		.2640	3-1/4	1-1/8	6	160455	111.69
.2650		.2650	3-1/4	1-1/8	6	160466	111.69
.2656	17/64	.2656	3-1/4	1-1/8	6	160477	100.60
.2660	H	.2660	3-1/4	1-1/8	6	160488	111.69
.2670		.2670	3-1/4	1-1/8	6	160499	111.69
.2680		.2680	3-1/4	1-1/8	6	160510	111.69
.2690		.2690	3-1/4	1-1/8	6	160521	111.69
.2700		.2700	3-1/4	1-1/8	6	160532	111.69
.2710		.2710	3-1/4	1-1/8	6	160543	111.69
.2720	I	.2720	3-1/4	1-1/8	6	160554	111.69
.2730		.2730	3-1/4	1-1/8	6	160565	111.69
.2740		.2740	3-1/4	1-1/8	6	160576	111.69
.2750		.2750	3-1/4	1-1/8	6	160587	111.69
.2756	7mm	.2756	3-1/4	1-1/8	6	160598	122.01
.2760		.2760	3-1/4	1-1/8	6	160609	111.69
.2770	J	.2770	3-1/4	1-1/8	6	160620	111.69
.2780		.2780	3-1/4	1-1/8	6	160631	111.69
.2790		.2790	3-1/4	1-1/8	6	160642	111.69
.2800		.2800	3-1/4	1-1/8	6	160653	111.69
.2810	K	.2810	3-1/4	1-1/8	6	160664	111.69
.2812	9/32	.2812	3-1/4	1-1/8	6	160675	100.60
.2820		.2820	3-1/4	1-1/8	6	160686	111.69
.2830		.2830	3-1/4	1-1/8	6	160697	111.69
.2840		.2840	3-1/4	1-1/8	6	160708	111.69
.2850		.2850	3-1/4	1-1/8	6	160719	111.69
.2860		.2860	3-1/4	1-1/8	6	160730	111.69
.2870		.2870	3-1/4	1-1/8	6	160741	111.69
.2880		.2880	3-1/4	1-1/8	6	160752	111.69
.2890		.2890	3-1/4	1-1/8	6	160763	111.69
.2900	L	.2900	3-1/4	1-1/8	6	160774	111.69
.2910		.2910	3-1/4	1-1/8	6	160785	111.69
.2920		.2920	3-1/4	1-1/8	6	160796	111.69
.2930		.2930	3-1/4	1-1/8	6	160807	111.69
.2940		.2940	3-1/4	1-1/8	6	160818	111.69
.2950	M	.2950	3-1/4	1-1/8	6	160829	111.69
.2953		.2953	3-1/4	1-1/8	6	160840	122.01
.2960		.2960	3-1/4	1-1/8	6	160851	111.69
.2969	19/64	.2969	3-1/4	1-1/8	6	160862	111.69

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

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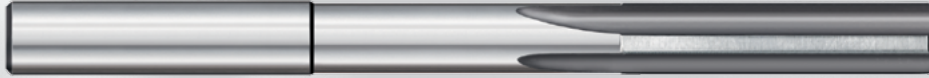
MADE IN THE USA



Carbide Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

STOCKED INTERMEDIATE & STANDARD SIZES



END MILLS

DRILL MILLS

CHAMFER MILLS

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BURS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2970		.2970	3-1/4	1-1/8	6	160873	111.69
.2980		.2980	3-1/4	1-1/8	6	160884	111.69
.2990		.2990	3-1/4	1-1/8	6	160895	111.69
.3000		.3000	3-1/4	1-1/8	6	160906	111.69
.3010		.3010	3-1/4	1-1/8	6	160917	111.69
.3020	N	.3020	3-1/4	1-1/8	6	160928	111.69
.3030		.3030	3-1/4	1-1/8	6	160939	111.69
.3040		.3040	3-1/4	1-1/8	6	160950	111.69
.3050		.3050	3-1/4	1-1/8	6	160961	111.69
.3060		.3060	3-1/4	1-1/8	6	160972	111.69
.3070		.3070	3-1/4	1-1/8	6	160983	111.69
.3080		.3080	3-1/4	1-1/8	6	160994	111.69
.3090		.3090	3-1/4	1-1/8	6	161005	111.69
.3100		.3100	3-1/4	1-1/8	6	161016	111.69
.3110		.3110	3-1/4	1-1/8	6	161027	111.69
.3115		.3115	3-1/4	1-1/8	6	161038	128.25
.3120		.3120	3-1/4	1-1/8	6	161049	111.69
.3125	5/16	.3125	3-1/4	1-1/8	6	161060	111.69
.3130		.3130	3-1/4	1-1/8	6	161071	111.69
.3135		.3135	3-1/4	1-1/8	6	161082	128.25
.3140		.3140	3-1/4	1-1/8	6	161093	111.69
.3150	8mm	.3150	3-1/4	1-1/8	6	161104	111.69
.3160	O	.3160	3-1/4	1-1/8	6	161115	124.91
.3170		.3170	3-1/4	1-1/8	6	161126	124.91
.3180		.3180	3-1/4	1-1/8	6	161137	124.91
.3190		.3190	3-1/4	1-1/8	6	161148	124.91
.3200		.3200	3-1/4	1-1/8	6	161159	124.91
.3210		.3210	3-1/2	1-1/4	6	161170	124.91
.3220		.3220	3-1/2	1-1/4	6	161181	124.91
.3230	P	.3230	3-1/2	1-1/4	6	161192	124.91
.3240		.3240	3-1/2	1-1/4	6	161203	124.91
.3250		.3250	3-1/2	1-1/4	6	161214	124.91
.3260		.3260	3-1/2	1-1/4	6	161225	124.91
.3270		.3270	3-1/2	1-1/4	6	161236	124.91
.3280		.3280	3-1/2	1-1/4	6	161247	124.91
.3281	21/64	.3281	3-1/2	1-1/4	6	161258	126.17
.3290		.3290	3-1/2	1-1/4	6	161269	124.91
.3300		.3300	3-1/2	1-1/4	6	161280	124.91
.3310		.3310	3-1/2	1-1/4	6	161291	124.91
.3320	Q	.3320	3-1/2	1-1/4	6	161302	124.91

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3330		.3330	3-1/2	1-1/4	6	161313	124.91
.3340		.3340	3-1/2	1-1/4	6	161324	124.91
.3346	8.5mm	.3346	3-1/2	1-1/4	6	161335	124.91
.3350		.3350	3-1/2	1-1/4	6	161346	124.91
.3360		.3360	3-1/2	1-1/4	6	161357	124.91
.3370		.3370	3-1/2	1-1/4	6	161368	124.91
.3380		.3380	3-1/2	1-1/4	6	161379	124.91
.3390	R	.3390	3-1/2	1-1/4	6	161390	125.73
.3400		.3400	3-1/2	1-1/4	6	161401	124.91
.3410		.3410	3-1/2	1-1/4	6	161412	124.91
.3420		.3420	3-1/2	1-1/4	6	161423	124.91
.3430		.3430	3-1/2	1-1/4	6	161434	124.91
.3438	11/32	.3438	3-1/2	1-1/4	6	161445	126.17
.3440		.3440	3-1/2	1-1/4	6	161456	124.91
.3450		.3450	3-1/2	1-1/4	6	161467	124.91
.3460		.3460	3-1/2	1-1/4	6	161478	124.91
.3470		.3470	3-1/2	1-1/4	6	161489	124.91
.3480	S	.3480	3-1/2	1-1/4	6	161500	124.91
.3490		.3490	3-1/2	1-1/4	6	161511	124.91
.3500		.3500	3-1/2	1-1/4	6	161522	124.91
.3510		.3510	3-1/2	1-1/4	6	161533	136.26
.3520		.3520	3-1/2	1-1/4	6	161544	136.26
.3530		.3530	3-1/2	1-1/4	6	161555	136.26
.3540		.3540	3-1/2	1-1/4	6	161566	136.26
.3543	9mm	.3543	3-1/2	1-1/4	6	161577	142.20
.3550		.3550	3-1/2	1-1/4	6	161588	136.26
.3560		.3560	3-1/2	1-1/4	6	161599	136.26
.3570		.3570	3-1/2	1-1/4	6	161610	136.26
.3580	T	.3580	3-1/2	1-1/4	6	161621	136.26
.3590		.3590	3-1/2	1-1/4	6	161632	138.60
.3594	23/64	.3594	3-1/2	1-1/4	6	161643	134.44
.3600		.3600	3-1/2	1-1/4	6	161654	136.26
.3610		.3610	3-1/2	1-1/4	6	161665	136.26
.3620		.3620	3-1/2	1-1/4	6	161676	136.26
.3630		.3630	3-1/2	1-1/4	6	161687	136.26
.3640		.3640	3-1/2	1-1/4	6	161698	136.26
.3650		.3650	3-1/2	1-1/4	6	161709	136.26
.3660		.3660	3-1/2	1-1/4	6	161720	136.26
.3670		.3670	3-1/2	1-1/4	6	161731	136.26
.3680	U	.3680	3-1/2	1-1/4	6	161742	136.26

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MADE IN THE USA

Carbide Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



STOCKED INTERMEDIATE & STANDARD SIZES



DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.3690		.3690	3-1/2	1-1/4	6	161753	136.26
.3700		.3700	3-1/2	1-1/4	6	161764	136.26
.3710		.3710	3-1/2	1-1/4	6	161775	136.26
.3720		.3720	3-1/2	1-1/4	6	161786	136.26
.3730		.3730	3-1/2	1-1/4	6	161797	136.26
.3740	9.5mm	.3740	3-1/2	1-1/4	6	161808	136.26
.3745		.3745	3-1/2	1-1/4	6	161819	165.46
.3750	3/8	.3750	3-1/2	1-1/4	6	161830	134.44
.3755		.3755	3-1/2	1-1/4	6	161841	165.46
.3760		.3760	3-1/2	1-1/4	6	161852	171.14
.3765		.3765	3-1/2	1-1/4	6	161863	179.54
.3770	V	.3770	3-1/2	1-1/4	6	161874	171.14
.3780		.3780	3-1/2	1-1/4	6	161885	171.14
.3790		.3790	3-1/2	1-1/4	6	161896	171.14
.3800		.3800	3-1/2	1-1/4	6	161907	171.14
.3810		.3810	3-1/2	1-1/4	6	161918	171.14
.3820		.3820	3-1/2	1-1/4	6	161929	171.14
.3830		.3830	3-1/2	1-1/4	6	161940	171.14
.3840		.3840	3-1/2	1-1/4	6	161951	171.14
.3850		.3850	3-1/2	1-1/4	6	161962	171.14
.3860	W	.3860	3-1/2	1-1/4	6	161973	171.14
.3870		.3870	3-1/2	1-1/4	6	161984	212.30
.3880		.3880	3-1/2	1-1/4	6	161995	212.30
.3890		.3890	3-1/2	1-1/4	6	162006	212.30
.3900		.3900	3-1/2	1-1/4	6	162017	212.30
.3906	25/64	.3906	3-1/2	1-1/4	6	162028	212.29
.3910		.3910	3-1/2	1-1/4	6	162039	212.30
.3920		.3920	3-1/2	1-1/4	6	162050	212.30
.3930		.3930	3-1/2	1-1/4	6	162061	212.30
.3937	10mm	.3937	3-1/2	1-1/4	6	162072	160.83
.3940		.3940	3-1/2	1-1/4	6	162083	212.30
.3950		.3950	3-1/2	1-1/4	6	162094	212.30
.3960		.3960	3-1/2	1-1/4	6	162105	212.30
.3970	X	.3970	3-1/2	1-1/4	6	162116	212.30
.3980		.3980	3-1/2	1-1/4	6	162127	212.30
.3990		.3990	3-1/2	1-1/4	6	162138	212.30
.4000		.4000	3-1/2	1-1/4	6	162149	212.30
.4010		.4010	3-1/2	1-1/4	6	162160	212.30
.4020		.4020	3-1/2	1-1/4	6	162171	212.30
.4030		.4030	3-1/2	1-1/4	6	162182	212.30

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.4040	Y	.4040	3-1/2	1-1/4	6	162193	212.30
.4050		.4050	3-1/2	1-1/4	6	162204	212.30
.4060		.4060	3-1/2	1-1/4	6	162215	212.30
.4062	13/32	.4062	3-1/2	1-1/4	6	162226	154.11
.4070		.4070	3-1/2	1-1/4	6	162237	212.30
.4080		.4080	3-1/2	1-1/4	6	162248	212.30
.4090		.4090	3-1/2	1-1/4	6	162259	212.30
.4100		.4100	3-1/2	1-1/4	6	162270	212.30
.4110		.4110	3-1/2	1-1/4	6	162281	212.30
.4120		.4120	3-1/2	1-1/4	6	162292	212.30
.4130	Z	.4130	3-1/2	1-1/4	6	162303	212.30
.4134	10.5mm	.4134	3-1/2	1-1/4	6	162314	193.36
.4140		.4140	3-1/2	1-1/4	6	162325	212.30
.4150		.4150	3-1/2	1-1/4	6	162336	212.30
.4160		.4160	4	1-3/8	6	162347	212.30
.4170		.4170	4	1-3/8	6	162358	212.30
.4180		.4180	4	1-3/8	6	162369	212.30
.4190		.4190	4	1-3/8	6	162380	212.30
.4200		.4200	4	1-3/8	6	162391	212.30
.4210		.4210	4	1-3/8	6	162402	212.30
.4219	27/64	.4219	4	1-3/8	6	162413	174.73
.4220		.4220	4	1-3/8	6	162424	212.30
.4230		.4230	4	1-3/8	6	162435	212.30
.4240		.4240	4	1-3/8	6	162446	212.30
.4250		.4250	4	1-3/8	6	162457	212.30
.4260		.4260	4	1-3/8	6	162468	212.30
.4270		.4270	4	1-3/8	6	162479	212.30
.4280		.4280	4	1-3/8	6	162490	212.30
.4290		.4290	4	1-3/8	6	162501	212.30
.4300		.4300	4	1-3/8	6	162512	212.30
.4310		.4310	4	1-3/8	6	162523	212.30
.4320		.4320	4	1-3/8	6	162534	212.30
.4330		.4330	4	1-3/8	6	162545	212.30
.4331	11mm	.4331	4	1-3/8	6	162556	193.36
.4340		.4340	4	1-3/8	6	162567	212.30
.4350		.4350	4	1-3/8	6	162578	212.30
.4360		.4360	4	1-3/8	6	162589	212.30
.4365		.4365	4	1-3/8	6	162600	212.30
.4370		.4370	4	1-3/8	6	162611	212.30
.4375	7/16	.4375	4	1-3/8	6	162622	174.73

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

For technical information, please see page 256.

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MADE IN THE USA



Carbide Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

STOCKED INTERMEDIATE & STANDARD SIZES



END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4380		.4380	4	1-3/8	6	162633	212.30
.4385		.4385	4	1-3/8	6	162644	253.67
.4390		.4390	4	1-3/8	6	162655	212.30
.4400		.4400	4	1-3/8	6	162666	212.30
.4410		.4410	4	1-3/8	6	162677	240.89
.4420		.4420	4	1-3/8	6	162688	240.89
.4430		.4430	4	1-3/8	6	162699	240.89
.4440		.4440	4	1-3/8	6	162710	240.89
.4450		.4450	4	1-3/8	6	162721	240.89
.4460		.4460	4	1-3/8	6	162732	240.89
.4470		.4470	4	1-3/8	6	162743	240.89
.4480		.4480	4	1-3/8	6	162754	240.89
.4490		.4490	4	1-3/8	6	162765	240.89
.4500		.4500	4	1-3/8	6	162776	240.89
.4510		.4510	4	1-3/8	6	162787	240.89
.4520		.4520	4	1-3/8	6	162798	240.89
.4528	11.5mm	.4528	4	1-3/8	6	162809	240.89
.4530		.4530	4	1-3/8	6	162820	220.79
.4531	29/64	.4531	4	1-3/8	6	162831	192.63
.4540		.4540	4	1-3/8	6	162842	240.89
.4550		.4550	4	1-3/8	6	162853	240.89
.4560		.4560	4	1-3/8	6	162864	240.89
.4570		.4570	4	1-3/8	6	162875	240.89
.4580		.4580	4	1-3/8	6	162886	240.89
.4590		.4590	4	1-3/8	6	162897	240.89
.4600		.4600	4	1-3/8	6	162908	240.89
.4610		.4610	4	1-3/8	6	162919	240.89
.4620		.4620	4	1-3/8	6	162930	240.89
.4630		.4630	4	1-3/8	6	162941	240.89
.4640		.4640	4	1-3/8	6	162952	240.89
.4650		.4650	4	1-3/8	6	162963	240.89
.4660		.4660	4	1-3/8	6	162974	240.89
.4670		.4670	4	1-3/8	6	162985	240.89
.4680		.4680	4	1-3/8	6	162996	240.89
.4688	15/32	.4688	4	1-3/8	6	163007	192.63
.4690		.4690	4	1-3/8	6	163018	253.85
.4700		.4700	4	1-3/8	6	163029	253.85

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4710		.4710	4	1-3/8	6	163040	253.85
.4720		.4720	4	1-3/8	6	163051	253.85
.4724	12mm	.4724	4	1-3/8	6	163062	244.58
.4730		.4730	4	1-3/8	6	163073	253.85
.4740		.4740	4	1-3/8	6	163084	253.85
.4750		.4750	4	1-3/8	6	163095	253.85
.4760		.4760	4	1-1/2	6	163106	253.85
.4770		.4770	4	1-1/2	6	163117	253.85
.4780		.4780	4	1-1/2	6	163128	253.85
.4790		.4790	4	1-1/2	6	163139	253.85
.4800		.4800	4	1-1/2	6	163150	253.85
.4810		.4810	4	1-1/2	6	163161	253.85
.4820		.4820	4	1-1/2	6	163172	253.85
.4830		.4830	4	1-1/2	6	163183	253.85
.4840		.4840	4	1-1/2	6	163194	253.85
.4844	31/64	.4844	4	1-1/2	6	163205	218.23
.4850		.4850	4	1-1/2	6	163216	253.85
.4860		.4860	4	1-1/2	6	163227	253.85
.4870		.4870	4	1-1/2	6	163238	306.10
.4880		.4880	4	1-1/2	6	163249	306.10
.4890		.4890	4	1-1/2	6	163260	306.10
.4900		.4900	4	1-1/2	6	163271	306.10
.4910		.4910	4	1-1/2	6	163282	306.10
.4920		.4920	4	1-1/2	6	163293	306.10
.4921	12.5mm	.4921	4	1-1/2	6	163304	306.10
.4930		.4930	4	1-1/2	6	163315	306.10
.4940		.4940	4	1-1/2	6	163326	306.10
.4950		.4950	4	1-1/2	6	163337	306.10
.4960		.4960	4	1-1/2	6	163348	306.10
.4970		.4970	4	1-1/2	6	163359	306.10
.4980		.4980	4	1-1/2	6	163370	306.10
.4990		.4990	4	1-1/2	6	163381	306.10
.4995		.4995	4	1-1/2	6	163392	306.10
.5000	1/2	.5000	4	1-1/2	6	163403	218.23
.5005		.5005	4	1-1/2	6	163414	306.10
.5010		.5010	4	1-1/2	6	163425	306.10
.5020		.5020	4	1-1/2	6	163436	306.10

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DIAMETER TOLERANCE +.0003, -.0000

MADE IN THE USA

Carbide Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



SPECIAL SIZES
PRICES INCLUDE THE FOLLOWING STYLES:

STRAIGHT FLUTE - RIGHT HAND CUT • RIGHT HAND SPIRAL - RIGHT HAND CUT • LEFT HAND SPIRAL - RIGHT HAND CUT

SIZE RANGE	SHANK	FL LGTH	OAL	1 pc	2 pcs	3-5 pcs	6-11 pcs	12-17 pcs	18-23 pcs	24-35 pcs	36-49 pcs	50-74 pcs
.0401 - .0450	0.037	3/8	1-1/2	294.39	194.77	169.84	108.70	86.05	77.00	72.47	67.92	63.41
.0451 - .0500	0.042	3/8	1-1/2	294.39	194.77	169.84	108.70	86.05	77.00	72.47	67.92	63.41
.0501 - .0570	0.046	3/8	1-1/2	296.64	197.00	172.10	110.96	88.32	79.25	74.73	70.20	65.69
.0571 - .0650	0.053	3/8	1-1/2	294.39	194.77	169.84	108.70	86.05	77.00	72.47	67.92	63.41
.0651 - .0800	0.060	1/2	1-3/4	296.64	197.00	172.10	110.96	88.32	79.25	74.73	70.20	65.69
.0801 - .0950	0.075	1/2	2	298.93	199.28	174.37	113.24	90.58	81.53	77.00	72.47	67.92
.0951 - .1150	0.090	5/8	2-1/4	303.45	203.80	178.89	117.75	95.10	86.05	81.53	77.00	72.47
.1151 - .1300	0.110	5/8	2-1/4	305.72	206.05	181.16	120.02	97.37	88.32	83.78	79.25	74.73
.1301 - .1450	0.125	3/4	2-1/2	312.49	212.86	187.96	126.81	104.19	95.10	90.58	86.05	81.53
.1451 - .1600	0.140	3/4	2-1/2	319.31	219.65	194.77	133.61	110.96	101.90	97.37	92.85	88.32
.1601 - .1750	0.155	7/8	2-3/4	326.08	226.45	201.52	140.39	117.75	108.70	104.19	99.64	95.10
.1751 - .1950	0.170	7/8	2-3/4	335.16	235.49	210.61	149.45	126.81	117.75	113.24	108.70	104.19
.1951 - .2100	0.188	1	3	353.26	253.62	228.73	167.57	144.94	135.87	131.34	126.81	122.28
.2101 - .2250	0.205	1	3	360.06	260.42	235.49	174.37	151.73	142.66	138.14	133.61	129.06
.2251 - .2400	0.220	1	3	371.38	271.76	246.84	185.68	163.06	153.98	149.45	144.94	140.39
.2401 - .2550	0.235	1	3	380.43	280.79	255.88	194.77	172.10	163.06	158.50	153.98	149.45
.2551 - .2750	0.250	1	3-1/4	403.10	303.45	278.52	217.40	194.77	185.68	181.16	176.64	172.10
.2751 - .2950	0.270	1-1/8	3-1/4	405.33	305.72	280.79	219.65	197.00	187.96	183.42	178.89	174.37
.2951 - .3150	0.290	1-1/8	3-1/4	427.97	328.33	303.45	242.30	219.65	210.61	206.05	201.52	197.00
.3151 - .3350	0.313	1-1/4	3-1/2	459.69	360.06	335.16	274.01	251.37	242.30	237.77	233.25	228.73
.3351 - .3550	0.330	1-1/4	3-1/2	464.21	369.11	339.69	278.52	255.88	246.84	242.30	237.77	233.25
.3551 - .3800	0.350	1-1/4	3-1/2	473.28	378.17	348.73	287.61	264.95	255.88	251.37	246.84	242.30
.3801 - .4100	0.375	1-1/4	4	507.24	407.62	382.70	321.57	298.93	289.84	285.34	280.79	276.26
.4101 - .4400	0.405	1-3/8	4	525.36	425.75	400.82	339.69	317.03	307.97	303.45	298.93	294.39
.4401 - .4700	0.438	1-3/8	4	552.53	452.91	427.97	366.85	344.20	335.16	330.62	326.08	321.57
.4701 - .5050	0.465	1-1/2	4	597.83	498.20	473.28	412.13	389.49	380.43	375.93	371.38	366.85
.5051 - .5400	0.500	1-1/2	4-1/2	656.70	557.07	532.17	471.03	448.37	439.31	434.79	430.26	425.75
.5401 - .5800	0.535	1-1/2	4-1/2	747.28	647.63	622.75	561.60	538.95	529.91	525.36	520.83	516.30
.5801 - .6260	0.575	1-3/4	4-1/2	819.76	720.12	695.20	634.07	611.42	602.37	597.83	593.30	588.77
.6261 - .6600	0.615	1-3/4	4-1/2	928.45	828.81	803.91	742.77	720.12	711.04	706.53	702.01	697.47
.6601 - .7050	0.655	2	5	1064.33	964.70	939.77	878.63	856.00	846.93	842.40	837.89	833.34
.7051 - .7550	0.700	2	5	1154.89	1055.28	1030.34	969.21	946.57	937.48	932.98	928.45	923.93
.7551 - .7950	0.750	2	5	1245.47	1145.85	1120.92	1059.78	1037.15	1028.10	1023.55	1019.03	1014.50
.7951 - .8450	0.750	2-1/4	5	1336.07	1236.43	1211.52	1150.37	1127.75	1118.66	1114.13	1109.62	1105.09
.8451 - .9000	0.750	2-1/4	5	1517.23	1417.61	1392.68	1331.54	1308.91	1299.82	1295.30	1290.78	1286.25
.9001 - .9600	0.875	2-1/4	5	1743.68	1644.04	1619.14	1557.99	1535.33	1526.28	1521.75	1517.23	1512.69
.9601 - 1.025	0.875	2-1/4	5	1924.83	1825.21	1800.30	1739.16	1716.50	1707.45	1702.92	1698.38	1693.85

FOR .0001" TOLERANCE, ALL SIZES ADD 20% TO ABOVE PRICING
 FOR .0002" TOLERANCE FROM .5001" - 1.025", ADD 10% TO ABOVE PRICING

For technical information, please see page 256.

DIAMETER TOLERANCE +.0003, -.0000

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

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Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

SA - CYLINDRICAL



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SA-61	1/16	3/32	1/4	1-1/2	260585	10.95	260750	10.95
* SA-41	1/16	1/8	1/4	1-1/2	122131	10.37	122461	10.37
* SA-41L2	1/16	1/8	1/4	2	260596	15.54	260761	15.54
* SA-41L3	1/16	1/8	1/4	3	260607	17.20	260772	17.20
* SA-63	3/32	3/32	3/8	1-1/2	260618	10.95	260783	10.95
* SA-42	3/32	1/8	7/16	1-1/2	122153	10.37	122483	10.37
* SA-42L2	3/32	1/8	7/16	2	260629	15.54	260794	15.54
* SA-42L3	3/32	1/8	7/16	3	260640	17.20	260805	17.20
* SA-43	1/8	1/8	9/16	1-1/2	122175	10.37	122505	10.37
* SA-43L2	1/8	1/8	9/16	2	260651	15.54	260816	15.54
* SA-43L3	1/8	1/8	9/16	3	260662	17.20	260827	17.20
* SA-11	1/8	1/4	1/2	2	122263	20.59	122593	20.59
* SA-12	1/8	1/4	5/8	2	260673	20.70	260838	20.70
SA-52	5/32	1/8	1/2	2	122197	22.82	122527	22.82
* SA-13	5/32	1/4	5/8	2	128973	28.54	129171	28.54
SA-53	3/16	1/8	1/2	2	122219	22.82	122549	22.82
* SA-81	3/16	3/16	1/2	2	260684	25.06	260849	25.06
* SA-14	3/16	1/4	5/8	2	122285	24.64	122615	24.64
SA-51	1/4	1/8	1/2	2	122241	15.39	122571	15.39
* SA-1	1/4	1/4	5/8	2	122307	17.45	122637	17.45
SA-1L6	1/4	1/4	1/2	6-1/2	127763	35.37	127829	35.37
* SA-1L	1/4	1/4	1	2	260695	26.95	260860	26.95
SA-2	5/16	1/4	3/4	2-1/2	122329	32.23	122659	32.23
SA-3	3/8	1/4	3/4	2-1/2	122351	21.60	122681	21.60
SA-3L6	3/8	1/4	3/4	6-3/4	127785	49.82	127851	49.82
SA-3L	3/8	1/4	1	2-3/4	260706	33.25	260871	33.25
SA-3X	3/8	1/4	1-1/2	3-1/4	260717	47.30	260882	47.30
SA-4	7/16	1/4	1	2-3/4	122373	50.07	122703	50.07
SA-5	1/2	1/4	1	2-3/4	122395	34.47	122725	34.47
SA-5L6	1/2	1/4	1	7	127807	77.86	127873	77.86
SA-6	5/8	1/4	1	2-3/4	122417	49.69	122747	49.69
SA-15	3/4	1/4	1/2	2-1/4	260728	75.68	260893	75.68
SA-16	3/4	1/4	3/4	2-1/2	260739	75.68	260904	75.68
SA-7	3/4	1/4	1	2-3/4	122439	77.49	122769	77.49
SA-9	1	1/4	1	2-3/4	128995	122.36	129193	122.36

* One Piece

SA - CYLINDRICAL - FOR ALUMINUM



TOOL #	SIZE	SHANK	LOC	OAL	ALUMA CUT	LIST PRICE
* SA-1NF	1/4	1/4	5/8	2	128423	25.25
SA-3NF	3/8	1/4	3/4	2-1/2	128445	35.30
SA-5NF	1/2	1/4	1	2-3/4	128467	58.96
SA-6NF	5/8	1/4	1	2-3/4	128489	87.62
SA-7NF	3/4	1/4	1	2-3/4	128511	115.13

* One Piece

For technical information, please see page 238.

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

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PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



SB - CYLINDRICAL END CUT



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SB-41	1/16	1/8	1/4	1-1/2	122791	13.98	129259	13.98
* SB-41L2	1/16	1/8	1/4	2	261135	17.09	261278	17.09
* SB-41L3	1/16	1/8	1/4	3	261146	18.92	261289	18.92
* SB-42	3/32	1/8	7/16	1-1/2	122813	11.06	129237	11.06
* SB-42L2	3/32	1/8	7/16	2	261157	17.09	261300	17.09
* SB-42L3	3/32	1/8	7/16	3	261168	18.92	261311	18.92
† SB-ECO	1/8	1/8	-	1-1/2	261179	8.03	-	-
* SB-43	1/8	1/8	9/16	1-1/2	122835	10.12	129215	10.12
* SB-43L2	1/8	1/8	9/16	2	261190	17.09	261333	17.09
* SB-43L3	1/8	1/8	9/16	3	261201	18.92	261344	18.92
* SB-11	1/8	1/4	1/2	2	122901	26.66	123077	26.66
* SB-12	1/8	1/4	5/8	2	261212	22.70	261355	22.70
* SB-13	5/32	1/4	5/8	2	129017	32.19	129281	32.19
* SB-14	3/16	1/4	5/8	2	122923	26.66	123099	26.66
SB-51	1/4	1/8	3/16	1-11/16	122857	15.43	123033	15.43
SB-51	1/4	1/8	1/2	2	122879	16.80	123055	16.80
* SB-1	1/4	1/4	5/8	2	122945	20.70	123121	20.70
* SB-1L	1/4	1/4	1	2	261223	29.64	261366	29.64
SB-2	5/16	1/4	3/4	2-1/2	122967	35.44	123143	35.44
SB-3	3/8	1/4	3/4	2-1/2	122989	24.71	123165	24.71
SB-3L	3/8	1/4	1	2-3/4	261234	36.52	261377	36.52
SB-3X	3/8	1/4	1-1/2	3-1/4	261245	48.28	261388	48.28
SB-4	7/16	1/4	1	2-3/4	129039	56.90	123187	56.90
SB-5	1/2	1/4	1	2-3/4	123011	37.93	123209	37.93
SB-6	5/8	1/4	1	2-3/4	129369	55.59	123231	55.59
SB-15	3/4	1/4	1/2	2-1/4	261256	82.92	261399	82.92
SB-16	3/4	1/4	3/4	2-1/2	261267	82.92	261410	82.92
SB-7	3/4	1/4	1	2-3/4	129061	85.38	123253	85.38
SB-9	1	1/4	1	2-3/4	129083	133.53	129303	133.53

* One Piece † SB-ECO = End Cut Only

SB - CYLINDRICAL END CUT - FOR ALUMINUM



TOOL #	SIZE	SHANK	LOC	OAL	ALUMA CUT	LIST PRICE
SB-3NF	3/8	1/4	3/4	2-1/2	261421	39.91
SB-5NF	1/2	1/4	1	2-3/4	261432	61.21
SB-6NF	5/8	1/4	1	2-3/4	261443	84.59
SB-7NF	3/4	1/4	1	2-3/4	261454	123.84

For technical information, please see page 238.

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

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Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

SC - CYLINDRICAL BALL NOSE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SC-61	3/32	3/32	3/8	1-1/2	260915	10.95	261025	10.95
* SC-41	3/32	1/8	7/16	1-1/2	123275	10.37	123583	10.37
* SC-42	1/8	1/8	9/16	1-1/2	123297	10.37	123605	10.37
* SC-42L2	1/8	1/8	9/16	2	260926	15.54	261036	15.54
* SC-42L3	1/8	1/8	9/16	3	260937	17.20	261047	17.20
* SC-11	1/8	1/4	1/2	2	123385	28.65	123693	28.65
* SC-12	1/8	1/4	5/8	2	260948	21.96	261058	21.96
SC-52	5/32	1/8	1/2	2	123319	22.82	123627	22.82
* SC-13	5/32	1/4	5/8	2	129105	32.77	129325	32.77
SC-53	3/16	1/8	1/2	2	123341	22.82	123649	22.82
* SC-81	3/16	3/16	1/2	2	260959	25.06	261069	25.06
* SC-14	3/16	1/4	5/8	2	123407	28.65	123715	28.65
SC-51	1/4	1/8	1/2	2	123363	15.43	123671	15.43
* SC-1	1/4	1/4	5/8	2	123429	20.74	123737	20.74
* SC-1L	1/4	1/4	1	2	260970	26.95	261080	26.95
SC-1L6	1/4	1/4	1/2	6-1/2	127895	41.19	127961	41.19
SC-2	5/16	1/4	3/4	2-1/2	123451	34.83	123759	34.83
SC-3	3/8	1/4	3/4	2-1/2	123473	25.07	123781	25.07
SC-3L	3/8	1/4	1	2-3/4	260981	36.41	261091	36.41
SC-3L6	3/8	1/4	3/4	6-3/4	127917	55.49	127983	55.49
SC-3X	3/8	1/4	1-1/2	3-1/4	260992	42.77	261102	42.77
SC-4	7/16	1/4	1	2-3/4	123495	55.02	123803	55.02
SC-5	1/2	1/4	1	2-3/4	123517	38.87	123825	38.87
SC-5L6	1/2	1/4	1	7	127939	87.32	128005	87.32
SC-6	5/8	1/4	1	2-3/4	123539	57.92	123847	57.92
SC-15	3/4	1/4	1/2	2-1/4	261003	81.25	261113	81.25
SC-16	3/4	1/4	3/4	2-1/2	261014	81.25	261124	81.25
SC-7	3/4	1/4	1	2-3/4	123561	83.47	123869	83.47
SC-9	1	1/4	1	2-3/4	129435	126.22	129457	126.22

* One Piece

SC - CYLINDRICAL BALL NOSE FOR ALUMINUM



TOOL #	SIZE	SHANK	LOC	OAL	ALUMA CUT	LIST PRICE
* SC-1NF	1/4	1/4	5/8	2	128533	24.86
SC-3NF	3/8	1/4	3/4	2-1/2	128555	33.13
SC-5NF	1/2	1/4	1	2-3/4	128577	46.97
SC-7NF	3/4	1/4	1	2-3/4	128599	113.84

* One Piece

For technical information, please see page 238.

MADE IN THE USA

Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



SD - BALL SHAPE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SD-40	1/16	1/8	1/16	1-1/2	126267	10.95	260255	10.95
* SD-61	3/32	3/32	3/32	1-1/2	260189	10.95	260266	10.95
* SD-41	3/32	1/8	3/32	1-1/2	126289	10.37	126531	10.37
* SD-42	1/8	1/8	1/8	1-1/2	129127	10.37	126553	10.37
* SD-42L2	1/8	1/8	1/8	2	260200	15.54	260277	15.54
SD-42L3	1/8	1/8	1/8	3	260211	17.20	260288	17.20
SD-11	1/8	1/4	1/8	2	126333	26.30	126619	26.30
* SD-52	5/32	1/8	5/32	1-21/32	260222	21.15	260299	21.15
* SD-53	3/16	1/8	3/16	1-11/16	260233	22.82	126575	22.82
SD-81	3/16	3/16	5/32	2	260244	25.06	260310	25.06
* SD-14	3/16	1/4	3/16	2	126355	26.30	126641	26.30
SD-51	1/4	1/8	1/4	1-3/4	126311	15.39	126597	15.39
SD-1	1/4	1/4	1/4	2	126377	20.16	126663	20.16
SD-1L6	1/4	1/4	1/4	6-1/4	128027	37.97	128093	37.97
SD-2	5/16	1/4	5/16	2-1/16	126399	28.32	126685	28.32
SD-3	3/8	1/4	3/8	2-1/8	126421	21.60	126707	21.60
SD-3L6	3/8	1/4	3/8	6-3/8	128049	45.67	128115	45.67
SD-4	7/16	1/4	7/16	2-3/16	126443	36.56	126729	36.56
SD-5	1/2	1/4	1/2	2-1/2	126465	29.30	126751	29.30
SD-5L6	1/2	1/4	1/2	6-1/2	128071	61.53	128137	61.53
SD-6	5/8	1/4	5/8	2-3/8	126487	45.62	126773	45.62
SD-7	3/4	1/4	3/4	2-1/2	126509	62.94	126795	62.94
SD-9	1	1/4	1	2-3/4	129149	133.53	129347	133.53

* One Piece

SD - BALL SHAPE FOR ALUMINUM



TOOL #	SIZE	SHANK	LOC	OAL	ALUMA CUT	LIST PRICE
* SD-1NF	1/4	1/4	1/4	2	128885	24.49
SD-3NF	3/8	1/4	3/8	2-1/8	128907	30.96
SD-5NF	1/2	1/4	1/2	2-13/64	128929	50.80
SD-6NF	5/8	1/4	5/8	2-5/16	128951	76.49

* One Piece

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

For technical information, please see page 238.

MADE IN THE USA



Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

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SE - EGG SHAPE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SE-61	3/32	3/32	1/8	1-1/2	260321	10.95	260409	10.95
* SE-41	1/8	1/8	7/32	1-1/2	125519	10.37	125695	10.37
* SE-41L2	1/8	1/8	7/32	2	260332	15.54	260420	15.54
* SE-41L3	1/8	1/8	7/32	3	260343	17.20	260431	17.20
SE-53	3/16	1/8	9/32	1-25/32	125541	22.82	125717	22.82
* SE-81	3/16	3/16	9/32	2	260354	25.06	260442	25.06
* SE-11	3/16	1/4	5/16	2	260365	22.53	260453	22.53
SE-51	1/4	1/8	3/8	1-7/8	125563	15.39	125739	15.39
* SE-1	1/4	1/4	3/8	2	125585	24.64	125761	24.64
SE-1L6	1/4	1/4	3/8	6-3/8	260376	33.25	260464	33.25
SE-3	3/8	1/4	5/8	2-3/8	125607	25.94	125783	25.94
SE-3L6	3/8	1/4	5/8	6-5/8	260387	37.27	260475	37.27
SE-5	1/2	1/4	7/8	2-5/8	125629	36.27	125805	36.27
SE-5L6	1/2	1/4	7/8	6-7/8	260398	55.90	260486	55.90
SE-6	5/8	1/4	1	2-3/4	125651	57.29	125827	57.29
SE-7	3/4	1/4	1	2-3/4	125673	80.14	125849	80.14

* One Piece

SE - EGG SHAPE FOR ALUMINUM



TOOL #	SIZE	SHANK	LOC	OAL	ALUMA CUT	LIST PRICE
SE-3NF	3/8	1/4	5/8	2-3/8	128731	34.39
SE-5NF	1/2	1/4	7/8	2-5/8	128753	59.86
SE-6NF	5/8	1/4	1	2-3/4	128775	84.80
SE-7NF	3/4	1/4	1	2-3/4	128797	121.36

For technical information, please see page 238.

MADE IN THE USA

Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



SF - ROUND NOSE TREE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SF-61	3/32	3/32	1/4	1-1/2	260497	10.95	260541	10.95
* SF-41	1/8	1/8	1/4	1-1/2	123891	10.37	124177	10.37
* SF-42	1/8	1/8	1/2	1-1/2	123913	10.37	124199	10.37
* SF-42L2	1/8	1/8	1/2	2	260508	15.54	260552	15.54
* SF-42L3	1/8	1/8	1/2	3	260519	17.20	260563	17.20
SF-53	3/16	1/8	1/2	2	123935	22.82	124221	22.82
* SF-81	3/16	3/16	1/2	2	260530	25.06	260574	25.06
SF-51	1/4	1/8	1/2	2	123957	15.39	124243	15.39
* SF-1	1/4	1/4	3/4	2	123979	22.47	124265	22.47
SF-1L6	1/4	1/4	1/2	6-1/2	128159	42.96	128225	42.96
SF-3	3/8	1/4	3/4	2-1/2	124001	25.07	124287	25.07
SF-3L6	3/8	1/4	3/4	6-3/4	128181	54.41	128247	54.41
SF-4	7/16	1/4	1	2-3/4	124023	52.42	124309	52.42
SF-13	1/2	1/4	3/4	2-1/2	124045	55.82	124331	55.82
SF-5	1/2	1/4	1	2-3/4	124067	37.65	124353	37.65
SF-5L6	1/2	1/4	1	7	128203	80.24	128269	80.24
SF-6	5/8	1/4	1	2-3/4	124089	57.63	124375	57.63
SF-7	3/4	1/4	1	2-3/4	124111	80.52	124397	80.52
SF-14	3/4	1/4	1-1/4	3	124133	146.62	124419	146.62
SF-15	3/4	1/4	1-1/2	3-1/4	124155	172.17	124441	172.17

* One Piece

SF - ROUND NOSE TREE FOR ALUMINUM



TOOL #	SIZE	SHANK	LOC	OAL	ALUMA CUT	LIST PRICE
* SF-1NF	1/4	1/4	3/4	2	128621	25.33
SF-3NF	3/8	1/4	3/4	2-1/2	128643	33.49
SF-5NF	1/2	1/4	1	2-3/4	128665	59.25
SF-6NF	5/8	1/4	1	2-3/4	128687	90.41
SF-14NF	3/4	1/4	1-1/4	3	128709	109.98

* One Piece

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

For technical information, please see page 238.

MADE IN THE USA



Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

SG - POINTED TREE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SG-61	3/32	3/32	1/4	1-1/2	261465	10.95	261553	10.95
* SG-41	1/8	1/8	1/4	1-1/2	124463	10.33	124749	10.33
* SG-42	1/8	1/8	5/16	1-1/2	124485	10.33	124771	10.33
* SG-43	1/8	1/8	3/8	1-1/2	124507	10.33	124793	10.33
* SG-44	1/8	1/8	1/2	1-1/2	124529	14.38	124815	14.38
* SG-44L2	1/8	1/8	1/2	2	261476	15.54	261564	15.54
* SG-44L3	1/8	1/8	1/2	3	261487	17.20	261575	17.20
SG-53	3/16	1/8	1/2	2	124551	22.82	124837	22.82
* SG-81	3/16	3/16	1/2	2	261498	25.06	261586	25.06
SG-51	1/4	1/8	1/2	2	124573	15.39	124859	15.39
* SG-1	1/4	1/4	5/8	2	124595	22.91	124881	22.91
SG-1L6	1/4	1/4	1/2	6-1/2	261509	31.42	261597	31.42
SG-2	5/16	1/4	3/4	2-1/2	124617	36.31	124903	36.31
SG-3	3/8	1/4	3/4	2-1/2	124639	25.83	124925	25.83
SG-3L6	3/8	1/4	3/4	6-3/4	261520	39.56	261608	39.56
SG-13	1/2	1/4	3/4	2-1/2	124661	54.77	124947	54.77
SG-5	1/2	1/4	1	2-3/4	124683	37.93	124969	37.93
SG-5L6	1/2	1/4	1	7	261531	51.60	261619	51.60
SG-6	5/8	1/4	1	2-3/4	124705	58.83	124991	58.83
SG-7	3/4	1/4	1	2-3/4	124727	78.73	125013	78.73
SG-15	3/4	1/4	1-1/2	3-1/4	261542	94.60	261630	94.60

* One Piece

SH - FLAME SHAPE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
SH-41	1/8	1/8	1/4	1-1/2	126817	10.37	126949	10.37
SH41L2	1/8	1/8	1/4	2	261641	15.54	261685	15.54
* SH41L3	1/8	1/8	1/4	3	261652	17.20	261696	17.20
* SH-53	3/16	1/8	3/8	1-7/8	126839	22.82	126971	22.82
* SH-1	1/4	1/4	5/8	2	129501	24.35	129523	24.35
SH-2	5/16	1/4	3/4	2-1/2	126861	28.07	126993	28.07
* SH-2L6	5/16	1/4	3/4	6-3/4	261663	37.27	261707	37.26
SH-5	1/2	1/4	1-1/4	3	126883	54.41	127015	54.41
SH-5L6	1/2	1/4	1-1/4	7-1/4	261674	60.20	261718	60.20
SH-6	5/8	1/4	1-7/16	3-3/16	126905	128.26	127037	128.26
SH-7	3/4	1/4	1-5/8	3-3/8	126927	162.95	127059	162.95

* One Piece

For technical information, please see page 238.

MADE IN THE USA

Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



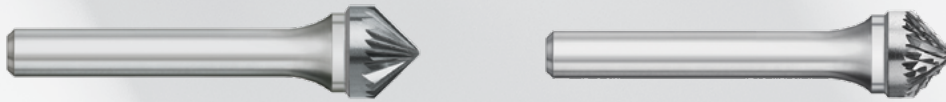
SJ - 60° INCLUDED ANGLE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SJ-42	1/8	1/8	3/32	1-1/2	127587	10.37	127675	10.37
* SJ-1	1/4	1/4	3/16	2	127609	20.16	127697	20.16
SJ-3	3/8	1/4	5/16	2-3/16	127631	24.71	127719	24.71
SJ-5	1/2	1/4	7/16	2-19/64	127653	33.89	127741	33.89
SJ-6	5/8	1/4	9/16	2-5/16	261729	40.88	261762	40.88
SJ-7	3/4	1/4	11/16	2-7/16	261740	53.61	261773	53.61
SJ-9	1	1/4	15/16	2-11/16	261751	107.85	261784	107.85

* One Piece

SK - 90° INCLUDED ANGLE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SK-42	1/8	1/8	1/16	1-1/2	127411	10.37	127499	10.37
* SK-1	1/4	1/4	1/8	2	127433	20.16	127521	20.16
SK-3	3/8	1/4	3/16	2-1/16	127455	20.85	127543	20.85
SK-5	1/2	1/4	1/4	2-1/8	127477	32.66	127565	32.66
SK-6	5/8	1/4	5/16	2-3/16	261795	40.88	261817	40.88
SK-7	3/4	1/4	3/8	2-1/4	129391	66.52	129413	66.52
SK-9	1	1/4	1/2	2-1/4	261806	101.31	261828	101.31

* One Piece



END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

For technical information, please see page 238.

MADE IN THE USA



Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

SL - INCLUDED ANGLE WITH RADIUS END



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SL-41	1/8	1/8	3/8	1-1/2	125871	10.33	126069	10.33
* SL-42	1/8	1/8	1/2	1-1/2	125893	10.33	126091	10.33
* SL-42L2	1/8	1/8	1/2	2	261839	15.54	261872	15.54
* SL-42L3	1/8	1/8	1/2	3	261850	17.20	261883	17.20
SL-53	3/16	1/8	1/2	2	125915	22.82	126113	22.82
* SL-81	3/16	3/16	7/16	2	261861	25.06	261894	25.06
* SL-1	1/4	1/4	5/8	2	125937	20.99	126135	20.99
SL-1L6	1/4	1/4	5/8	6-5/8	128291	44.00	128357	44.00
SL-2	5/16	1/4	7/8	2-3/4	125959	40.14	126157	40.14
SL-3	3/8	1/4	1-1/16	2-15/16	125981	29.05	126179	29.05
SL-3L6	3/8	1/4	1-1/16	7-1/16	128313	69.33	128379	69.33
SL-4	1/2	1/4	1-1/8	3	126003	58.85	126201	58.85
SL-4L6	1/2	1/4	1-1/4	7-1/4	128335	84.94	128401	84.94
SL-6	5/8	1/4	1-5/16	3-3/16	126025	94.39	126223	94.39
SL-7	3/4	1/4	1-1/2	3-3/8	126047	129.17	126245	129.17

* One Piece

SL - INCLUDED ANGLE WITH RADIUS END - FOR ALUMINUM



TOOL #	SIZE	SHANK	LOC	OAL	ALUMA CUT	LIST PRICE
SL-3NF	3/8	1/4	1-1/16	2-15/16	259483	51.87
SL-4NF	1/2	1/4	1-1/4	3	128819	59.39
SL-5NF	5/8	1/4	1-3/16	3-5/16	259494	108.06
SL-6NF	5/8	1/4	1-5/16	3-3/16	128841	119.61
SL-7NF	3/4	1/4	1-1/2	3-3/8	128863	148.57

SM - POINTED CONE



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SM-61	3/32	3/32	1/4	1-1/2	260002	10.95	260035	10.95
* SM-41	1/8	1/8	11/32	1-1/2	125035	10.37	125277	10.37
* SM-42	1/8	1/8	7/16	1-1/2	125057	10.37	125299	10.37
* SM-42L2	1/8	1/8	7/16	2	260013	15.54	260046	15.54
* SM-42L3	1/8	1/8	7/16	3	260024	17.20	260057	17.20
* SM-43	1/8	1/8	5/8	1-1/2	125079	10.37	125321	10.37
SM-53	3/16	1/8	1/2	2	125101	22.82	125343	22.82
SM-51	1/4	1/8	1/2	2-1/8	125123	15.39	125365	15.39
* SM-1	1/4	1/4	1/2	2	125145	19.73	125387	19.73
* SM-2	1/4	1/4	3/4	2	125167	30.56	125409	30.56
* SM-3	1/4	1/4	1	2	125189	22.04	125431	22.04
SM-4	3/8	1/4	5/8	2-1/2	125211	29.37	125453	29.37
SM-5	1/2	1/4	7/8	2-3/4	125233	41.11	125475	41.11
SM-6	5/8	1/4	1	2-7/8	125255	92.86	125497	92.86

* One Piece

For technical information, please see page 238.

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

Carbide Burs

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



SN - INVERTED TAPER



TOOL #	SIZE	SHANK	LOC	OAL	SINGLE CUT	LIST PRICE	DOUBLE CUT	LIST PRICE
* SN-61	3/32	3/32	1/8	1-1/2	260068	10.95	260123	10.95
* SN-41	3/32	1/8	1/8	1-1/2	127081	10.37	260134	10.37
* SN-42	1/8	1/8	3/16	1-1/2	127103	10.37	127213	10.37
SN-53	3/16	1/8	1/4	1-3/4	127125	22.82	127235	22.82
* SN-81	3/16	3/16	1/4	2	260079	25.06	260145	25.06
SN-51	1/4	1/8	1/4	1-3/4	127147	15.39	127257	15.39
* SN-1	1/4	1/4	5/16	2	127169	20.05	127279	20.05
SN-2	3/8	1/4	3/8	2-1/8	260090	28.21	260156	28.21
SN-4	1/2	1/4	1/2	2-1/4	127191	58.53	127301	58.53
SN-6	5/8	1/4	3/4	2-1/2	260101	51.77	260167	51.77
SN-7	3/4	1/4	5/8	2-3/8	260112	62.50	260178	62.50

* One Piece

CARBIDE BUR SETS



ITEM# 127323



ITEM# 129545

SET SIZES	# OF PCS. IN SET	DIA.	SHANK DIAMETER	CASE TYPE	TYPE	ITEM#	LIST PRICE
SA-42, SA-43, SC-41, SC-42, SD-42, SE-41, SF-42, SG-42, SM-43	9 PCS.	1/8	1/8	WOOD	DOUBLE CUT	127323	152.74
SA-1, SC-1, SD-3, SH-1, SF-3, SA-3, SC-3, SC-5, SF-5, SA-5	10 PCS.	-	1/4	METAL	DOUBLE CUT	129545	287.61

For technical information, please see page 238.

MADE IN THE USA

END MILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



Carbide Micro End Mills

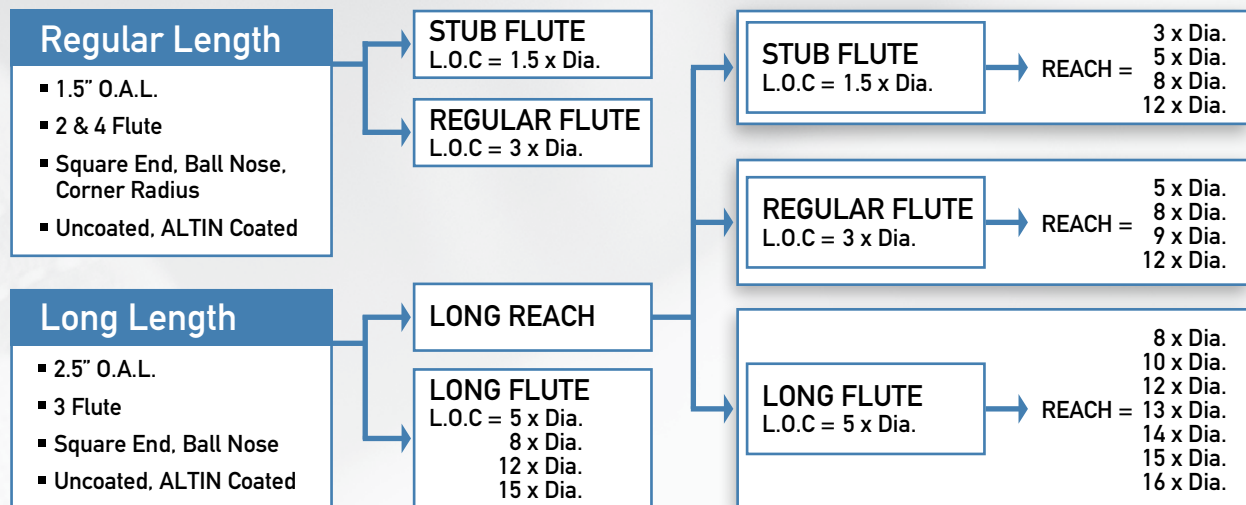
PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



Top Quality Carbide Micro End Mills 100% American Made

Expanded selection of Micro End Mills covering a wide range of profiles. Choose from 2, 3 and 4 Flute, Square, Ball, Corner Radius, and Stub, Regular, Long Flute lengths and Long Reaches. All micro tools stocked uncoated, and Altin coated for optimum tool performance. All tools are stocked and ready to ship. Order today, and we'll ship today!

Micro End Mills are stocked in sizes from 0.005" to 0.120" in the following:




Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS




Reach and Length of Cut are measured as multiples of the cutting Diameter

Long Reaches of 3x, 5x, 8x, 9x, 10x, 12x, 13x, 14x, 15x and 16x Dia.
Lengths of Cut of 1.5x, 3x, 5x, 8x, 12x and 15x Dia.

- REGULAR LENGTH - STUB FLUTE
2FL & 4FL • Square End, Ball Nose &  Corner Radius



- REGULAR LENGTH - REGULAR FLUTE
2FL & 4FL • Square End, Ball Nose &  Corner Radius



- LONG REACH - STUB FLUTE
3FL • Square End & Ball Nose



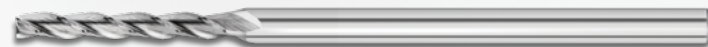
- LONG REACH - REGULAR FLUTE
3FL • Square End & Ball Nose



- LONG REACH - LONG FLUTE
3FL • Square End & Ball Nose



- LONG LENGTH - LONG FLUTE
3FL • Square End & Ball Nose



With over 2400 carbide Micro End Mills stocked and ready to ship, we are committed to providing you with the highest quality, American-made Micro End Mills for all your micro machining needs.

Also stocked with ALTIN coating





Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - STUB FLUTE - SQUARE END - 30° HELIX
LOC = 1.5 X DIA



UNCOATED

DIA	LOC	ITEM#	LIST PRICE
0.005	0.008	220526	63.56
0.010	0.015	220537	56.96
0.015	0.023	220548	35.64
0.020	0.030	220559	32.40
0.025	0.038	220570	32.40
0.030	0.045	220581	30.42
0.031	0.047	220592	28.50
0.035	0.053	220603	28.50
0.040	0.060	220614	28.50
0.045	0.068	220625	27.80
0.047	0.071	220636	27.80
0.050	0.075	220647	27.80
0.055	0.083	220658	27.80

DIA	LOC	ITEM#	LIST PRICE
0.060	0.090	220669	27.80
0.062	0.093	220680	27.80
0.065	0.098	220691	27.80
0.070	0.105	220702	27.80
0.075	0.113	220713	27.80
0.078	0.117	220724	27.80
0.080	0.120	220735	27.80
0.085	0.128	220746	27.80
0.090	0.135	220757	27.80
0.093	0.140	220768	27.80
0.095	0.143	220779	27.80
0.100	0.150	220790	27.80



ALTiN COATED

DIA	LOC	ITEM#	LIST PRICE
0.005	0.008	220801	76.26
0.010	0.015	220812	68.34
0.015	0.023	220823	42.79
0.020	0.030	220834	38.88
0.025	0.038	220845	38.88
0.030	0.045	220856	36.49
0.031	0.047	220867	34.17
0.035	0.053	220878	34.17
0.040	0.060	220889	34.17
0.045	0.068	220900	33.36
0.047	0.071	220911	33.36
0.050	0.075	220922	33.36
0.055	0.083	220933	33.36

DIA	LOC	ITEM#	LIST PRICE
0.060	0.090	220944	33.36
0.062	0.093	220955	33.36
0.065	0.098	220966	33.36
0.070	0.105	220977	33.36
0.075	0.113	220988	33.36
0.078	0.117	220999	33.36
0.080	0.120	221010	33.36
0.085	0.128	221021	33.36
0.090	0.135	221032	33.36
0.093	0.140	221043	33.36
0.095	0.143	221054	33.36
0.100	0.150	221065	33.36

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.005, -0.005	-0.001, -.0003 ISO H6

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



2 FLUTE - STUB FLUTE - BALL NOSE - 30° HELIX
LOC = 1.5 X DIA



UNCOATED

DIA	LOC	ITEM#	LIST PRICE
0.005	0.008	221076	79.43
0.010	0.015	221087	71.22
0.015	0.023	221098	44.56
0.020	0.030	221109	40.50
0.025	0.038	221120	40.50
0.030	0.045	221131	38.00
0.031	0.047	221142	35.64
0.035	0.053	221153	35.64
0.040	0.060	221164	35.64
0.045	0.068	221175	34.76
0.047	0.071	221186	34.76
0.050	0.075	221197	34.76
0.055	0.083	221208	34.76

DIA	LOC	ITEM#	LIST PRICE
0.060	0.090	221219	34.76
0.062	0.093	221230	34.76
0.065	0.098	221241	34.76
0.070	0.105	221252	34.76
0.075	0.113	221263	34.76
0.078	0.117	221274	34.76
0.080	0.120	221285	34.76
0.085	0.128	221296	34.76
0.090	0.135	221307	34.76
0.093	0.140	221318	34.76
0.095	0.143	221329	34.76
0.100	0.150	221340	34.76



ALUMIN COATED

DIA	LOC	ITEM#	LIST PRICE
0.005	0.008	221351	95.33
0.010	0.015	221362	85.43
0.015	0.023	221373	53.47
0.020	0.030	221384	48.61
0.025	0.038	221395	48.61
0.030	0.045	221406	45.59
0.031	0.047	221417	42.79
0.035	0.053	221428	42.79
0.040	0.060	221439	42.79
0.045	0.068	221450	41.76
0.047	0.071	221461	41.76
0.050	0.075	221472	41.76
0.055	0.083	221483	41.76

DIA	LOC	ITEM#	LIST PRICE
0.060	0.090	221494	41.76
0.062	0.093	221505	41.76
0.065	0.098	221516	41.76
0.070	0.105	221527	41.76
0.075	0.113	221538	41.76
0.078	0.117	221549	41.76
0.080	0.120	221560	41.76
0.085	0.128	221571	41.76
0.090	0.135	221582	41.76
0.093	0.140	221593	41.76
0.095	0.143	221604	41.76
0.100	0.150	221615	41.76

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - REGULAR FLUTE - SQUARE END - 30° HELIX
LOC = 3 X DIA



UNCOATED

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

DIA	LOC	ITEM#	LIST PRICE
0.005	0.015	143768	55.27
0.006	0.018	143779	55.27
0.007	0.021	143790	55.27
0.008	0.024	143801	55.27
0.009	0.027	143812	49.53
0.010	0.030	143823	49.53
0.011	0.033	143834	44.33
0.012	0.036	143845	44.33
0.013	0.039	143856	36.68
0.014	0.042	143867	36.68
0.015	0.045	143878	31.00
0.016	0.048	143889	31.00
0.017	0.051	143900	31.00
0.018	0.054	143911	31.00
0.019	0.057	143922	31.00
0.020	0.060	143933	28.17
0.021	0.063	143944	28.17
0.022	0.066	143955	28.17
0.023	0.069	143966	28.17
0.024	0.072	143977	28.17
0.025	0.075	143988	28.17
0.026	0.078	143999	26.44
0.027	0.081	144010	26.44
0.028	0.084	144021	26.44
0.029	0.087	144032	26.44
0.030	0.090	144043	26.44
0.031	0.093	144054	24.78
0.032	0.096	144065	24.78
0.033	0.099	144076	24.78
0.034	0.102	144087	24.78
0.035	0.105	144098	24.78
0.036	0.108	144109	24.78
0.037	0.111	144120	24.78
0.038	0.114	144131	24.78
0.039	0.117	144142	24.78
0.040	0.120	144153	24.78

DIA	LOC	ITEM#	LIST PRICE
0.041	0.123	144164	24.78
0.042	0.126	144175	24.78
0.043	0.129	144186	24.78
0.044	0.132	144197	24.16
0.045	0.135	144208	24.16
0.046	0.138	144219	24.16
0.047	0.141	144230	24.16
0.048	0.144	144241	24.16
0.049	0.147	144252	24.16
0.050	0.150	144263	24.16
0.051	0.153	144274	24.16
0.052	0.156	144285	24.16
0.053	0.159	144296	24.16
0.054	0.162	144307	24.16
0.055	0.165	144318	24.16
0.056	0.168	144329	24.16
0.057	0.171	144340	24.16
0.058	0.174	144351	24.16
0.059	0.177	144362	24.16
0.060	0.180	144373	24.16
0.061	0.183	144384	24.16
0.062	0.186	144395	24.16
0.063	0.189	144406	24.16
0.064	0.192	144417	24.16
0.065	0.195	144428	24.16
0.066	0.198	144439	24.16
0.067	0.201	144450	24.16
0.068	0.204	144461	24.16
0.069	0.207	144472	24.16
0.070	0.210	144483	24.16
0.071	0.213	144494	24.16
0.072	0.216	144505	24.16
0.073	0.219	144516	24.16
0.074	0.222	144527	24.16
0.075	0.225	144538	24.16
0.076	0.228	144549	24.16

DIA	LOC	ITEM#	LIST PRICE
0.077	0.231	144560	24.16
0.078	0.234	144571	24.16
0.079	0.237	144582	24.16
0.080	0.240	144593	24.16
0.081	0.243	144604	24.16
0.082	0.246	144615	24.16
0.083	0.249	144626	24.16
0.084	0.252	144637	24.16
0.085	0.255	144648	24.16
0.086	0.258	144659	24.16
0.087	0.261	144670	24.16
0.088	0.264	144681	24.16
0.089	0.267	144692	24.16
0.090	0.270	144703	24.16
0.091	0.273	144714	24.16
0.092	0.276	144725	24.16
0.093	0.279	144736	24.16
0.094	0.282	144747	24.16
0.095	0.285	144758	24.16
0.096	0.288	144769	24.16
0.097	0.291	144780	24.16
0.098	0.294	144791	24.16
0.099	0.297	144802	24.16
0.100	0.300	144813	24.16
0.101	0.303	144824	24.16
0.102	0.306	144835	24.16
0.103	0.309	144846	24.16
0.104	0.312	144857	24.16
0.105	0.315	144868	24.16
0.106	0.318	144879	24.16
0.107	0.321	144890	24.16
0.108	0.324	144901	24.16
0.109	0.327	144912	24.16
0.110	0.330	144923	24.16
0.115	0.345	144934	24.16
0.120	0.360	144945	24.16

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



2 FLUTE - REGULAR FLUTE - SQUARE END - 30° HELIX
LOC = 3 X DIA



ALTIM COATED

DIA	LOC	ITEM#	LIST PRICE
0.005	0.015	222682	66.32
0.006	0.018	222693	66.32
0.007	0.021	222704	66.32
0.008	0.024	222715	66.32
0.009	0.027	222726	59.43
0.010	0.030	222737	59.43
0.011	0.033	222748	53.21
0.012	0.036	222759	53.21
0.013	0.039	222770	44.00
0.014	0.042	222781	44.00
0.015	0.045	222792	37.19
0.016	0.048	222803	37.19
0.017	0.051	222814	37.19
0.018	0.054	222825	37.19
0.019	0.057	222836	37.19
0.020	0.060	222847	33.80
0.021	0.063	222858	33.80
0.022	0.066	222869	33.80
0.023	0.069	222880	33.80
0.024	0.072	222891	33.80
0.025	0.075	222902	33.80
0.026	0.078	222913	31.74
0.027	0.081	222924	31.74
0.028	0.084	222935	31.74
0.029	0.087	222946	31.74
0.030	0.090	222957	31.74
0.031	0.093	222968	29.72
0.032	0.096	222979	29.72
0.033	0.099	222990	29.72
0.034	0.102	223001	29.72
0.035	0.105	223012	29.72
0.036	0.108	223023	29.72
0.037	0.111	223034	29.72
0.038	0.114	223045	29.72
0.039	0.117	223056	29.72
0.040	0.120	223067	29.72

DIA	LOC	ITEM#	LIST PRICE
0.041	0.123	223078	29.72
0.042	0.126	223089	29.72
0.043	0.129	223100	29.72
0.044	0.132	223111	29.02
0.045	0.135	223122	29.02
0.046	0.138	223133	29.02
0.047	0.141	223144	29.02
0.048	0.144	223155	29.02
0.049	0.147	223166	29.02
0.050	0.150	223177	29.02
0.051	0.153	223188	29.02
0.052	0.156	223199	29.02
0.053	0.159	223210	29.02
0.054	0.162	223221	29.02
0.055	0.165	223232	29.02
0.056	0.168	223243	29.02
0.057	0.171	223254	29.02
0.058	0.174	223265	29.02
0.059	0.177	223276	29.02
0.060	0.180	223287	29.02
0.061	0.183	223298	29.02
0.062	0.186	223309	29.02
0.063	0.189	223320	29.02
0.064	0.192	223331	29.02
0.065	0.195	223342	29.02
0.066	0.198	223353	29.02
0.067	0.201	223364	29.02
0.068	0.204	223375	29.02
0.069	0.207	223386	29.02
0.070	0.210	223397	29.02
0.071	0.213	223408	29.02
0.072	0.216	223419	29.02
0.073	0.219	223430	29.02
0.074	0.222	223441	29.02
0.075	0.225	223452	29.02
0.076	0.228	223463	29.02

DIA	LOC	ITEM#	LIST PRICE
0.077	0.231	223474	29.02
0.078	0.234	223485	29.02
0.079	0.237	223496	29.02
0.080	0.240	223507	29.02
0.081	0.243	223518	29.02
0.082	0.246	223529	29.02
0.083	0.249	223540	29.02
0.084	0.252	223551	29.02
0.085	0.255	223562	29.02
0.086	0.258	223573	29.02
0.087	0.261	223584	29.02
0.088	0.264	223595	29.02
0.089	0.267	223606	29.02
0.090	0.270	223617	29.02
0.091	0.273	223628	29.02
0.092	0.276	223639	29.02
0.093	0.279	223650	29.02
0.094	0.282	223661	29.02
0.095	0.285	223672	29.02
0.096	0.288	223683	29.02
0.097	0.291	223694	29.02
0.098	0.294	223705	29.02
0.099	0.297	223716	29.02
0.100	0.300	223727	29.02
0.101	0.303	223738	29.02
0.102	0.306	223749	29.02
0.103	0.309	223760	29.02
0.104	0.312	223771	29.02
0.105	0.315	223782	29.02
0.106	0.318	223793	29.02
0.107	0.321	223804	29.02
0.108	0.324	223815	29.02
0.109	0.327	223826	29.02
0.110	0.330	223837	29.02
0.115	0.345	223848	29.02
0.120	0.360	223859	29.02

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

2 FLUTE - REGULAR FLUTE - BALL NOSE - 30° HELIX
LOC = 3 X DIA



UNCOATED

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

DIA	LOC	ITEM#	LIST PRICE
0.005	0.015	144956	69.08
0.006	0.018	144967	69.08
0.007	0.021	144978	69.08
0.008	0.024	144989	69.08
0.009	0.027	145000	61.94
0.010	0.030	145011	61.94
0.011	0.033	145022	55.42
0.012	0.036	145033	55.42
0.013	0.039	145044	45.92
0.014	0.042	145055	45.92
0.015	0.045	145066	38.74
0.016	0.048	145077	38.74
0.017	0.051	145088	38.74
0.018	0.054	145099	38.74
0.019	0.057	145110	38.74
0.020	0.060	145121	35.24
0.021	0.063	145132	35.24
0.022	0.066	145143	35.24
0.023	0.069	145154	35.24
0.024	0.072	145165	35.24
0.025	0.075	145176	35.24
0.026	0.078	145187	33.07
0.027	0.081	145198	33.07
0.028	0.084	145209	33.07
0.029	0.087	145220	33.07
0.030	0.090	145231	33.07
0.031	0.093	145242	31.00
0.032	0.096	145253	31.00
0.033	0.099	145264	31.00
0.034	0.102	145275	31.00
0.035	0.105	145286	31.00
0.036	0.108	145297	31.00
0.037	0.111	145308	31.00
0.038	0.114	145319	31.00
0.039	0.117	145330	31.00
0.040	0.120	145341	31.00

DIA	LOC	ITEM#	LIST PRICE
0.041	0.123	145352	31.00
0.042	0.126	145363	31.00
0.043	0.129	145374	31.00
0.044	0.132	145385	30.23
0.045	0.135	145396	30.23
0.046	0.138	145407	30.23
0.047	0.141	145418	30.23
0.048	0.144	145429	30.23
0.049	0.147	145440	30.23
0.050	0.150	145451	30.23
0.051	0.153	145462	30.23
0.052	0.156	145473	30.23
0.053	0.159	145484	30.23
0.054	0.162	145495	30.23
0.055	0.165	145506	30.23
0.056	0.168	145517	30.23
0.057	0.171	145528	30.23
0.058	0.174	145539	30.23
0.059	0.177	145550	30.23
0.060	0.180	145561	30.23
0.061	0.183	145572	30.23
0.062	0.186	145583	30.23
0.063	0.189	145594	30.23
0.064	0.192	145605	30.23
0.065	0.195	145616	30.23
0.066	0.198	145627	30.23
0.067	0.201	145638	30.23
0.068	0.204	145649	30.23
0.069	0.207	145660	30.23
0.070	0.210	145671	30.23
0.071	0.213	145682	30.23
0.072	0.216	145693	30.23
0.073	0.219	145704	30.23
0.074	0.222	145715	30.23
0.075	0.225	145726	30.23
0.076	0.228	145737	30.23

DIA	LOC	ITEM#	LIST PRICE
0.077	0.231	145748	30.23
0.078	0.234	145759	30.23
0.079	0.237	145770	30.23
0.080	0.240	145781	30.23
0.081	0.243	145792	30.23
0.082	0.246	145803	30.23
0.083	0.249	145814	30.23
0.084	0.252	145825	30.23
0.085	0.255	145836	30.23
0.086	0.258	145847	30.23
0.087	0.261	145858	30.23
0.088	0.264	145869	30.23
0.089	0.267	145880	30.23
0.090	0.270	145891	30.23
0.091	0.273	145902	30.23
0.092	0.276	145913	30.23
0.093	0.279	145924	30.23
0.094	0.282	145935	30.23
0.095	0.285	145946	30.23
0.096	0.288	145957	30.23
0.097	0.291	145968	30.23
0.098	0.294	145979	30.23
0.099	0.297	145990	30.23
0.100	0.300	146001	30.23
0.101	0.303	146012	30.23
0.102	0.306	146023	30.23
0.103	0.309	146034	30.23
0.104	0.312	146045	30.23
0.105	0.315	146056	30.23
0.106	0.318	146067	30.23
0.107	0.321	146078	30.23
0.108	0.324	146089	30.23
0.109	0.327	146100	30.23
0.110	0.330	146111	30.23
0.115	0.345	146122	30.23
0.120	0.360	146133	30.23

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



2 FLUTE - REGULAR FLUTE - BALL NOSE - 30° HELIX
LOC = 3 X DIA



ALTIN COATED

DIA	LOC	ITEM#	LIST PRICE
0.005	0.015	223870	82.89
0.006	0.018	223881	82.89
0.007	0.021	223892	82.89
0.008	0.024	223903	82.89
0.009	0.027	223914	74.31
0.010	0.030	223925	74.31
0.011	0.033	223936	66.54
0.012	0.036	223947	66.54
0.013	0.039	223958	55.09
0.014	0.042	223969	55.09
0.015	0.045	223980	46.47
0.016	0.048	223991	46.47
0.017	0.051	224002	46.47
0.018	0.054	224013	46.47
0.019	0.057	224024	46.47
0.020	0.060	224035	42.27
0.021	0.063	224046	42.27
0.022	0.066	224057	42.27
0.023	0.069	224068	42.27
0.024	0.072	224079	42.27
0.025	0.075	224090	42.27
0.026	0.078	224101	39.66
0.027	0.081	224112	39.66
0.028	0.084	224123	39.66
0.029	0.087	224134	39.66
0.030	0.090	224145	39.66
0.031	0.093	224156	37.19
0.032	0.096	224167	37.19
0.033	0.099	224178	37.19
0.034	0.102	224189	37.19
0.035	0.105	224200	37.19
0.036	0.108	224211	37.19
0.037	0.111	224222	37.19
0.038	0.114	224233	37.19
0.039	0.117	224244	37.19
0.040	0.120	224255	37.19

DIA	LOC	ITEM#	LIST PRICE
0.041	0.123	224266	37.19
0.042	0.126	224277	37.19
0.043	0.129	224288	37.19
0.044	0.132	224299	36.31
0.045	0.135	224310	36.31
0.046	0.138	224321	36.31
0.047	0.141	224332	36.31
0.048	0.144	224343	36.31
0.049	0.147	224354	36.31
0.050	0.150	224365	36.31
0.051	0.153	224376	36.31
0.052	0.156	224387	36.31
0.053	0.159	224398	36.31
0.054	0.162	224409	36.31
0.055	0.165	224420	36.31
0.056	0.168	224431	36.31
0.057	0.171	224442	36.31
0.058	0.174	224453	36.31
0.059	0.177	224464	36.31
0.060	0.180	224475	36.31
0.061	0.183	224486	36.31
0.062	0.186	224497	36.31
0.063	0.189	224508	36.31
0.064	0.192	224519	36.31
0.065	0.195	224530	36.31
0.066	0.198	224541	36.31
0.067	0.201	224552	36.31
0.068	0.204	224563	36.31
0.069	0.207	224574	36.31
0.070	0.210	224585	36.31
0.071	0.213	224596	36.31
0.072	0.216	224607	36.31
0.073	0.219	224618	36.31
0.074	0.222	224629	36.31
0.075	0.225	224640	36.31
0.076	0.228	224651	36.31

DIA	LOC	ITEM#	LIST PRICE
0.077	0.231	224662	36.31
0.078	0.234	224673	36.31
0.079	0.237	224684	36.31
0.080	0.240	224695	36.31
0.081	0.243	224706	36.31
0.082	0.246	224717	36.31
0.083	0.249	224728	36.31
0.084	0.252	224739	36.31
0.085	0.255	224750	36.31
0.086	0.258	224761	36.31
0.087	0.261	224772	36.31
0.088	0.264	224783	36.31
0.089	0.267	224794	36.31
0.090	0.270	224805	36.31
0.091	0.273	224816	36.31
0.092	0.276	224827	36.31
0.093	0.279	224838	36.31
0.094	0.282	224849	36.31
0.095	0.285	224860	36.31
0.096	0.288	224871	36.31
0.097	0.291	224882	36.31
0.098	0.294	224893	36.31
0.099	0.297	224904	36.31
0.100	0.300	224915	36.31
0.101	0.303	224926	36.31
0.102	0.306	224937	36.31
0.103	0.309	224948	36.31
0.104	0.312	224959	36.31
0.105	0.315	224970	36.31
0.106	0.318	224981	36.31
0.107	0.321	224992	36.31
0.108	0.324	225003	36.31
0.109	0.327	225014	36.31
0.110	0.330	225025	36.31
0.115	0.345	225036	36.31
0.120	0.360	225047	36.31

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - STUB FLUTE - SQUARE END - 30° HELIX
LOC = 1.5 X DIA



UNCOATED

DIA	LOC	ITEM#	LIST PRICE
0.010	0.015	221626	56.96
0.015	0.023	221637	35.64
0.020	0.030	221648	32.40
0.025	0.038	221659	32.40
0.030	0.045	221670	30.42
0.031	0.047	221681	28.50
0.035	0.053	221692	28.50
0.040	0.060	221703	28.50
0.045	0.068	221714	27.80
0.047	0.071	221725	27.80
0.050	0.075	221736	27.80
0.055	0.083	221747	27.80

DIA	LOC	ITEM#	LIST PRICE
0.060	0.090	221758	27.80
0.062	0.093	221769	27.80
0.065	0.098	221780	27.80
0.070	0.105	221791	27.80
0.075	0.113	221802	27.80
0.078	0.117	221813	27.80
0.080	0.120	221824	27.80
0.085	0.128	221835	27.80
0.090	0.135	221846	27.80
0.093	0.140	221857	27.80
0.095	0.143	221868	27.80
0.100	0.150	221879	27.80



ALTiN COATED

DIA	LOC	ITEM#	LIST PRICE
0.010	0.015	221890	68.34
0.015	0.023	221901	42.79
0.020	0.030	221912	38.88
0.025	0.038	221923	38.88
0.030	0.045	221934	36.49
0.031	0.047	221945	34.17
0.035	0.053	221956	34.17
0.040	0.060	221967	34.17
0.045	0.068	221978	33.36
0.047	0.071	221989	33.36
0.050	0.075	222000	33.36
0.055	0.083	222011	33.36

DIA	LOC	ITEM#	LIST PRICE
0.060	0.090	222022	33.36
0.062	0.093	222033	33.36
0.065	0.098	222044	33.36
0.070	0.105	222055	33.36
0.075	0.113	222066	33.36
0.078	0.117	222077	33.36
0.080	0.120	222088	33.36
0.085	0.128	222099	33.36
0.090	0.135	222110	33.36
0.093	0.140	222121	33.36
0.095	0.143	222132	33.36
0.100	0.150	222143	33.36

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.0005, -0.0005	-0.0001, -0.0003 ISO H6

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - STUB FLUTE - BALL NOSE - 30° HELIX
LOC = 1.5 X DIA



UNCOATED

DIA	LOC	ITEM#	LIST PRICE
0.010	0.015	222154	61.94
0.015	0.023	222165	38.74
0.020	0.030	222176	35.24
0.025	0.038	222187	35.24
0.030	0.045	222198	33.07
0.031	0.047	222209	31.00
0.035	0.053	222220	31.00
0.040	0.060	222231	31.00
0.045	0.068	222242	30.23
0.047	0.071	222253	30.23
0.050	0.075	222264	30.23
0.055	0.083	222275	30.23

DIA	LOC	ITEM#	LIST PRICE
0.060	0.090	222286	30.23
0.062	0.093	222297	30.23
0.065	0.098	222308	30.23
0.070	0.105	222319	30.23
0.075	0.113	222330	30.23
0.078	0.117	222341	30.23
0.080	0.120	222352	30.23
0.085	0.128	222363	30.23
0.090	0.135	222374	30.23
0.093	0.140	222385	30.23
0.095	0.143	222396	30.23
0.100	0.150	222407	30.23



ALTiN COATED

DIA	LOC	ITEM#	LIST PRICE
0.010	0.015	222418	85.43
0.015	0.023	222429	53.47
0.020	0.030	222440	48.61
0.025	0.038	222451	48.61
0.030	0.045	222462	45.59
0.031	0.047	222473	42.79
0.035	0.053	222484	42.79
0.040	0.060	222495	42.79
0.045	0.068	222506	41.76
0.047	0.071	222517	41.76
0.050	0.075	222528	41.76
0.055	0.083	222539	41.76

DIA	LOC	ITEM#	LIST PRICE
0.060	0.090	222550	41.76
0.062	0.093	222561	41.76
0.065	0.098	222572	41.76
0.070	0.105	222583	41.76
0.075	0.113	222594	41.76
0.078	0.117	222605	41.76
0.080	0.120	222616	41.76
0.085	0.128	222627	41.76
0.090	0.135	222638	41.76
0.093	0.140	222649	41.76
0.095	0.143	222660	41.76
0.100	0.150	222671	41.76

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - STUB FLUTE  CORNER RADIUS - 30° HELIX
LOC = 1.5 X DIA



UNCOATED

DIA	LOC	RAD	ITEM#	LIST PRICE
0.015	0.023	0.003	218722	75.38
0.020	0.030	0.005	218733	70.37
0.025	0.038	0.005	218744	70.37
0.030	0.045	0.005	218755	50.26
0.030	0.045	0.010	218766	50.26
0.031	0.047	0.005	218777	50.26
0.031	0.047	0.010	218788	50.26
0.035	0.053	0.005	218799	50.26
0.035	0.053	0.010	218810	50.26
0.040	0.060	0.005	218821	50.26
0.040	0.060	0.010	218832	50.26
0.045	0.068	0.005	218843	50.26
0.045	0.068	0.010	218854	50.26
0.045	0.068	0.015	218865	50.26

DIA	LOC	RAD	ITEM#	LIST PRICE
0.047	0.071	0.005	218876	50.26
0.047	0.071	0.010	218887	50.26
0.047	0.071	0.015	218898	50.26
0.050	0.075	0.005	218909	50.26
0.050	0.075	0.010	218920	50.26
0.050	0.075	0.015	218931	50.26
0.060	0.090	0.005	218942	50.26
0.060	0.090	0.010	218953	50.26
0.060	0.090	0.015	218964	50.26
0.062	0.093	0.005	218975	50.26
0.062	0.093	0.010	218986	50.26
0.062	0.093	0.015	218997	50.26
0.075	0.113	0.005	219008	50.26
0.075	0.113	0.010	219019	50.26

DIA	LOC	RAD	ITEM#	LIST PRICE
0.075	0.113	0.015	219030	50.26
0.078	0.117	0.005	219041	50.26
0.078	0.117	0.010	219052	50.26
0.078	0.117	0.015	219063	50.26
0.090	0.135	0.005	219074	50.26
0.090	0.135	0.010	219085	50.26
0.090	0.135	0.015	219096	50.26
0.093	0.140	0.005	219107	50.26
0.093	0.140	0.010	219118	50.26
0.093	0.140	0.015	219129	50.26
0.100	0.150	0.005	219140	50.26
0.100	0.150	0.010	219151	50.26
0.100	0.150	0.015	219162	50.26



ALTIN COATED

DIA	LOC	RAD	ITEM#	LIST PRICE
0.015	0.023	0.003	219173	93.46
0.020	0.030	0.005	219184	87.23
0.025	0.038	0.005	219195	87.23
0.030	0.045	0.005	219206	62.30
0.030	0.045	0.010	219217	62.30
0.031	0.047	0.005	219228	62.30
0.031	0.047	0.010	219239	62.30
0.035	0.053	0.005	219250	62.30
0.035	0.053	0.010	219261	62.30
0.040	0.060	0.005	219272	62.30
0.040	0.060	0.010	219283	62.30
0.045	0.068	0.005	219294	62.30
0.045	0.068	0.010	219305	62.30
0.045	0.068	0.015	219316	62.30

DIA	LOC	RAD	ITEM#	LIST PRICE
0.047	0.071	0.005	219327	62.30
0.047	0.071	0.010	219338	62.30
0.047	0.071	0.015	219349	62.30
0.050	0.075	0.005	219360	62.30
0.050	0.075	0.010	219371	62.30
0.050	0.075	0.015	219382	62.30
0.060	0.090	0.005	219393	62.30
0.060	0.090	0.010	219404	62.30
0.060	0.090	0.015	219415	62.30
0.062	0.093	0.005	219426	62.30
0.062	0.093	0.010	219437	62.30
0.062	0.093	0.015	219448	62.30
0.075	0.113	0.005	219459	62.30
0.075	0.113	0.010	219470	62.30

DIA	LOC	RAD	ITEM#	LIST PRICE
0.075	0.113	0.015	219481	62.30
0.078	0.117	0.005	219492	62.30
0.078	0.117	0.010	219503	62.30
0.078	0.117	0.015	219514	62.30
0.090	0.135	0.005	219525	62.30
0.090	0.135	0.010	219536	62.30
0.090	0.135	0.015	219547	62.30
0.093	0.140	0.005	219558	62.30
0.093	0.140	0.010	219569	62.30
0.093	0.140	0.015	219580	62.30
0.100	0.150	0.005	219591	62.30
0.100	0.150	0.010	219602	62.30
0.100	0.150	0.015	219613	62.30

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	RADIUS
ALL SIZES	+0.0005, -0.0005	-0.0001, -0.0003 ISO H6	+0.0002, -0.0002

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL


LONG REACH LONG FL

LONG LENGTH LONG FL

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - REGULAR FLUTE  CORNER RADIUS - 30° HELIX
LOC = 3 X DIA



UNCOATED

DIA	LOC	RAD	ITEM#	LIST PRICE
0.015	0.045	0.003	219624	75.38
0.020	0.060	0.005	219635	70.37
0.025	0.075	0.005	219646	70.37
0.030	0.090	0.005	219657	50.26
0.030	0.090	0.010	219668	50.26
0.031	0.093	0.005	219679	50.26
0.031	0.093	0.010	219690	50.26
0.035	0.105	0.005	219701	50.26
0.035	0.105	0.010	219712	50.26
0.040	0.120	0.005	219723	50.26
0.040	0.120	0.010	219734	50.26
0.045	0.135	0.005	219745	50.26
0.045	0.135	0.010	219756	50.26
0.045	0.135	0.015	219767	50.26

DIA	LOC	RAD	ITEM#	LIST PRICE
0.047	0.141	0.005	219778	50.26
0.047	0.141	0.010	219789	50.26
0.047	0.141	0.015	219800	50.26
0.050	0.150	0.005	219811	50.26
0.050	0.150	0.010	219822	50.26
0.050	0.150	0.015	219833	50.26
0.060	0.180	0.005	219844	50.26
0.060	0.180	0.010	219855	50.26
0.060	0.180	0.015	219866	50.26
0.062	0.186	0.005	219877	50.26
0.062	0.186	0.010	219888	50.26
0.062	0.186	0.015	219899	50.26
0.075	0.225	0.005	219910	50.26
0.075	0.225	0.010	219921	50.26

DIA	LOC	RAD	ITEM#	LIST PRICE
0.075	0.225	0.015	219932	50.26
0.078	0.234	0.005	219943	50.26
0.078	0.234	0.010	219954	50.26
0.078	0.234	0.015	219965	50.26
0.090	0.270	0.005	219976	50.26
0.090	0.270	0.010	219987	50.26
0.090	0.270	0.015	219998	50.26
0.093	0.279	0.005	220009	50.26
0.093	0.279	0.010	220020	50.26
0.093	0.279	0.015	220031	50.26
0.100	0.300	0.005	220042	50.26
0.100	0.300	0.010	220053	50.26
0.100	0.300	0.015	220064	50.26

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL



ALTIN COATED

DIA	LOC	RAD	ITEM#	LIST PRICE
0.015	0.045	0.003	220075	93.46
0.020	0.060	0.005	220086	87.23
0.025	0.075	0.005	220097	87.23
0.030	0.090	0.005	220108	62.30
0.030	0.090	0.010	220119	62.30
0.031	0.093	0.005	220130	62.30
0.031	0.093	0.010	220141	62.30
0.035	0.105	0.005	220152	62.30
0.035	0.105	0.010	220163	62.30
0.040	0.120	0.005	220174	62.30
0.040	0.120	0.010	220185	62.30
0.045	0.135	0.005	220196	62.30
0.045	0.135	0.010	220207	62.30
0.045	0.135	0.015	220218	62.30

DIA	LOC	RAD	ITEM#	LIST PRICE
0.047	0.141	0.005	220229	62.30
0.047	0.141	0.010	220240	62.30
0.047	0.141	0.015	220251	62.30
0.050	0.150	0.005	220262	62.30
0.050	0.150	0.010	220273	62.30
0.050	0.150	0.015	220284	62.30
0.060	0.180	0.005	220295	62.30
0.060	0.180	0.010	220306	62.30
0.060	0.180	0.015	220317	62.30
0.062	0.186	0.005	220328	62.30
0.062	0.186	0.010	220339	62.30
0.062	0.186	0.015	220350	62.30
0.075	0.225	0.005	220361	62.30
0.075	0.225	0.010	220372	62.30

DIA	LOC	RAD	ITEM#	LIST PRICE
0.075	0.225	0.015	220383	62.30
0.078	0.234	0.005	220394	62.30
0.078	0.234	0.010	220405	62.30
0.078	0.234	0.015	220416	62.30
0.090	0.270	0.005	220427	62.30
0.090	0.270	0.010	220438	62.30
0.090	0.270	0.015	220449	62.30
0.093	0.279	0.005	220460	62.30
0.093	0.279	0.010	220471	62.30
0.093	0.279	0.015	220482	62.30
0.100	0.300	0.005	220493	62.30
0.100	0.300	0.010	220504	62.30
0.100	0.300	0.015	220515	62.30

LONG REACH LONG FL

LONG LENGTH LONG FL

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	RADIUS
ALL SIZES	+0.0005, -0.0005	-0.0001, -0.0003 ISO H6	+0.0002, -0.0002

MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - REGULAR FLUTE - SQUARE END - 30° HELIX
LOC = 3 X DIA



UNCOATED

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

DIA	LOC	ITEM#	LIST PRICE
0.010	0.030	146144	49.53
0.011	0.033	146155	44.33
0.012	0.036	146166	44.33
0.013	0.039	146177	36.68
0.014	0.042	146188	36.68
0.015	0.045	146199	31.00
0.016	0.048	146210	31.00
0.017	0.051	146221	31.00
0.018	0.054	146232	31.00
0.019	0.057	146243	31.00
0.020	0.060	146254	28.17
0.021	0.063	146265	28.17
0.022	0.066	146276	28.17
0.023	0.069	146287	28.17
0.024	0.072	146298	28.17
0.025	0.075	146309	28.17
0.026	0.078	146320	26.44
0.027	0.081	146331	26.44
0.028	0.084	146342	26.44
0.029	0.087	146353	26.44
0.030	0.090	146364	26.44
0.031	0.093	146375	24.78
0.032	0.096	146386	24.78
0.033	0.099	146397	24.78
0.034	0.102	146408	24.78
0.035	0.105	146419	24.78
0.036	0.108	146430	24.78
0.037	0.111	146441	24.78
0.038	0.114	146452	24.78
0.039	0.117	146463	24.78
0.040	0.120	146474	24.78
0.041	0.123	146485	24.78
0.042	0.126	146496	24.78
0.043	0.129	146507	24.78
0.044	0.132	146518	24.16

DIA	LOC	ITEM#	LIST PRICE
0.045	0.135	146529	24.16
0.046	0.138	146540	24.16
0.047	0.141	146551	24.16
0.048	0.144	146562	24.16
0.049	0.147	146573	24.16
0.050	0.150	146584	24.16
0.051	0.153	146595	24.16
0.052	0.156	146606	24.16
0.053	0.159	146617	24.16
0.054	0.162	146628	24.16
0.055	0.165	146639	24.16
0.056	0.168	146650	24.16
0.057	0.171	146661	24.16
0.058	0.174	146672	24.16
0.059	0.177	146683	24.16
0.060	0.180	146694	24.16
0.061	0.183	146705	24.16
0.062	0.186	146716	24.16
0.063	0.189	146727	24.16
0.064	0.192	146738	24.16
0.065	0.195	146749	24.16
0.066	0.198	146760	24.16
0.067	0.201	146771	24.16
0.068	0.204	146782	24.16
0.069	0.207	146793	24.16
0.070	0.210	146804	24.16
0.071	0.213	146815	24.16
0.072	0.216	146826	24.16
0.073	0.219	146837	24.16
0.074	0.222	146848	24.16
0.075	0.225	146859	24.16
0.076	0.228	146870	24.16
0.077	0.231	146881	24.16
0.078	0.234	146892	24.16
0.079	0.237	146903	24.16

DIA	LOC	ITEM#	LIST PRICE
0.080	0.240	146914	24.16
0.081	0.243	146925	24.16
0.082	0.246	146936	24.16
0.083	0.249	146947	24.16
0.084	0.252	146958	24.16
0.085	0.255	146969	24.16
0.086	0.258	146980	24.16
0.087	0.261	146991	24.16
0.088	0.264	147002	24.16
0.089	0.267	147013	24.16
0.090	0.270	147024	24.16
0.091	0.273	147035	24.16
0.092	0.276	147046	24.16
0.093	0.279	147057	24.16
0.094	0.282	147068	24.16
0.095	0.285	147079	24.16
0.096	0.288	147090	24.16
0.097	0.291	147101	24.16
0.098	0.294	147112	24.16
0.099	0.297	147123	24.16
0.100	0.300	147134	24.16
0.101	0.303	147145	24.16
0.102	0.306	147156	24.16
0.103	0.309	147167	24.16
0.104	0.312	147178	24.16
0.105	0.315	147189	24.16
0.106	0.318	147200	24.16
0.107	0.321	147211	24.16
0.108	0.324	147222	24.16
0.109	0.327	147233	24.16
0.110	0.330	147244	24.16
0.115	0.345	147255	24.16
0.120	0.360	147266	24.16

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - REGULAR FLUTE - SQUARE END - 30° HELIX
LOC = 3 X DIA



ALTiN COATED

DIA	LOC	ITEM#	LIST PRICE
0.010	0.030	225058	59.43
0.011	0.033	225069	53.21
0.012	0.036	225080	53.21
0.013	0.039	225091	44.00
0.014	0.042	225102	44.00
0.015	0.045	225113	37.19
0.016	0.048	225124	37.19
0.017	0.051	225135	37.19
0.018	0.054	225146	37.19
0.019	0.057	225157	37.19
0.020	0.060	225168	33.80
0.021	0.063	225179	33.80
0.022	0.066	225190	33.80
0.023	0.069	225201	33.80
0.024	0.072	225212	33.80
0.025	0.075	225223	33.80
0.026	0.078	225234	31.74
0.027	0.081	225245	31.74
0.028	0.084	225256	31.74
0.029	0.087	225267	31.74
0.030	0.090	225278	31.74
0.031	0.093	225289	29.72
0.032	0.096	225300	29.72
0.033	0.099	225311	29.72
0.034	0.102	225322	29.72
0.035	0.105	225333	29.72
0.036	0.108	225344	29.72
0.037	0.111	225355	29.72
0.038	0.114	225366	29.72
0.039	0.117	225377	29.72
0.040	0.120	225388	29.72
0.041	0.123	225399	29.72
0.042	0.126	225410	29.72
0.043	0.129	225421	29.72
0.044	0.132	225432	29.02

DIA	LOC	ITEM#	LIST PRICE
0.045	0.135	225443	29.02
0.046	0.138	225454	29.02
0.047	0.141	225465	29.02
0.048	0.144	225476	29.02
0.049	0.147	225487	29.02
0.050	0.150	225498	29.02
0.051	0.153	225509	29.02
0.052	0.156	225520	29.02
0.053	0.159	225531	29.02
0.054	0.162	225542	29.02
0.055	0.165	225553	29.02
0.056	0.168	225564	29.02
0.057	0.171	225575	29.02
0.058	0.174	225586	29.02
0.059	0.177	225597	29.02
0.060	0.180	225608	29.02
0.061	0.183	225619	29.02
0.062	0.186	225630	29.02
0.063	0.189	225641	29.02
0.064	0.192	225652	29.02
0.065	0.195	225663	29.02
0.066	0.198	225674	29.02
0.067	0.201	225685	29.02
0.068	0.204	225696	29.02
0.069	0.207	225707	29.02
0.070	0.210	225718	29.02
0.071	0.213	225729	29.02
0.072	0.216	225740	29.02
0.073	0.219	225751	29.02
0.074	0.222	225762	29.02
0.075	0.225	225773	29.02
0.076	0.228	225784	29.02
0.077	0.231	225795	29.02
0.078	0.234	225806	29.02
0.079	0.237	225817	29.02

DIA	LOC	ITEM#	LIST PRICE
0.080	0.240	225828	29.02
0.081	0.243	225839	29.02
0.082	0.246	225850	29.02
0.083	0.249	225861	29.02
0.084	0.252	225872	29.02
0.085	0.255	225883	29.02
0.086	0.258	225894	29.02
0.087	0.261	225905	29.02
0.088	0.264	225916	29.02
0.089	0.267	225927	29.02
0.090	0.270	225938	29.02
0.091	0.273	225949	29.02
0.092	0.276	225960	29.02
0.093	0.279	225971	29.02
0.094	0.282	225982	29.02
0.095	0.285	225993	29.02
0.096	0.288	226004	29.02
0.097	0.291	226015	29.02
0.098	0.294	226026	29.02
0.099	0.297	226037	29.02
0.100	0.300	226048	29.02
0.101	0.303	226059	29.02
0.102	0.306	226070	29.02
0.103	0.309	226081	29.02
0.104	0.312	226092	29.02
0.105	0.315	226103	29.02
0.106	0.318	226114	29.02
0.107	0.321	226125	29.02
0.108	0.324	226136	29.02
0.109	0.327	226147	29.02
0.110	0.330	226158	29.02
0.115	0.345	226169	29.02
0.120	0.360	226180	29.02

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 FLUTE - REGULAR FLUTE - BALL NOSE - 30° HELIX
LOC = 3 X DIA



UNCOATED

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

DIA	LOC	ITEM#	LIST PRICE
0.010	0.030	147277	61.94
0.011	0.033	147288	55.42
0.012	0.036	147299	55.42
0.013	0.039	147310	45.92
0.014	0.042	147321	45.92
0.015	0.045	147332	38.74
0.016	0.048	147343	38.74
0.017	0.051	147354	38.74
0.018	0.054	147365	38.74
0.019	0.057	147376	38.74
0.020	0.060	147387	35.24
0.021	0.063	147398	35.24
0.022	0.066	147409	35.24
0.023	0.069	147420	35.24
0.024	0.072	147431	35.24
0.025	0.075	147442	35.24
0.026	0.078	147453	33.07
0.027	0.081	147464	33.07
0.028	0.084	147475	33.07
0.029	0.087	147486	33.07
0.030	0.090	147497	33.07
0.031	0.093	147508	31.00
0.032	0.096	147519	31.00
0.033	0.099	147530	31.00
0.034	0.102	147541	31.00
0.035	0.105	147552	31.00
0.036	0.108	147563	31.00
0.037	0.111	147574	31.00
0.038	0.114	147585	31.00
0.039	0.117	147596	31.00
0.040	0.120	147607	31.00
0.041	0.123	147618	31.00
0.042	0.126	147629	31.00
0.043	0.129	147640	31.00
0.044	0.132	147651	30.23

DIA	LOC	ITEM#	LIST PRICE
0.045	0.135	147662	30.23
0.046	0.138	147673	30.23
0.047	0.141	147684	30.23
0.048	0.144	147695	30.23
0.049	0.147	147706	30.23
0.050	0.150	147717	30.23
0.051	0.153	147728	30.23
0.052	0.156	147739	30.23
0.053	0.159	147750	30.23
0.054	0.162	147761	30.23
0.055	0.165	147772	30.23
0.056	0.168	147783	30.23
0.057	0.171	147794	30.23
0.058	0.174	147805	30.23
0.059	0.177	147816	30.23
0.060	0.180	147827	30.23
0.061	0.183	147838	30.23
0.062	0.186	147849	30.23
0.063	0.189	147860	30.23
0.064	0.192	147871	30.23
0.065	0.195	147882	30.23
0.066	0.198	147893	30.23
0.067	0.201	147904	30.23
0.068	0.204	147915	30.23
0.069	0.207	147926	30.23
0.070	0.210	147937	30.23
0.071	0.213	147948	30.23
0.072	0.216	147959	30.23
0.073	0.219	147970	30.23
0.074	0.222	147981	30.23
0.075	0.225	147992	30.23
0.076	0.228	148003	30.23
0.077	0.231	148014	30.23
0.078	0.234	148025	30.23
0.079	0.237	148036	30.23

DIA	LOC	ITEM#	LIST PRICE
0.080	0.240	148047	30.23
0.081	0.243	148058	30.23
0.082	0.246	148069	30.23
0.083	0.249	148080	30.23
0.084	0.252	148091	30.23
0.085	0.255	148102	30.23
0.086	0.258	148113	30.23
0.087	0.261	148124	30.23
0.088	0.264	148135	30.23
0.089	0.267	148146	30.23
0.090	0.270	148157	30.23
0.091	0.273	148168	30.23
0.092	0.276	148179	30.23
0.093	0.279	148190	30.23
0.094	0.282	148201	30.23
0.095	0.285	148212	30.23
0.096	0.288	148223	30.23
0.097	0.291	148234	30.23
0.098	0.294	148245	30.23
0.099	0.297	148256	30.23
0.100	0.300	148267	30.23
0.101	0.303	148278	30.23
0.102	0.306	148289	30.23
0.103	0.309	148300	30.23
0.104	0.312	148311	30.23
0.105	0.315	148322	30.23
0.106	0.318	148333	30.23
0.107	0.321	148344	30.23
0.108	0.324	148355	30.23
0.109	0.327	148366	30.23
0.110	0.330	148377	30.23
0.115	0.345	148388	30.23
0.120	0.360	148399	30.23

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



4 FLUTE - REGULAR FLUTE - BALL NOSE - 30° HELIX
LOC = 3 X DIA



ALTiN COATED

DIA	LOC	ITEM#	LIST PRICE
0.010	0.030	226191	74.31
0.011	0.033	226202	66.54
0.012	0.036	226213	66.54
0.013	0.039	226224	55.09
0.014	0.042	226235	55.09
0.015	0.045	226246	46.47
0.016	0.048	226257	46.47
0.017	0.051	226268	46.47
0.018	0.054	226279	46.47
0.019	0.057	226290	46.47
0.020	0.060	226301	42.27
0.021	0.063	226312	42.27
0.022	0.066	226323	42.27
0.023	0.069	226334	42.27
0.024	0.072	226345	42.27
0.025	0.075	226356	42.27
0.026	0.078	226367	39.66
0.027	0.081	226378	39.66
0.028	0.084	226389	39.66
0.029	0.087	226400	39.66
0.030	0.090	226411	39.66
0.031	0.093	226422	37.19
0.032	0.096	226433	37.19
0.033	0.099	226444	37.19
0.034	0.102	226455	37.19
0.035	0.105	226466	37.19
0.036	0.108	226477	37.19
0.037	0.111	226488	37.19
0.038	0.114	226499	37.19
0.039	0.117	226510	37.19
0.040	0.120	226521	37.19
0.041	0.123	226532	37.19
0.042	0.126	226543	37.19
0.043	0.129	226554	37.19
0.044	0.132	226565	36.31

DIA	LOC	ITEM#	LIST PRICE
0.045	0.135	226576	36.31
0.046	0.138	226587	36.31
0.047	0.141	226598	36.31
0.048	0.144	226609	36.31
0.049	0.147	226620	36.31
0.050	0.150	226631	36.31
0.051	0.153	226642	36.31
0.052	0.156	226653	36.31
0.053	0.159	226664	36.31
0.054	0.162	226675	36.31
0.055	0.165	226686	36.31
0.056	0.168	226697	36.31
0.057	0.171	226708	36.31
0.058	0.174	226719	36.31
0.059	0.177	226730	36.31
0.060	0.180	226741	36.31
0.061	0.183	226752	36.31
0.062	0.186	226763	36.31
0.063	0.189	226774	36.31
0.064	0.192	226785	36.31
0.065	0.195	226796	36.31
0.066	0.198	226807	36.31
0.067	0.201	226818	36.31
0.068	0.204	226829	36.31
0.069	0.207	226840	36.31
0.070	0.210	226851	36.31
0.071	0.213	226862	36.31
0.072	0.216	226873	36.31
0.073	0.219	226884	36.31
0.074	0.222	226895	36.31
0.075	0.225	226906	36.31
0.076	0.228	226917	36.31
0.077	0.231	226928	36.31
0.078	0.234	226939	36.31
0.079	0.237	226950	36.31

DIA	LOC	ITEM#	LIST PRICE
0.080	0.240	226961	36.31
0.081	0.243	226972	36.31
0.082	0.246	226983	36.31
0.083	0.249	226994	36.31
0.084	0.252	227005	36.31
0.085	0.255	227016	36.31
0.086	0.258	227027	36.31
0.087	0.261	227038	36.31
0.088	0.264	227049	36.31
0.089	0.267	227060	36.31
0.090	0.270	227071	36.31
0.091	0.273	227082	36.31
0.092	0.276	227093	36.31
0.093	0.279	227104	36.31
0.094	0.282	227115	36.31
0.095	0.285	227126	36.31
0.096	0.288	227137	36.31
0.097	0.291	227148	36.31
0.098	0.294	227159	36.31
0.099	0.297	227170	36.31
0.100	0.300	227181	36.31
0.101	0.303	227192	36.31
0.102	0.306	227203	36.31
0.103	0.309	227214	36.31
0.104	0.312	227225	36.31
0.105	0.315	227236	36.31
0.106	0.318	227247	36.31
0.107	0.321	227258	36.31
0.108	0.324	227269	36.31
0.109	0.327	227280	36.31
0.110	0.330	227291	36.31
0.115	0.345	227302	36.31
0.120	0.360	227313	36.31

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All regular length Micro End Mills are 1/8" shank, 1-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

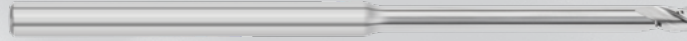
MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - LONG REACH - STUB FLUTE - SQUARE END - 30° HELIX
LOC = 1.5 X DIA



UNCOATED

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.015	3	0.030	264895	78.60
0.010	0.015	5	0.050	264906	78.60
0.010	0.015	8	0.080	264917	78.60
0.010	0.015	12	0.125	264928	82.93
0.015	0.022	3	0.045	264939	65.19
0.015	0.022	5	0.078	264950	65.19
0.015	0.022	8	0.125	264961	65.19
0.015	0.022	12	0.187	264972	67.46
0.020	0.030	3	0.060	264983	62.51
0.020	0.030	5	0.100	264994	62.51
0.020	0.030	8	0.160	265005	62.51
0.020	0.030	12	0.250	265016	64.98
0.025	0.037	3	0.075	265027	60.03
0.025	0.037	5	0.125	265038	60.03
0.025	0.037	8	0.203	265049	60.03
0.025	0.037	12	0.312	265060	62.09
0.030	0.045	3	0.090	265071	60.03
0.030	0.045	5	0.156	265082	60.03
0.030	0.045	8	0.250	265093	60.03
0.030	0.045	12	0.375	265104	62.09
0.031	0.046	3	0.093	265115	60.03
0.031	0.046	5	0.156	265126	60.03
0.031	0.046	8	0.250	265137	60.03
0.031	0.046	12	0.375	265148	62.09
0.035	0.052	3	0.105	265159	60.03
0.035	0.052	5	0.187	265170	60.03
0.035	0.052	8	0.281	265181	60.03
0.035	0.052	12	0.425	265192	62.09
0.040	0.060	3	0.120	265203	60.03
0.040	0.060	5	0.203	265214	60.03
0.040	0.060	8	0.325	265225	60.03
0.040	0.060	12	0.480	265236	62.09

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.045	0.067	3	0.135	265247	58.79
0.045	0.067	5	0.225	265258	58.79
0.045	0.067	8	0.375	265269	58.79
0.045	0.067	12	0.550	265280	60.65
0.047	0.070	3	0.141	265291	58.79
0.047	0.070	5	0.250	265302	58.79
0.047	0.070	8	0.375	265313	58.79
0.047	0.070	12	0.570	265324	60.65
0.050	0.075	3	0.150	265335	58.79
0.050	0.075	5	0.250	265346	58.79
0.050	0.075	8	0.400	265357	58.79
0.050	0.075	12	0.600	265368	60.65
0.055	0.082	3	0.165	265379	58.79
0.055	0.082	5	0.275	265390	58.79
0.055	0.082	8	0.450	265401	58.79
0.055	0.082	12	0.660	265412	60.65
0.060	0.090	3	0.180	265423	58.79
0.060	0.090	5	0.312	265434	58.79
0.060	0.090	8	0.500	265445	58.79
0.060	0.090	12	0.720	265456	60.65
0.062	0.093	3	0.186	265467	58.79
0.062	0.093	5	0.312	265478	58.79
0.062	0.093	8	0.500	265489	58.79
0.062	0.093	12	0.750	265500	60.65
0.065	0.097	3	0.195	265511	58.79
0.065	0.097	5	0.325	265522	58.79
0.065	0.097	8	0.530	265533	58.79
0.065	0.097	12	0.800	265544	60.65
0.070	0.105	3	0.210	265555	58.79
0.070	0.105	5	0.375	265566	58.79
0.070	0.105	8	0.570	265577	58.79
0.070	0.105	12	0.850	265588	60.65

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.075	0.112	3	0.225	265599	58.79
0.075	0.112	5	0.375	265610	58.79
0.075	0.112	8	0.625	265621	58.79
0.075	0.112	12	0.900	265632	60.65
0.078	0.117	3	0.234	265643	58.79
0.078	0.117	5	0.406	265654	58.79
0.078	0.117	8	0.625	265665	58.79
0.078	0.117	12	0.940	265676	60.65
0.080	0.120	3	0.240	265687	58.79
0.080	0.120	5	0.406	265698	58.79
0.080	0.120	8	0.650	265709	58.79
0.080	0.120	12	0.960	265720	60.65
0.085	0.127	3	0.255	265731	58.79
0.085	0.127	5	0.425	265742	58.79
0.085	0.127	8	0.700	265753	58.79
0.085	0.127	12	1.020	265764	60.65
0.090	0.135	3	0.270	265775	58.79
0.090	0.135	5	0.450	265786	58.79
0.090	0.135	8	0.750	265797	58.79
0.090	0.135	12	1.080	265808	60.65
0.093	0.139	3	0.279	265819	58.79
0.093	0.139	5	0.500	265830	58.79
0.093	0.139	8	0.750	265841	58.79
0.093	0.139	12	1.125	265852	60.65
0.095	0.142	3	0.285	265863	58.79
0.095	0.142	5	0.500	265874	58.79
0.095	0.142	8	0.750	265885	58.79
0.095	0.142	12	1.150	265896	60.65
0.100	0.150	3	0.300	265907	58.79
0.100	0.150	5	0.500	265918	58.79
0.100	0.150	8	0.800	265929	58.79
0.100	0.150	12	1.200	265940	60.65

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.005, -0.005	-.0001, -.0003 ISO H6	+0.010, -.000

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - LONG REACH - STUB FLUTE - SQUARE END - 30° HELIX
LOC = 1.5 X DIA



ALTiN COATED

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.015	3	0.030	272287	94.32
0.010	0.015	5	0.050	272298	94.32
0.010	0.015	8	0.080	272309	94.32
0.010	0.015	12	0.125	272320	99.51
0.015	0.022	3	0.045	272331	78.22
0.015	0.022	5	0.078	272342	78.22
0.015	0.022	8	0.125	272353	78.22
0.015	0.022	12	0.187	272364	80.95
0.020	0.030	3	0.060	272375	75.01
0.020	0.030	5	0.100	272386	75.01
0.020	0.030	8	0.160	272397	75.01
0.020	0.030	12	0.250	272408	77.98
0.025	0.037	3	0.075	272419	72.04
0.025	0.037	5	0.125	272430	72.04
0.025	0.037	8	0.203	272441	72.04
0.025	0.037	12	0.312	272452	74.51
0.030	0.045	3	0.090	272463	72.04
0.030	0.045	5	0.156	272474	72.04
0.030	0.045	8	0.250	272485	72.04
0.030	0.045	12	0.375	272496	74.51
0.031	0.046	3	0.093	272507	72.04
0.031	0.046	5	0.156	272518	72.04
0.031	0.046	8	0.250	272529	72.04
0.031	0.046	12	0.375	272540	74.51
0.035	0.052	3	0.105	272551	72.04
0.035	0.052	5	0.187	272562	72.04
0.035	0.052	8	0.281	272573	72.04
0.035	0.052	12	0.425	272584	74.51
0.040	0.060	3	0.120	272595	72.04
0.040	0.060	5	0.203	272606	72.04
0.040	0.060	8	0.325	272617	72.04
0.040	0.060	12	0.480	272628	74.51

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.045	0.067	3	0.135	272639	70.55
0.045	0.067	5	0.225	272650	70.55
0.045	0.067	8	0.375	272661	70.55
0.045	0.067	12	0.550	272672	72.78
0.047	0.070	3	0.141	272683	70.55
0.047	0.070	5	0.250	272694	70.55
0.047	0.070	8	0.375	272705	70.55
0.047	0.070	12	0.570	272716	72.78
0.050	0.075	3	0.150	272727	70.55
0.050	0.075	5	0.250	272738	70.55
0.050	0.075	8	0.400	272749	70.55
0.050	0.075	12	0.600	272760	72.78
0.055	0.082	3	0.165	272771	70.55
0.055	0.082	5	0.275	272782	70.55
0.055	0.082	8	0.450	272793	70.55
0.055	0.082	12	0.660	272804	72.78
0.060	0.090	3	0.180	272815	70.55
0.060	0.090	5	0.312	272826	70.55
0.060	0.090	8	0.500	272837	70.55
0.060	0.090	12	0.720	272848	72.78
0.062	0.093	3	0.186	272859	70.55
0.062	0.093	5	0.312	272870	70.55
0.062	0.093	8	0.500	272881	70.55
0.062	0.093	12	0.750	272892	72.78
0.065	0.097	3	0.195	272903	70.55
0.065	0.097	5	0.325	272914	70.55
0.065	0.097	8	0.530	272925	70.55
0.065	0.097	12	0.800	272936	72.78
0.070	0.105	3	0.210	272947	70.55
0.070	0.105	5	0.375	272958	70.55
0.070	0.105	8	0.570	272969	70.55
0.070	0.105	12	0.850	272980	72.78

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.075	0.112	3	0.225	272991	70.55
0.075	0.112	5	0.375	273002	70.55
0.075	0.112	8	0.625	273013	70.55
0.075	0.112	12	0.900	273024	72.78
0.078	0.117	3	0.234	273035	70.55
0.078	0.117	5	0.406	273046	70.55
0.078	0.117	8	0.625	273057	70.55
0.078	0.117	12	0.940	273068	72.78
0.080	0.120	3	0.240	273079	70.55
0.080	0.120	5	0.406	273090	70.55
0.080	0.120	8	0.650	273101	70.55
0.080	0.120	12	0.960	273112	72.78
0.085	0.127	3	0.255	273123	70.55
0.085	0.127	5	0.425	273134	70.55
0.085	0.127	8	0.700	273145	70.55
0.085	0.127	12	1.020	273156	72.78
0.090	0.135	3	0.270	273167	70.55
0.090	0.135	5	0.450	273178	70.55
0.090	0.135	8	0.750	273189	70.55
0.090	0.135	12	1.080	273200	72.78
0.093	0.139	3	0.279	273211	70.55
0.093	0.139	5	0.500	273222	70.55
0.093	0.139	8	0.750	273233	70.55
0.093	0.139	12	1.125	273244	72.78
0.095	0.142	3	0.285	273255	70.55
0.095	0.142	5	0.500	273266	70.55
0.095	0.142	8	0.750	273277	70.55
0.095	0.142	12	1.150	273288	72.78
0.100	0.150	3	0.300	273299	70.55
0.100	0.150	5	0.500	273310	70.55
0.100	0.150	8	0.800	273321	70.55
0.100	0.150	12	1.200	273332	72.78

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+ .0005, - .0005	- .0001, -.0003 ISO H6	+ .010, -.000

MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - LONG REACH - STUB FLUTE - BALL NOSE - 30° HELIX
LOC = 1.5 X DIA



UNCOATED

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.015	3	0.030	267007	98.61
0.010	0.015	5	0.050	267018	98.61
0.010	0.015	8	0.080	267029	102.94
0.010	0.015	12	0.125	267040	115.73
0.015	0.022	3	0.045	267051	84.37
0.015	0.022	5	0.078	267062	84.37
0.015	0.022	8	0.125	267073	84.37
0.015	0.022	12	0.187	267084	86.43
0.020	0.030	3	0.060	267095	81.69
0.020	0.030	5	0.100	267106	81.69
0.020	0.030	8	0.160	267117	81.69
0.020	0.030	12	0.250	267128	83.96
0.025	0.037	3	0.075	267139	70.55
0.025	0.037	5	0.125	267150	70.55
0.025	0.037	8	0.203	267161	70.55
0.025	0.037	12	0.312	267172	72.61
0.030	0.045	3	0.090	267183	70.55
0.030	0.045	5	0.156	267194	70.55
0.030	0.045	8	0.250	267205	70.55
0.030	0.045	12	0.375	267216	72.61
0.031	0.046	3	0.093	267227	70.55
0.031	0.046	5	0.156	267238	70.55
0.031	0.046	8	0.250	267249	70.55
0.031	0.046	12	0.375	267260	72.61
0.035	0.052	3	0.105	267271	70.55
0.035	0.052	5	0.187	267282	70.55
0.035	0.052	8	0.281	267293	70.55
0.035	0.052	12	0.425	267304	72.61
0.040	0.060	3	0.120	267315	70.55
0.040	0.060	5	0.203	267326	70.55
0.040	0.060	8	0.325	267337	70.55
0.040	0.060	12	0.480	267348	72.61

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.045	0.067	3	0.135	267359	68.90
0.045	0.067	5	0.225	267370	68.90
0.045	0.067	8	0.375	267381	68.90
0.045	0.067	12	0.550	267392	70.76
0.047	0.070	3	0.141	267403	68.90
0.047	0.070	5	0.250	267414	68.90
0.047	0.070	8	0.375	267425	68.90
0.047	0.070	12	0.570	267436	70.76
0.050	0.075	3	0.150	267447	68.90
0.050	0.075	5	0.250	267458	68.90
0.050	0.075	8	0.400	267469	68.90
0.050	0.075	12	0.600	267480	70.76
0.055	0.082	3	0.165	267491	68.90
0.055	0.082	5	0.275	267502	68.90
0.055	0.082	8	0.450	267513	68.90
0.055	0.082	12	0.660	267524	70.76
0.060	0.090	3	0.180	267535	68.90
0.060	0.090	5	0.312	267546	68.90
0.060	0.090	8	0.500	267557	68.90
0.060	0.090	12	0.720	267568	70.76
0.062	0.093	3	0.186	267579	68.90
0.062	0.093	5	0.312	267590	68.90
0.062	0.093	8	0.500	267601	68.90
0.062	0.093	12	0.750	267612	70.76
0.065	0.097	3	0.195	267623	68.90
0.065	0.097	5	0.325	267634	68.90
0.065	0.097	8	0.530	267645	68.90
0.065	0.097	12	0.780	267656	70.76
0.070	0.105	3	0.210	267667	68.90
0.070	0.105	5	0.375	267678	68.90
0.070	0.105	8	0.570	267689	68.90
0.070	0.105	12	0.840	267700	70.76

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.075	0.112	3	0.225	267711	68.90
0.075	0.112	5	0.375	267722	68.90
0.075	0.112	8	0.625	267733	68.90
0.075	0.112	12	0.900	267744	70.76
0.078	0.117	3	0.234	267755	68.90
0.078	0.117	5	0.406	267766	68.90
0.078	0.117	8	0.625	267777	68.90
0.078	0.117	12	0.940	267788	70.76
0.080	0.120	3	0.240	267799	68.90
0.080	0.120	5	0.406	267810	68.90
0.080	0.120	8	0.650	267821	68.90
0.080	0.120	12	0.960	267832	70.76
0.085	0.127	3	0.255	267843	68.90
0.085	0.127	5	0.425	267854	68.90
0.085	0.127	8	0.700	267865	68.90
0.085	0.127	12	1.020	267876	70.76
0.090	0.135	3	0.270	267887	68.90
0.090	0.135	5	0.450	267898	68.90
0.090	0.135	8	0.750	267909	68.90
0.090	0.135	12	1.080	267920	70.76
0.093	0.139	3	0.279	267931	68.90
0.093	0.139	5	0.500	267942	68.90
0.093	0.139	8	0.750	267953	68.90
0.093	0.139	12	1.125	267964	70.76
0.095	0.142	3	0.285	267975	68.90
0.095	0.142	5	0.500	267986	68.90
0.095	0.142	8	0.750	267997	68.90
0.095	0.142	12	1.150	268008	70.76
0.100	0.150	3	0.300	268019	68.90
0.100	0.150	5	0.500	268030	68.90
0.100	0.150	8	0.800	268041	68.90
0.100	0.150	12	1.200	268052	70.76

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.0005, -0.0005	-0.0001, -0.0003 ISO H6	+0.010, -0.000

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - LONG REACH - STUB FLUTE - BALL NOSE - 30° HELIX
LOC = 1.5 X DIA



ALTIN COATED

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.015	3	0.030	268063	118.33
0.010	0.015	5	0.050	268074	118.33
0.010	0.015	8	0.080	268085	123.53
0.010	0.015	12	0.125	268096	138.87
0.015	0.022	3	0.045	268107	101.25
0.015	0.022	5	0.078	268118	101.25
0.015	0.022	8	0.125	268129	101.25
0.015	0.022	12	0.187	268140	103.72
0.020	0.030	3	0.060	268151	98.03
0.020	0.030	5	0.100	268162	98.03
0.020	0.030	8	0.160	268173	98.03
0.020	0.030	12	0.250	268184	100.75
0.025	0.037	3	0.075	268195	84.66
0.025	0.037	5	0.125	268206	84.66
0.025	0.037	8	0.203	268217	84.66
0.025	0.037	12	0.312	268228	87.14
0.030	0.045	3	0.090	268239	84.66
0.030	0.045	5	0.156	268250	84.66
0.030	0.045	8	0.250	268261	84.66
0.030	0.045	12	0.375	268272	87.14
0.031	0.046	3	0.093	268283	84.66
0.031	0.046	5	0.156	268294	84.66
0.031	0.046	8	0.250	268305	84.66
0.031	0.046	12	0.375	268316	87.14
0.035	0.052	3	0.105	268327	84.66
0.035	0.052	5	0.187	268338	84.66
0.035	0.052	8	0.281	268349	84.66
0.035	0.052	12	0.425	268360	87.14
0.040	0.060	3	0.120	268371	84.66
0.040	0.060	5	0.203	268382	84.66
0.040	0.060	8	0.325	268393	84.66
0.040	0.060	12	0.480	268404	87.14

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.045	0.067	3	0.135	268415	82.68
0.045	0.067	5	0.225	268426	82.68
0.045	0.067	8	0.375	268437	82.68
0.045	0.067	12	0.550	268448	84.91
0.047	0.070	3	0.141	268459	82.68
0.047	0.070	5	0.250	268470	82.68
0.047	0.070	8	0.375	268481	82.68
0.047	0.070	12	0.570	268492	84.91
0.050	0.075	3	0.150	268503	82.68
0.050	0.075	5	0.250	268514	82.68
0.050	0.075	8	0.400	268525	82.68
0.050	0.075	12	0.600	268536	84.91
0.055	0.082	3	0.165	268547	82.68
0.055	0.082	5	0.275	268558	82.68
0.055	0.082	8	0.450	268569	82.68
0.055	0.082	12	0.660	268580	84.91
0.060	0.090	3	0.180	268591	82.68
0.060	0.090	5	0.312	268602	82.68
0.060	0.090	8	0.500	268613	82.68
0.060	0.090	12	0.720	268624	84.91
0.062	0.093	3	0.186	268635	82.68
0.062	0.093	5	0.312	268646	82.68
0.062	0.093	8	0.500	268657	82.68
0.062	0.093	12	0.750	268668	84.91
0.065	0.097	3	0.195	268679	82.68
0.065	0.097	5	0.325	268690	82.68
0.065	0.097	8	0.530	268701	82.68
0.065	0.097	12	0.780	268712	84.91
0.070	0.105	3	0.210	268723	82.68
0.070	0.105	5	0.375	268734	82.68
0.070	0.105	8	0.570	268745	82.68
0.070	0.105	12	0.840	268756	84.91

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.075	0.112	3	0.225	268767	82.68
0.075	0.112	5	0.375	268778	82.68
0.075	0.112	8	0.625	268789	82.68
0.075	0.112	12	0.900	268800	84.91
0.078	0.117	3	0.234	268811	82.68
0.078	0.117	5	0.406	268822	82.68
0.078	0.117	8	0.625	268833	82.68
0.078	0.117	12	0.940	268844	84.91
0.080	0.120	3	0.240	268855	82.68
0.080	0.120	5	0.406	268866	82.68
0.080	0.120	8	0.650	268877	82.68
0.080	0.120	12	0.960	268888	84.91
0.085	0.127	3	0.255	268899	82.68
0.085	0.127	5	0.425	268910	82.68
0.085	0.127	8	0.700	268921	82.68
0.085	0.127	12	1.020	268932	84.91
0.090	0.135	3	0.270	268943	82.68
0.090	0.135	5	0.450	268954	82.68
0.090	0.135	8	0.750	268965	82.68
0.090	0.135	12	1.080	268976	84.91
0.093	0.139	3	0.279	268987	82.68
0.093	0.139	5	0.500	268998	82.68
0.093	0.139	8	0.750	269009	82.68
0.093	0.139	12	1.125	269020	84.91
0.095	0.142	3	0.285	269031	82.68
0.095	0.142	5	0.500	269042	82.68
0.095	0.142	8	0.750	269053	82.68
0.095	0.142	12	1.150	269064	84.91
0.100	0.150	3	0.300	269075	82.68
0.100	0.150	5	0.500	269086	82.68
0.100	0.150	8	0.800	269097	82.68
0.100	0.150	12	1.200	269108	84.91

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.005, -0.005	-0.001, -0.003 ISO H6	+0.010, -0.000

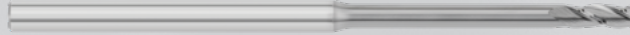
MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - LONG REACH - REGULAR FLUTE - SQUARE END - 30° HELIX
LOC = 3 X DIA



UNCOATED

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.030	5	0.050	269119	78.60
0.010	0.030	8	0.080	269130	78.60
0.010	0.030	12	0.125	269141	82.93
0.015	0.045	5	0.078	269152	65.19
0.015	0.045	8	0.128	269163	65.19
0.015	0.045	12	0.187	269174	67.46
0.020	0.060	5	0.100	269185	62.51
0.020	0.060	8	0.170	269196	62.51
0.020	0.060	12	0.250	269207	64.98
0.025	0.075	5	0.125	269218	60.03
0.025	0.075	8	0.213	269229	60.03
0.025	0.075	12	0.312	269240	62.30
0.030	0.090	5	0.156	269251	60.03
0.030	0.090	9	0.270	269262	60.03
0.030	0.090	12	0.375	269273	62.09
0.031	0.093	5	0.156	269284	60.03
0.031	0.093	9	0.279	269295	60.03
0.031	0.093	12	0.375	269306	62.09
0.035	0.105	5	0.175	269317	60.03
0.035	0.105	9	0.315	269328	60.03
0.035	0.105	12	0.420	269339	62.09
0.040	0.120	5	0.203	269350	60.03
0.040	0.120	9	0.360	269361	60.03
0.040	0.120	12	0.480	269372	62.09
0.045	0.135	5	0.225	269383	58.79
0.045	0.135	9	0.405	269394	58.79
0.045	0.135	12	0.540	269405	62.09
0.047	0.141	5	0.250	269416	58.79
0.047	0.141	9	0.423	269427	58.79
0.047	0.141	12	0.570	269438	60.65
0.050	0.150	5	0.250	269449	58.79
0.050	0.150	8	0.400	269460	58.79
0.050	0.150	12	0.600	269471	60.65
0.055	0.165	5	0.275	269482	58.79
0.055	0.165	8	0.440	269493	58.79
0.055	0.165	12	0.660	269504	60.65

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.060	0.180	5	0.312	269515	58.79
0.060	0.180	8	0.500	269526	58.79
0.060	0.180	12	0.720	269537	60.65
0.062	0.186	5	0.312	269548	58.79
0.062	0.186	8	0.500	269559	58.79
0.062	0.186	12	0.750	269570	60.65
0.065	0.195	5	0.325	269581	58.79
0.065	0.195	8	0.500	269592	58.79
0.065	0.195	12	0.780	269603	60.65
0.070	0.210	5	0.350	269614	58.79
0.070	0.210	8	0.560	269625	58.79
0.070	0.210	12	0.850	269636	60.65
0.075	0.225	5	0.375	269647	58.79
0.075	0.225	8	0.600	269658	58.79
0.075	0.225	12	0.900	269669	60.65
0.078	0.234	5	0.390	269680	58.79
0.078	0.234	8	0.624	269691	58.79
0.078	0.234	12	0.940	269702	60.65
0.080	0.240	5	0.400	269713	58.79
0.080	0.240	8	0.640	269724	58.79
0.080	0.240	12	0.960	269735	60.65
0.085	0.255	5	0.425	269746	58.79
0.085	0.255	8	0.680	269757	58.79
0.085	0.255	12	1.020	269768	60.65
0.090	0.270	5	0.450	269779	58.79
0.090	0.270	8	0.720	269790	58.79
0.090	0.270	12	1.080	269801	60.65
0.093	0.279	5	0.500	269812	58.79
0.093	0.279	8	0.744	269823	58.79
0.093	0.279	12	1.125	269834	60.65
0.095	0.285	5	0.475	269845	58.79
0.095	0.285	8	0.760	269856	58.79
0.095	0.285	12	1.140	269867	60.65
0.100	0.300	5	0.500	269878	58.79
0.100	0.300	8	0.800	269889	58.79
0.100	0.300	12	1.200	269900	60.65

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
 For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.005, -0.005	-0.001, -0.003 ISO H6	+0.010, -0.000

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - LONG REACH - REGULAR FLUTE - SQUARE END - 30° HELIX
LOC = 3 X DIA



ALTIN COATED

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.030	5	0.050	269911	94.32
0.010	0.030	8	0.080	269922	94.32
0.010	0.030	12	0.125	269933	99.51
0.015	0.045	5	0.078	269944	78.22
0.015	0.045	8	0.128	269955	78.22
0.015	0.045	12	0.187	269966	80.95
0.020	0.060	5	0.100	269977	75.01
0.020	0.060	8	0.170	269988	75.01
0.020	0.060	12	0.250	269999	77.98
0.025	0.075	5	0.125	270010	72.04
0.025	0.075	8	0.213	270021	72.04
0.025	0.075	12	0.312	270032	74.76
0.030	0.090	5	0.156	270043	72.04
0.030	0.090	9	0.270	270054	72.04
0.030	0.090	12	0.375	270065	74.51
0.031	0.093	5	0.156	270076	72.04
0.031	0.093	9	0.279	270087	72.04
0.031	0.093	12	0.375	270098	74.51
0.035	0.105	5	0.175	270109	72.04
0.035	0.105	9	0.315	270120	72.04
0.035	0.105	12	0.420	270131	74.51
0.040	0.120	5	0.203	270142	72.04
0.040	0.120	9	0.360	270153	72.04
0.040	0.120	12	0.480	270164	74.51
0.045	0.135	5	0.225	270175	70.55
0.045	0.135	9	0.405	270186	70.55
0.045	0.135	12	0.540	270197	74.51
0.047	0.141	5	0.250	270208	70.55
0.047	0.141	9	0.423	270219	70.55
0.047	0.141	12	0.570	270230	72.78
0.050	0.150	5	0.250	270241	70.55
0.050	0.150	8	0.400	270252	70.55
0.050	0.150	12	0.600	270263	72.78
0.055	0.165	5	0.275	270274	70.55
0.055	0.165	8	0.440	270285	70.55
0.055	0.165	12	0.660	270296	72.78

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.060	0.180	5	0.312	270307	70.55
0.060	0.180	8	0.500	270318	70.55
0.060	0.180	12	0.720	270329	72.78
0.062	0.186	5	0.312	270340	70.55
0.062	0.186	8	0.500	270351	70.55
0.062	0.186	12	0.750	270362	72.78
0.065	0.195	5	0.325	270373	70.55
0.065	0.195	8	0.500	270384	70.55
0.065	0.195	12	0.780	270395	72.78
0.070	0.210	5	0.350	270406	70.55
0.070	0.210	8	0.560	270417	70.55
0.070	0.210	12	0.850	270428	72.78
0.075	0.225	5	0.375	270439	70.55
0.075	0.225	8	0.600	270450	70.55
0.075	0.225	12	0.900	270461	72.78
0.078	0.234	5	0.390	270472	70.55
0.078	0.234	8	0.624	270483	70.55
0.078	0.234	12	0.940	270494	72.78
0.080	0.240	5	0.400	270505	70.55
0.080	0.240	8	0.640	270516	70.55
0.080	0.240	12	0.960	270527	72.78
0.085	0.255	5	0.425	270538	70.55
0.085	0.255	8	0.680	270549	70.55
0.085	0.255	12	1.020	270560	72.78
0.090	0.270	5	0.450	270571	70.55
0.090	0.270	8	0.720	270582	70.55
0.090	0.270	12	1.080	270593	72.78
0.093	0.279	5	0.500	270604	70.55
0.093	0.279	8	0.744	270615	70.55
0.093	0.279	12	1.125	270626	72.78
0.095	0.285	5	0.475	270637	70.55
0.095	0.285	8	0.760	270648	70.55
0.095	0.285	12	1.140	270659	72.78
0.100	0.300	5	0.500	270670	70.55
0.100	0.300	8	0.800	270681	70.55
0.100	0.300	12	1.200	270692	72.78

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
 For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.005, -0.005	-0.001, -0.003 ISO H6	+0.010, -0.000

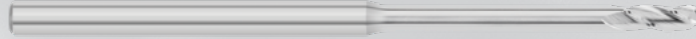
MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - LONG REACH - REGULAR FLUTE - BALL NOSE - 30° HELIX
LOC = 3 X DIA



UNCOATED

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.030	5	0.050	270703	106.45
0.010	0.030	8	0.080	270714	106.45
0.010	0.030	12	0.125	270725	108.30
0.015	0.045	5	0.078	270736	85.40
0.015	0.045	8	0.128	270747	85.40
0.015	0.045	12	0.187	270758	87.26
0.020	0.060	5	0.100	270769	82.10
0.020	0.060	8	0.170	270780	82.10
0.020	0.060	12	0.250	270791	83.96
0.025	0.075	5	0.125	270802	75.09
0.025	0.075	8	0.213	270813	75.09
0.025	0.075	12	0.312	270824	76.95
0.030	0.090	5	0.156	270835	75.09
0.030	0.090	9	0.270	270846	75.09
0.030	0.090	12	0.375	270857	76.95
0.031	0.093	5	0.156	270868	75.09
0.031	0.093	9	0.279	270879	75.09
0.031	0.093	12	0.375	270890	76.95
0.035	0.105	5	0.175	270901	75.09
0.035	0.105	8	0.280	270912	75.09
0.035	0.105	12	0.420	270923	76.95
0.040	0.120	5	0.200	270934	75.09
0.040	0.120	8	0.320	270945	75.09
0.040	0.120	12	0.480	270956	76.95
0.045	0.135	5	0.225	270967	72.61
0.045	0.135	8	0.360	270978	72.61
0.045	0.135	12	0.540	270989	74.47
0.047	0.141	5	0.250	271000	72.61
0.047	0.141	8	0.376	271011	72.61
0.047	0.141	12	0.570	271022	74.47
0.050	0.150	5	0.250	271033	72.61
0.050	0.150	8	0.400	271044	72.61
0.050	0.150	12	0.600	271055	74.47
0.055	0.165	5	0.275	271066	72.61
0.055	0.165	8	0.440	271077	72.61
0.055	0.165	12	0.660	271088	74.47

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.060	0.180	5	0.300	271099	72.61
0.060	0.180	8	0.500	271110	72.61
0.060	0.180	12	0.720	271121	74.47
0.062	0.186	5	0.312	271132	72.61
0.062	0.186	8	0.500	271143	72.61
0.062	0.186	12	0.750	271154	74.47
0.065	0.195	5	0.325	271165	72.61
0.065	0.195	8	0.500	271176	72.61
0.065	0.195	12	0.780	271187	74.47
0.070	0.210	5	0.350	271198	72.61
0.070	0.210	8	0.560	271209	72.61
0.070	0.210	12	0.840	271220	74.47
0.075	0.225	5	0.375	271231	72.61
0.075	0.225	8	0.600	271242	72.61
0.075	0.225	12	0.900	271253	74.47
0.078	0.234	5	0.390	271264	72.61
0.078	0.234	8	0.624	271275	72.61
0.078	0.234	12	0.940	271286	74.47
0.080	0.240	5	0.400	271297	72.61
0.080	0.240	8	0.640	271308	72.61
0.080	0.240	12	0.960	271319	74.47
0.085	0.255	5	0.425	271330	72.61
0.085	0.255	8	0.680	271341	72.61
0.085	0.255	12	1.020	271352	74.47
0.090	0.270	5	0.450	271363	72.61
0.090	0.270	8	0.720	271374	72.61
0.090	0.270	12	1.080	271385	74.47
0.093	0.279	5	0.500	271396	72.61
0.093	0.279	8	0.744	271407	72.61
0.093	0.279	12	1.125	271418	74.47
0.095	0.285	5	0.475	271429	72.61
0.095	0.285	8	0.760	271440	72.61
0.095	0.285	12	1.140	271451	74.47
0.100	0.300	5	0.500	271462	72.61
0.100	0.300	8	0.800	271473	72.61
0.100	0.300	12	1.200	271484	74.47

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.005, -0.005	-.0001, -.0003 ISO H6	+0.010, -.000

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

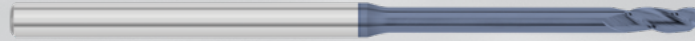
LONG LENGTH LONG FL

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - LONG REACH - REGULAR FLUTE - BALL NOSE - 30° HELIX
LOC = 3 X DIA



ALTIN COATED

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.030	5	0.050	271495	127.73
0.010	0.030	8	0.080	271506	127.73
0.010	0.030	12	0.125	271517	129.96
0.015	0.045	5	0.078	271528	102.48
0.015	0.045	8	0.128	271539	102.48
0.015	0.045	12	0.187	271550	104.71
0.020	0.060	5	0.100	271561	98.52
0.020	0.060	8	0.170	271572	98.52
0.020	0.060	12	0.250	271583	100.75
0.025	0.075	5	0.125	271594	90.11
0.025	0.075	8	0.213	271605	90.11
0.025	0.075	12	0.312	271616	92.33
0.030	0.090	5	0.156	271627	90.11
0.030	0.090	9	0.270	271638	90.11
0.030	0.090	12	0.375	271649	92.33
0.031	0.093	5	0.156	271660	90.11
0.031	0.093	9	0.279	271671	90.11
0.031	0.093	12	0.375	271682	92.33
0.035	0.105	5	0.175	271693	90.11
0.035	0.105	8	0.280	271704	90.11
0.035	0.105	12	0.420	271715	92.33
0.040	0.120	5	0.200	271726	90.11
0.040	0.120	8	0.320	271737	90.11
0.040	0.120	12	0.480	271748	92.33
0.045	0.135	5	0.225	271759	87.14
0.045	0.135	8	0.360	271770	87.14
0.045	0.135	12	0.540	271781	89.36
0.047	0.141	5	0.250	271792	87.14
0.047	0.141	8	0.376	271803	87.14
0.047	0.141	12	0.570	271814	89.36
0.050	0.150	5	0.250	271825	87.14
0.050	0.150	8	0.400	271836	87.14
0.050	0.150	12	0.600	271847	89.36
0.055	0.165	5	0.275	271858	87.14
0.055	0.165	8	0.440	271869	87.14
0.055	0.165	12	0.660	271880	89.36

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.060	0.180	5	0.300	271891	87.14
0.060	0.180	8	0.500	271902	87.14
0.060	0.180	12	0.720	271913	89.36
0.062	0.186	5	0.312	271924	87.14
0.062	0.186	8	0.500	271935	87.14
0.062	0.186	12	0.750	271946	89.36
0.065	0.195	5	0.325	271957	87.14
0.065	0.195	8	0.500	271968	87.14
0.065	0.195	12	0.780	271979	89.36
0.070	0.210	5	0.350	271990	87.14
0.070	0.210	8	0.560	272001	87.14
0.070	0.210	12	0.840	272012	89.36
0.075	0.225	5	0.375	272023	87.14
0.075	0.225	8	0.600	272034	87.14
0.075	0.225	12	0.900	272045	89.36
0.078	0.234	5	0.390	272056	87.14
0.078	0.234	8	0.624	272067	87.14
0.078	0.234	12	0.940	272078	89.36
0.080	0.240	5	0.400	272089	87.14
0.080	0.240	8	0.640	272100	87.14
0.080	0.240	12	0.960	272111	89.36
0.085	0.255	5	0.425	272122	87.14
0.085	0.255	8	0.680	272133	87.14
0.085	0.255	12	1.020	272144	89.36
0.090	0.270	5	0.450	272155	87.14
0.090	0.270	8	0.720	272166	87.14
0.090	0.270	12	1.080	272177	89.36
0.093	0.279	5	0.500	272188	87.14
0.093	0.279	8	0.744	272199	87.14
0.093	0.279	12	1.125	272210	89.36
0.095	0.285	5	0.475	272221	87.14
0.095	0.285	8	0.760	272232	87.14
0.095	0.285	12	1.140	272243	89.36
0.100	0.300	5	0.500	272254	87.14
0.100	0.300	8	0.800	272265	87.14
0.100	0.300	12	1.200	272276	89.36

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.0005, -0.0005	-0.0001, -0.0003 ISO H6	+0.010, -0.000

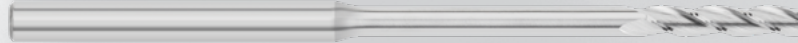
MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - LONG REACH - LONG FLUTE - SQUARE END - 30° HELIX
LOC = 5 X DIA



UNCOATED

REGULAR
LENGTH

LONG REACH
STUB FL

LONG REACH
REG FL

LONG REACH
LONG FL

LONG LENGTH
LONG FL

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.050	10	0.100	265951	79.83
0.010	0.050	15	0.150	265962	98.61
0.015	0.075	10	0.150	265973	66.63
0.015	0.075	15	0.225	265984	84.78
0.020	0.100	10	0.200	265995	64.16
0.020	0.100	15	0.300	266006	81.69
0.025	0.125	10	0.250	266017	61.47
0.025	0.125	15	0.375	266028	79.21
0.030	0.150	10	0.300	266039	61.47
0.030	0.150	15	0.450	266050	79.21
0.031	0.155	10	0.310	266061	61.47
0.031	0.155	15	0.470	266072	79.21
0.035	0.175	10	0.350	266083	61.47
0.035	0.175	15	0.525	266094	79.21
0.040	0.200	10	0.400	266105	61.47
0.040	0.200	15	0.600	266116	79.21
0.045	0.225	10	0.450	266127	60.24
0.045	0.225	15	0.675	266138	75.30
0.047	0.250	10	0.500	266149	60.24
0.047	0.250	15	0.710	266160	75.30
0.050	0.300	10	0.500	266171	60.24
0.050	0.300	15	0.750	266182	75.30
0.055	0.385	10	0.550	266193	60.24
0.055	0.385	15	0.825	266204	75.30

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.060	0.312	10	0.625	266215	60.24
0.060	0.500	16	1.000	266226	60.24
0.062	0.312	10	0.625	266237	60.24
0.062	0.500	16	1.000	266248	60.24
0.065	0.325	10	0.650	266259	60.24
0.065	0.500	15	1.000	266270	60.24
0.070	0.350	10	0.700	266281	60.24
0.070	0.500	14	1.000	266292	60.24
0.075	0.375	10	0.750	266303	60.24
0.075	0.500	13	1.000	266314	60.24
0.078	0.406	10	0.800	266325	60.24
0.078	0.406	15	1.187	266336	60.24
0.080	0.400	10	0.800	266347	60.24
0.080	0.750	15	1.250	266358	60.24
0.085	0.425	10	0.850	266369	60.24
0.085	0.750	14	1.250	266380	60.24
0.090	0.450	10	0.900	266391	60.24
0.090	0.750	13	1.250	266402	60.24
0.093	0.500	10	0.950	266413	60.24
0.093	0.500	15	1.400	266424	60.24
0.095	0.500	10	0.950	266435	60.24
0.095	0.750	13	1.250	266446	60.24
0.100	0.500	10	1.000	266457	60.24
0.100	0.750	12	1.250	266468	60.24



All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For technical information, please see page 246.

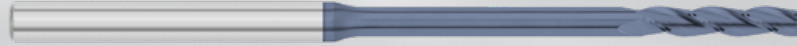
TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.005, -0.005	-0.001, -0.003 ISO H6	+0.010, -0.000

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



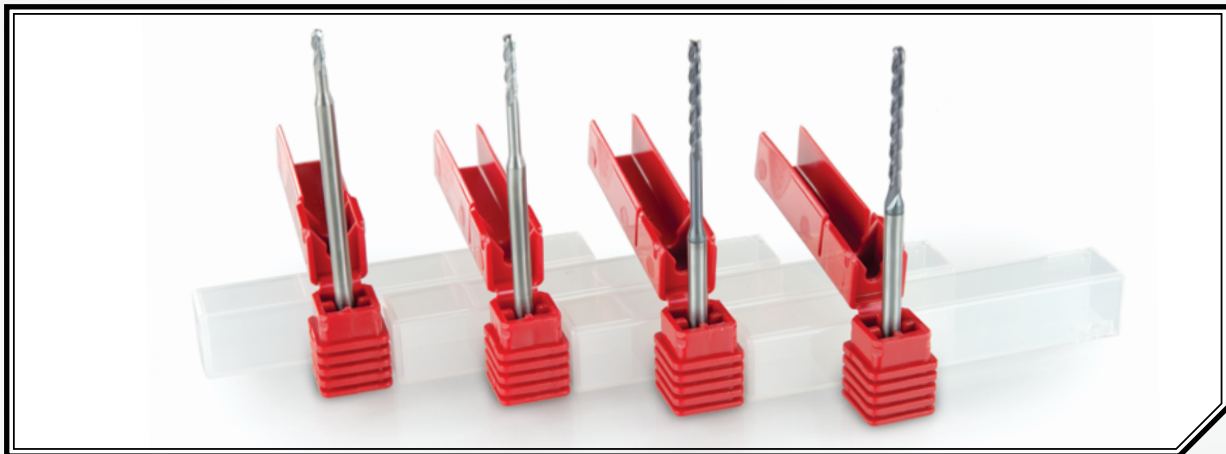
3 FLUTE - LONG REACH - LONG FLUTE - SQUARE END - 30° HELIX
LOC = 5 X DIA



ALTIN COATED

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.050	10	0.100	266479	95.80
0.010	0.050	15	0.150	266490	118.33
0.015	0.075	10	0.150	266501	79.96
0.015	0.075	15	0.225	266512	101.74
0.020	0.100	10	0.200	266523	76.99
0.020	0.100	15	0.300	266534	98.03
0.025	0.125	10	0.250	266545	73.77
0.025	0.125	15	0.375	266556	95.06
0.030	0.150	10	0.300	266567	73.77
0.030	0.150	15	0.450	266578	95.06
0.031	0.155	10	0.310	266589	73.77
0.031	0.155	15	0.470	266600	95.06
0.035	0.175	10	0.350	266611	73.77
0.035	0.175	15	0.525	266622	95.06
0.040	0.200	10	0.400	266633	73.77
0.040	0.200	15	0.600	266644	95.06
0.045	0.225	10	0.450	266655	72.28
0.045	0.225	15	0.675	266666	90.35
0.047	0.250	10	0.500	266677	72.28
0.047	0.250	15	0.710	266688	90.35
0.050	0.300	10	0.500	266699	72.28
0.050	0.300	15	0.750	266710	90.35
0.055	0.385	10	0.550	266721	72.28
0.055	0.385	15	0.825	266732	90.35

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.060	0.312	10	0.625	266743	72.28
0.060	0.500	16	1.000	266754	72.28
0.062	0.312	10	0.625	266765	72.28
0.062	0.500	16	1.000	266776	72.28
0.065	0.325	10	0.650	266787	72.28
0.065	0.500	15	1.000	266798	72.28
0.070	0.350	10	0.700	266809	72.28
0.070	0.500	14	1.000	266820	72.28
0.075	0.375	10	0.750	266831	72.28
0.075	0.500	13	1.000	266842	72.28
0.078	0.406	10	0.800	266853	72.28
0.078	0.406	15	1.187	266864	72.28
0.080	0.400	10	0.800	266875	72.28
0.080	0.750	15	1.250	266886	72.28
0.085	0.425	10	0.850	266897	72.28
0.085	0.750	14	1.250	266908	72.28
0.090	0.450	10	0.900	266919	72.28
0.090	0.750	13	1.250	266930	72.28
0.093	0.500	10	0.950	266941	72.28
0.093	0.500	15	1.400	266952	72.28
0.095	0.500	10	0.950	266963	72.28
0.095	0.750	13	1.250	266974	72.28
0.100	0.500	10	1.000	266985	72.28
0.100	0.750	12	1.250	266996	72.28



All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.005, -0.005	-0.001, -0.003 ISO H6	+0.010, -0.000

MADE IN THE USA

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

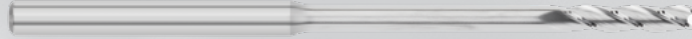
LONG LENGTH LONG FL



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - LONG REACH - LONG FLUTE - BALL NOSE - 30° HELIX
LOC = 5 X DIA



UNCOATED

REGULAR
LENGTH

LONG REACH
STUB FL

LONG REACH
REG FL

LONG REACH
LONG FL

LONG LENGTH
LONG FL

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.050	10	0.100	260143	99.84
0.010	0.050	15	0.150	260154	99.84
0.015	0.075	10	0.150	260165	85.61
0.015	0.075	15	0.225	260176	85.61
0.020	0.100	10	0.200	260187	82.93
0.020	0.100	15	0.300	260198	82.93
0.025	0.125	10	0.250	260209	71.79
0.025	0.125	15	0.375	260220	71.79
0.030	0.150	10	0.300	260231	71.79
0.030	0.150	15	0.450	260242	71.79
0.031	0.155	10	0.310	260253	71.79
0.031	0.155	15	0.470	260264	71.79
0.035	0.175	10	0.350	260275	71.79
0.035	0.175	15	0.525	260286	71.79
0.040	0.200	10	0.400	260297	71.79
0.040	0.200	15	0.600	260308	71.79
0.045	0.225	10	0.450	260319	69.93
0.045	0.225	15	0.675	260330	69.93
0.047	0.250	10	0.500	260341	69.93
0.047	0.250	15	0.710	260352	69.93
0.050	0.300	10	0.500	260363	69.93
0.050	0.300	15	0.750	260374	69.93
0.055	0.385	10	0.550	260385	69.93
0.055	0.385	15	0.825	260396	69.93

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.060	0.312	10	0.625	260407	69.93
0.060	0.500	16	1.000	260418	69.93
0.062	0.312	10	0.625	260429	69.93
0.062	0.500	16	1.000	260440	69.93
0.065	0.325	10	0.650	260451	69.93
0.065	0.500	15	1.000	260462	69.93
0.070	0.350	10	0.700	260473	69.93
0.070	0.500	14	1.000	260484	69.93
0.075	0.375	10	0.750	260495	69.93
0.075	0.500	13	1.000	260506	69.93
0.078	0.406	10	0.800	260517	69.93
0.078	0.406	15	1.187	260528	69.93
0.080	0.400	10	0.800	260539	69.93
0.080	0.750	15	1.250	260550	69.93
0.085	0.425	10	0.850	260561	69.93
0.085	0.750	14	1.250	260572	69.93
0.090	0.450	10	0.900	260583	69.93
0.090	0.750	13	1.250	260594	69.93
0.093	0.500	10	0.950	260605	69.93
0.093	0.500	15	1.400	260616	69.93
0.095	0.500	10	0.950	260627	69.93
0.095	0.750	13	1.250	260638	69.93
0.100	0.500	10	1.000	260649	69.93
0.100	0.750	12	1.250	260660	69.93



All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For technical information, please see page 246.

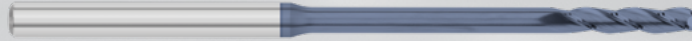
TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.0005, -0.0005	-0.0001, -0.0003 ISO H6	+0.010, -0.000

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - LONG REACH - LONG FLUTE - BALL NOSE - 30° HELIX
LOC = 5 X DIA



ALTiN COATED

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.010	0.050	10	0.100	260671	119.81
0.010	0.050	15	0.150	260682	119.81
0.015	0.075	10	0.150	260693	102.73
0.015	0.075	15	0.225	260704	102.73
0.020	0.100	10	0.200	260715	99.51
0.020	0.100	15	0.300	260726	99.51
0.025	0.125	10	0.250	260737	86.15
0.025	0.125	15	0.375	260748	86.15
0.030	0.150	10	0.300	260759	86.15
0.030	0.150	15	0.450	260770	86.15
0.031	0.155	10	0.310	260781	86.15
0.031	0.155	15	0.470	260792	86.15
0.035	0.175	10	0.350	260803	86.15
0.035	0.175	15	0.525	260814	86.15
0.040	0.200	10	0.400	260825	86.15
0.040	0.200	15	0.600	260836	86.15
0.045	0.225	10	0.450	260847	83.92
0.045	0.225	15	0.675	260858	83.92
0.047	0.250	10	0.500	260869	83.92
0.047	0.250	15	0.710	260880	83.92
0.050	0.300	10	0.500	260891	83.92
0.050	0.300	15	0.750	260902	83.92
0.055	0.385	10	0.550	260913	83.92
0.055	0.385	15	0.825	260924	83.92

DIA	LOC	xDIA	REACH	ITEM#	LIST PRICE
0.060	0.312	10	0.625	260935	83.92
0.060	0.500	16	1.000	260946	83.92
0.062	0.312	10	0.625	260957	83.92
0.062	0.500	16	1.000	260968	83.92
0.065	0.325	10	0.650	260979	83.92
0.065	0.500	15	1.000	260990	83.92
0.070	0.350	10	0.700	261001	83.92
0.070	0.500	14	1.000	261012	83.92
0.075	0.375	10	0.750	261023	83.92
0.075	0.500	13	1.000	261034	83.92
0.078	0.406	10	0.800	261045	83.92
0.078	0.406	15	1.187	261056	83.92
0.080	0.400	10	0.800	261067	83.92
0.080	0.750	15	1.250	261078	83.92
0.085	0.425	10	0.850	261089	83.92
0.085	0.750	14	1.250	261100	83.92
0.090	0.450	10	0.900	261111	83.92
0.090	0.750	13	1.250	261122	83.92
0.093	0.500	10	0.950	261133	83.92
0.093	0.500	15	1.400	261144	83.92
0.095	0.500	10	0.950	261155	83.92
0.095	0.750	13	1.250	261166	83.92
0.100	0.500	10	1.000	261177	83.92
0.100	0.750	12	1.250	261188	83.92



All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.0005, -0.0005	-.0001, -.0003 ISO H6	+0.010, -.000

MADE IN THE USA

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - LONG LENGTH - LONG FLUTE - SQUARE END - 30° HELIX



UNCOATED

DIA	xDIA	LOC	ITEM#	LIST PRICE
0.010	5	0.050	261199	64.16
0.010	8	0.080	261210	107.68
0.010	12	0.120	261221	127.90
0.015	5	0.078	261232	59.62
0.015	8	0.125	261243	102.94
0.015	12	0.187	261254	126.66
0.020	5	0.100	261265	51.16
0.020	8	0.160	261276	92.47
0.020	12	0.250	261287	121.50
0.025	5	0.125	261298	48.89
0.025	8	0.203	261309	92.47
0.025	12	0.312	261320	107.48
0.030	5	0.150	261331	47.03
0.030	8	0.250	261342	79.24
0.030	12	0.375	261353	102.11
0.031	5	0.156	261364	47.03
0.031	8	0.250	261375	75.64
0.031	12	0.375	261386	102.11
0.035	5	0.175	261397	47.03
0.035	8	0.280	261408	75.64
0.035	12	0.425	261419	102.11
0.040	5	0.200	261430	47.03
0.040	8	0.325	261441	75.64
0.040	12	0.480	261452	102.11
0.045	5	0.225	261463	47.03
0.045	8	0.375	261474	75.64
0.045	12	0.550	261485	101.49
0.047	5	0.250	261496	47.03
0.047	8	0.375	261507	75.64
0.047	12	0.570	261518	101.49
0.050	5	0.250	261529	47.03
0.050	8	0.400	261540	75.64
0.050	12	0.600	261551	102.11
0.055	5	0.275	261562	47.03
0.055	8	0.440	261573	75.64
0.055	12	0.660	261584	102.11
0.060	5	0.312	261595	41.88
0.060	8	0.500	261606	47.03
0.060	12	0.720	261617	102.11
0.062	5	0.312	261628	41.88
0.062	8	0.500	261639	46.83
0.062	12	0.750	261650	80.04

DIA	xDIA	LOC	ITEM#	LIST PRICE
0.062	15	0.950	261661	109.54
0.065	5	0.325	261672	41.88
0.065	8	0.500	261683	46.83
0.065	12	0.780	261694	80.04
0.070	5	0.375	261705	41.88
0.070	8	0.560	261716	46.83
0.070	12	0.850	261727	80.04
0.075	5	0.375	261738	41.88
0.075	8	0.625	261749	46.83
0.075	12	0.900	261760	80.04
0.078	5	0.406	261771	41.88
0.078	8	0.625	261782	46.83
0.078	12	0.940	261793	80.04
0.078	15	1.187	261804	109.54
0.080	5	0.406	261815	41.88
0.080	8	0.750	261826	46.83
0.080	12	0.960	261837	80.04
0.085	5	0.425	261848	41.88
0.085	8	0.750	261859	46.83
0.085	12	1.020	261870	80.04
0.090	5	0.450	261881	41.88
0.090	8	0.750	261892	46.83
0.090	12	1.080	261903	80.04
0.093	5	0.500	261914	41.88
0.093	8	0.750	261925	46.83
0.093	12	1.125	261936	80.04
0.093	15	1.400	261947	113.87
0.095	5	0.500	261958	41.88
0.095	8	0.750	261969	46.83
0.095	12	1.140	261980	80.04
0.100	5	0.500	261991	41.88
0.100	8	0.800	262002	46.83
0.100	12	1.200	262013	80.04
0.109	5	0.570	262024	41.88
0.109	8	0.900	262035	46.83
0.109	12	1.320	262046	80.04
0.118	5	0.625	262057	41.88
0.118	8	0.950	262068	46.83
0.118	12	1.375	262079	80.04
0.120	5	0.600	262090	41.88
0.120	8	1.000	262101	46.83
0.120	12	1.500	262112	80.04

All long length Micro End Mills are 1/8" shank, 2-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - LONG LENGTH - LONG FLUTE - SQUARE END - 30° HELIX



ALTIM COATED

DIA	xDIA	LOC	ITEM#	LIST PRICE
0.010	5	0.050	262123	76.99
0.010	8	0.080	262134	129.22
0.010	12	0.120	262145	153.48
0.015	5	0.078	262156	71.54
0.015	8	0.125	262167	123.53
0.015	12	0.187	262178	151.99
0.020	5	0.100	262189	61.39
0.020	8	0.160	262200	110.96
0.020	12	0.250	262211	145.80
0.025	5	0.125	262222	58.67
0.025	8	0.203	262233	110.96
0.025	12	0.312	262244	128.97
0.030	5	0.150	262255	56.44
0.030	8	0.250	262266	95.09
0.030	12	0.375	262277	122.54
0.031	5	0.156	262288	56.44
0.031	8	0.250	262299	90.77
0.031	12	0.375	262310	122.54
0.035	5	0.175	262321	56.44
0.035	8	0.280	262332	90.77
0.035	12	0.425	262343	122.54
0.040	5	0.200	262354	56.44
0.040	8	0.325	262365	90.77
0.040	12	0.480	262376	122.54
0.045	5	0.225	262387	56.44
0.045	8	0.375	262398	90.77
0.045	12	0.550	262409	121.79
0.047	5	0.250	262420	56.44
0.047	8	0.375	262431	90.77
0.047	12	0.570	262442	121.79
0.050	5	0.250	262453	56.44
0.050	8	0.400	262464	90.77
0.050	12	0.600	262475	122.54
0.055	5	0.275	262486	56.44
0.055	8	0.440	262497	90.77
0.055	12	0.660	262508	122.54
0.060	5	0.312	262519	50.25
0.060	8	0.500	262530	56.44
0.060	12	0.720	262541	122.54
0.062	5	0.312	262552	50.25
0.062	8	0.500	262563	56.19
0.062	12	0.750	262574	96.05

DIA	xDIA	LOC	ITEM#	LIST PRICE
0.062	15	0.950	262585	131.45
0.065	5	0.325	262596	50.25
0.065	8	0.500	262607	56.19
0.065	12	0.780	262618	96.05
0.070	5	0.375	262629	50.25
0.070	8	0.560	262640	56.19
0.070	12	0.850	262651	96.05
0.075	5	0.375	262662	50.25
0.075	8	0.625	262673	56.19
0.075	12	0.900	262684	96.05
0.078	5	0.406	262695	50.25
0.078	8	0.625	262706	56.19
0.078	12	0.940	262717	96.05
0.078	15	1.187	262728	131.45
0.080	5	0.406	262739	50.25
0.080	8	0.750	262750	56.19
0.080	12	0.960	262761	96.05
0.085	5	0.425	262772	50.25
0.085	8	0.750	262783	56.19
0.085	12	1.020	262794	96.05
0.090	5	0.450	262805	50.25
0.090	8	0.750	262816	56.19
0.090	12	1.080	262827	96.05
0.093	5	0.500	262838	50.25
0.093	8	0.750	262849	56.19
0.093	12	1.125	262860	96.05
0.093	15	1.400	262871	136.65
0.095	5	0.500	262882	50.25
0.095	8	0.750	262893	56.19
0.095	12	1.140	262904	96.05
0.100	5	0.500	262915	50.25
0.100	8	0.800	262926	56.19
0.100	12	1.200	262937	96.05
0.109	5	0.570	262948	50.25
0.109	8	0.900	262959	56.19
0.109	12	1.320	262970	96.05
0.118	5	0.625	262981	50.25
0.118	8	0.950	262992	56.19
0.118	12	1.375	263003	96.05
0.120	5	0.600	263014	50.25
0.120	8	1.000	263025	56.19
0.120	12	1.500	263036	96.05

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All long length Micro End Mills are 1/8" shank, 2-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.0005, -.0005	-.0001, -.0003 ISO H6

MADE IN THE USA



Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

3 FLUTE - LONG LENGTH - LONG FLUTE - BALL NOSE - 30° HELIX



UNCOATED

DIA	xDIA	LOC	ITEM#	LIST PRICE
0.010	5	0.050	263047	73.44
0.010	8	0.080	263058	123.36
0.010	12	0.120	263069	144.40
0.015	5	0.078	263080	68.28
0.015	8	0.125	263091	118.20
0.015	12	0.187	263102	146.05
0.020	5	0.100	263113	58.79
0.020	8	0.160	263124	109.75
0.020	12	0.250	263135	137.18
0.025	5	0.125	263146	55.90
0.025	8	0.203	263157	106.86
0.025	12	0.312	263168	132.02
0.030	5	0.150	263179	54.05
0.030	8	0.250	263190	88.41
0.030	12	0.375	263201	129.96
0.031	5	0.156	263212	54.05
0.031	8	0.250	263223	85.14
0.031	12	0.375	263234	117.17
0.035	5	0.175	263245	54.05
0.035	8	0.281	263256	88.41
0.035	12	0.425	263267	117.17
0.040	5	0.200	263278	54.05
0.040	8	0.325	263289	88.41
0.040	12	0.480	263300	117.17
0.045	5	0.225	263311	54.05
0.045	8	0.375	263322	88.41
0.045	12	0.550	263333	117.17
0.047	5	0.250	263344	54.05
0.047	8	0.375	263355	88.41
0.047	12	0.570	263366	117.17
0.050	5	0.250	263377	54.05
0.050	8	0.400	263388	88.41
0.050	12	0.600	263399	117.17
0.055	5	0.275	263410	47.86
0.055	8	0.440	263421	57.76
0.055	12	0.660	263432	109.33
0.060	5	0.312	263443	47.86
0.060	8	0.500	263454	54.05
0.060	12	0.720	263465	99.43
0.062	5	0.312	263476	47.86
0.062	8	0.500	263487	53.43
0.062	12	0.750	263498	91.80

DIA	xDIA	LOC	ITEM#	LIST PRICE
0.062	15	0.950	263509	125.63
0.065	5	0.325	263520	47.86
0.065	8	0.500	263531	53.43
0.065	12	0.780	263542	91.80
0.070	5	0.375	263553	47.86
0.070	8	0.560	263564	53.43
0.070	12	0.900	263575	91.80
0.075	5	0.375	263586	47.86
0.075	8	0.625	263597	53.43
0.075	12	0.900	263608	91.80
0.078	5	0.406	263619	47.86
0.078	8	0.625	263630	53.43
0.078	12	0.940	263641	91.80
0.078	15	1.187	263652	125.63
0.080	5	0.406	263663	47.86
0.080	8	0.750	263674	53.43
0.080	12	0.960	263685	91.80
0.085	5	0.425	263696	47.86
0.085	8	0.750	263707	53.43
0.085	12	1.020	263718	91.80
0.090	5	0.450	263729	47.86
0.090	8	0.750	263740	53.43
0.090	12	1.080	263751	91.80
0.093	5	0.500	263762	47.86
0.093	8	0.750	263773	53.43
0.093	12	1.125	263784	91.80
0.093	15	1.400	263795	128.31
0.095	5	0.500	263806	47.86
0.095	8	0.750	263817	53.43
0.095	12	1.140	263828	91.80
0.100	5	0.500	263839	47.86
0.100	8	0.800	263850	53.43
0.100	12	1.200	263861	91.80
0.109	5	0.570	263872	47.86
0.109	8	0.900	263883	53.43
0.109	12	1.320	263894	91.80
0.118	5	0.625	263905	47.86
0.118	8	0.950	263916	53.43
0.118	12	1.375	263927	91.80
0.120	5	0.600	263938	47.86
0.120	8	1.000	263949	53.43
0.120	12	1.500	263960	91.80

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.005, -0.005	-0.001, -0.003 ISO H6	+0.010, -0.000

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

Carbide Micro End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



3 FLUTE - LONG LENGTH - LONG FLUTE - BALL NOSE - 30° HELIX



ALTiN COATED

DIA	xDIA	LOC	ITEM#	LIST PRICE
0.010	5	0.050	263971	88.13
0.010	8	0.080	263982	148.03
0.010	12	0.120	263993	173.28
0.015	5	0.078	264004	81.94
0.015	8	0.125	264015	141.84
0.015	12	0.187	264026	175.26
0.020	5	0.100	264037	70.55
0.020	8	0.160	264048	131.69
0.020	12	0.250	264059	164.62
0.025	5	0.125	264070	67.09
0.025	8	0.203	264081	128.23
0.025	12	0.312	264092	158.43
0.030	5	0.150	264103	64.86
0.030	8	0.250	264114	106.09
0.030	12	0.375	264125	155.95
0.031	5	0.156	264136	64.86
0.031	8	0.250	264147	102.16
0.031	12	0.375	264158	140.61
0.035	5	0.175	264169	64.86
0.035	8	0.281	264180	106.09
0.035	12	0.425	264191	140.61
0.040	5	0.200	264202	64.86
0.040	8	0.325	264213	106.09
0.040	12	0.480	264224	140.61
0.045	5	0.225	264235	64.86
0.045	8	0.375	264246	106.09
0.045	12	0.550	264257	140.61
0.047	5	0.250	264268	64.86
0.047	8	0.375	264279	106.09
0.047	12	0.570	264290	140.61
0.050	5	0.250	264301	64.86
0.050	8	0.400	264312	106.09
0.050	12	0.600	264323	140.61
0.055	5	0.275	264334	57.43
0.055	8	0.440	264345	69.31
0.055	12	0.660	264356	131.20
0.060	5	0.312	264367	57.43
0.060	8	0.500	264378	64.86
0.060	12	0.720	264389	119.32
0.062	5	0.312	264400	57.43
0.062	8	0.500	264411	64.11
0.062	12	0.750	264422	110.16

DIA	xDIA	LOC	ITEM#	LIST PRICE
0.062	15	0.950	264433	150.76
0.065	5	0.325	264444	57.43
0.065	8	0.500	264455	64.11
0.065	12	0.780	264466	110.16
0.070	5	0.375	264477	57.43
0.070	8	0.560	264488	64.11
0.070	12	0.900	264499	110.16
0.075	5	0.375	264510	57.43
0.075	8	0.625	264521	64.11
0.075	12	0.900	264532	110.16
0.078	5	0.406	264543	57.43
0.078	8	0.625	264554	64.11
0.078	12	0.940	264565	110.16
0.078	15	1.187	264576	150.76
0.080	5	0.406	264587	57.43
0.080	8	0.750	264598	64.11
0.080	12	0.960	264609	110.16
0.085	5	0.425	264620	57.43
0.085	8	0.750	264631	64.11
0.085	12	1.020	264642	110.16
0.090	5	0.450	264653	57.43
0.090	8	0.750	264664	64.11
0.090	12	1.080	264675	110.16
0.093	5	0.500	264686	57.43
0.093	8	0.750	264697	64.11
0.093	12	1.125	264708	110.16
0.093	15	1.400	264719	153.97
0.095	5	0.500	264730	57.43
0.095	8	0.750	264741	64.11
0.095	12	1.140	264752	110.16
0.100	5	0.500	264763	57.43
0.100	8	0.800	264774	64.11
0.100	12	1.200	264785	110.16
0.109	5	0.570	264796	57.43
0.109	8	0.900	264807	64.11
0.109	12	1.320	264818	110.16
0.118	5	0.625	264829	57.43
0.118	8	0.950	264840	64.11
0.118	12	1.375	264851	110.16
0.120	5	0.600	264862	57.43
0.120	8	1.000	264873	64.11
0.120	12	1.500	264884	110.16

REGULAR LENGTH

LONG REACH STUB FL

LONG REACH REG FL

LONG REACH LONG FL

LONG LENGTH LONG FL

All long reach Micro End Mills are 1/8" shank, 2-1/2" OAL.
For coating information see page 6. For technical information, please see page 246.

TOLERANCES	DIAMETER	SHANK	REACH
ALL SIZES	+0.0005, -0.0005	-0.0001, -0.0003 ISO H6	+0.010, -0.000

MADE IN THE USA



M42 Cobalt Roughing End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

COARSE PITCH - CENTER CUTTING - 30° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE
1/4	3/8	5/8	2-7/16	3	167385	101.89
5/16	3/8	3/4	2-1/2	3	167396	111.27
3/8	3/8	3/4	2-1/2	4	167407	116.24
7/16	3/8	1	2-11/16	4	167418	116.92
1/2	1/2	1	3	4	167429	119.05
1/2	1/2	1-1/4	3-1/4	4	167440	123.12
5/8	5/8	1-5/8	3-3/4	4	167451	156.68
* 3/4	3/4	1-5/8	3-7/8	4	167462	172.43
* 7/8	3/4	1-7/8	4-1/8	5	167473	238.94
* 1	1	2	4-1/2	5	167484	230.96
* 1-1/8	1	2	4-1/2	6	167495	358.67
* 1-1/4	1-1/4	2	4-1/2	6	167506	389.25
* 1-1/2	1-1/4	2	4-1/2	6	167517	456.52
* 2	1-1/4	2	4-1/2	8	167539	634.35

*NON CENTER CUTTING

FINE PITCH - CENTER CUTTING - 30° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE
1/4	3/8	5/8	2-7/16	3	168518	101.89
5/16	3/8	3/4	2-1/2	3	168529	111.27
3/8	3/8	3/4	2-1/2	4	168540	116.92
7/16	3/8	1	2-11/16	4	168551	117.52
1/2	1/2	1-1/4	3-1/4	4	168562	119.05
5/8	5/8	1-5/8	3-3/4	4	168573	156.68
* 3/4	3/4	1-5/8	3-7/8	4	168584	172.43
* 7/8	3/4	1-7/8	4-1/8	5	168595	225.56
* 1	1	2	4-1/2	5	168606	231.13
* 1-1/8	1	2	4-1/2	6	168617	383.18
* 1-1/4	1-1/4	2	4-1/2	6	168628	389.25
* 1-1/2	1-1/4	2	4-1/2	6	168639	480.99
* 2	1-1/4	2	4-1/2	8	168661	678.01

*NON CENTER CUTTING

For coating information see page 6. For technical information please see page 247.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.005, -0.005	+0.0000, -.0005

COBALT END MILLS

M42 Cobalt End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



2 FLUTE - CENTER CUTTING - 30° HELIX



ALTiN COATED

COBALT END MILLS

DIA	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE
1/8	3/8	3/8	2-5/16	2	232549	48.70
3/16	3/8	9/32	2-5/16	2	232571	48.70
1/4	3/8	1/2	2-5/16	2	232593	48.70
5/16	3/8	9/16	2-5/16	2	232615	48.70
3/8	3/8	9/16	2-5/16	2	232626	48.70
7/16	3/8	13/16	2-1/2	2	232637	67.27
1/2	3/8	13/16	2-1/2	2	232648	67.27
1/2	1/2	1	3	2	232659	71.17
9/16	1/2	1-1/8	3-1/8	2	232670	80.09
5/8	1/2	1-1/8	3-1/8	2	232681	89.68
5/8	5/8	1-5/16	3-7/16	2	232692	91.09
3/4	1/2	1-5/16	3-5/16	2	232703	104.24
3/4	5/8	1-5/16	3-7/16	2	232714	104.24
3/4	3/4	1-5/16	3-9/16	2	232725	104.24
13/16	5/8	1-1/2	3-5/8	2	232736	128.00
13/16	3/4	1-1/2	3-3/4	2	232747	128.46
7/8	3/4	1-1/2	3-3/4	2	232769	142.66
7/8	7/8	1-1/2	3-3/4	2	232780	142.66
15/16	5/8	1-1/2	3-5/8	2	232791	155.03
15/16	3/4	1-1/2	3-3/4	2	232802	164.27
1	3/4	1-1/2	3-3/4	2	232835	145.16
1	1	1-5/8	4-1/8	2	232857	165.29
1-1/8	1	1-5/8	4-1/8	2	232879	241.75
1-1/4	1	1-5/8	4-1/8	2	232901	269.49
1-1/2	1-1/4	1-5/8	4-1/8	2	232945	322.34



All cobalt End Mills stocked with ALTiN coating

For coating information, please see page 6.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .003, -.0000	+ .0000, -.0004

MADE IN THE USA



M42 Cobalt End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

4 & 6 FLUTE - CENTER CUTTING - 30° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE
1/8	3/8	3/8	2-5/16	4	230800	49.69
5/32	3/8	3/8	2-5/16	4	230811	68.08
3/16	3/8	1/2	2-3/8	4	230822	49.69
7/32	3/8	1/2	2-3/8	4	230833	68.08
1/4	3/8	5/8	2-7/16	4	230844	49.69
9/32	3/8	11/16	2-1/2	4	230855	68.08
5/16	3/8	3/4	2-1/2	4	230866	49.69
11/32	3/8	3/4	2-1/2	4	230877	69.53
3/8	3/8	3/4	2-1/2	4	230888	49.69
13/32	3/8	11/16	2-1/2	4	230899	101.60
7/16	3/8	1	2-11/16	4	230910	67.16
15/32	3/8	1	2-11/16	4	230921	107.22
1/2	3/8	1	2-11/16	4	230932	67.16
1/2	1/2	1-1/4	3-1/4	4	230943	67.16
17/32	1/2	1-3/8	3-3/8	4	230954	125.85
9/16	1/2	1-3/8	3-3/8	4	230965	80.55
5/8	1/2	1-3/8	3-3/8	4	230976	87.70
5/8	5/8	1-5/8	3-3/4	4	230987	97.43
11/16	1/2	1-5/8	3-5/8	4	230998	101.66
11/16	5/8	1-5/8	3-3/4	4	231009	103.60
3/4	1/2	1-5/8	3-5/8	4	231020	123.34
3/4	5/8	1-5/8	3-3/4	4	231031	123.34
3/4	3/4	1-5/8	3-7/8	4	231042	123.34
13/16	3/4	1-7/8	4-1/8	4	231053	139.24
7/8	3/4	1-7/8	4-1/8	4	231064	138.75
7/8	7/8	1-7/8	4-1/8	4	231075	138.75
15/16	3/4	1-7/8	4-1/8	4	231086	178.16
1	3/4	1-7/8	4-1/8	4	231097	157.89
1	1	2	4-1/2	4	231119	167.20
1-1/8	3/4	1-5/8	3-7/8	6	231130	237.87
1-1/4	1	2	4-1/2	6	231141	255.71
1-1/4	1-1/4	2	4-1/2	6	231152	260.65
1-3/8	3/4	2	4-1/4	6	231163	354.59
1-1/2	1	2	4-1/2	6	231174	398.35
1-1/2	1-1/4	2	4-1/2	4	231185	326.54
1-5/8	1-1/4	2	4-1/2	6	231196	519.54
2	1-1/4	2	4-1/2	6	231207	589.15

For coating information, please see page 6.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.003, -.0000	+0.0000, -.0004

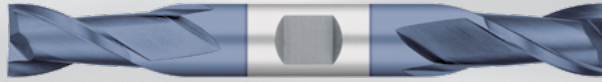
COBALT END MILLS

M42 Cobalt End Mills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



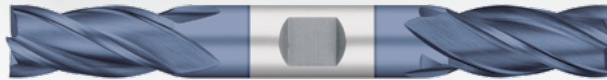
2 FLUTE - DOUBLE END - CENTER CUTTING - 30° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/16	2	231449	74.50
5/32	3/8	7/16	3-1/8	2	231460	79.09
3/16	3/8	7/16	3-1/8	2	231471	74.54
7/32	3/8	1/2	3-1/8	2	231482	79.12
1/4	3/8	1/2	3-1/8	2	231493	74.54
9/32	3/8	9/16	3-1/8	2	231504	79.12
5/16	3/8	9/16	3-1/8	2	231515	74.54
11/32	3/8	9/16	3-1/8	2	231526	79.12
3/8	3/8	9/16	3-1/8	2	231537	74.54
13/32	1/2	13/16	3-3/4	2	231548	51.76
7/16	1/2	13/16	3-3/4	2	231559	113.37
1/2	1/2	13/16	3-3/4	2	231581	113.37
9/16	5/8	1-1/8	4-1/2	2	231592	142.27
5/8	5/8	1-1/8	4-1/2	2	231603	142.27
3/4	3/4	1-5/16	5	2	231625	179.22
7/8	7/8	1-9/16	5-1/2	2	231647	225.43
1	1	1-5/8	5-7/8	2	231669	277.29

4 FLUTE - DOUBLE END - CENTER CUTTING - 30° HELIX



ALTiN COATED

DIA	SHANK	LOC	OAL	# OF FLUTES	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/16	4	231911	75.26
5/32	3/8	7/16	3-1/8	4	231922	79.47
3/16	3/8	1/2	3-1/8	4	231933	75.26
7/32	3/8	9/16	3-1/4	4	231944	79.47
1/4	3/8	5/8	3-3/8	4	231955	75.26
9/32	3/8	11/16	3-3/8	4	231966	79.47
5/16	3/8	3/4	3-1/2	4	231977	75.26
11/32	3/8	3/4	3-1/2	4	231988	79.47
3/8	3/8	3/4	3-1/2	4	231999	75.26
13/32	1/2	1	4-1/8	4	232010	116.81
7/16	1/2	1	4-1/8	4	232021	113.64
1/2	1/2	1	4-1/8	4	232043	113.64
9/16	5/8	1-3/8	5	4	232054	139.88
5/8	5/8	1-3/8	5	4	232065	139.88
3/4	3/4	1-5/8	5-5/8	4	232087	176.18
7/8	7/8	1-7/8	6-1/8	4	232109	235.23
1	1	1-7/8	6-3/8	4	232131	272.95

For coating information, please see page 6.

TOLERANCES	DIAMETER		SHANK
	IF SIZE & SHANK DIA. ARE NOT THE SAME	IF SIZE & SHANK DIA. ARE THE SAME	
ALL SIZES	+ .0000, - .0015	+ .0000, - .0025	+ .0001, - .0005

COBALT END MILLS

MADE IN THE USA



Carbide Countersinks

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

COUNTERSINKS

SINGLE FLUTE COUNTERSINKS



CARBIDE
60° 82° 90° 100°

SIZE	SHANK	OAL	PKG QTY	60° - ITEM #	82° - ITEM #	90° - ITEM #	100° - ITEM #	LIST PRICE
1/8	1/8	1-1/2	1	118842	118930	119018	216313	24.57
3/16	3/16	2	1	118853	118941	119029	216324	26.24
1/4	1/4	2	1	118864	118952	119040	216335	29.81
3/8	1/4	2-5/8	1	118875	118963	119051	216346	53.98
1/2	1/4	2-5/8	1	118886	118974	119062	216357	66.86
5/8	3/8	2-3/4	1	118897	118985	119073	216368	97.69
3/4	3/8	2-3/4	1	118908	118996	119084	216379	138.08
1	1/2	3	1	118919	119007	119095	216390	204.69

THREE FLUTE COUNTERSINKS



CARBIDE
60° 82° 90° 100°

SIZE	SHANK	OAL	PKG QTY	60° - ITEM #	82° - ITEM #	90° - ITEM #	100° - ITEM #	LIST PRICE
1/8	1/8	1-1/2	1	119106	119194	119282	216401	24.57
3/16	3/16	2	1	119117	119205	119293	216412	26.24
1/4	1/4	2	1	119128	119216	119304	216423	29.81
3/8	1/4	2-5/8	1	119139	119227	119315	216434	53.98
1/2	1/4	2-5/8	1	119150	119238	119326	216445	66.86
5/8	3/8	2-3/4	1	119161	119249	119337	216456	97.69
3/4	3/8	2-3/4	1	119172	119260	119348	216467	138.08
1	1/2	3	1	119183	119271	119359	216478	204.69

SIX FLUTE CHATTERLESS COUNTERSINKS



CARBIDE
60° 82° 90° 100°

SIZE	SHANK	OAL	PKG QTY	60° - ITEM #	82° - ITEM #	90° - ITEM #	100° - ITEM #	LIST PRICE
1/8	1/8	1-1/2	1	119480	119568	119656	216489	24.57
3/16	3/16	2	1	119491	119579	119667	216500	26.24
1/4	1/4	2	1	119502	119590	119678	216511	29.81
3/8	1/4	2-5/8	1	119513	119601	119689	216522	53.98
1/2	1/4	2-5/8	1	119524	119612	119700	216533	66.86
5/8	3/8	2-3/4	1	119535	119623	119711	216544	97.69
3/4	3/8	2-3/4	1	119546	119634	119722	216555	138.08
1	1/2	3	1	119557	119645	119733	216566	204.69

HSS Countersinks

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



SINGLE FLUTE COUNTERSINKS

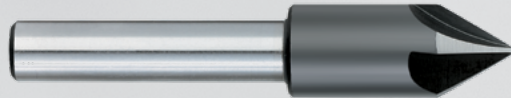


HIGH SPEED STEEL
60° 82° 90°

SIZE	SHANK	OAL	PKG QTY	60°-ITEM#	82°-ITEM#	90°-ITEM#	LIST PRICE
1/4	3/16	1-7/16	1	113408	113463	113518	26.97
3/8	1/4	1-21/32	1	113419	113474	113529	30.69
1/2	1/4	1-13/32	1	113430	113485	113540	39.25
3/4	1/2	1-27/32	1	113441	113496	113551	54.20
1	1/2	2-13/16	1	113452	113507	113562	84.20

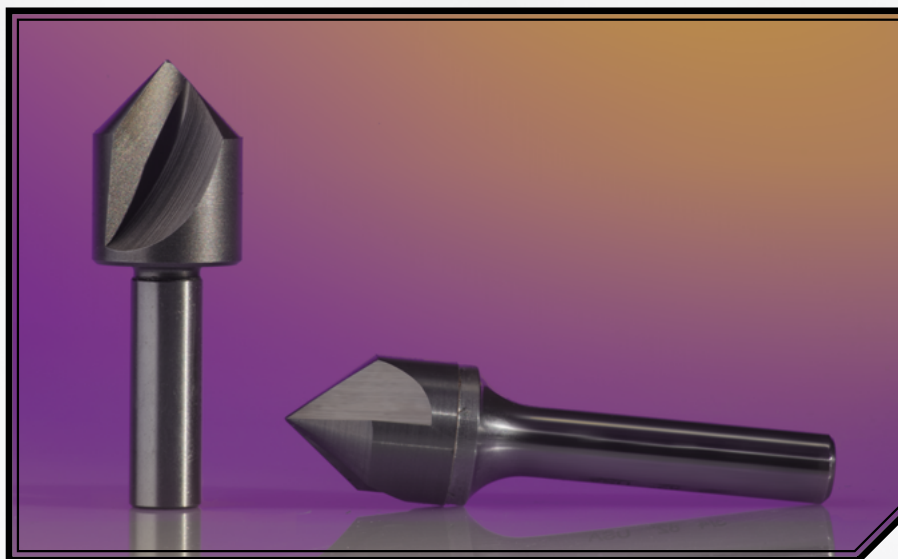
COUNTERSINKS

FOUR FLUTE COUNTERSINKS



HIGH SPEED STEEL
60° 82°

SIZE	SHANK	OAL	PKG. QTY	60°-ITEM#	82°-ITEM#	LIST PRICE
1/2	1/2	3-7/8	1	113573	113628	86.07
5/8	1/2	4	1	113584	113639	96.89
3/4	1/2	4-1/8	1	113595	113650	123.65
7/8	1/2	4-1/4	1	113606	113661	145.34
1	1/2	4-3/8	1	113617	113672	150.20



MADE IN THE USA



Combined Drill & Countersinks

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

COUNTERSINKS

CARBIDE



UNCOATED
REGULAR - 60°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY	ITEM#	LIST PRICE
00	.025	1/8	1-1/2	1	216302	32.74
0	1/32	1/8	1-1/2	1	216291	31.29
1	3/64	1/8	1-1/2	1	118776	28.48
2	5/64	3/16	2	1	118787	42.38
3	7/64	1/4	2	1	118798	47.80
4	1/8	5/16	2-1/8	1	118809	61.70
5	3/16	7/16	2-3/4	1	118820	97.81
6	7/32	1/2	3	1	118831	121.75



ALTiN COATED
REGULAR - 60°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY	ITEM#	LIST PRICE
00	.025	1/8	1-1/2	1	118833	40.89
0	1/32	1/8	1-1/2	1	118834	39.12
1	3/64	1/8	1-1/2	1	118835	35.59
2	5/64	3/16	2	1	118836	52.98
3	7/64	1/4	2	1	118837	59.73
4	1/8	5/16	2-1/8	1	118838	77.12
5	3/16	7/16	2-3/4	1	118839	122.27
6	7/32	1/2	3	1	118840	152.20

M42 COBALT



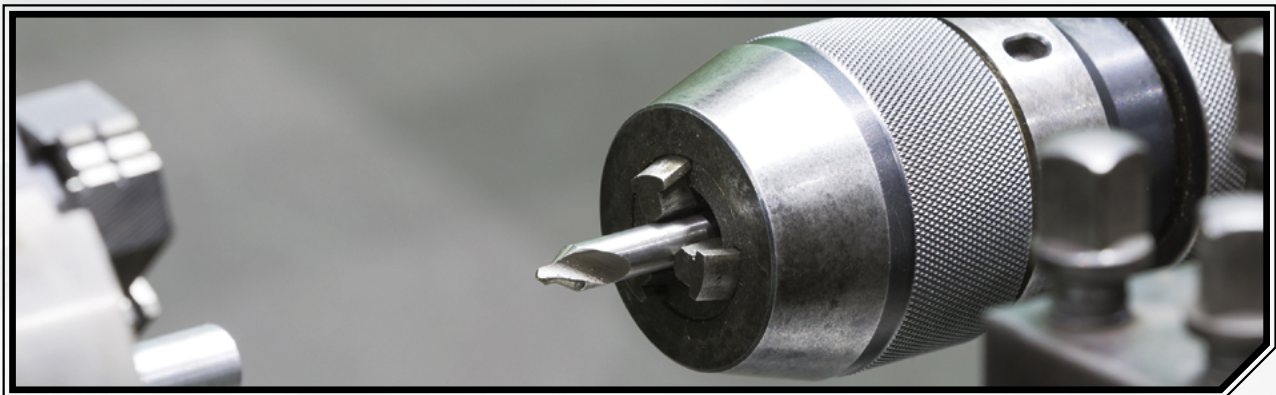
UNCOATED
REGULAR - 60°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY	ITEM#	LIST PRICE
1	3/64	1/8	1-1/4	6	118732	29.47
2	5/64	3/16	1-7/8	6	118743	31.85
3	7/64	1/4	2	6	118754	32.93
4	1/8	5/16	2-1/8	6	118765	34.25



ALTiN COATED
REGULAR - 60°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY	ITEM#	LIST PRICE
1	3/64	1/8	1-1/4	6	118767	37.18
2	5/64	3/16	1-7/8	6	118768	40.49
3	7/64	1/4	2	6	118769	43.71
4	1/8	5/16	2-1/8	6	118770	46.27



Countersinks stocked in sizes from #00000 to #8

For coating information, please see page 6.

Combined Drill & Countersinks

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL



UNCOATED
REGULAR - 60°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY	ITEM#	LIST PRICE
00000	.010	1/8	1-1/4	6	118567	17.95
0000	.015	1/8	1-1/4	6	118556	16.48
000	.020	1/8	1-1/4	6	118545	15.58
00	.025	1/8	1-1/4	6	118534	15.58
0	1/32	1/8	1-1/4	6	118666	16.61
1	3/64	1/8	1-1/4	6	118578	9.93
2	5/64	3/16	1-7/8	6	118589	10.38
3	7/64	1/4	2	6	118600	10.84
4	1/8	5/16	2-1/8	6	118611	11.16
5	3/16	7/16	2-3/4	1	118622	17.67
6	7/32	1/2	3	1	118633	26.55
7	1/4	5/8	3-1/4	1	118644	46.31
8	5/16	3/4	3-1/2	1	118655	64.43



ALTIN COATED
REGULAR - 60°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY	ITEM#	LIST PRICE
00000	.010	1/8	1-1/4	6	119466	23.83
0000	.015	1/8	1-1/4	6	119467	22.31
000	.020	1/8	1-1/4	6	119468	21.83
00	.025	1/8	1-1/4	6	119469	20.84
0	1/32	1/8	1-1/4	6	119458	20.84
1	3/64	1/8	1-1/4	6	119370	15.76
2	5/64	3/16	1-7/8	6	119381	16.19
3	7/64	1/4	2	6	119392	22.05
4	1/8	5/16	2-1/8	6	119403	22.73
5	3/16	7/16	2-3/4	1	119414	31.65
6	7/32	1/2	3	1	119425	50.52
7	1/4	5/8	3-1/4	1	119436	72.61
8	5/16	3/4	3-1/2	1	119447	116.84

COUNTERSINKS

HIGH SPEED STEEL



LONG LENGTH - 60°

SIZE	DRILL DIA.	BODY DIA.	PKG. QTY	ITEM#	LIST PRICE
1 x 3	3/64	1/8	1	119832	24.91
1 x 4	3/64	1/8	1	119843	26.00
1 x 5	3/64	1/8	1	119854	36.11
1 x 6	3/64	1/8	1	119865	47.31
2 x 3	5/64	3/16	1	119876	25.19
2 x 4	5/64	3/16	1	119887	28.50
2 x 5	5/64	3/16	1	119898	36.49
2 x 6	5/64	3/16	1	119909	47.45
3 x 3	7/64	1/4	1	119920	26.33
3 x 4	7/64	1/4	1	119931	30.01
3 x 5	7/64	1/4	1	119942	39.47
3 x 6	7/64	1/4	1	119953	47.88
4 x 4	1/8	5/16	1	119975	33.28

SIZE	DRILL DIA.	BODY DIA.	PKG. QTY	ITEM#	LIST PRICE
4 x 5	1/8	5/16	1	119986	42.49
4 x 6	1/8	5/16	1	119997	49.11
4-1/2 x 4	9/64	3/8	1	119964	37.39
4-1/2 x 5	9/64	3/8	1	120008	54.41
4-1/2 x 6	9/64	3/8	1	120052	60.80
5 x 4	3/16	7/16	1	120019	43.67
5 x 5	3/16	7/16	1	120030	50.57
5 x 6	3/16	7/16	1	120041	56.77
6 x 5	7/32	1/2	1	120063	54.36
6 x 6	7/32	1/2	1	120074	65.70
7 x 6	1/4	5/8	1	120085	122.37
8 x 6	5/16	3/4	1	120096	147.96

For coating information, please see page 6.

MADE IN THE USA

Spiral Point Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



Predator

PREMIUM POWDERED METAL

ANSI



UNCOATED



ALTIN COATED



STEAM OXIDE



TiCN COATED

SIZE	H LIMIT	# OF FLUTES	UNCOATED	LIST PRICE	STM OXIDE	LIST PRICE	ALTIN	LIST PRICE	TiCN	LIST PRICE
2-56	H2	2	263555	37.23	263544	39.38	263566	44.23	263830	44.23
4-40	H2	3	213002	28.75	212793	33.07	213211	44.23	263841	44.23
6-32	H3	3	213013	28.75	212804	33.07	213222	44.23	263852	44.23
8-32	H3	3	213024	28.75	212815	33.07	213233	44.23	263863	44.23
10-24	H3	3	213035	28.75	212826	33.07	213244	44.23	263874	44.23
10-32	H3	3	213046	28.75	212837	33.07	213255	44.23	263885	44.23
1/4-20	H3	3	273519	31.41	273365	36.13	273673	48.32	274443	48.32
1/4-20	H5	3	213057	31.41	212848	36.13	213266	48.32	263896	48.32
1/4-28	H3	3	273530	31.41	273376	36.13	273684	48.32	274454	48.32
1/4-28	H4	3	213068	31.41	212859	36.13	213277	48.32	263907	48.32
5/16-18	H3	3	273541	34.34	273387	39.50	273695	52.85	274465	52.85
5/16-18	H5	3	213079	34.34	212870	39.50	213288	52.85	263918	52.85
5/16-24	H3	3	273552	34.34	273398	39.50	273706	52.85	274476	52.85
5/16-24	H4	3	213090	34.34	212881	39.50	213299	52.85	263929	52.85
3/8-16	H3	3	273563	40.85	273409	46.97	273717	62.85	274487	62.86
3/8-16	H5	3	213101	40.85	212892	46.97	213310	62.85	263940	62.86
3/8-24	H3	3	273574	40.85	273420	46.97	273728	62.85	274498	62.86
3/8-24	H4	3	213112	40.85	212903	46.97	213321	62.85	263951	62.86
7/16-14	H3	3	273585	52.33	273431	60.15	273739	80.48	274509	80.48
7/16-14	H5	3	213123	52.33	212914	60.15	213332	80.48	263962	80.48
7/16-20	H3	3	273596	52.33	273442	60.15	273750	80.48	274520	80.48
7/16-20	H5	3	213134	52.33	212925	60.15	213343	80.48	263973	80.48
1/2-13	H3	4	273607	62.45	273453	71.82	273761	96.08	274531	96.08
1/2-13	H5	4	213145	62.45	212936	71.82	213354	96.08	263984	96.08
1/2-20	H3	4	273618	62.45	273464	71.82	273772	96.08	274542	96.08
1/2-20	H5	4	213156	62.45	212947	71.82	213365	96.08	263995	96.08
5/8-11	H3	4	273629	118.99	273475	136.86	273783	183.07	274553	183.08
5/8-11	H6	4	213167	118.99	212958	136.86	213376	183.07	264006	183.08
5/8-18	H3	4	273640	118.99	273486	136.86	273794	183.07	274564	183.08
5/8-18	H5	4	213178	118.99	212969	136.86	213387	183.07	264017	183.08
3/4-10	H3	4	273662	153.85	273508	176.92	273816	236.67	274586	236.68
3/4-10	H6	4	213189	153.85	212980	176.92	213398	236.67	264028	236.68
3/4-16	H3	4	273651	153.85	273497	176.92	273805	236.67	274575	236.68
3/4-16	H5	4	213200	153.85	212991	176.92	213409	236.67	264039	236.68

All taps sold individually

Predator Tap sizes 3/8" and smaller have male center.

For coating information see page 6. For technical information, please see page 248.

HP TAPS

TAPS

DIES

Spiral Point Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



Predator

PREMIUM POWDERED METAL
METRIC



UNCOATED



ALTiN COATED



STEAM OXIDE



TiCN COATED

SIZE	D LIMIT	# OF FLUTES	UNCOATED LIST PRICE	STM OXIDE LIST PRICE	ALTiN LIST PRICE	TiCN LIST PRICE
M2.5 x 0.45	D3	2	264050 32.62	264072 37.54	264094 48.91	264303 48.91
M3 x 0.5	D3	3	214311 32.62	214388 37.54	214465 48.91	264314 48.91
M3.5 x 0.6	D3	3	274597 32.62	274696 37.54	274795 48.91	275290 48.91
M3.5 x 0.6	D4	3	264061 32.62	264083 37.54	264105 48.91	264325 48.91
M4 x 0.7	D3	3	274608 32.62	274707 37.54	274806 48.91	275301 48.91
M4 x 0.7	D4	3	214322 32.62	214399 37.54	214476 48.91	264336 48.91
M5 x 0.8	D3	3	274619 32.62	274718 37.54	274817 48.91	275312 48.91
M5 x 0.8	D4	3	214333 32.62	214410 37.54	214487 48.91	264347 48.91
M6 x 1.0	D3	3	274630 35.85	274729 41.22	274828 53.75	275323 53.76
M6 x 1.0	D5	3	214344 35.85	214421 41.22	214498 53.75	264358 53.76
M8 x 1.25	D3	3	274641 39.00	274740 44.86	274839 58.56	275334 58.56
M8 x 1.25	D5	3	214355 39.00	214432 44.86	214509 58.56	264369 58.56
M10 x 1.5	D3	3	274652 46.32	274751 53.23	274850 68.92	275345 68.91
M10 x 1.5	D6	3	214366 46.32	214443 53.23	214520 68.92	264380 68.91
M12 x 1.75	D3	4	274663 70.98	274762 81.61	274861 106.12	275356 106.12
M12 x 1.75	D6	4	214377 70.98	214454 81.61	214531 106.12	264391 106.12
M14 x 2.0	D3	4	274674 108.22	274773 124.44	274872 145.98	275367 145.98
M14 x 2.0	D7	4	233858 108.22	233880 124.44	233902 145.98	264402 145.98
M16 x 2.0	D3	4	274685 127.10	274784 146.17	274883 171.51	275378 171.51
M16 x 2.0	D7	4	233869 127.10	233891 146.17	233913 171.51	264413 171.51

- CNC STYLE
- SHANK & OAL MANUFACTURED TO ANSI SPECIFICATIONS
- FOR THROUGH HOLE TAPPING
- MATERIALS: STEEL, STEEL ALLOYS, STAINLESS STEELS, AND A VARIETY OF OTHER STEELS WITH A MAXIMUM OF RC 32

All taps sold individually

Predator Tap sizes 3/8" and smaller have male center.

For coating information see page 6. For technical information, please see page 248.

HP TAPS

TAPS

DIES



Spiral Flute Taps

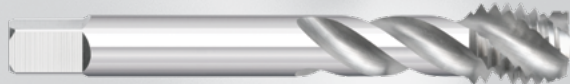
PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

Predator

HIGH VANADIUM POWDERED METAL

ANSI

45° HELIX - SEMI BOTTOMING • 2 - 2-1/2 THREAD CHAMFER



UNCOATED



ALTiN COATED



STEAM OXIDE



TiCN COATED

SIZE	H LIMIT	# OF FLUTES	UNCOATED	LIST PRICE	STM OXIDE	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
2-56	H2	2	263577	44.47	263599	51.14	263588	68.37	263610	68.37
4-40	H2	2	213420	44.47	213838	51.14	213629	68.37	263621	68.37
6-32	H3	3	213431	44.47	213849	51.14	213640	68.37	263632	68.37
8-32	H3	3	213442	44.47	213860	51.14	213651	68.37	263643	68.37
10-24	H3	3	213453	44.47	213871	51.14	213662	68.37	263654	68.37
10-32	H3	3	213464	44.47	213882	51.14	213673	68.37	263665	68.37
1/4-20	H3	3	273827	45.82	274135	52.69	273981	70.47	274289	70.48
1/4-20	H5	3	213475	45.82	213893	52.69	213684	70.47	263676	70.48
1/4-28	H3	3	273838	45.82	274146	52.69	273992	70.47	274300	70.48
1/4-28	H4	3	213486	45.82	213904	52.69	213695	70.47	263687	70.48
5/16-18	H3	3	273849	50.19	274157	57.69	274003	77.18	274311	77.18
5/16-18	H5	3	213497	50.19	213915	57.69	213706	77.18	263698	77.18
5/16-24	H3	3	273860	50.19	274168	57.69	274014	77.18	274322	77.18
5/16-24	H4	3	213508	50.19	213926	57.69	213717	77.18	263709	77.18
3/8-16	H3	3	273871	59.44	274179	68.37	274025	91.48	274333	91.48
3/8-16	H5	3	213519	59.44	213937	68.37	213728	91.48	263720	91.48
3/8-24	H3	3	273882	59.44	274190	68.37	274036	91.48	274344	91.48
3/8-24	H4	3	213530	59.44	213948	68.37	213739	91.48	263731	91.48
7/16-14	H3	3	273893	75.20	274201	86.51	274047	115.70	274355	115.70
7/16-14	H5	3	213541	75.20	213959	86.51	213750	115.70	263742	115.70
7/16-20	H3	3	273904	75.20	274212	86.51	274058	115.70	274366	115.70
7/16-20	H5	3	213552	75.20	213970	86.51	213761	115.70	263753	115.70
1/2-13	H3	3	273915	89.17	274223	102.59	274069	137.21	274377	137.21
1/2-13	H5	3	213563	89.17	213981	102.59	213772	137.21	263764	137.21
1/2-20	H3	3	273926	89.17	274234	102.59	274080	137.21	274388	137.21
1/2-20	H5	3	213574	89.17	213992	102.59	213783	137.21	263775	137.21
5/8-11	H3	4	273937	170.37	274245	195.94	274091	262.12	274399	262.12
5/8-11	H6	4	213585	170.37	214003	195.94	213794	262.12	263786	262.12
5/8-18	H3	4	273948	170.37	274256	195.94	274102	262.12	274410	262.12
5/8-18	H5	4	213596	170.37	214014	195.94	213805	262.12	263797	262.12
3/4-10	H3	4	273959	199.11	274267	229.01	274113	306.39	274421	306.40
3/4-10	H6	4	213607	199.11	214025	229.01	213816	306.39	263808	306.40
3/4-16	H3	4	273970	199.11	274278	229.01	274124	306.39	274432	306.40
3/4-16	H5	4	213618	199.11	214036	229.01	213827	306.39	263819	306.40

All taps sold individually

Predator Tap sizes 3/8" and smaller have male center.

For coating information see page 6. For technical information, please see page 248.

HP TAPS

TAPS

DIES

Spiral Flute Taps

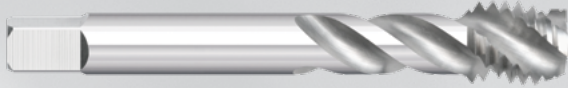
PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



Predator

HIGH VANADIUM POWDERED METAL
METRIC

45° HELIX - SEMI BOTTOMING • 2 - 2-1/2 THREAD CHAMFER



UNCOATED



ALTiN COATED



STEAM OXIDE



TiCN COATED

SIZE	D LIMIT	# OF FLUTES	UNCOATED	LIST PRICE	STM OXIDE	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
M2.5 x 0.45	D3	2	264116	50.45	264138	58.00	264160	74.44	264182	74.44
M3 x 0.5	D3	3	214542	50.45	214619	58.00	214696	74.44	264193	74.44
M3.5 x 0.6	D3	3	274894	50.45	274993	58.00	275092	74.44	275191	74.44
M3.5 x 0.6	D4	3	264127	50.45	264149	58.00	264171	74.44	264204	74.44
M4 x 0.7	D3	3	274905	50.45	275004	58.00	275103	74.44	275202	74.44
M4 x 0.7	D4	3	214553	50.45	214630	58.00	214707	74.44	264215	74.44
M5 x 0.8	D3	3	274916	50.45	275015	58.00	275114	74.44	275213	74.44
M5 x 0.8	D4	3	214564	50.45	214641	58.00	214718	74.44	264226	74.44
M6 x 1.0	D3	3	274927	51.95	275026	59.76	275125	77.18	275224	77.18
M6 x 1.0	D5	3	214575	51.95	214652	59.76	214729	77.18	264237	77.18
M8 x 1.25	D3	3	274938	57.06	275037	65.62	275136	85.44	275235	85.43
M8 x 1.25	D5	3	214586	57.06	214663	65.62	214740	85.44	264248	85.43
M10 x 1.5	D3	3	274949	67.46	275048	77.59	275147	100.60	275246	100.60
M10 x 1.5	D6	3	214597	67.46	214674	77.59	214751	100.60	264259	100.60
M12 x 1.75	D3	3	274960	101.24	275059	116.40	275158	151.61	275257	151.61
M12 x 1.75	D6	3	214608	101.24	214685	116.40	214762	151.61	264270	151.61
M14 x 2.0	D3	4	274971	143.47	275070	165.02	275169	193.69	275268	193.70
M14 x 2.0	D7	4	233924	143.47	233946	165.02	233968	193.69	264281	193.70
M16 x 2.0	D3	4	274982	167.87	275081	193.06	275180	226.62	275279	226.62
M16 x 2.0	D7	4	233935	167.87	233957	193.06	233979	226.62	264292	226.62

- CNC STYLE
- SHANK & OAL MANUFACTURED TO ANSI SPECIFICATIONS
- SUITED FOR BLIND HOLE TAPPING
- MATERIALS: STEEL, STEEL ALLOYS, STAINLESS STEELS, AND A VARIETY OF OTHER STEELS WITH A MAXIMUM OF RC 32

All taps sold individually

Predator Tap sizes 3/8" and smaller have male center.

For coating information see page 6. For technical information, please see page 248.

HP TAPS

TAPS

DIES



Thread Forming Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



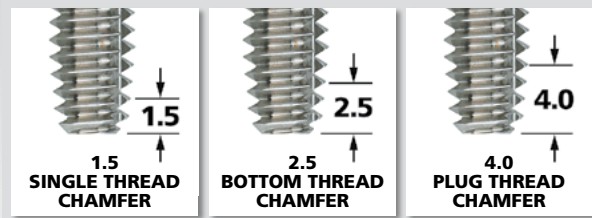
HIGH SPEED STEEL
UNCOATED

HIGH SPEED STEEL - METRIC
UNCOATED

SIZE	H LIMIT	LUBE GROOVES	1.5 ITEM#	2.5 ITEM#	4.0 ITEM#	LIST PRICE
0-80	H2	0	262664	257987	-	30.79
0-80	H3	0	262675	257998	-	30.79
1-64	H3	0	-	258009	-	30.79
1-72	H3	0	262686	258020	-	30.79
2-56	H3	0	262697	258031	-	30.58
2-56	H4	0	262708	258042	-	30.58
2-64	H3	0	-	258064	-	30.58
3-48	H3	0	-	258086	-	30.58
3-56	H3	0	-	258097	-	30.58
3-56	H5	0	-	258108	-	30.58
4-40	H3	0	262719	258130	258119	27.57
4-40	H5	0	262730	258152	258141	27.57
4-48	H4	0	-	258174	-	27.57
5-40	H4	0	-	258218	258207	27.57
5-44	H4	0	-	258262	-	27.57
6-32	H3	1	262741	258306	258295	22.72
6-32	H5	1	262752	258328	258317	22.72
6-40	H4	1	-	258372	258361	22.72
8-32	H3	1	262763	258416	258405	22.72
8-32	H5	1	262774	258438	258427	22.72
8-32	H7	1	-	258460	258449	22.72
8-36	H4	1	-	258482	258471	22.72
10-24	H5	1	-	258504	258493	21.85
10-24	H7	1	-	258526	258515	21.85
10-32	H3	1	262785	258548	258537	21.85
10-32	H5	1	262796	258570	258559	21.85
12-24	H5	2	-	258592	258581	21.85
12-28	H4	2	-	258636	258625	21.85
1/4-20	H5	2	262807	258658	258647	23.20
1/4-20	H8	2	262818	258680	258669	23.20
1/4-28	H4	2	262829	258724	258713	23.20
1/4-28	H6	2	262840	258746	258735	23.20
5/16-18	H8	2	262851	258790	258779	25.76
5/16-18	H5	2	-	258768	258757	25.76
5/16-24	H5	2	262862	258812	258801	25.76
5/16-24	H7	2	262873	258834	258823	25.76
3/8-16	H6	2	262884	258856	258845	29.40
3/8-16	H8	2	262895	258878	258867	29.40
3/8-24	H5	2	262906	258900	258889	29.40
3/8-24	H7	2	262917	258922	258911	29.40
7/16-14	H7	4	-	258944	258933	44.74
7/16-14	H9	4	-	258966	258955	44.74
7/16-20	H5	4	-	258988	258977	44.74
7/16-20	H8	4	-	259010	258999	44.74
1/2-13	H7	6	-	259032	259021	50.04
1/2-13	H10	6	-	259054	259043	50.04
1/2-20	H5	6	-	259076	259065	50.04
1/2-20	H8	6	-	259098	259087	50.04

SIZE	D LIMIT	LUBE GROOVES	1.5 ITEM#	2.5 ITEM#	4.0 ITEM#	LIST PRICE
M1.6 x 0.35	D5	0	-	263412	-	25.33
M1.7 x 0.35	D5	0	-	263423	-	25.33
M2 x 0.4	D5	0	262928	263434	-	25.33
M2.5 x 0.45	D6	0	262939	263445	-	25.33
M3 x 0.5	D6	0	262950	259120	-	25.33
M3.5 x 0.6	D7	1	262961	263467	263456	22.86
M4 x 0.7	D7	1	262972	259142	259131	22.86
M5 x 0.8	D8	1	262983	259164	259153	22.86
M6 x 1.0	D9	2	262994	259186	259175	24.24
M8 x 1.25	D10	2	263005	259208	259197	27.74
M10 x 1.5	D11	2	263016	259230	259219	31.21
M12 x 1.75	D12	4	263027	259252	259241	53.85

Plug Tap sizes M10 and smaller have male centers



- **SINGLE THREAD – 1.5 Thread Chamfer**
For maximum thread length in blind holes due to its short chamfer
- **BOTTOM – 2.5 Thread Chamfer**
For blind hole tapping
- **PLUG – 4.0 Thread Chamfer**
For through hole tapping
- **THREAD FORMING**
Taps have no flutes or cutting edges & provide chipless tapping
- **LUBE GROOVES**
For lubrication & venting in blind holes
- **MATERIALS:**
aluminum, brass, copper, zinc, most ductile materials producing stringy chips are great for uncoated thread forming taps

For technical information, please see page 252, 253.

Plug Tap sizes 3/8" and smaller have male centers

All taps sold individually

MADE IN THE USA

HP TAPS

TAPS

DIES

Thread Forming Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



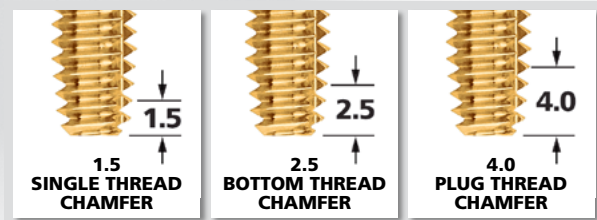
HIGH SPEED STEEL
TIN COATED

SIZE	H LIMIT	LUBE GROOVES	1.5 ITEM#	2.5 ITEM#	4.0 ITEM#	LIST PRICE
0-80	H2	0	263038	209669	-	38.48
0-80	H3	0	263049	209680	-	38.48
1-64	H3	0	-	209691	-	38.48
1-72	H3	0	263060	209702	-	38.48
2-56	H3	0	263071	209713	-	38.23
2-56	H4	0	263082	209724	-	38.23
2-64	H3	0	-	209746	-	38.23
3-48	H3	0	-	209768	-	38.23
3-56	H3	0	-	209779	-	38.23
3-56	H5	0	-	209790	-	38.23
4-40	H3	0	263093	209812	209801	34.46
4-40	H5	0	263104	209834	209823	34.46
4-48	H4	0	-	209856	-	34.46
5-40	H4	0	-	209900	209889	34.46
5-44	H4	0	-	209944	-	34.46
6-32	H3	1	263115	209988	209977	28.39
6-32	H5	1	263126	210010	209999	28.39
6-40	H4	1	-	210054	210043	28.39
8-32	H3	1	263137	210098	210087	28.39
8-32	H5	1	263148	210120	210109	28.39
8-32	H7	1	-	210142	210131	28.39
8-36	H4	1	-	210164	210153	28.39
10-24	H5	1	-	210186	210175	27.32
10-24	H7	1	-	210208	210197	27.32
10-32	H3	1	263159	210230	210219	27.32
10-32	H5	1	263170	210252	210241	27.32
12-24	H5	2	-	210274	210263	27.32
12-28	H4	2	-	210318	210307	27.32
1/4-20	H5	2	263181	210340	210329	29.01
1/4-20	H8	2	263192	210362	210351	29.01
1/4-28	H4	2	263203	210406	210395	29.01
1/4-28	H6	2	263214	210428	210417	29.01
5/16-18	H8	2	263225	210472	210461	32.21
5/16-18	H5	2	-	210450	210439	32.21
5/16-24	H5	2	263236	210494	210483	32.21
5/16-24	H7	2	263247	210516	210505	32.21
3/8-16	H6	2	263258	-	-	32.20
3/8-16	H8	2	263269	-	-	32.20
3/8-16	H6	2	-	210538	210527	36.75
3/8-16	H8	2	-	210560	210549	36.75
3/8-24	H5	2	263280	210582	210571	36.75
3/8-24	H7	2	263291	210604	210593	36.75
7/16-14	H7	4	-	210626	210615	55.93
7/16-14	H9	4	-	210648	210637	55.93
7/16-20	H5	4	-	210670	210659	55.93
7/16-20	H8	4	-	210692	210681	55.93
1/2-13	H7	6	-	210714	210703	62.55
1/2-13	H10	6	-	210736	210725	62.55
1/2-20	H5	6	-	210758	210747	62.55
1/2-20	H8	6	-	210780	210769	62.55

HIGH SPEED STEEL - METRIC
TIN COATED

SIZE	D LIMIT	LUBE GROOVES	1.5 ITEM#	2.5 ITEM#	4.0 ITEM#	LIST PRICE
M1.6 x 0.35	D5	0	-	263478	-	30.84
M1.7 x 0.35	D5	0	-	263489	-	30.84
M2 x 0.4	D5	0	263302	263500	-	30.84
M2.5 x 0.45	D6	0	263313	263511	-	30.84
M3 x 0.5	D6	0	263324	199340	-	30.84
M3.5 x 0.6	D7	1	263335	263533	263522	28.58
M4 x 0.7	D7	1	263346	199362	199351	28.58
M5 x 0.8	D8	1	263357	199384	199373	28.58
M6 x 1.0	D9	2	263368	199406	199395	30.30
M8 x 1.25	D10	2	263379	199428	199417	34.68
M10 x 1.5	D11	2	263390	199450	199439	39.00
M12 x 1.75	D12	4	263401	199472	199461	67.31

Plug Tap sizes M10 and smaller have male center



- **SINGLE THREAD – 1.5 Thread Chamfer**
For maximum thread length in blind holes due to its short chamfer
- **BOTTOM – 2.5 Thread Chamfer**
For blind hole tapping
- **PLUG – 4.0 Thread Chamfer**
For through hole tapping
- **THREAD FORMING**
Taps have no flutes or cutting edges & provide chipless tapping
- **LUBE GROOVES**
For lubrication & venting in blind holes
- **MATERIALS:**
lead, stainless steels, carbon steels, die cast aluminum, most ductile materials producing stringy chips are great for Tin coated forming taps

For technical information, please see page 252, 253.
For coating information see page 6.

All taps sold individually

MADE IN THE USA

HP TAPS

TAPS

DIES



Taper Pipe Taps

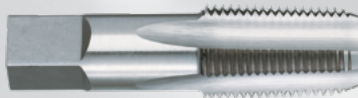
PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS

TAPS

DIES

NPT HIGH SPEED STEEL



UNCOATED



STEAM-OXIDE

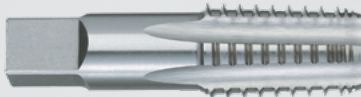


TIN COATED

SIZE	# OF FLUTES	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	TIN	LIST PRICE
1/16-27	4	212023	36.73	233396	42.26	233407	47.79
* 1/8-27	4	212034	36.73	233418	42.26	233429	47.79
1/8-27	4	212045	36.73	233440	42.26	233451	47.79
1/4-18	4	212056	40.67	233462	46.75	233473	52.88
3/8-18	4	212067	53.52	233484	61.56	233495	69.55
1/2-14	4	212078	85.11	233506	97.88	233517	110.62
3/4-14	5	212089	119.05	233528	136.92	233539	154.78
1-11-1/2	5	212100	180.92	233550	208.02	233561	216.89
1-1/4-11-1/2	5	212111	257.88	233572	296.55	233583	335.23
1-1/2-11-1/2	7	212122	345.89	233594	397.82	233605	449.67
2-11-1/2	7	212133	470.52	233616	541.10	233627	611.69

* SMALL SHANK

NPT - INTERRUPTED HIGH SPEED STEEL



UNCOATED



STEAM-OXIDE



TIN COATED

SIZE	# OF FLUTES	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	TIN	LIST PRICE
* 1/8-27	5	212144	56.98	233638	65.53	233649	74.09
1/8-27	5	212155	56.98	233660	65.53	233671	74.09
1/4-18	5	212166	63.03	233682	72.46	233693	81.93
3/8-18	5	212177	79.74	233704	91.68	233715	103.65
1/2-14	5	212188	126.81	233726	145.83	233737	164.85
3/4-14	5	212199	184.55	233748	212.20	233759	239.89
1-11-1/2	5	212210	280.44	233770	322.50	233781	364.56
1-1/4-11-1/2	5	212221	397.14	233792	456.71	233803	516.27
1-1/2-11-1/2	7	212232	532.71	233814	612.61	233825	692.50
2-11-1/2	7	212243	719.92	233836	827.91	233847	935.86

* SMALL SHANK

All taps sold individually.

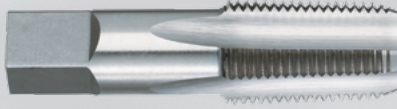
For coating information see page 6. For technical information, please see pages 249-251.

Taper Pipe Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



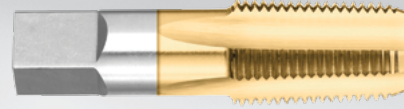
NPTF DRYSEAL HIGH SPEED STEEL



UNCOATED

SIZE	# OF FLUTES	ITEM#	LIST PRICE
1/16-27	4	212254	40.43
* 1/8-27	4	212265	40.43
1/8-27	4	212276	40.43
1/4-18	4	212287	44.72
3/8-18	4	212298	58.85
1/2-14	4	212309	93.63
3/4-14	5	212320	130.95
1-11-1/2	5	212331	198.99
1-1/4-11-1/2	5	212342	283.66
1-1/2-11-1/2	7	212353	380.47
2-11-1/2	7	212364	517.59

* SMALL SHANK



TIN COATED

SIZE	# OF FLUTES	ITEM#	LIST PRICE
1/16-27	4	245700	60.56
* 1/8-27	4	245711	60.56
1/8-27	4	245722	60.56
1/4-18	4	245733	67.01
3/8-18	4	245744	88.17
1/2-14	4	245755	140.22
3/4-14	5	245766	196.16
1-11-1/2	5	245777	298.11
1-1/4-11-1/2	5	245788	424.92
1-1/2-11-1/2	7	245799	569.99
2-11-1/2	7	245810	775.35

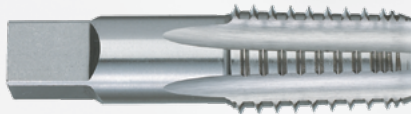
* SMALL SHANK

HP TAPS

TAPS

DIES

NPTF DRYSEAL - INTERRUPTED HIGH SPEED STEEL



UNCOATED

SIZE	# OF FLUTES	ITEM#	LIST PRICE
* 1/8-27	5	212375	62.67
1/8-27	5	212386	62.67
1/4-18	5	212397	69.31
3/8-18	5	212408	87.70
1/2-14	5	212419	139.50
3/4-14	5	212430	202.97
1-11-1/2	5	212441	308.45
1-1/4-11-1/2	5	212452	436.81
1-1/2-11-1/2	7	212463	585.99
2-11-1/2	7	212474	791.90

* SMALL SHANK



TIN COATED

SIZE	# OF FLUTES	ITEM#	LIST PRICE
* 1/8-27	5	212475	93.90
1/8-27	5	212476	93.90
1/4-18	5	212477	103.85
3/8-18	5	212478	131.39
1/2-14	5	212479	208.94
3/4-14	5	212480	304.07
1-11-1/2	5	212481	462.08
1-1/4-11-1/2	5	212482	654.39
1-1/2-11-1/2	7	212483	877.77
2-11-1/2	7	212484	1186.26

* SMALL SHANK

All taps sold individually.

For coating information see page 6. For technical information, please see pages 249-251.

MADE IN THE USA



Straight & Taper Pipe Taps

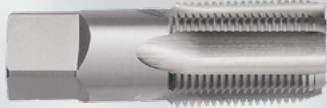
PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS

TAPS

DIES

STRAIGHT PIPE - NPS HIGH SPEED STEEL



UNCOATED

SIZE	# OF FLUTES	ITEM#	LIST PRICE
1/8-27	4	212683	58.69
1/4-18	4	212694	64.94
3/8-18	4	212705	85.47
1/2-14	4	212716	135.96
3/4-14	5	212727	190.16
1-11-1/2	5	212738	288.95

TIN COATED

SIZE	# OF FLUTES	ITEM#	LIST PRICE
1/8-27	4	212740	87.94
1/4-18	4	212742	97.29
3/8-18	4	212744	128.04
1/2-14	4	212745	203.64
3/4-14	5	212746	284.86
1-11-1/2	5	212747	432.87

EXTENSION TAPER PIPE - NPT HIGH SPEED STEEL



UNCOATED

SIZE	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8-27	6	4	212749	110.02
1/4-18	6	4	212760	126.81
3/8-18	6	4	212771	171.57
1/2-14	6	4	212782	275.35



TIN COATED

SIZE	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8-27	6	4	212784	164.81
1/4-18	6	4	212786	190.00
3/8-18	6	4	212788	257.04
1/2-14	6	4	212790	412.46

All taps sold individually.

For coating information see page 6. For technical information, please see pages 249-251.

Spiral Flute Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



52° HELIX - SEMI BOTTOMING - 2 TO 2-1/2 THREAD CHAMFER
HIGH SPEED STEEL



HIGH SPEED STEEL



HIGH SPEED STEEL - METRIC

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
3 -48	H2	2	198504	39.07
3-56	H2	2	198515	39.07
4-40	H2	2	198526	32.15
4-48	H2	2	198537	32.15
5-40	H3	2	198548	32.15
5-44	H3	2	198559	32.15
6-32	H3	2	198570	26.10
6-40	H3	2	198581	26.10
8-32	H3	3	198592	26.10
8-36	H3	3	198603	26.10
10-24	H3	3	198614	26.10
10-32	H3	3	198625	26.10
12-24	H3	3	198636	28.33
12-28	H3	3	198647	28.33
1/4-20	H3	3	198658	28.33
1/4-28	H3	3	198669	28.33
5/16-18	H3	3	198680	34.90
5/16-24	H3	3	198691	34.90
3/8-16	H3	3	198702	40.27
3/8-24	H3	3	198713	40.27
7/16-14	H3	3	198724	60.36
7/16-20	H3	3	198735	60.36
1/2-13	H3	3	198746	72.66
1/2-20	H3	3	198757	72.66
9/16-12	H3	4	198768	121.20
9/16-18	H3	4	198779	121.20
5/8-11	H3	4	198790	158.17
5/8-18	H3	4	198801	158.17
3/4-10	H3	4	198812	202.45
3/4-16	H3	4	198823	202.45

SIZE	D LIMIT	# OF FLUTES	ITEM#	LIST PRICE
M3 x 0.5	D3	2	198834	33.07
M3.5 x 0.6	D4	3	198845	26.78
M4 x 0.7	D4	3	198856	26.78
M4.5 x 0.75	D4	3	198867	26.78
M5 x 0.8	D4	3	198878	26.78
M6 x 1.0	D5	3	198889	29.25
M8 x 1.25	D5	3	198900	36.05
M10 x 1.5	D6	3	198911	62.31
M12 x 1.75	D6	3	198922	75.00

- CAN BE USED FOR PLUG OR BOTTOMING APPLICATIONS
- ALLOWS FOR THREADING CLOSE TO BOTTOM IN BLIND HOLES
- CAN BE USED FOR THROUGH OR BLIND HOLES
- CUTS MORE EFFICIENTLY THAN BOTTOMING TAPS
- SLIGHTLY LONGER CHAMFER DISTRIBUTES CUTTING OVER GREATER NUMBER OF TEETH FOR INCREASED PRODUCTION
- MATERIALS: FOR TAPPING IN RELATIVELY DEEP HOLES IN COPPER, BRASS, ALUMINUM AND OTHER SOFT DUCTILE MATERIALS

HP TAPS

TAPS

DIES



Spiral flute taps provide proper chip evacuation in blind holes

All taps sold individually.

MADE IN THE USA



Hand Tap Sets

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS

TAPS

DIES



HIGH SPEED STEEL - HAND TAP SETS

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
0-80	H1	2	199549	56.27
1-72	H1	2	199703	52.33
2-56	H1	3	199769	48.39
2-56	H2	3	199868	45.05
* 2-64	H2	3	199945	48.39
3-48	H2	3	200055	34.65
3-56	H2	3	200099	38.93
4-40	H1	3	200154	30.56
* 4-40	H2	3	200275	28.45
4-48	H2	3	200385	30.56
5-40	H2	3	200627	28.45
5-44	H2	3	200737	30.67
6-32	H1	3	200792	26.88
6-32	H2	3	200913	23.16
* 6-32	H3	3	200979	21.81
6-40	H2	3	201122	23.16
8-32	H1	4	201199	26.88
8-32	H2	4	201287	23.16
8-32	H3	4	201430	22.33
* 8-36	H2	4	201584	23.16
10-24	H1	4	201639	23.84
10-24	H2	4	201716	23.84
10-24	H3	4	201859	23.16
* 10-32	H1	4	201980	23.84
10-32	H2	4	202068	23.84
10-32	H3	4	202211	23.16
* 12-24	H3	4	202354	24.44
12-28	H3	4	202464	26.88

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
1/4-20	H1	4	202519	31.08
1/4-20	H2	4	202574	29.62
1/4-20	H3	4	202717	24.89
* 1/4-28	H3	4	202948	24.89
5/16-18	H2	4	203047	34.46
5/16-18	H3	4	203190	30.63
* 5/16-24	H3	4	203410	30.63
3/8-16	H2	4	203509	38.78
3/8-16	H3	4	203630	34.57
* 3/8-24	H3	4	203850	34.57
7/16-14	H3	4	204026	59.42
7/16-20	H3	4	204202	59.42
1/2-13	H3	4	204389	61.97
1/2-20	H3	4	204576	70.05
9/16-12	H3	4	204708	103.98
9/16-18	H3	4	204840	103.98
5/8-11	H3	4	204983	124.74
5/8-18	H3	4	205137	124.74
11/16-11	H3	4	205258	154.96
11/16-16	H3	4	205357	154.96
3/4-10	H3	4	205478	174.55
3/4-16	H3	4	205621	174.55
7/8-9	H4	4	205753	243.36
7/8-14	H4	4	205874	243.36
1-8	H4	4	205995	323.57
1-12	H4	4	206105	323.57
1-14	H4	4	206215	323.57

* popular size when multiple options available

For technical information, please see pages 249-251.

Hand Tap Sets

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HP TAPS

TAPS

DIES

HIGH SPEED STEEL - HAND TAP SETS - METRIC

SIZE	D LIMIT	# OF FLUTES	ITEM#	LIST PRICE
M2 x 0.4	D3	3	211594	75.19
M3 x 0.5	D3	3	211605	38.55
M4 x 0.7	D4	4	211616	31.87
M5 x 0.8	D4	4	211627	31.87
M6 x 1.0	D5	4	211638	33.63
M7 x 1.0	D5	4	211649	33.67
M8 x 1.25	D5	4	211660	33.67
M10 x 1.25	D5	4	211671	69.11
M10 x 1.50	D6	4	211682	69.11
M12 x 1.25	D5	4	211693	81.04
M12 x 1.75	D6	4	211704	81.04
M14 x 1.5	D6	4	211715	121.17
M14 x 2.0	D7	4	211726	121.17
M16 x 1.5	D6	4	211737	147.64
M16 x 2.0	D7	4	211748	147.64
M18 x 1.5	D6	4	211759	198.84
M18 x 2.5	D7	4	211770	198.84
M20 x 2.5	D7	4	211781	257.17
M24 x 3.0	D8	4	211792	376.32

For technical information, please see pages 249-251.

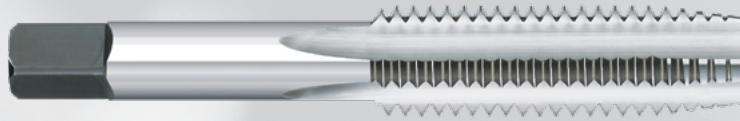
MADE IN THE USA



Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS



HIGH SPEED STEEL

TAPS

DIES

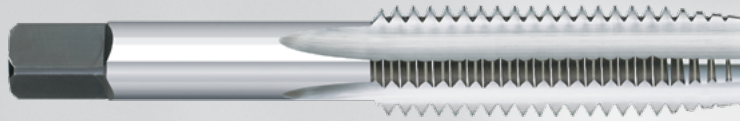
SIZE	H LIMIT	# OF FLUTES	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
* 0-80	H1	2	199483	199505	199527	18.77
0-80	H2	2	-	199560	199571	18.77
1-64	H1	2	-	199604	199626	17.45
* 1-72	H1	2	199670	199681	199692	17.45
1-72	H2	2	-	199714	199725	17.45
2-56	H1	3	199736	199747	199758	16.14
2-56	H2	2	-	199780	199791	16.14
* 2-56	H2	3	199802	199824	199846	15.02
2-64	H2	3	199879	199901	199923	16.14
3-48	H2	2	-	199967	-	13.14
* 3-48	H2	3	199989	200011	200033	11.56
3-56	H2	3	200066	200077	200088	12.99
4-40	H1	2	-	200110	-	10.62
4-40	H1	3	200121	200132	200143	10.21
4-40	H2	2	-	200165	200176	10.21
* 4-40	H2	3	200187	200209	200242	9.50
4-48	H2	3	200297	200319	200352	10.21
4-36	H2	3	-	200418	-	10.21
5-40	H1	3	-	200495	200506	10.21
5-40	H2	2	-	200517	200528	10.21
* 5-40	H2	3	200539	200561	200594	9.50
5-44	H2	3	200649	200671	200704	10.21
6-32	H1	3	200759	200770	200781	8.97
6-32	H2	2	-	200803	200814	8.97
* 6-32	H2	3	200825	200847	200880	7.70
6-32	H3	2	-	200924	200935	7.70
6-32	H3	3	200946	200957	200968	7.28
6-32	H7	3	-	200990	201001	8.97
6-40	H2	2	-	201023	-	8.97
* 6-40	H2	3	201034	201056	201089	7.70
8-32	H1	3	-	201144	201155	8.97
8-32	H1	4	201166	201177	201188	8.97
8-32	H2	2	-	201210	201221	8.97
8-32	H2	3	-	201232	201243	8.97
8-32	H2	4	201254	201265	201276	7.70
8-32	H3	2	-	201298	201309	7.70
8-32	H3	3	-	201320	201331	7.70
* 8-32	H3	4	201342	201364	201397	7.43

* popular size when multiple options available

All taps sold individually.
For technical information, please see pages 251-253.

Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL

HP TAPS

TAPS

DIES

SIZE	H LIMIT	# OF FLUTES	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
8-32	H7	3	-	201441	201452	8.97
8-36	H1	4	-	201485	-	8.97
* 8-36	H2	4	201496	201518	201551	7.70
10-24	H1	3	-	201595	-	8.97
10-24	H1	4	201606	201617	201628	7.96
10-24	H2	2	-	201650	201661	8.97
10-24	H2	3	-	201672	-	8.97
10-24	H2	4	201683	201694	201705	7.96
10-24	H3	2	-	201727	201738	7.96
10-24	H3	3	-	201749	201760	7.96
* 10-24	H3	4	201771	201793	201826	7.70
10-24	H7	3	-	201870	201881	8.97
10-24	H7	4	-	201892	201903	8.97
10-32	H1	2	-	201914	201925	8.97
10-32	H1	3	-	201936	-	8.97
10-32	H1	4	201947	201958	201969	7.96
10-32	H2	2	-	201991	202002	8.97
10-32	H2	3	-	202013	202024	8.97
10-32	H2	4	202035	202046	202057	7.96
10-32	H3	2	-	202079	202090	7.96
10-32	H3	3	-	202101	202112	7.96
* 10-32	H3	4	202123	202145	202178	7.70
12-24	H3	4	202266	202288	202321	8.15
12-28	H3	4	202376	202398	202431	8.97
1/4-20	H1	3	-	202475	-	10.36
1/4-20	H1	4	202486	202497	202508	10.36
1/4-20	H2	3	-	202530	-	10.36
1/4-20	H2	4	202541	202552	202563	9.87
1/4-20	H3	2	-	202585	202596	10.36
1/4-20	H3	3	-	202607	202618	9.87
* 1/4-20	H3	4	202629	202651	202684	8.30
1/4-20	H5	3	-	202728	202739	10.36
1/4-20	H5	4	-	202750	202761	9.87
1/4-28	H1	4	-	202772	202783	9.87
1/4-28	H2	4	-	202794	202805	10.36
1/4-28	H3	2	-	202816	202827	10.36
1/4-28	H3	3	-	202838	202849	10.36
* 1/4-28	H3	4	202860	202882	202915	8.30

* popular size when multiple options available

All taps sold individually.
For technical information, please see pages 251-253.

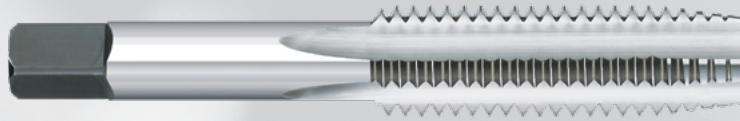
MADE IN THE USA



Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS



HIGH SPEED STEEL

TAPS

DIES

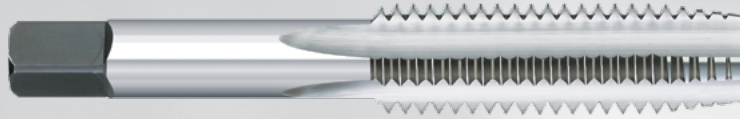
SIZE	H LIMIT	# OF FLUTES	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
1/4-28	H4	4	-	202959	202970	10.36
5/16-18	H1	4	202981	202992	203003	11.49
5/16-18	H2	4	203014	203025	203036	11.49
5/16-18	H3	2	-	203058	203069	12.91
5/16-18	H3	3	-	203080	203091	11.49
* 5/16-18	H3	4	203102	203124	203157	10.21
5/16-18	H5	3	-	203201	203212	12.91
5/16-18	H5	4	-	203223	203234	11.49
5/16-24	H1	4	-	203256	203267	11.49
5/16-24	H2	4	-	203278	-	11.49
5/16-24	H3	3	-	203300	203311	11.49
* 5/16-24	H3	4	203322	203344	203377	10.21
5/16-24	H4	4	-	203421	203432	11.49
3/8-16	H1	3	-	203443	-	14.71
3/8-16	H2	4	203476	203487	203498	12.91
3/8-16	H3	3	-	203520	203531	12.91
* 3/8-16	H3	4	203542	203564	203597	11.52
3/8-16	H5	3	-	203641	203652	14.71
3/8-16	H5	4	-	203663	203674	12.91
3/8-24	H3	3	-	203740	203751	14.71
* 3/8-24	H3	4	203762	203784	203817	11.52
3/8-24	H4	4	-	203861	203872	12.91
7/16-14	H2	4	-	203905	203916	21.77
7/16-14	H3	3	-	203927	-	21.77
* 7/16-14	H3	4	203938	203960	203993	19.82
7/16-14	H5	4	-	204037	204048	21.77
7/16-20	H2	4	-	204081	204092	21.77
7/16-20	H3	3	-	204103	-	21.77
* 7/16-20	H3	4	204114	204136	204169	19.82
7/16-20	H5	4	-	204213	204224	21.77
1/2-13	H1	4	-	204235	204246	25.41
1/2-13	H2	4	-	204257	204268	25.41
1/2-13	H3	3	-	204279	204290	25.41
* 1/2-13	H3	4	204301	204323	204356	20.65
1/2-13	H5	4	-	204400	204411	25.79
1/2-20	H1	4	204422	204433	204444	25.41
1/2-20	H3	3	-	204477	-	25.41
* 1/2-20	H3	4	204488	204510	204543	23.35
1/2-20	H5	4	-	204587	204598	25.41

* popular size when multiple options available

All taps sold individually.
For technical information, please see pages 251-253.

Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL

HP TAPS

TAPS

DIES

SIZE	H LIMIT	# OF FLUTES	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
9/16-12	H2	4	-	204609	-	37.76
* 9/16-12	H3	4	204620	204642	204675	34.65
9/16-12	H5	4	-	204719	204730	37.76
9/16-18	H2	4	-	204741	-	37.76
* 9/16-18	H3	4	204752	204774	204807	34.65
9/16-18	H5	4	-	204851	204862	37.76
* 5/8-11	H3	4	204895	204917	204950	41.59
5/8-11	H5	4	-	204994	205005	47.82
5/8-18	H2	4	-	205027	205038	47.82
* 5/8-18	H3	4	205049	205071	205104	41.59
11/16-11	H3	4	205170	205192	205225	51.65
11/16-16	H3	4	205269	205291	205324	51.65
3/4-10	H2	4	-	205379	-	62.88
* 3/4-10	H3	4	205390	205412	205445	58.22
3/4-10	H5	4	-	205489	205500	62.88
3/4-16	H2	4	-	205522	-	62.88
* 3/4-16	H3	4	205533	205555	205588	58.22
3/4-16	H5	4	-	205632	205643	62.88
* 7/8-9	H4	4	205665	205687	205720	81.12
7/8-9	H6	4	-	205764	-	85.17
7/8-14	H2	4	-	205775	-	85.17
* 7/8-14	H4	4	205786	205808	205841	81.12
7/8-14	H6	4	-	205885	-	85.17
1-8	H2	4	-	205896	-	111.07
* 1-8	H4	4	205907	205929	205962	107.85
1-8	H6	4	-	206006	-	111.07
1-12	H4	4	206017	206039	206072	107.85
1-14	H2	4	-	206116	-	111.07
* 1-14	H4	4	206127	206149	206182	107.85
1-14	H6	4	206226	206237	206248	111.07
1-1/8-7	H4	4	206259	206281	206314	174.55
1-1/8-12	H4	4	206358	206380	206413	184.87
1-1/4-7	H4	4	206457	206479	206512	229.13
1-1/4-12	H4	6	206556	206578	206611	233.11
1-3/8-6	H4	4	206655	206677	206710	287.88
1-3/8-12	H4	6	206754	206776	206809	289.90
1-1/2-6	H4	4	206853	206875	206908	332.43
1-1/2-12	H4	6	206952	206974	207007	338.55

* popular size when multiple options available

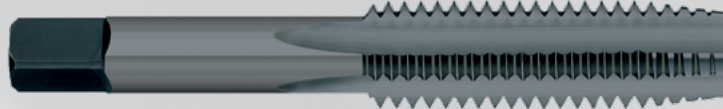
All taps sold individually.
For technical information, please see pages 251-253.

MADE IN THE USA



Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL
STEAM OXIDE

SIZE	H LIMIT	# OF FLUTES	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
0-80	H1	2	199494	199516	199538	21.58
2-56	H2	3	199813	199835	199857	17.30
3-48	H2	3	200000	200022	200044	13.33
4-40	H2	3	200198	200231	200264	10.92
4-48	H2	3	200308	200341	200374	11.75
5-40	H2	3	200550	200583	200616	10.92
6-32	H2	3	200836	200869	200902	8.90
6-40	H2	3	201045	201078	201111	8.90
8-32	H3	4	201353	201386	201419	8.60
8-36	H2	4	201507	201540	201573	8.90
10-24	H3	4	201782	201815	201848	8.90
10-32	H3	4	202134	202167	202200	8.90
12-24	H3	4	202277	202310	202343	9.38
12-28	H3	4	202387	202420	202453	10.32
1/4-20	H3	4	202640	202673	202706	9.53
1/4-28	H3	4	202871	202904	202937	9.53
5/16-18	H3	4	203113	203146	203179	11.75
5/16-24	H3	4	203333	203366	203399	11.75
3/8-16	H3	4	203553	203586	203619	13.25
3/8-24	H3	4	203773	203806	203839	13.25
7/16-14	H3	4	203949	203982	204015	22.82
7/16-20	H3	4	204125	204158	204191	22.82
1/2-13	H3	4	204312	204345	204378	23.76
1/2-20	H3	4	204499	204532	204565	26.88
9/16-12	H3	4	204631	204664	204697	39.83
9/16-18	H3	4	204763	204796	204829	39.83
5/8-11	H3	4	204906	204939	204972	47.82
5/8-18	H3	4	205060	205093	205126	47.82
3/4-10	H3	4	205401	205434	205467	66.93
3/4-16	H3	4	205544	205577	205610	66.93
7/8-9	H4	4	205676	205709	205742	93.32
7/8-14	H4	4	205797	205830	205863	93.32
1-8	H4	4	205918	205951	205984	123.95
1-12	H4	4	206028	206061	206094	123.95
1-14	H4	4	206138	206171	206204	123.95
1-1/8-7	H4	4	206270	206303	206336	200.71
1-1/8-12	H4	4	206369	206402	206435	212.61
1-1/4-7	H4	4	206468	206501	206534	263.48
1-1/4-12	H4	6	206567	206600	206633	268.06
1-3/8-6	H4	4	206666	206699	206732	331.04
1-3/8-12	H4	6	206765	206798	206831	333.37
1-1/2-6	H4	4	206864	206897	206930	382.28
1-1/2-12	H4	6	206963	206996	207029	389.34

STEAM OXIDE: A BLACK OXIDE TREATMENT OF NON-MEASURABLE THICKNESS IS USED TO INCREASE TAP SURFACE CAPILLARY WHERE LUBRICANT PROPERTIES ARE REQUIRED.

MATERIALS: STEEL, STEEL ALLOYS, STAINLESS STEELS, TITANIUM ALLOYS AND A WIDE RANGE OF FERROUS MATERIALS (IRON BASED).

**All taps sold individually.
For technical information, please see pages 249-251.**

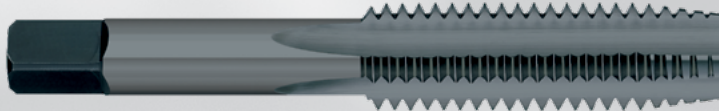
HP TAPS

TAPS

DIES

Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL
NITRIDE & STEAM OXIDE

SIZE	H LIMIT	# OF FLUTES	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
4-40	H2	3	200220	200253	10.92
6-32	H2	3	200858	200891	8.90
6-40	H2	3	201067	201100	8.90
8-32	H3	4	201375	201408	8.60
10-24	H3	4	201804	201837	8.90
10-32	H3	4	202156	202189	8.90
1/4-20	H3	4	202662	202695	9.53
1/4-28	H3	4	202893	202926	9.53
5/16-18	H3	4	203135	203168	11.75
3/8-16	H3	4	203575	203608	13.25
3/8-24	H3	4	203795	203828	13.25
7/16-14	H3	4	203971	204004	22.82
7/16-20	H3	4	204147	204180	22.82
1/2-13	H3	4	204334	204367	23.76
1/2-20	H3	4	204521	204554	26.88
9/16-12	H3	4	204653	204686	39.83
9/16-18	H3	4	204785	204818	39.83
5/8-11	H3	4	204928	204961	47.82
5/8-18	H3	4	205082	205115	47.82
3/4-10	H3	4	205423	205456	66.93
3/4-16	H3	4	205566	205599	66.93
7/8-9	H4	4	205698	205731	93.32
7/8-14	H4	4	205819	205852	93.32
1-8	H4	4	205940	205973	123.95
1-1/8-7	H4	4	206292	206325	200.71
1-1/4-7	H4	4	206490	206523	263.48
1-1/4-12	H4	6	206589	206622	268.06
1-1/2-6	H4	4	206886	206919	382.28
1-1/2-12	H4	6	206985	207018	389.34

NITRIDE & STEAM OXIDE: A NITRIDED SURFACE FOLLOWED BY A STEAM OXIDE TREATMENT PROVIDES THE BENEFITS OF WEAR AND DUCTILITY.

MATERIALS: ALL TYPES OF GRAY, DUCTILE AND MALLEABLE CAST IRON FERROUS MATERIALS (IRON BASED).

HP TAPS

TAPS

DIES

All taps sold individually.
For technical information, please see pages 249-251.

MADE IN THE USA



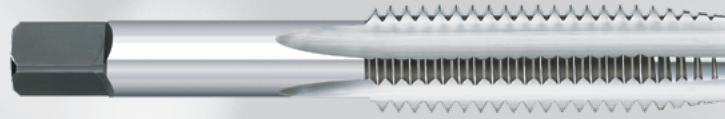
Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS

TAPS

DIES



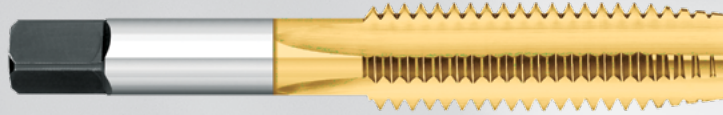
HIGH SPEED STEEL
METRIC
UNCOATED

SIZE	D LIMIT	# OF FLUTES	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
M1.6 x 0.35	D3	2	-	210791	-	25.08
M2 x 0.4	D3	3	210802	210813	210824	25.08
M2.5 x 0.45	D3	3	-	210835	-	15.43
M3 x 0.5	D3	3	210846	210857	210868	12.84
M3.5 x 0.6	D4	3	-	210879	-	10.62
M4 x 0.7	D4	4	210890	210901	210912	10.62
M4.5 x 0.75	D4	4	-	210923	-	10.62
M5 x 0.8	D4	4	210934	210945	210956	10.62
M6 x 1.0	D5	4	210967	210978	210989	11.22
M7 x 1.0	D5	4	211000	211011	211022	11.22
M8 x 1.25	D5	4	211033	211044	211055	11.22
M10 x 1.25	D5	4	211066	211077	211088	23.05
M10 x 1.50	D6	4	211099	211110	211121	23.05
M12 x 1.25	D5	4	211132	211143	211154	27.03
M12 x 1.75	D6	4	211165	211176	211187	27.03
M14 x 1.5	D6	4	211198	211209	211220	40.39
M14 x 2.0	D7	4	211231	211242	211253	40.39
M16 x 1.5	D6	4	211264	211275	211286	49.21
M16 x 2.0	D7	4	211297	211308	211319	49.21
M18 x 1.5	D6	4	211330	211341	211352	66.29
M18 x 2.5	D7	4	211363	211374	211385	66.29
M20 x 2.5	D7	4	211396	211407	211418	85.74
M24 x 3.0	D8	4	211429	211440	211451	125.45
M27 x 3.0	D8	4	211462	211473	211484	216.82
M30 x 3.5	D9	4	211495	211506	211517	276.92
M33 x 3.5	D9	4	211528	211539	211550	276.16
M36 x 4.0	D9	4	211561	211572	211583	350.23

All taps sold individually.
For technical information, please see pages 249-251.

Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL
METRIC
TIN COATED

SIZE	D LIMIT	# OF FLUTES	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
M1.6 x 0.35	D3	2	-	243486	-	45.16
M2 x 0.4	D3	3	243497	243508	243519	45.16
M2.5 x 0.45	D3	3	-	243530	-	27.77
M3 x 0.5	D3	3	243541	243552	243563	23.16
M3.5 x 0.6	D4	3	-	243574	-	19.14
M4 x 0.7	D4	4	243585	243596	243607	19.14
M4.5 x 0.75	D4	4	-	243618	-	19.14
M5 x 0.8	D4	4	243629	243640	243651	19.14
M6 x 1.0	D5	4	243662	243673	243684	20.21
M7 x 1.0	D5	4	243695	243706	243717	20.25
M8 x 1.25	D5	4	243728	243739	243750	20.25
M10 x 1.25	D5	4	243761	243772	243783	41.50
M10 x 1.50	D6	4	243794	243805	243816	41.50
M12 x 1.25	D5	4	243827	243838	243849	48.66
M12 x 1.75	D6	4	243860	243871	243882	48.66
M14 x 1.5	D6	4	243893	243904	243915	72.78
M14 x 2.0	D7	4	243926	243937	243948	72.78
M16 x 1.5	D6	4	243959	243970	243981	88.69
M16 x 2.0	D7	4	243992	244003	244014	88.69
M18 x 1.5	D6	4	244025	244036	244047	119.41
M18 x 2.5	D7	4	244058	244069	244080	119.41
M20 x 2.5	D7	4	244091	244102	244113	154.46
M24 x 3.0	D8	4	244124	244135	244146	226.05
M27 x 3.0	D8	4	244157	244168	244179	390.70
M30 x 3.5	D9	4	244190	244201	244212	498.97
M33 x 3.5	D9	4	244223	244234	244245	497.65
M36 x 4.0	D9	4	244256	244267	244278	631.15

HP TAPS

TAPS

DIES

All taps sold individually.

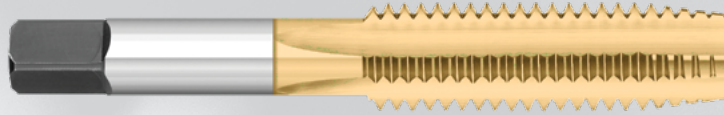
For coating information see page 6. For technical information, please see pages 249-251.

MADE IN THE USA



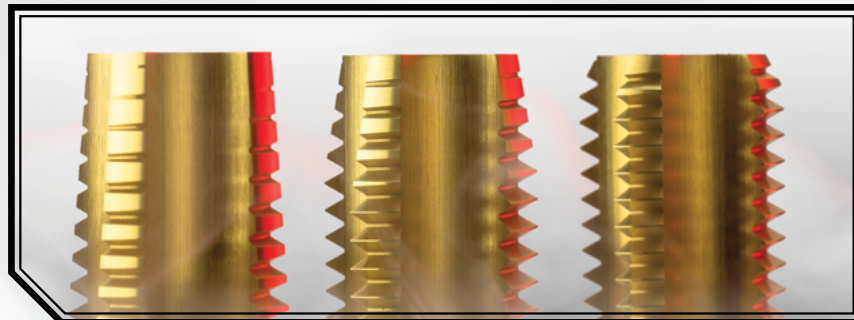
Hand Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL
TIN COATED

SIZE	D LIMIT	# OF FLUTES	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
0 - 80	H1	2	240494	240505	240516	33.78
2 - 56	H2	3	240538	240549	240560	27.06
4 - 40	H2	3	240582	240593	240604	17.07
5 - 40	H2	3	240626	240637	240648	17.07
6 - 32	H3	3	240670	240681	240692	13.09
8 - 32	H3	4	240714	240725	240736	13.41
10 - 24	H3	4	240758	240769	240780	13.89
10 - 32	H3	4	240802	240813	240824	13.89
12 - 24	H3	4	240846	240857	240868	14.68
12 - 28	H3	4	240890	240901	240912	16.15
1/4 - 20	H3	4	240934	240945	240956	14.92
1/4 - 28	H3	4	240978	240989	241000	14.92
5/16 - 18	H3	4	241022	241033	241044	18.42
5/16 - 24	H3	4	241066	241077	241088	18.42
3/8 - 16	H3	4	241110	241121	241132	20.77
3/8 - 24	H3	4	241154	241165	241176	20.77
7/16 - 14	H3	4	241198	241209	241220	35.69
7/16 - 20	H3	4	241242	241253	241264	35.69
1/2 - 13	H3	4	241286	241297	241308	37.20
1/2 - 20	H3	4	241330	241341	241352	42.06
9/16 - 18	H3	4	254709	254720	254731	57.14
5/8 - 11	H3	4	241374	241385	241396	74.96
5/8 - 18	H3	4	241418	241429	241440	74.96
3/4 - 10	H3	4	241462	241473	241484	104.89
3/4 - 16	H3	4	241506	241517	241528	104.89
1 - 8	H4	4	254753	254764	254775	177.98



3 chamfers to choose from - Taper Plug & Bottom

All taps sold individually.

For coating information see page 6. For technical information, please see pages 249-251.

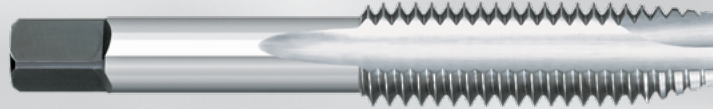
HP TAPS

TAPS

DIES

Spiral Point Plug Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL
UNCOATED

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
0-80	H1	2	207161	23.12
* 0-80	H2	2	207172	23.12
1-64	H1	2	207194	20.87
* 1-64	H2	2	207205	20.87
1-72	H1	2	207227	20.87
* 1-72	H2	2	207238	20.87
2-56	H1	2	207260	19.86
* 2-56	H2	2	207271	17.72
2-64	H1	2	207293	19.86
* 2-64	H2	2	207304	19.86
3-48	H1	2	207326	14.23
* 3-48	H2	2	207337	14.23
3-56	H1	2	207359	17.42
* 3-56	H2	2	207370	15.84
4-40	H1	2	207392	12.99
* 4-40	H2	2	207403	11.41
4-48	H1	2	207436	13.21
* 4-48	H2	2	207447	12.99
4-36	H2	2	207480	12.99
5-40	H1	2	207513	12.99
* 5-40	H2	2	207524	11.41
5-44	H2	2	207557	12.99
6-32	H1	2	207590	11.41
6-32	H2	2	207601	9.61
* 6-32	H3	2	207612	9.61
6-32	H7	2	207645	10.89
6-40	H1	2	207656	10.89
* 6-40	H2	2	207667	10.89
8-32	H1	2	207700	10.89
8-32	H2	2	207711	9.61
* 8-32	H3	2	207722	9.61
8-32	H7	2	207755	10.89
8-36	H1	2	207766	10.89

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
* 8-36	H2	2	207777	10.89
10-24	H1	2	207810	11.90
10-24	H2	2	207821	10.89
* 10-24	H3	2	207832	9.61
10-24	H7	2	207865	11.90
10-32	H1	2	207876	10.89
10-32	H2	2	207887	9.61
* 10-32	H3	2	207898	9.61
10-32	H7	2	207931	11.90
12-24	H1	2	207942	10.89
* 12-24	H3	2	207953	10.89
12-28	H3	2	207986	10.89
1/4-20	H1	2	207997	10.89
1/4-20	H2	2	208008	10.89
* 1/4-20	H3	2	208019	9.61
1/4-20	H3	3	208052	11.90
1/4-20	H5	2	208063	10.85
1/4-28	H5	3	208074	11.90
1/4-28	H1	2	208085	11.90
1/4-28	H2	2	208096	10.85
1/4-28	H2	3	208107	11.90
1/4-28	H3	2	208118	9.61
* 1/4-28	H4	2	208151	11.90
1/4-28	H4	3	208162	11.90
5/16-18	H1	2	208173	13.70
5/16-18	H2	2	208184	11.90
* 5/16-18	H3	2	208195	10.36
5/16-18	H3	3	208228	13.70
5/16-18	H5	2	208239	11.90
5/16-18	H5	3	208250	13.70
5/16-24	H1	2	208261	13.70
5/16-24	H2	2	208272	13.70
5/16-24	H2	3	208283	13.70

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
* 5/16-24	H3	2	208294	12.09
5/16-24	H4	2	208327	13.70
5/16-24	H4	3	208338	13.70
3/8-16	H1	3	208349	15.35
3/8-16	H2	3	208360	14.26
* 3/8-16	H3	3	208371	12.27
3/8-16	H5	3	208404	15.47
3/8-24	H1	3	208415	15.58
3/8-24	H2	3	208426	15.58
* 3/8-24	H3	3	208437	13.21
3/8-24	H4	3	208470	15.58
7/16-14	H2	3	208481	22.79
* 7/16-14	H3	3	208492	20.87
7/16-14	H5	3	208525	22.79
7/16-20	H2	3	208536	22.79
* 7/16-20	H3	3	208547	20.87
7/16-20	H5	3	208580	22.79
1/2-13	H1	3	208591	27.89
1/2-13	H2	3	208602	27.89
* 1/2-13	H3	3	208613	21.28
1/2-13	H5	3	208646	25.11
1/2-20	H1	3	208657	27.89
1/2-20	H2	3	208668	27.89
* 1/2-20	H3	3	208679	25.00
1/2-20	H5	3	208712	27.89
9/16-12	H3	3	208723	34.76
9/16-18	H3	3	208756	34.76
* 5/8-11	H3	3	208789	47.45
5/8-11	H5	3	208822	47.45
5/8-18	H3	3	208833	47.45
* 3/4-10	H3	3	208866	66.93
3/4-10	H5	3	208899	66.93
3/4-16	H3	3	208910	66.93

* popular size when multiple options available

All taps sold individually.
For technical information, please see pages 249-251.

MADE IN THE USA

HP TAPS

TAPS

DIES



Spiral Point Plug Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS

TAPS

DIES



HIGH SPEED STEEL
STEAM OXIDE

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
0-80	H2	2	207183	26.61
1-64	H2	2	207216	24.06
1-72	H2	2	207249	24.06
2-56	H2	2	207282	20.42
2-64	H2	2	207315	22.86
3-48	H2	2	207348	16.37
3-56	H2	2	207381	18.24
4-40	H2	2	207425	13.14
4-48	H2	2	207469	14.98
4-36	H2	2	207502	14.98
5-40	H2	2	207546	13.14
5-44	H2	2	207579	14.98
6-32	H3	2	207634	11.04
6-40	H2	2	207689	12.54
8-32	H3	2	207744	11.04
8-36	H2	2	207799	12.54
10-24	H3	2	207854	11.04
10-32	H3	2	207920	11.04
12-24	H3	2	207975	12.54
1/4-20	H3	2	208041	11.04
1/4-28	H3	2	208140	11.04
5/16-18	H3	2	208217	11.94
5/16-24	H3	2	208316	12.72
3/8-16	H3	3	208393	14.15
3/8-24	H3	3	208459	15.20
7/16-14	H3	3	208514	24.06
7/16-20	H3	3	208569	24.06
1/2-13	H3	3	208635	24.51
1/2-20	H3	3	208701	28.75
9/16-12	H3	3	208745	39.98
9/16-18	H3	3	208778	39.98
5/8-11	H3	3	208811	54.58
5/8-18	H3	3	208855	54.58
3/4-10	H3	3	208888	76.99
3/4-16	H3	3	208932	76.99



HIGH SPEED STEEL
NITRIDE & STEAM OXIDE

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
4-40	H2	2	207414	13.14
4-48	H2	2	207458	14.98
4-36	H2	2	207491	14.98
5-40	H2	2	207535	13.14
5-44	H2	2	207568	14.98
6-32	H3	2	207623	11.04
6-40	H2	2	207678	12.54
8-32	H3	2	207733	11.04
8-36	H2	2	207788	12.54
10-24	H3	2	207843	11.04
10-32	H3	2	207909	11.04
12-24	H3	2	207964	12.54
1/4-20	H3	2	208030	11.04
1/4-28	H3	2	208129	11.04
5/16-18	H3	2	208206	11.94
5/16-24	H3	2	208305	11.94
3/8-16	H3	3	208382	14.15
3/8-24	H3	3	208448	15.20
7/16-14	H3	3	208503	24.06
7/16-20	H3	3	208558	24.06
1/2-13	H3	3	208624	24.51
1/2-20	H3	3	208690	28.75
9/16-12	H3	3	208734	39.98
9/16-18	H3	3	208767	39.98
5/8-11	H3	3	208800	54.58
5/8-18	H3	3	208844	54.58
3/4-10	H3	3	208877	76.99
3/4-16	H3	3	208921	76.99

NITRIDE & STEAM OXIDE: A NITRIDED SURFACE FOLLOWED BY A STEAM OXIDE TREATMENT PROVIDES THE BENEFITS OF WEAR AND DUCTILITY.

MATERIALS: ALL TYPES OF GRAY, DUCTILE AND MALLEABLE CAST IRON FERROUS MATERIALS (IRON BASED).

STEAM OXIDE: A BLACK OXIDE TREATMENT OF NON-MEASURABLE THICKNESS IS USED TO INCREASE TAP SURFACE CAPILLARY WHERE LUBRICANT PROPERTIES ARE REQUIRED.

MATERIALS: STEEL, STEEL ALLOYS, STAINLESS STEELS, TITANIUM ALLOYS AND A WIDE RANGE OF FERROUS MATERIALS (IRON BASED).

All taps sold individually.

For technical information, please see pages 249-251.

Spiral Point Plug Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL
TIN COATED

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
0-80	H2	2	214773	34.22
2-56	H2	2	214784	27.46
4-40	H2	2	214795	19.42
5-40	H2	2	214806	19.42
6-32	H3	2	214817	18.14
8-32	H3	2	214828	18.14
10-24	H3	2	214839	18.14
10-32	H3	2	214850	18.14
12-24	H3	2	214861	19.82
12-28	H3	2	214872	19.82
1/4-20	H3	2	214883	18.14
1/4-28	H3	2	214894	18.14
5/16-18	H3	2	214905	20.96
5/16-24	H3	2	214916	20.96
3/8-16	H3	3	214927	23.32
3/8-24	H3	3	214938	24.51
7/16-14	H3	3	214949	38.56
7/16-20	H3	3	214960	38.56
1/2-13	H3	3	214971	39.07
1/2-20	H3	3	214982	43.65
5/8-11	H3	3	214993	90.32
5/8-18	H3	3	215004	90.32
3/4-10	H3	3	215015	117.94
3/4-16	H3	3	215026	117.94

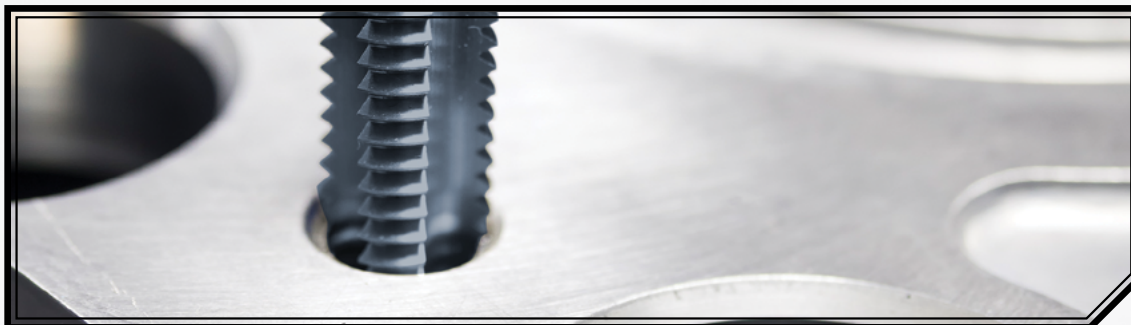
TIN COATED: IT IS AN EXCELLENT GENERAL PURPOSE WEAR COATING WITH GOOD LUBRICITY.



HIGH SPEED STEEL
ALTiN COATED

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
0-80	H2	2	214047	34.22
2-56	H2	2	214058	27.46
4-40	H2	2	214069	19.42
5-40	H2	2	214080	19.42
6-32	H3	2	214091	18.14
8-32	H3	2	214102	18.14
10-24	H3	2	214113	18.14
10-32	H3	2	214124	18.14
12-24	H3	2	214135	19.82
12-28	H3	2	214146	19.82
1/4-20	H3	2	214157	18.14
1/4-28	H3	2	214168	18.14
5/16-18	H3	2	214179	20.96
5/16-24	H3	2	214190	20.96
3/8-16	H3	3	214201	23.32
3/8-24	H3	3	214212	24.51
7/16-14	H3	3	214223	38.56
7/16-20	H3	3	214234	38.56
1/2-13	H3	3	214245	39.07
1/2-20	H3	3	214256	43.65
5/8-11	H3	3	214267	90.32
5/8-18	H3	3	214278	90.32
3/4-10	H3	3	214289	117.94
3/4-16	H3	3	214300	117.94

ALTiN COATED: A MULTI-LAYERED COATING FOR A WIDE RANGE OF HIGH SPEED STEEL APPLICATIONS FOR CAST IRON, STAINLESS STEEL, NICKEL BASED HIGH TEMPERATURE ALLOYS AND TITANIUM ALLOYS.



All taps sold individually.

For coating information see page 6. For technical information, please see pages 249-251.

MADE IN THE USA

HP TAPS

TAPS

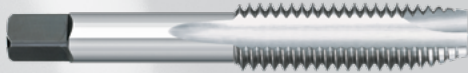
DIES



Spiral Point Plug & Bottoming Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

SPIRAL POINT PLUG TAPS



HIGH SPEED STEEL - METRIC
UNCOATED

SIZE	D LIMIT	# OF FLUTES	ITEM#	LIST PRICE
M2 x 0.4	D3	2	211847	25.60
M2.5 x 0.45	D3	2	211858	18.36
M3 x 0.5	D3	2	211869	14.75
M3.5 x 0.6	D4	2	211880	12.73
M4 x 0.7	D4	2	211891	12.73
M4.5 x 0.75	D4	2	211902	12.73
M5 x 0.8	D4	2	211913	12.73
M6 x 1.0	D5	2	211924	12.73
M7 x 1.0	D5	2	211935	14.71
M8 x 1.25	D5	2	211946	14.71
M10 x 1.50	D6	3	211957	24.44
M12 x 1.75	D6	3	211968	30.59
M14 x 2.0	D7	3	211979	47.49
M16 x 2.0	D7	3	211990	53.79
M18 x 2.5	D7	3	212001	79.13
M20 x 2.5	D7	3	212012	104.43



HIGH SPEED STEEL - METRIC
TIN COATED

SIZE	D LIMIT	# OF FLUTES	ITEM#	LIST PRICE
M2 x 0.4	D3	2	233220	35.29
M2.5 x 0.45	D3	2	233231	25.31
M3 x 0.5	D3	2	233242	20.37
M3.5 x 0.6	D4	2	233253	17.55
M4 x 0.7	D4	2	233264	17.55
M4.5 x 0.75	D4	2	233275	17.55
M5 x 0.8	D4	2	233286	17.55
M6 x 1.0	D5	2	233297	17.55
M7 x 1.0	D5	2	233308	20.25
M8 x 1.25	D5	2	233319	20.25
M10 x 1.50	D6	3	233330	33.66
M12 x 1.75	D6	3	233341	42.18
M14 x 2.0	D7	3	233352	65.41
M16 x 2.0	D7	3	233363	74.13
M18 x 2.5	D7	3	233374	109.02
M20 x 2.5	D7	3	233385	143.92

SPIRAL POINT BOTTOMING TAPS



HIGH SPEED STEEL
UNCOATED

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
0-80	H2	2	208943	42.58
2-56	H2	2	208954	32.63
3-48	H2	2	208965	26.18
4-40	H2	2	208976	21.01
5-40	H2	2	208987	21.01
6-32	H2	2	208998	17.67
6-32	H3	2	209009	17.67
6-40	H2	2	209020	20.09
8-32	H2	2	209031	17.67
8-32	H3	2	209042	17.67
10-24	H2	2	209053	20.09
10-24	H3	2	209064	17.67
10-32	H2	2	209075	17.67
10-32	H3	2	209086	17.67
12-24	H3	2	209097	20.09
1/4-20	H3	2	209108	17.67
1/4-28	H3	2	209119	17.67
5/16-18	H3	2	209130	19.06
5/16-24	H3	2	209141	19.06



HIGH SPEED STEEL
TIN COATED

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
0-80	H2	2	259263	57.48
2-56	H2	2	259274	44.05
3-48	H2	2	259285	35.35
4-40	H2	2	259296	28.36
5-40	H2	2	259307	28.36
6-32	H2	2	259318	23.85
6-32	H3	2	259329	23.85
6-40	H2	2	259340	27.13
8-32	H2	2	259351	23.85
8-32	H3	2	259362	23.85
10-24	H2	2	259373	27.13
10-24	H3	2	259384	23.85
10-32	H2	2	259395	23.85
10-32	H3	2	259406	23.85
12-24	H3	2	259417	27.13
1/4-20	H3	2	259428	23.85
1/4-28	H3	2	259439	23.85
5/16-18	H3	2	259450	25.73
5/16-24	H3	2	259461	25.73

SPIRAL POINT BOTTOMING TAPS ARE RECOMMENDED FOR USE WHERE CLOSE GAGING IS REQUIRED.

All taps sold individually.

For coating information see page 6. For technical information, please see pages 249-251.

HP TAPS

TAPS

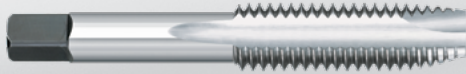
DIES

STI Taps • Oversize Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



STI - SPIRAL POINT PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
4-40	H1	2	209262	27.85
5-40	H1	2	209273	27.85
6-32	H2	2	209284	28.05
6-40	H2	2	209295	28.05
8-32	H2	2	209306	28.33
10-24	H2	2	209317	28.85
10-32	H2	2	209328	29.37
12-24	H2	2	209339	29.37
1/4-20	H2	2	209350	29.37
1/4-28	H2	2	209361	29.84
5/16-18	H3	3	209372	37.72
5/16-24	H2	3	209383	38.20
3/8-16	H3	3	209394	46.43
3/8-24	H2	3	209405	46.99
7/16-14	H3	3	209416	50.93
7/16-20	H3	3	209427	50.93
1/2-13	H3	3	209438	56.70
1/2-20	H3	3	209449	56.70

STI - HAND PLUG & BOTTOMING



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
4-40	H1	3	198933	198944	24.83
5-40	H1	3	198955	198966	24.83
6-32	H2	3	198977	198988	25.27
6-40	H1	3	198999	199010	25.27
8-32	H2	3	199021	199032	25.86
10-24	H2	3	199043	199054	25.86
10-32	H2	3	199065	199076	26.90
12-24	H2	3	199087	199098	26.90
1/4-20	H2	3	199109	199120	27.02
1/4-28	H2	3	199131	199142	27.02
5/16-18	H3	4	199153	199164	29.17
5/16-24	H2	4	199175	199186	29.17
3/8-16	H3	4	199197	199208	31.67
3/8-24	H2	4	199219	199230	31.67
7/16-14	H3	4	199241	199252	43.57
7/16-20	H3	4	199263	199274	43.57
1/2-13	H3	4	199285	199296	48.90
1/2-20	H3	4	199307	199318	48.90

STI TAPS ARE OVERSIZE SO THAT THEY WILL PRODUCE THREADS THAT WILL ACCEPT HELICAL COIL WIRE SCREW THREAD INSERTS THAT HAVE THE SAME SIZE AND PITCH. MATERIALS: ALUMINUM AND NON-FERROUS MATERIALS

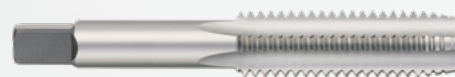
+.005 OVERSIZE SPIRAL POINT PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
6-32	H11	2	209152	14.40
8-32	H11	2	209163	14.40
10-24	H11	2	209174	15.68
10-32	H11	2	209185	15.68
1/4-20	H11	2	209196	17.87
5/16-18	H11	2	209207	20.53
3/8-16	H11	3	209218	23.32
7/16-14	H11	3	209229	35.02
1/2-13	H11	3	209240	42.62
5/8-11	H11	3	209251	72.62

+.005 OVERSIZE HAND PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	ITEM#	LIST PRICE
6-32	H11	3	207051	11.98
8-32	H11	4	207062	11.98
10-24	H11	4	207073	13.25
10-32	H11	4	207084	13.25
1/4-20	H11	4	207095	15.80
5/16-18	H11	4	207106	19.89
3/8-16	H11	4	207117	22.84
7/16-14	H11	4	207128	34.39
1/2-13	H11	4	207139	38.80
5/8-11	H11	4	207150	73.05

THESE OVERSIZE TAPS CAN BE USED ON A WIDE RANGE OF MATERIALS. PRIMARILY USED WHERE PARTS ARE GOING TO BE PLATED AFTER TAPPING.

All taps sold individually.
For technical information, please see pages 249-251.

MADE IN THE USA

HP TAPS

TAPS

DIES



Combination Drill & Tap

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS

TAPS

DIES



HIGH SPEED STEEL

SIZE	SHANK DIAMETER	OVERALL LENGTH	DRILL LENGTH	DRILL SIZE	THREAD LENGTH	# OF FLUTES	ITEM#	LIST PRICE
4-40	.141	1-7/8	1/4	0.0890	3/8	2	198251	42.81
5-40	.141	1-15/16	9/32	0.1015	13/32	2	198262	42.81
6-32	.141	2	5/16	0.1110	7/16	2	198273	42.81
8-32	.168	2-5/32	13/32	0.1360	1/2	2	198284	42.81
10-24	.194	2-13/32	7/16	0.1540	5/8	2	198295	42.81
10-32	.194	2-13/32	7/16	0.1610	5/8	2	198306	42.81
12-24	.220	2-13/32	1/2	0.1800	21/32	2	198317	46.28
1/4-20	.255	2-9/16	9/16	0.2055	25/32	2	198328	42.81
1/4-28	.255	2-9/16	9/16	0.2188	25/32	2	198339	42.81
5/16-18	.318	2-29/32	3/4	0.2660	15/16	2	198350	63.23
5/16-24	.318	2-29/32	3/4	0.2770	15/16	2	198361	63.23
3/8-16	.381	3-15/32	29/32	0.3230	1-1/16	2	198372	76.83
3/8-24	.381	3-15/32	29/32	0.3390	1-1/16	2	198383	76.83
7/16-14	.323	3-27/32	1-3/32	0.3770	1-1/4	2	198394	91.95
7/16-20	.323	3-27/32	1-3/32	0.3937	1-1/4	2	198405	91.95
1/2-13	.367	4-3/16	1-1/4	0.4331	1-3/8	2	198416	103.77
1/2-20	.367	4-3/16	1-1/4	0.4531	1-3/8	2	198427	103.77

PITCH DIAMETER AND THREAD TOLERANCES ARE DESIGNED TO PRODUCE A CLASS 2B FIT.



HIGH SPEED STEEL METRIC

SIZE	SHANK DIAMETER	OVERALL LENGTH	DRILL LENGTH	DRILL SIZE	THREAD LENGTH	# OF FLUTES	ITEM#	LIST PRICE
M4 x 0.7	.168	2-5/32	13/32	0.1310	1/2	2	198438	47.11
M5 x 0.8	.194	2-13/32	7/16	0.1660	5/8	2	198449	47.11
M6 x 1.0	.255	2-17/32	9/16	0.1980	25/32	2	198460	47.11
M8 x 1.25	.318	2-29/32	3/4	0.2670	15/16	2	198471	85.35
M10 x 1.50	.381	3-15/32	29/32	0.3360	1-1/16	2	198482	97.53
M12 x 1.75	.367	4-3/16	1-1/4	0.4050	1-3/8	2	198493	97.53

PITCH DIAMETER AND THREAD TOLERANCES ARE DESIGNED TO PRODUCE A CLASS 6H FIT.

All taps sold individually.

For technical information, please see pages 249-251.

Pulley Taps • Extension Taps

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



PULLEY - PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	OVERALL LENGTH	ITEM#	LIST PRICE
1/4-20	H3	4	6	209460	84.51
1/4-20	H3	4	8	209471	104.49
5/16-18	H3	4	6	209482	89.13
5/16-18	H3	4	8	209493	107.59
3/8-16	H3	4	6	209504	99.87
3/8-16	H3	4	8	209515	119.85
3/8-16	H3	4	10	209526	150.60
7/16-14	H3	4	6	209537	106.04
7/16-14	H3	4	8	209548	138.31
1/2-13	H3	4	6	209559	107.59

SIZE	H LIMIT	# OF FLUTES	OVERALL LENGTH	ITEM#	LIST PRICE
1/2-13	H3	4	8	209570	141.37
1/2-13	H3	4	10	209581	173.64
1/2-13	H3	4	12	209592	213.59
5/8-11	H3	4	6	209603	142.93
5/8-11	H3	4	8	209614	185.94
5/8-11	H3	4	10	209625	233.61
5/8-11	H3	4	12	209636	273.56
3/4-10	H3	4	10	209647	273.56
3/4-10	H3	4	12	209658	325.80

HP TAPS

TAPS

SMALL SHANK EXTENSION - SPIRAL POINT PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	OVERALL LENGTH	NC/NF	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE	# OF FLUTES	ITEM#	LIST PRICE
6-32	H3	6	NC	11/16	3/16	0.097	0.073	2	212485	85.75
8-32	H3	6	NC	3/4	1/4	0.123	0.092	2	212496	84.00
10-24	H3	6	NC	7/8	1/4	0.136	0.102	2	212507	78.74
10-32	H3	6	NF	7/8	1/4	0.136	0.102	2	212518	78.74
1/4-20	H3	6	NC	1	5/16	0.185	0.139	2	212529	107.43
1/4-28	H3	6	NF	1	5/16	0.185	0.139	2	212540	107.43
5/16-18	H3	6	NC	1-1/8	3/8	0.240	0.180	2	212551	112.76
5/16-24	H3	6	NF	1-1/8	3/8	0.240	0.180	2	212562	112.76
3/8-16	H3	6	NC	1-1/4	7/16	0.275	0.206	3	212573	121.48
3/8-24	H3	6	NF	1-1/4	7/16	0.275	0.206	3	212584	121.48
7/16-14	H3	6	NC	1-7/16	13/32	0.323	0.242	3	212595	139.26
7/16-20	H3	6	NF	1-7/16	13/32	0.323	0.242	3	212606	139.26
1/2-13	H3	6	NC	1-21/32	7/16	0.367	0.275	3	212617	146.19
1/2-20	H3	6	NF	1-21/32	7/16	0.367	0.275	3	212628	146.19
5/8-11	H3	6	NC	1-13/16	9/16	0.480	0.360	3	212639	188.88
5/8-18	H3	6	NF	1-13/16	9/16	0.480	0.360	3	212650	188.88
3/4-10	H3	6	NC	2	11/16	0.590	0.442	3	212661	245.31
3/4-16	H3	6	NF	2	11/16	0.590	0.442	3	212672	245.31

SMALL SHANK EXTENSIONS: LONG REACH SMALL SHANKS ALLOW FOR DEEPER TAPPING

DIES

All taps sold individually.
For technical information, please see pages 249-251.

MADE IN THE USA



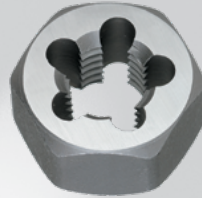
Carbon Steel Dies

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HP TAPS

TAPS

DIES

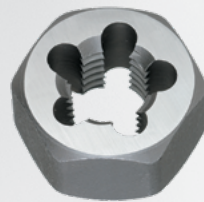


HEXAGON RETHREADING

CARBON STEEL

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
1/4-20	19/32	1/4	171037	26.01
1/4-28	19/32	1/4	171048	26.01
5/16-18	11/16	5/16	171059	30.33
5/16-24	11/16	5/16	171070	30.33
3/8-16	25/32	3/8	171081	33.59
3/8-24	25/32	3/8	171092	33.59
7/16-14	7/8	7/16	171103	41.16
7/16-20	7/8	7/16	171114	41.16
1/2-13	1-1/16	1/2	171125	45.52
1/2-20	1-1/16	1/2	171136	45.52
9/16-12	1-1/16	1/2	171147	48.73
9/16-18	1-1/16	1/2	171158	48.73
5/8-11	1-1/4	5/8	171169	50.91
5/8-18	1-1/4	5/8	171180	50.91
11/16-11	1-7/16	3/4	171191	56.35
11/16-16	1-7/16	3/4	171202	56.35

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
3/4-10	1-7/16	3/4	171213	62.85
3/4-16	1-7/16	3/4	171224	62.85
7/8-9	1-5/8	7/8	171235	68.24
7/8-14	1-5/8	7/8	171246	68.24
1-8	1-13/16	1	171257	76.93
1-12	1-13/16	1	171268	76.93
1-14	1-13/16	1	171279	76.93
1-1/8-7	2	1	171290	88.82
1-1/8-12	2	1	171301	88.82
1-1/4-7	2-3/16	1	171312	97.51
1-1/4-12	2-3/16	1	171323	97.51
1-3/8-6	2-3/8	1	171334	184.19
1-3/8-12	2-3/8	1	171345	184.19
1-1/2-6	2-9/16	1	171356	205.84
1-1/2-12	2-9/16	1	171367	205.84



HEXAGON RETHREADING METRIC

CARBON STEEL

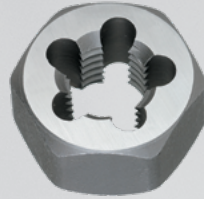
SIZE	ACROSS FLATS	ITEM#	LIST PRICE
M3 x 0.5	1	171378	19.81
M4 x 0.7	1	171389	19.28
M5 x 0.8	1	171400	19.28
M6 x 1.0	1	171411	19.28
M7 x 1.0	1	171422	19.81
M8 x 1.25	1	171433	19.28
M10 x 1.25	1	171444	19.28
M10 x 1.50	1	171455	19.28
M12 x 1.25	1	171466	19.28

SIZE	ACROSS FLATS	ITEM#	LIST PRICE
M12 x 1.75	1	171477	19.28
M14 x 1.50	1-7/16	171488	29.91
M14 x 2.0	1-7/16	171499	29.91
M16 x 1.50	1-7/16	171510	29.91
M16 x 2.0	1-7/16	171521	29.91
M18 x 1.50	1-7/16	171532	29.91
M18 x 2.50	1-7/16	171543	29.91
M20 x 2.5	1-13/16	171554	62.47
M24 x 3.0	1-13/16	171565	62.47

Dies sold individually.

Carbon Steel Dies

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



NPT HEXAGON RETHREADING

CARBON STEEL

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
1/8-27 NPT	1-1/16	3/8	171576	35.96
1/4 - 18 NPT	1-1/4	5/8	171587	39.86
3/8 - 18 NPT	1-7/16	5/8	171598	55.12

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
1/2 - 14 NPT	1-5/8	3/4	171609	79.64
3/4 - 14 NPT	2	13/16	171620	98.46
1 - 11-1/2 NPT	2-3/8	1	171631	190.61



ADJUSTABLE ROUND SPLIT

CARBON STEEL

SIZE	OUTSIDE DIAMETER	ITEM#	LIST PRICE
6 - 32	1	170377	44.37
8 - 32	1	170410	44.37
10 - 24	1	170443	44.37
10 - 32	1	170465	44.37
1/4 - 20	1	170531	44.37
1/4 - 20	1-1/2	170542	72.60
1/4 - 28	1	170553	44.37
1/4 - 32	1	170586	44.37
5/16 - 18	1	170597	44.37
5/16 - 18	1-1/2	170608	72.60
5/16 - 24	1	170619	44.37
5/16 - 24	1-1/2	170630	72.60
5/16 - 32	1	170641	44.37

SIZE	OUTSIDE DIAMETER	ITEM#	LIST PRICE
3/8 - 16	1	170652	44.37
3/8 - 16	1-1/2	170663	72.60
3/8 - 24	1	170674	44.37
3/8 - 24	1-1/2	170685	72.60
7/16 - 14	1	170696	44.37
7/16 - 14	1-1/2	170707	72.60
7/16 - 20	1	170718	44.37
1/2 - 13	1-1/2	170740	72.60
1/2 - 20	1-1/2	170751	72.60
9/16 - 12	1-1/2	170762	72.60
9/16 - 18	1-1/2	170773	72.60
5/8 - 11	1-1/2	170784	72.60
5/8 - 18	1-1/2	170806	72.60

HP TAPS

TAPS

DIES

Dies sold individually.

MADE IN THE USA



High Speed Steel Dies

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



ADJUSTABLE
ROUND SPLIT

HIGH SPEED STEEL

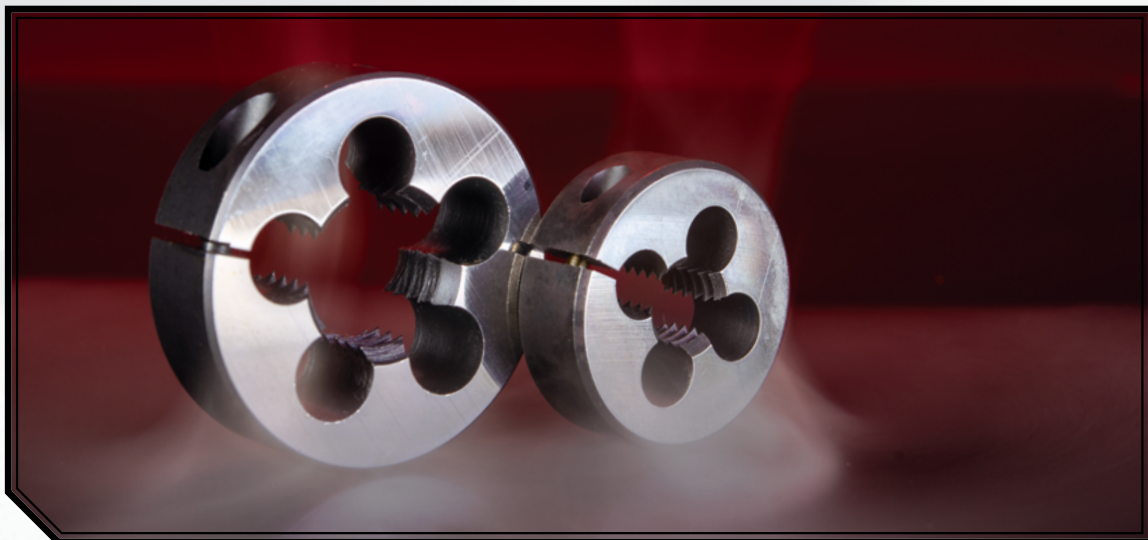
HP TAPS

TAPS

DIES

SIZE	OUTSIDE DIAMETER	ITEM#	LIST PRICE
4-40	1	171708	83.04
5-40	13/16	171719	56.35
5-44	13/16	171730	56.35
6-32	13/16	171741	56.35
6-32	1	171752	68.24
6-40	13/16	171763	56.35
8-32	13/16	171774	56.35
8-32	1	171785	68.24
10-24	13/16	171796	56.35
10-24	1	171807	68.24
10-32	13/16	171818	56.35
10-32	1	171829	68.24
12-24	13/16	171840	56.35
12-24	1	171851	68.24
12-28	13/16	171862	56.35
1/4-20	13/16	171873	56.35
1/4-20	1	171884	68.24
1/4-20	1-1/2	171895	111.58
1/4-28	13/16	171906	56.35
1/4-28	1	171917	68.24
1/4-28	1-1/2	171928	111.58
5/16-18	13/16	171939	56.35
5/16-18	1	171950	68.24
5/16-18	1-1/2	171961	111.58
5/16-24	13/16	171972	56.35
5/16-24	1	171983	68.24

SIZE	OUTSIDE DIAMETER	ITEM#	LIST PRICE
5/16-24	1-1/2	171994	111.58
3/8-16	1	172005	68.24
3/8-16	1-1/2	172016	111.58
3/8-24	1	172027	68.24
3/8-24	1-1/2	172038	111.58
7/16-14	1	172049	68.24
7/16-14	1-1/2	172060	111.58
7/16-20	1	172071	68.24
7/16-20	1-1/2	172082	111.58
1/2-13	1	172093	68.24
1/2-13	1-1/2	172104	111.58
1/2-20	1	172115	68.24
1/2-20	1-1/2	172126	111.58
9/16-12	1-1/2	172137	111.58
9/16-18	1-1/2	172148	111.58
5/8-11	1-1/2	172159	111.58
5/8-11	2	172170	151.67
5/8-18	1-1/2	172181	111.58
5/8-18	2	172192	151.67
3/4-10	1-1/2	172203	111.58
3/4-10	2	172214	151.67
3/4-16	1-1/2	172225	111.58
3/4-16	2	172236	151.67
7/8-9	2	172247	151.67
7/8-14	2	172258	151.67



Dies sold individually.

Tap Handles & Die Stocks

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HP TAPS

TAPS

DIES

T - HANDLE TAP WRENCHES



SIZE	ITEM#	LIST PRICE
0 - 1/4	170146	16.45
1/4-1/2	170157	24.63

DIE STOCKS



SIZE	ITEM#	LIST PRICE
1 OD	170201	50.80
1-1/2 OD	170212	83.20
2 OD	170223	146.47

Tools sold individually.

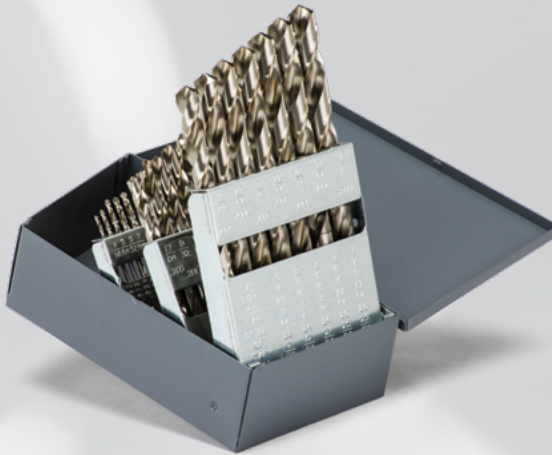
MADE IN THE USA



HSS Drill Sets

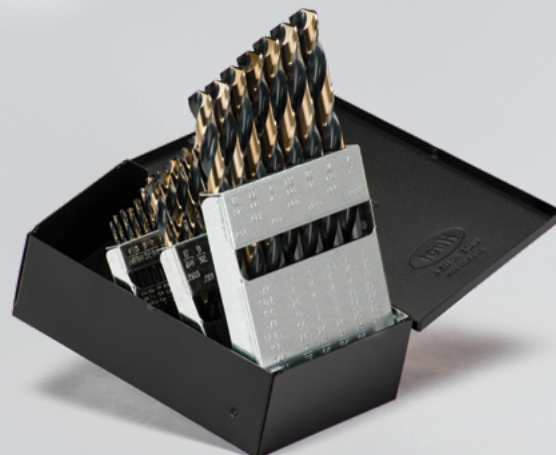
PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HSS & COBALT DRILLS



ITEM# 120250

29 PC JOBBER DRILL SET - BRIGHT FINISH
HIGH SPEED STEEL



ITEM# 120281

29 PC HEAVY DUTY DRILL SET - BLACK & GOLD
HIGH SPEED STEEL

HIGH SPEED STEEL - JOBBER DRILL SETS

DESCRIPTION	ITEM#	LIST PRICE
13PC • 1/16" - 1/4" by 64ths • 118° Point • Oxided	120107	43.45
13PC • 1/16" - 1/4" by 64ths • 118° Point • Bright	120118	43.45
15PC • 1/16" - 1/2" by 32nds • 118° Point • Oxided	120140	121.32
15PC • 1/16" - 1/2" by 32nds • 118° Point • Bright	120162	121.32
15PC • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Oxided	120173	133.81
21PC • 1/16" - 3/8" by 64ths • 118° Point • Oxided	120184	102.54
21PC • 1/16" - 3/8" by 64ths • 118° Point • Bright	120195	102.54
25PC • 1.0 - 13.0 by 0.5 • 118° Point • Oxided	120203	234.16
26PC • A-Z • 118° Point • Oxided	120217	171.61
26PC • A-Z • 118° Point • Bright	120228	171.61
29PC • 1/16" - 1/2" by 64ths • 118° Point • Oxided	120239	166.72
29PC • 1/16" - 1/2" by 64ths • 118° Point • Bright	120250	166.72
29PC • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Oxided	120272	207.50
29PC • 1/16" - 1/2" by 64ths • 118° Point • TIN Coated	120294	412.30
60PC • #1 - #60 • 118° Point • Oxided	120305	150.80
60PC • #1 - #60 • 118° Point • Bright	120316	150.80
115PC • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point • Oxided	120327	479.19
115PC • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point • Bright	120338	479.19

HIGH SPEED STEEL - BLACK & GOLD SETS

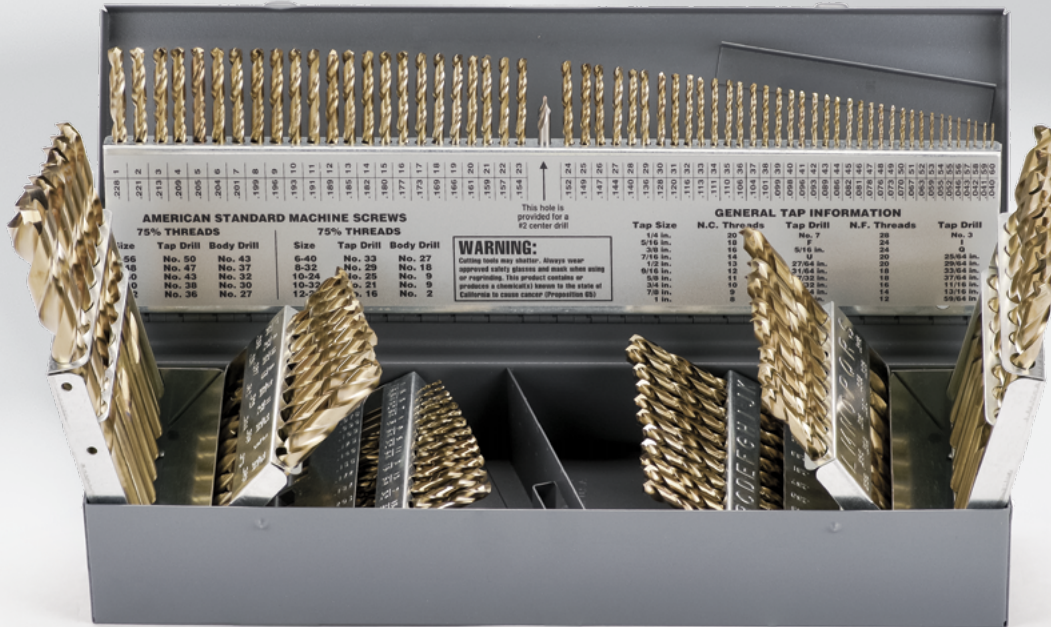
DESCRIPTION	ITEM#	LIST PRICE
13PC • 1/16" - 1/4" by 64ths • Heavy Duty • 135° SP/PT • Black & Gold	120129	54.19
15PC • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Black & Gold	120151	156.97
21PC • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT • Black & Gold	120206	153.75
29PC • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black & Gold	120261	251.15
29PC • 1/16" - 1/2" by 64ths • H.D. • 135° SP/PT • Black & Gold • Plastic Case	120569	251.15
115PC • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black & Gold	120349	692.74

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.

For coating information see page 6. For technical information, please see pages 254, 255.

M42 Cobalt Drill Sets

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HSS & COBALT DRILLS

ITEM# 120426

115 PC JOBBER DRILL SET - M42 COBALT

M42 COBALT - JOBBER DRILL SETS

DESCRIPTION	ITEM#	LIST PRICE
13PC • 1/16" - 1/4" by 64ths • Heavy Duty • 135° SP/PT	120360	58.57
15PC • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT	120371	197.64
21PC • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT	120382	215.26
26PC • A - Z • Heavy Duty • 135° SP/PT	120393	327.79
29PC • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT	120404	320.83
60PC • #1 - #60 • Heavy Duty • 135° SP/PT	120415	280.04
115PC • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • H.D. • 135° SP/PT	120426	1,181.04

M42 COBALT - SCREW MACHINE DRILL SET

DESCRIPTION	ITEM#	LIST PRICE
115PC • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • H.D. • 135° SP/PT	259472	979.09

For technical information, please see pages 254, 255.

MADE IN THE USA



M42 & HSS Drill Sets

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HSS & COBALT DRILLS



ITEM# 120448
8 PC SILVER & DEMING DRILL SET
HIGH SPEED STEEL

SILVER & DEMING SETS - 1/2" SHANK

DESCRIPTION	ITEM#	LIST PRICE
8PC • HSS • 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 15/16", 1" • 118° Point • Plastic Case	120448	405.18
8PC • HSS • Black & Gold • 118° Split Point • Plastic Case	120481	514.56
8PC • M42 Cobalt • 118° Split Point • Plastic Case	120470	835.92
33PC • HSS • 1/2" - 1" by 64ths • 118° Point • Metal Stand	120459	1,822.86

ITEM# 120580

29 PC MECHANICS LENGTH DRILL SET
HIGH SPEED STEEL - BLACK & GOLD



HIGH SPEED STEEL - MECHANICS LENGTH SETS

DESCRIPTION	ITEM#	LIST PRICE
15PC • 1/16" - 1/2" by 32ths • Black & Gold • Heavy Duty • 135° SP/PT • Metal Case	120558	147.74
29PC • 1/16" - 1/2" by 64ths • Black & Gold • Heavy Duty • 135° SP/PT • Metal Case	120547	272.64
29PC • 1/16" - 1/2" by 64ths • Black & Gold • Heavy Duty • 135° SP/PT • Plastic Case	120580	272.64

MECHANICS LENGTH: SIZES 3/16" TO 1/2" - HAVE 3 FLATS;
SIZES 27/64" AND HIGHER - HAVE 3/8" REDUCED FLATTED SHANKS

HIGH SPEED STEEL - TAP & DRILL SETS

DESCRIPTION	ITEM#	LIST PRICE
18PC • (6-32, #36), (8-32, #29), (10-24, #25), (10-32, #21), (1/4-20, #7) (5/16-18,"F"), (3/8-16, 5/16"), (7/16-14,"U"), (1/2-13, 27/64) • Metal Case	120437	223.54

For technical information, please see pages 254, 255.

HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



MECHANICS LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "B"



BLACK & GOLD

FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	OAL	PACKAGE QUANTITY	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PACKAGE QUANTITY	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	110328	2.40	19/64	2-3/8	3-7/8	6	110493	8.11
5/64	1	2	12	110339	2.59	5/16	2-1/2	4	6	110504	8.67
3/32	1-1/4	2-1/4	12	110350	2.59	21/64	2-9/16	4-1/16	6	110515	9.23
7/64	1-5/16	2-3/8	12	110361	2.67	11/32	2-5/8	4-1/8	6	110526	10.06
1/8	1-7/16	2-1/2	12	110372	2.78	23/64	2-11/16	4-3/16	6	110537	10.70
9/64	1-9/16	2-5/8	12	110383	2.85	3/8	2-11/16	4-1/4	6	110548	11.34
5/32	1-11/16	2-3/4	12	110394	3.42	25/64	2-3/4	4-5/16	6	110559	12.05
11/64	1-13/16	2-7/8	12	110405	3.49	13/32	2-13/16	4-3/8	6	110570	12.99
3/16	1-7/8	3	12	110416	3.98	27/64	2-7/8	4-7/16	6	110581	14.64
13/64	1-15/16	3-1/8	12	110427	4.32	7/16	2-15/16	4-1/2	6	110592	15.47
7/32	2	3-1/4	12	110438	4.80	29/64	3	4-5/8	6	110603	16.85
15/64	2-1/16	3-3/8	12	110449	5.14	15/32	3-1/8	4-3/4	6	110614	18.06
1/4	2	3-1/2	12	110460	5.44	31/64	3-1/4	4-7/8	6	110625	18.43
17/64	2-1/8	3-5/8	6	110471	6.83	1/2	3-3/8	5	6	110636	18.92
9/32	2-1/4	3-3/4	6	110482	6.83						

SIZES 3/16" TO 1/2" - HAVE 3 FLATS;
SIZES 27/64" AND HIGHER - HAVE 3/8" REDUCED FLATTED SHANKS



For technical information, please see pages 254, 255.

MADE IN THE USA

HSS & COBALT DRILLS



HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

STUB LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "C"



OXIDE FINISH

HSS & COBALT DRILLS

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
1/16	5/8	1-5/8	12	102100	2.06
5/64	11/16	1-11/16	12	102111	2.10
3/32	3/4	1-3/4	12	102122	2.10
7/64	13/16	1-13/16	12	102133	2.10
1/8	7/8	1-7/8	12	102144	2.10
9/64	15/16	1-15/16	12	102155	2.10
5/32	1	2-1/16	12	102166	2.29
11/64	1-1/16	2-1/8	12	102177	2.29
3/16	1-1/8	2-3/16	12	102188	2.67
13/64	1-3/16	2-1/4	12	102199	2.74
7/32	1-1/4	2-3/8	12	102210	3.12
15/64	1-5/16	2-7/16	12	102221	3.60
1/4	1-3/8	2-1/2	12	102232	3.98
17/64	1-7/16	2-5/8	6	102243	4.09
9/32	1-1/2	2-11/16	6	102254	4.32

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
19/64	1-9/16	2-3/4	6	102265	4.69
5/16	1-5/8	2-13/16	6	102276	4.99
21/64	1-11/16	2-15/16	6	102287	5.59
11/32	1-11/16	3	6	102298	5.97
23/64	1-3/4	3-1/16	6	102309	6.34
3/8	1-13/16	3-1/8	6	102320	6.91
25/64	1-7/8	3-1/4	6	102331	7.32
13/32	1-15/16	3-5/16	6	102342	8.03
27/64	2	3-3/8	6	102353	8.48
7/16	1-1/16	3-7/16	6	102364	9.27
29/64	2-1/8	3-9/16	6	102375	9.84
15/32	2-1/8	3-5/8	6	102386	10.81
31/64	2-3/16	3-11/16	6	102397	11.22
1/2	2-1/4	3-3/4	6	102408	11.82

LETTER SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
A	1-5/16	2-7/16	12	103079	4.32
B	1-3/8	2-1/2	12	103090	4.54
C	1-3/8	2-1/2	12	103101	4.54
D	1-3/8	2-1/2	12	103112	4.58
E	1-3/8	2-1/2	12	103123	4.58
F	1-7/16	2-5/8	6	103134	5.89
G	1-7/16	2-5/8	6	103145	6.31
H	1-1/2	2-11/16	6	103156	6.49
I	1-1/2	2-11/16	6	103167	6.53
J	1-1/2	2-11/16	6	103178	6.68
K	1-1/2	2-11/16	6	103189	6.79
L	1-9/16	2-3/4	6	103200	6.94
M	1-9/16	2-3/4	6	103211	7.28

LETTER SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
N	1-5/8	2-13/16	6	103222	7.58
O	1-11/16	2-15/16	6	103233	8.52
P	1-11/16	2-15/16	6	103244	8.75
Q	1-11/16	3	6	103255	9.12
R	1-11/16	3	6	103266	9.38
S	1-3/4	3-1/16	6	103277	9.76
T	1-3/4	3-1/16	6	103288	9.99
U	1-13/16	3-1/8	6	103299	10.77
V	1-7/8	3-1/4	6	103310	11.45
W	1-7/8	3-1/4	6	103321	11.86
X	1-15/16	3-5/16	6	103332	12.58
Y	1-15/16	3-5/16	6	103343	12.84
Z	2	3-3/8	6	103354	13.29

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.

For technical information, please see pages 254, 255.

HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



STUB LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "C"



OXIDE FINISH

WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
#1	1-5/16	2-7/16	12	102419	3.60	#31	7/8	1-7/8	12	102749	2.33
#2	1-5/16	2-7/16	12	102430	3.60	#32	7/8	1-7/8	12	102760	2.33
#3	1-1/4	2-3/8	12	102441	3.72	#33	7/8	1-7/8	12	102771	2.33
#4	1-1/4	2-3/8	12	102452	3.72	#34	7/8	1-7/8	12	102782	2.33
#5	1-1/4	2-3/8	12	102463	3.72	#35	7/8	1-7/8	12	102793	2.33
#6	1-1/4	2-3/8	12	102474	3.72	#36	13/16	1-13/16	12	102804	2.33
#7	1-3/16	2-1/4	12	102485	3.19	#37	13/16	1-13/16	12	102815	2.33
#8	1-3/16	2-1/4	12	102496	3.19	#38	13/16	1-13/16	12	102826	2.33
#9	1-3/16	2-1/4	12	102507	3.19	#39	13/16	1-13/16	12	102837	2.33
#10	1-3/16	2-1/4	12	102518	3.19	#40	13/16	1-13/16	12	102848	2.33
#11	1-3/16	2-1/4	12	102529	3.19	#41	13/16	1-13/16	12	102859	2.33
#12	1-3/16	2-1/4	12	102540	3.19	#42	3/4	1-3/4	12	102870	2.33
#13	1-1/8	2-3/16	12	102551	3.19	#43	3/4	1-3/4	12	102881	2.33
#14	1-1/8	2-3/16	12	102562	3.19	#44	3/4	1-3/4	12	102892	2.33
#15	1-1/8	2-3/16	12	102573	3.19	#45	3/4	1-3/4	12	102903	2.33
#16	1-1/8	2-3/16	12	102584	3.19	#46	3/4	1-3/4	12	102914	2.33
#17	1-1/8	2-3/16	12	102595	3.19	#47	11/16	1-11/16	12	102925	2.33
#18	1-1/16	2-1/8	12	102606	3.04	#48	11/16	1-11/16	12	102936	2.33
#19	1-1/16	2-1/8	12	102617	3.04	#49	11/16	1-11/16	12	102947	2.33
#20	1-1/16	2-1/8	12	102628	3.04	#50	11/16	1-11/16	12	102958	2.33
#21	1-1/16	2-1/8	12	102639	3.04	#51	11/16	1-11/16	12	102969	2.33
#22	1-1/16	2-1/8	12	102650	2.97	#52	11/16	1-11/16	12	102980	2.33
#23	1	2-1/16	12	102661	2.97	#53	5/8	1-5/8	12	102991	2.33
#24	1	2-1/16	12	102672	2.97	#54	5/8	1-5/8	12	103002	2.33
#25	1	2-1/16	12	102683	2.97	#55	5/8	1-5/8	12	103013	2.33
#26	1	2-1/16	12	102694	2.97	#56	1/2	1-3/8	12	103024	2.33
#27	1	2-1/16	12	102705	2.97	#57	1/2	1-3/8	12	103035	2.33
#28	15/16	1-15/16	12	102716	2.97	#58	1/2	1-3/8	12	103046	2.33
#29	15/16	1-15/16	12	102727	2.97	#59	1/2	1-3/8	12	103057	2.33
#30	15/16	1-15/16	12	102738	2.33	#60	1/2	1-3/8	12	103068	2.33

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.

For technical information, please see pages 254, 255.

MADE IN THE USA

HSS & COBALT DRILLS



M42 Cobalt Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

STUB LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "J"

NAS 907 - M42 COBALT



NAS 907 - M42 COBALT
ALTIN COATED



HSS & COBALT DRILLS

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/16	5/8	1-5/8	12	103365	2.60	233990	4.72
5/64	11/16	1-11/16	12	103376	2.60	234001	4.72
3/32	3/4	1-3/4	12	103387	2.60	234012	4.72
7/64	13/16	1-13/16	12	103398	2.94	234023	5.34
1/8	7/8	1-7/8	12	103409	3.40	234034	6.20
9/64	15/16	1-15/16	12	103420	3.40	234045	6.20
5/32	1	2-1/16	12	103431	3.75	234056	6.78
11/64	1-1/16	2-1/8	12	103442	4.25	234067	7.64
3/16	1-1/8	2-3/16	12	103453	4.97	234078	9.00
13/64	1-3/16	2-1/4	12	103464	5.70	234089	10.25
7/32	1-1/4	2-3/8	12	103475	6.27	234100	11.34
15/64	1-5/16	2-7/16	12	103486	6.73	234111	12.20
1/4	1-3/8	2-1/2	12	103497	7.00	234122	12.67
17/64	1-7/16	2-5/8	6	103508	7.99	234133	14.42
9/32	1-1/2	2-11/16	6	103519	8.68	234144	15.71

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
19/64	1-9/16	2-3/4	6	103530	10.06	234155	18.17
5/16	1-5/8	2-13/16	6	103541	10.79	234166	19.49
21/64	1-11/16	2-15/16	6	103552	11.97	234177	21.63
11/32	1-11/16	3	6	103563	12.93	234188	23.39
23/64	1-3/4	3-1/16	6	103574	14.88	234199	26.90
3/8	1-13/16	3-1/8	6	103585	14.88	234210	26.90
25/64	1-7/8	3-1/4	6	103596	17.02	234221	30.80
13/32	1-15/16	3-5/16	6	103607	17.59	234232	31.77
27/64	2	3-3/8	6	103618	19.51	234243	35.20
7/16	1-1/16	3-7/16	6	103629	20.04	234254	36.21
29/64	2-1/8	3-9/16	6	103640	24.06	234265	43.43
15/32	2-1/8	3-5/8	6	103651	24.06	234276	43.43
31/64	2-3/16	3-11/16	6	103662	24.06	234287	43.43
1/2	2-1/4	3-3/4	6	103673	24.06	234298	43.43

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
A	1-5/16	2-7/16	12	104344	8.03	234969	14.50
B	1-3/8	2-1/2	12	104355	8.53	234980	15.40
C	1-3/8	2-1/2	12	104366	8.53	234991	15.40
D	1-3/8	2-1/2	12	104377	8.53	235002	15.40
E	1-3/8	2-1/2	12	104388	7.76	235013	14.07
F	1-7/16	2-5/8	6	104399	9.03	235024	16.29
G	1-7/16	2-5/8	6	104410	9.03	235035	16.29
H	1-1/2	2-11/16	6	104421	9.56	235046	17.31
I	1-1/2	2-11/16	6	104432	9.56	235057	17.31
J	1-1/2	2-11/16	6	104443	9.56	235068	17.31
K	1-1/2	2-11/16	6	104454	9.56	235079	17.31
L	1-9/16	2-3/4	6	104465	11.36	235090	20.50
M	1-9/16	2-3/4	6	104476	11.36	235101	20.50

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
N	1-5/8	2-13/16	6	104487	12.20	235112	22.02
O	1-11/16	2-15/16	6	104498	13.50	235123	24.40
P	1-11/16	2-15/16	6	104509	13.50	235134	24.40
Q	1-11/16	3	6	104520	14.61	235145	26.39
R	1-11/16	3	6	104531	14.61	235156	26.39
S	1-3/4	3-1/16	6	104542	18.17	235167	32.86
T	1-3/4	3-1/16	6	104553	18.17	235178	32.86
U	1-13/16	3-1/8	6	104564	18.17	235189	32.86
V	1-7/8	3-1/4	6	104575	20.19	235200	36.45
W	1-7/8	3-1/4	6	104586	20.19	235211	36.45
X	1-15/16	3-5/16	6	104597	20.19	235222	36.45
Y	1-15/16	3-5/16	6	104608	20.19	235233	36.45
Z	2	3-3/8	6	104619	23.14	235244	41.83

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.

All cobalt drills have identification ring on shank.
For coating information see page 6. For technical information, please see pages 254, 255.

M42 Cobalt Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



STUB LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "J"

NAS 907 - M42 COBALT



NAS 907 - M42 COBALT
ALTIN COATED



HSS & COBALT DRILLS

WIRE SIZES							WIRE SIZES								
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
#1	1-5/16	2-7/16	12	103684	7.73	234309	13.96	#31	7/8	1-7/8	12	104014	3.21	234639	5.81
#2	1-5/16	2-7/16	12	103695	7.73	234320	13.96	#32	7/8	1-7/8	12	104025	3.21	234650	5.81
#3	1-1/4	2-3/8	12	103706	7.73	234331	13.96	#33	7/8	1-7/8	12	104036	3.10	234661	5.61
#4	1-1/4	2-3/8	12	103717	6.88	234342	12.47	#34	7/8	1-7/8	12	104047	3.10	234672	5.61
#5	1-1/4	2-3/8	12	103728	6.88	234353	12.47	#35	7/8	1-7/8	12	104058	3.10	234683	5.61
#6	1-1/4	2-3/8	12	103739	6.88	234364	12.47	#36	13/16	1-13/16	12	104069	3.10	234694	5.61
#7	1-3/16	2-1/4	12	103750	5.43	234375	9.78	#37	13/16	1-13/16	12	104080	3.10	234705	5.61
#8	1-3/16	2-1/4	12	103761	5.43	234386	9.78	#38	13/16	1-13/16	12	104091	2.83	234716	5.11
#9	1-3/16	2-1/4	12	103772	5.43	234397	9.78	#39	13/16	1-13/16	12	104102	2.83	234727	5.11
#10	1-3/16	2-1/4	12	103783	5.43	234408	9.78	#40	13/16	1-13/16	12	104113	2.83	234738	5.11
#11	1-3/16	2-1/4	12	103794	5.28	234419	9.51	#41	13/16	1-13/16	12	104124	2.72	234749	5.11
#12	1-3/16	2-1/4	12	103805	5.28	234430	9.51	#42	3/4	1-3/4	12	104135	2.68	234760	5.11
#13	1-1/8	2-3/16	12	103816	5.16	234441	9.36	#43	3/4	1-3/4	12	104146	2.68	234771	5.11
#14	1-1/8	2-3/16	12	103827	5.16	234452	9.36	#44	3/4	1-3/4	12	104157	2.68	234782	5.11
#15	1-1/8	2-3/16	12	103838	5.16	234463	9.36	#45	3/4	1-3/4	12	104168	2.68	234793	5.11
#16	1-1/8	2-3/16	12	103849	5.16	234474	9.32	#46	3/4	1-3/4	12	104179	2.68	234804	5.11
#17	1-1/8	2-3/16	12	103860	4.97	234485	9.00	#47	11/16	1-11/16	12	104190	2.68	234815	5.11
#18	1-1/16	2-1/8	12	103871	4.25	234496	7.64	#48	11/16	1-11/16	12	104201	2.68	234826	5.11
#19	1-1/16	2-1/8	12	103882	4.02	234507	7.25	#49	11/16	1-11/16	12	104212	2.68	234837	5.11
#20	1-1/16	2-1/8	12	103893	4.02	234518	7.25	#50	11/16	1-11/16	12	104223	2.68	234848	5.11
#21	1-1/16	2-1/8	12	103904	4.02	234529	7.25	#51	11/16	1-11/16	12	104234	2.68	234859	5.11
#22	1-1/16	2-1/8	12	103915	4.02	234540	7.25	#52	11/16	1-11/16	12	104245	2.68	234870	5.11
#23	1	2-1/16	12	103926	4.02	234551	7.25	#53	5/8	1-5/8	12	104256	3.02	234881	5.46
#24	1	2-1/16	12	103937	4.02	234562	7.25	#54	5/8	1-5/8	12	104267	3.02	234892	5.46
#25	1	2-1/16	12	103948	3.75	234573	6.78	#55	5/8	1-5/8	12	104278	3.02	234903	5.46
#26	1	2-1/16	12	103959	3.75	234584	6.78	#56	1/2	1-3/8	12	104289	3.02	234914	5.46
#27	1	2-1/16	12	103970	3.75	234595	6.78	#57	1/2	1-3/8	12	104300	3.02	234925	5.46
#28	15/16	1-15/16	12	103981	3.40	234606	6.20	#58	1/2	1-3/8	12	104311	3.21	234936	5.81
#29	15/16	1-15/16	12	103992	3.40	234617	6.20	#59	1/2	1-3/8	12	104322	3.21	234947	5.81
#30	15/16	1-15/16	12	104003	3.21	234628	5.81	#60	1/2	1-3/8	12	104333	3.21	234958	5.81

- ALTIN coating for use in high temperature drilling applications
- Coating allows for increased machining speeds from 50% up to 200%
- Used in drilling Stainless Steels, Nickel-based and Titanium alloys
- Not recoended for Aluminum

All cobalt drills have identification ring on shank.
For coating information see page 6. For technical information, please see pages 254, 255.

MADE IN THE USA



HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

JOBBER LENGTH - 118° POINT

BRIGHT FINISH



TIN COATED



HSS & COBALT DRILLS

FRACTIONAL SIZES								FRACTIONAL SIZES							
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BRIGHT	LIST PRICE	TIN	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BRIGHT	LIST PRICE	TIN	LIST PRICE
1/16	7/8	1-7/8	12	106313	1.76	110647	4.99	19/64	3-1/16	4-3/8	6	106478	5.48	110812	15.94
5/64	1	2	12	106324	1.76	110658	4.99	5/16	3-3/16	4-1/2	6	106489	5.71	110823	16.83
3/32	1-1/4	2-1/4	12	106335	1.76	110669	4.99	21/64	3-5/16	4-5/8	6	106500	6.38	110834	19.18
7/64	1-1/2	2-5/8	12	106346	1.76	110680	5.07	11/32	3-7/16	4-3/4	6	106511	6.83	110845	20.20
1/8	1-5/8	2-3/4	12	106357	1.76	110691	5.07	23/64	3-1/2	4-7/8	6	106522	7.51	110856	22.79
9/64	1-3/4	2-7/8	12	106368	1.88	110702	5.31	3/8	3-5/8	5	6	106533	7.88	110867	23.04
5/32	2	3-1/8	12	106379	1.95	110713	5.92	25/64	3-3/4	5-1/8	6	106544	8.52	110878	28.51
11/64	2-1/8	3-1/4	12	106390	2.10	110724	6.00	13/32	3-7/8	5-1/4	6	106555	9.31	110889	29.16
3/16	2-5/16	3-1/2	12	106401	2.29	110735	6.33	27/64	3-15/16	5-3/8	6	106566	9.91	110900	30.17
13/64	2-7/16	3-5/8	12	106412	2.59	110746	9.00	7/16	4-1/16	5-1/2	6	106577	10.81	110911	30.82
7/32	2-1/2	3-3/4	12	106423	2.85	110757	9.25	29/64	4-3/16	5-5/8	6	106588	11.52	110922	33.86
15/64	2-5/8	3-7/8	12	106434	3.19	110768	9.65	15/32	4-5/16	5-3/4	6	106599	12.54	110933	34.84
1/4	2-3/4	4	12	106445	3.27	110779	9.90	31/64	4-3/8	5-7/8	6	106610	13.25	110944	35.12
17/64	2-7/8	4-1/8	6	106456	4.69	110790	14.07	1/2	4-1/2	6	6	106621	13.81	110955	35.85
9/32	2-15/16	4-1/4	6	106467	4.99	110801	15.61								

LETTER SIZES								LETTER SIZES							
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BRIGHT	LIST PRICE	TIN	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BRIGHT	LIST PRICE	TIN	LIST PRICE
A	2-5/8	3-7/8	12	107512	3.19	110966	10.06	N	3-1/16	4-3/8	6	107655	5.71	111109	19.06
B	2-3/4	4	12	107523	3.27	110977	10.30	O	3-3/16	4-1/2	6	107666	6.19	111120	19.06
C	2-3/4	4	12	107534	3.27	110988	10.30	P	3-5/16	4-5/8	6	107677	6.64	111131	19.87
D	2-3/4	4	12	107545	3.38	110999	10.30	Q	3-7/16	4-3/4	6	107688	6.91	111142	19.87
E	2-3/4	4	12	107556	3.42	111010	9.90	R	3-7/16	4-3/4	6	107699	7.17	111153	20.40
F	2-7/8	4-1/8	6	107567	4.73	111021	16.99	S	3-1/2	4-7/8	6	107710	7.51	111164	25.71
G	2-7/8	4-1/8	6	107578	4.54	111032	16.99	T	3-1/2	4-7/8	6	107721	7.88	111175	26.93
H	2-7/8	4-1/8	6	107589	4.62	111043	16.99	U	3-5/8	5	6	107732	8.52	111186	26.93
I	2-7/8	4-1/8	6	107600	4.73	111054	16.99	V	3-5/8	5	6	107743	8.82	111197	27.29
J	2-7/8	4-1/8	6	107611	4.88	111065	17.11	W	3-3/4	5-1/8	6	107754	9.38	111208	31.59
K	2-15/16	4-1/4	6	107622	4.99	111076	18.41	X	3-3/4	5-1/8	6	107765	9.95	111219	34.03
L	2-15/16	4-1/4	6	107633	5.22	111087	18.41	Y	3-7/8	5-1/4	6	107776	10.44	111230	36.26
M	3-1/16	4-3/8	6	107644	5.52	111098	18.74	Z	3-7/8	5-1/4	6	107787	10.66	111241	36.66

For coating information see page 6. For technical information, please see pages 254, 255.

HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



JOBBER LENGTH - 118° POINT

BRIGHT FINISH



TIN COATED



HSS & COBALT DRILLS

WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BRIGHT LIST PRICE	TIN LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BRIGHT LIST PRICE	TIN LIST PRICE
#1	2-5/8	3-7/8	12	106632 3.49	111252 10.06	#31	1-5/8	2-3/4	12	106962 1.61	111582 5.07
#2	2-5/8	3-7/8	12	106643 3.49	111263 10.06	#32	1-5/8	2-3/4	12	106973 1.61	111593 5.07
#3	2-1/2	3-3/4	12	106654 3.19	111274 9.65	#33	1-1/2	2-5/8	12	106984 1.61	111604 5.07
#4	2-1/2	3-3/4	12	106665 3.19	111285 9.65	#34	1-1/2	2-5/8	12	106995 1.61	111615 5.07
#5	2-1/2	3-3/4	12	106676 3.15	111296 9.65	#35	1-1/2	2-5/8	12	107006 1.61	111626 5.07
#6	2-1/2	3-3/4	12	106687 3.15	111307 9.65	#36	1-7/16	2-1/2	12	107017 1.61	111637 4.99
#7	2-7/16	3-5/8	12	106698 3.04	111318 9.17	#37	1-7/16	2-1/2	12	107028 1.61	111648 4.99
#8	2-7/16	3-5/8	12	106709 3.04	111329 9.17	#38	1-7/16	2-1/2	12	107039 1.61	111659 4.99
#9	2-7/16	3-5/8	12	106720 3.00	111340 9.17	#39	1-3/8	2-3/8	12	107050 1.61	111670 4.99
#10	2-7/16	3-5/8	12	106731 2.74	111351 9.17	#40	1-3/8	2-3/8	12	107061 1.61	111681 4.99
#11	2-5/16	3-1/2	12	106742 2.74	111362 9.17	#41	1-3/8	2-3/8	12	107072 1.61	111692 4.99
#12	2-5/16	3-1/2	12	106753 2.74	111373 7.50	#42	1-1/4	2-1/4	12	107083 1.61	111703 4.99
#13	2-5/16	3-1/2	12	106764 2.74	111384 7.38	#43	1-1/4	2-1/4	12	107094 1.61	111714 4.99
#14	2-3/16	3-3/8	12	106775 2.59	111395 7.38	#44	1-1/8	2-1/8	12	107105 1.61	111725 4.99
#15	2-3/16	3-3/8	12	106786 2.59	111406 7.38	#45	1-1/8	2-1/8	12	107116 1.69	111736 4.99
#16	2-3/16	3-3/8	12	106797 2.59	111417 7.38	#46	1-1/8	2-1/8	12	107127 1.69	111747 4.99
#17	2-3/16	3-3/8	12	106808 2.48	111428 7.38	#47	1	2	12	107138 1.69	111758 4.99
#18	2-1/8	3-1/4	12	106819 2.48	111439 6.57	#48	1	2	12	107149 1.69	111769 4.99
#19	2-1/8	3-1/4	12	106830 2.48	111450 6.57	#49	1	2	12	107160 1.69	111780 4.99
#20	2-1/8	3-1/4	12	106841 2.21	111461 6.57	#50	1	2	12	107171 1.69	111791 4.99
#21	2-1/8	3-1/4	12	106852 2.21	111472 6.49	#51	1	2	12	107182 1.69	111802 4.99
#22	2	3-1/8	12	106863 2.10	111483 6.49	#52	7/8	1-7/8	12	107193 1.69	111813 4.99
#23	2	3-1/8	12	106874 2.10	111494 6.41	#53	7/8	1-7/8	12	107204 1.69	111824 4.99
#24	2	3-1/8	12	106885 2.10	111505 6.41	#54	7/8	1-7/8	12	107215 1.80	111835 4.99
#25	1-7/8	3	12	106896 1.84	111516 6.29	#55	7/8	1-7/8	12	107226 1.80	111846 4.99
#26	1-7/8	3	12	106907 1.84	111527 6.29	#56	3/4	1-3/4	12	107237 1.80	111857 4.99
#27	1-7/8	3	12	106918 1.84	111538 6.29	#57	3/4	1-3/4	12	107248 1.99	111868 4.99
#28	1-3/4	2-7/8	12	106929 1.69	111549 6.08	#58	11/16	1-5/8	12	107259 1.99	111879 4.99
#29	1-3/4	2-7/8	12	106940 1.69	111560 6.08	#59	11/16	1-5/8	12	107270 1.99	111890 4.99
#30	1-5/8	2-3/4	12	106951 1.65	111571 5.07	#60	11/16	1-5/8	12	107281 1.99	111901 4.99

For coating information see page 6. For technical information, please see pages 254, 255.

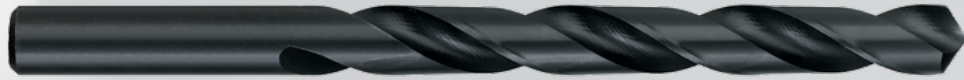
MADE IN THE USA



HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

JOBBER LENGTH - 118° POINT



OXIDE FINISH

HSS & COBALT DRILLS

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
1/16	7/8	1-7/8	12	104663	1.76
5/64	1	2	12	104674	1.76
3/32	1-1/4	2-1/4	12	104685	1.76
7/64	1-1/2	2-5/8	12	104696	1.76
1/8	1-5/8	2-3/4	12	104707	1.76
9/64	1-3/4	2-7/8	12	104718	1.88
5/32	2	3-1/8	12	104729	1.95
11/64	2-1/8	3-1/4	12	104740	2.10
3/16	2-5/16	3-1/2	12	104751	2.29
13/64	2-7/16	3-5/8	12	104762	2.59
7/32	2-1/2	3-3/4	12	104773	2.85
15/64	2-5/8	3-7/8	12	104784	3.19
1/4	2-3/4	4	12	104795	3.27
17/64	2-7/8	4-1/8	6	104806	4.69
9/32	2-15/16	4-1/4	6	104817	4.99
19/64	3-1/16	4-3/8	6	104828	5.48
5/16	3-3/16	4-1/2	6	104839	5.71
21/64	3-5/16	4-5/8	6	104850	6.38
11/32	3-7/16	4-3/4	6	104861	6.83
23/64	3-1/2	4-7/8	6	104872	7.51
3/8	3-5/8	5	6	104883	7.88

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
25/64	3-3/4	5-1/8	6	104894	8.52
13/32	3-7/8	5-1/4	6	104905	9.31
27/64	3-15/16	5-3/8	6	104916	9.91
7/16	4-1/16	5-1/2	6	104927	10.81
29/64	4-3/16	5-5/8	6	104938	11.52
15/32	4-5/16	5-3/4	6	104949	12.54
31/64	4-3/8	5-7/8	6	104960	13.25
1/2	4-1/2	6	6	104971	13.81
33/64	4-13/16	6-5/8	1	104982	33.00
17/32	4-13/16	6-5/8	1	104993	34.57
35/64	4-13/16	6-5/8	1	105004	37.42
9/16	4-13/16	6-5/8	1	105015	39.19
37/64	4-13/16	6-5/8	1	105026	39.30
19/32	5-3/16	7-1/8	1	105037	40.39
39/64	5-3/16	7-1/8	1	105048	44.37
5/8	5-3/16	7-1/8	1	105059	43.32
41/64	5-3/16	7-1/8	1	105070	47.37
21/32	5-3/16	7-1/8	1	105081	45.76
43/64	5-5/8	7-5/8	1	105092	53.79
11/16	5-5/8	7-5/8	1	105103	52.63

METRIC SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
1.00	17	41	12	215037	2.31
1.05	17	41	12	215048	2.55
1.10	19	44	12	215059	2.43
1.15	19	44	12	215070	2.47
1.20	22	48	12	215081	2.43
1.25	22	48	12	215092	2.47
1.30	22	48	12	215103	2.43
1.35	22	48	12	215114	2.55
1.40	22	48	12	215125	2.43
1.50	22	48	12	215147	2.43
1.60	22	48	12	215169	2.43
1.70	25	51	12	215191	2.47
1.80	25	51	12	215213	2.47
1.90	25	51	12	215235	2.47
2.00	25	51	12	215257	2.47
2.50	35	60	12	215367	2.59
3.00	41	70	12	215422	2.71
3.50	45	73	12	215477	2.83
4.00	54	83	12	215532	2.94

METRIC SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
4.50	56	86	12	215587	3.30
5.00	62	92	12	215642	3.74
5.50	64	95	12	215697	4.22
6.00	70	102	12	215752	4.58
6.50	73	105	6	215807	5.85
7.00	73	105	6	215862	6.09
7.50	78	111	6	215917	7.24
8.00	81	114	6	215972	7.96
8.50	87	121	6	216027	9.11
9.00	89	124	6	216082	10.27
9.50	92	127	6	216137	10.74
10.00	95	130	6	216192	13.13
10.50	98	133	6	216214	13.13
11.00	103	140	6	216225	13.49
11.50	106	143	6	216247	15.16
12.00	111	149	6	216258	16.71
12.50	114	152	6	216269	17.07
13.00	114	152	6	216280	28.29

For technical information, please see pages 254, 255.

HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



JOBBER LENGTH - 118° POINT



OXIDE FINISH

HSS & COBALT DRILLS

LETTER SIZES						LETTER SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
A	2-5/8	3-7/8	12	105994	3.19	N	3-1/16	4-3/8	6	106137	5.71
B	2-3/4	4	12	106005	3.27	O	3-3/16	4-1/2	6	106148	6.19
C	2-3/4	4	12	106016	3.27	P	3-5/16	4-5/8	6	106159	6.64
D	2-3/4	4	12	106027	3.38	Q	3-7/16	4-3/4	6	106170	6.91
E	2-3/4	4	12	106038	3.42	R	3-7/16	4-3/4	6	106181	7.17
F	2-7/8	4-1/8	6	106049	4.73	S	3-1/2	4-7/8	6	106192	7.51
G	2-7/8	4-1/8	6	106060	4.54	T	3-1/2	4-7/8	6	106203	7.88
H	2-7/8	4-1/8	6	106071	4.62	U	3-5/8	5	6	106214	8.52
I	2-7/8	4-1/8	6	106082	4.73	V	3-5/8	5	6	106225	8.82
J	2-7/8	4-1/8	6	106093	4.88	W	3-3/4	5-1/8	6	106236	9.38
K	2-15/16	4-1/4	6	106104	4.99	X	3-3/4	5-1/8	6	106247	9.95
L	2-15/16	4-1/4	6	106115	5.22	Y	3-7/8	5-1/4	6	106258	10.44
M	3-1/16	4-3/8	6	106126	5.52	Z	3-7/8	5-1/4	6	106269	10.66

WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE
#1	2-5/8	3-7/8	12	105114	3.49	#31	1-5/8	2-3/4	12	105444	1.61
#2	2-5/8	3-7/8	12	105125	3.49	#32	1-5/8	2-3/4	12	105455	1.61
#3	2-1/2	3-3/4	12	105136	3.19	#33	1-1/2	2-5/8	12	105466	1.61
#4	2-1/2	3-3/4	12	105147	3.19	#34	1-1/2	2-5/8	12	105477	1.61
#5	2-1/2	3-3/4	12	105158	3.15	#35	1-1/2	2-5/8	12	105488	1.61
#6	2-1/2	3-3/4	12	105169	3.15	#36	1-7/16	2-1/2	12	105499	1.61
#7	2-7/16	3-5/8	12	105180	3.04	#37	1-7/16	2-1/2	12	105510	1.61
#8	2-7/16	3-5/8	12	105191	3.04	#38	1-7/16	2-1/2	12	105521	1.61
#9	2-7/16	3-5/8	12	105202	3.00	#39	1-3/8	2-3/8	12	105532	1.61
#10	2-7/16	3-5/8	12	105213	2.74	#40	1-3/8	2-3/8	12	105543	1.61
#11	2-5/16	3-1/2	12	105224	2.74	#41	1-3/8	2-3/8	12	105554	1.61
#12	2-5/16	3-1/2	12	105235	2.74	#42	1-1/4	2-1/4	12	105565	1.61
#13	2-5/16	3-1/2	12	105246	2.74	#43	1-1/4	2-1/4	12	105576	1.61
#14	2-3/16	3-3/8	12	105257	2.59	#44	1-1/8	2-1/8	12	105587	1.61
#15	2-3/16	3-3/8	12	105268	2.59	#45	1-1/8	2-1/8	12	105598	1.69
#16	2-3/16	3-3/8	12	105279	2.59	#46	1-1/8	2-1/8	12	105609	1.69
#17	2-3/16	3-3/8	12	105290	2.48	#47	1	2	12	105620	1.69
#18	2-1/8	3-1/4	12	105301	2.48	#48	1	2	12	105631	1.69
#19	2-1/8	3-1/4	12	105312	2.48	#49	1	2	12	105642	1.69
#20	2-1/8	3-1/4	12	105323	2.21	#50	1	2	12	105653	1.69
#21	2-1/8	3-1/4	12	105334	2.21	#51	1	2	12	105664	1.69
#22	2	3-1/8	12	105345	2.14	#52	7/8	1-7/8	12	105675	1.69
#23	2	3-1/8	12	105356	2.14	#53	7/8	1-7/8	12	105686	1.69
#24	2	3-1/8	12	105367	2.14	#54	7/8	1-7/8	12	105697	1.80
#25	1-7/8	3	12	105378	1.84	#55	7/8	1-7/8	12	105708	1.80
#26	1-7/8	3	12	105389	1.84	#56	3/4	1-3/4	12	105719	1.80
#27	1-7/8	3	12	105400	1.84	#57	3/4	1-3/4	12	105730	1.99
#28	1-3/4	2-7/8	12	105411	1.69	#58	11/16	1-5/8	12	105741	1.99
#29	1-3/4	2-7/8	12	105422	1.69	#59	11/16	1-5/8	12	105752	1.99
#30	1-5/8	2-3/4	12	105433	1.65	#60	11/16	1-5/8	12	105763	1.99

For technical information, please see pages 254, 255.

MADE IN THE USA



HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

JOBBER LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "B"

HIGH SPEED STEEL
OXIDE FINISH



HIGH SPEED STEEL
BLACK & GOLD



HSS & COBALT DRILLS

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	BLACK & GOLD	LIST PRICE
1/16	7/8	1-7/8	12	107798	1.76	109063	2.03
5/64	1	2	12	107809	1.76	109074	2.02
3/32	1-1/4	2-1/4	12	107820	1.76	109085	2.03
7/64	1-1/2	2-5/8	12	107831	1.76	109096	2.10
1/8	1-5/8	2-3/4	12	107842	1.76	109107	2.33
9/64	1-3/4	2-7/8	12	107853	1.91	109118	2.44
5/32	2	3-1/8	12	107864	2.33	109129	2.93
11/64	2-1/8	3-1/4	12	107875	2.48	109140	3.08
3/16	2-5/16	3-1/2	12	107886	2.82	109151	3.42
13/64	2-7/16	3-5/8	12	107897	3.04	109162	3.72
7/32	2-1/2	3-3/4	12	107908	3.34	109173	4.05
15/64	2-5/8	3-7/8	12	107919	3.64	109184	4.47
1/4	2-3/4	4	12	107930	3.87	109195	4.69
17/64	2-7/8	4-1/8	6	107941	5.33	109206	6.31
9/32	2-15/16	4-1/4	6	107952	5.78	109217	6.79

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	BLACK & GOLD	LIST PRICE
19/64	3-1/16	4-3/8	6	107963	6.38	109228	7.47
5/16	3-3/16	4-1/2	6	107974	6.57	109239	7.73
21/64	3-5/16	4-5/8	6	107985	7.43	109250	8.52
11/32	3-7/16	4-3/4	6	107996	7.88	109261	9.12
23/64	3-1/2	4-7/8	6	108007	8.30	109272	9.87
3/8	3-5/8	5	6	108018	9.05	109283	10.32
25/64	3-3/4	5-1/8	6	108029	9.84	109294	11.22
13/32	3-7/8	5-1/4	6	108040	10.66	109305	12.35
27/64	3-15/16	5-3/8	6	108051	11.49	109316	13.18
7/16	4-1/16	5-1/2	6	108062	12.46	109327	14.19
29/64	4-3/16	5-5/8	6	108073	13.29	109338	15.09
15/32	4-5/16	5-3/4	6	108084	14.45	109349	16.40
31/64	4-3/8	5-7/8	6	108095	15.28	109360	17.30
1/2	4-1/2	6	6	108106	16.07	109371	18.09

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	BLACK & GOLD	LIST PRICE
A	2-5/8	3-7/8	12	108777	4.17	110042	6.58
B	2-3/4	4	12	108788	4.17	110053	6.58
C	2-3/4	4	12	108799	4.17	110064	6.58
D	2-3/4	4	12	108810	4.17	110075	6.37
E	2-3/4	4	12	108821	4.17	110086	5.31
F	2-7/8	4-1/8	6	108832	5.29	110097	7.11
G	2-7/8	4-1/8	6	108843	5.29	110108	7.69
H	2-7/8	4-1/8	6	108854	5.29	110119	7.85
I	2-7/8	4-1/8	6	108865	5.29	110130	7.85
J	2-7/8	4-1/8	6	108876	6.42	110141	8.33
K	2-15/16	4-1/4	6	108887	6.42	110152	9.29
L	2-15/16	4-1/4	6	108898	6.42	110163	8.97
M	3-1/16	4-3/8	6	108909	7.88	110174	9.87

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	BLACK & GOLD	LIST PRICE
N	3-1/16	4-3/8	6	108920	7.88	110185	9.87
O	3-3/16	4-1/2	6	108931	7.88	110196	9.87
P	3-5/16	4-5/8	6	108942	8.90	110207	11.04
Q	3-7/16	4-3/4	6	108953	8.90	110218	11.35
R	3-7/16	4-3/4	6	108964	8.90	110229	11.83
S	3-1/2	4-7/8	6	108975	10.14	110240	12.79
T	3-1/2	4-7/8	6	108986	10.14	110251	14.38
U	3-5/8	5	6	108997	10.77	110262	14.38
V	3-5/8	5	6	109008	10.77	110273	14.64
W	3-3/4	5-1/8	6	109019	12.24	110284	17.93
X	3-3/4	5-1/8	6	109030	12.24	110295	21.17
Y	3-7/8	5-1/4	6	109041	13.33	110306	21.44
Z	3-7/8	5-1/4	6	109052	13.33	110317	21.91

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.

For technical information, please see pages 254, 255.

HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



JOBBER LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "B"

HIGH SPEED STEEL
OXIDE FINISH



HIGH SPEED STEEL
BLACK & GOLD



HSS & COBALT DRILLS

WIRE SIZES						WIRE SIZES									
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	BLACK & GOLD	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	BLACK OXIDE	LIST PRICE	BLACK & GOLD	LIST PRICE
#1	2-5/8	3-7/8	12	108117	3.60	109382	6.10	#31	1-5/8	2-3/4	12	108447	2.52	109712	3.04
#2	2-5/8	3-7/8	12	108128	3.60	109393	6.10	#32	1-5/8	2-3/4	12	108458	2.52	109723	3.04
#3	2-1/2	3-3/4	12	108139	3.34	109404	5.68	#33	1-1/2	2-5/8	12	108469	2.52	109734	3.04
#4	2-1/2	3-3/4	12	108150	3.34	109415	5.68	#34	1-1/2	2-5/8	12	108480	2.52	109745	3.04
#5	2-1/2	3-3/4	12	108161	3.34	109426	5.68	#35	1-1/2	2-5/8	12	108491	2.52	109756	3.04
#6	2-1/2	3-3/4	12	108172	3.34	109437	5.68	#36	1-7/16	2-1/2	12	108502	2.52	109767	2.93
#7	2-7/16	3-5/8	12	108183	3.15	109448	4.99	#37	1-7/16	2-1/2	12	108513	2.52	109778	2.93
#8	2-7/16	3-5/8	12	108194	3.19	109459	4.99	#38	1-7/16	2-1/2	12	108524	2.52	109789	2.93
#9	2-7/16	3-5/8	12	108205	3.19	109470	4.99	#39	1-3/8	2-3/8	12	108535	2.52	109800	2.93
#10	2-7/16	3-5/8	12	108216	2.89	109481	4.88	#40	1-3/8	2-3/8	12	108546	2.52	109811	2.93
#11	2-5/16	3-1/2	12	108227	2.89	109492	4.51	#41	1-3/8	2-3/8	12	108557	2.40	109822	2.93
#12	2-5/16	3-1/2	12	108238	2.89	109503	4.51	#42	1-1/4	2-1/4	12	108568	2.40	109833	2.93
#13	2-5/16	3-1/2	12	108249	3.19	109514	4.35	#43	1-1/4	2-1/4	12	108579	2.40	109844	2.93
#14	2-3/16	3-3/8	12	108260	3.19	109525	4.35	#44	1-1/8	2-1/8	12	108590	2.40	109855	2.93
#15	2-3/16	3-3/8	12	108271	3.19	109536	4.35	#45	1-1/8	2-1/8	12	108601	2.40	109866	2.93
#16	2-3/16	3-3/8	12	108282	3.19	109547	4.35	#46	1-1/8	2-1/8	12	108612	2.40	109877	2.93
#17	2-3/16	3-3/8	12	108293	3.19	109558	4.35	#47	1	2	12	108623	2.40	109888	2.93
#18	2-1/8	3-1/4	12	108304	3.19	109569	3.82	#48	1	2	12	108634	2.40	109899	2.93
#19	2-1/8	3-1/4	12	108315	3.04	109580	3.82	#49	1	2	12	108645	2.40	109910	2.93
#20	2-1/8	3-1/4	12	108326	3.04	109591	3.82	#50	1	2	12	108656	2.40	109921	2.93
#21	2-1/8	3-1/4	12	108337	2.85	109602	3.79	#51	1	2	12	108667	2.40	109932	2.93
#22	2	3-1/8	12	108348	2.85	109613	3.79	#52	7/8	1-7/8	12	108678	2.40	109943	2.74
#23	2	3-1/8	12	108359	2.85	109624	3.68	#53	7/8	1-7/8	12	108689	2.40	109954	2.74
#24	2	3-1/8	12	108370	2.85	109635	3.68	#54	7/8	1-7/8	12	108700	2.40	109965	2.74
#25	1-7/8	3	12	108381	2.85	109646	3.68	#55	7/8	1-7/8	12	108711	2.40	109976	2.74
#26	1-7/8	3	12	108392	2.85	109657	3.68	#56	3/4	1-3/4	12	108722	2.40	109987	2.74
#27	1-7/8	3	12	108403	2.85	109668	3.57	#57	3/4	1-3/4	12	108733	2.40	109998	2.74
#28	1-3/4	2-7/8	12	108414	2.85	109679	3.57	#58	11/16	1-5/8	12	108744	2.40	110009	2.74
#29	1-3/4	2-7/8	12	108425	2.29	109690	3.49	#59	11/16	1-5/8	12	108755	2.40	110020	2.74
#30	1-5/8	2-3/4	12	108436	2.29	109701	3.04	#60	11/16	1-5/8	12	108766	2.40	110031	2.74

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.

For technical information, please see pages 254, 255.

MADE IN THE USA



M42 Cobalt Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

JOBBER LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "J"

NAS 907 - M42 COBALT



NAS 907 - M42 COBALT
ALTIN COATED



HSS & COBALT DRILLS

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/16	7/8	1-7/8	12	111923	3.02	235266	5.42
5/64	1	2	12	111934	3.02	235277	5.42
3/32	1-1/4	2-1/4	12	111945	3.02	235288	5.42
7/64	1-1/2	2-5/8	12	111956	3.17	235299	5.73
1/8	1-5/8	2-3/4	12	111967	3.90	235310	7.02
9/64	1-3/4	2-7/8	12	111978	3.90	235321	7.02
5/32	2	3-1/8	12	111989	4.36	235332	7.87
11/64	2-1/8	3-1/4	12	112000	4.59	235343	8.30
3/16	2-5/16	3-1/2	12	112011	5.16	235354	9.32
13/64	2-7/16	3-5/8	12	112022	6.20	235365	11.19
7/32	2-1/2	3-3/4	12	112033	6.77	235376	12.24
15/64	2-5/8	3-7/8	12	112044	7.19	235387	12.98
1/4	2-3/4	4	12	112055	7.69	235398	13.92
17/64	2-7/8	4-1/8	6	112066	8.72	235409	15.75
9/32	2-15/16	4-1/4	6	112077	9.14	235420	16.53

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
19/64	3-1/16	4-3/8	6	112088	11.13	235431	20.11
5/16	3-3/16	4-1/2	6	112099	11.86	235442	21.40
21/64	3-5/16	4-5/8	6	112110	13.12	235453	23.70
11/32	3-7/16	4-3/4	6	112121	14.42	235464	26.04
23/64	3-1/2	4-7/8	6	112132	16.52	235475	29.82
3/8	3-5/8	5	6	112143	16.52	235486	29.82
25/64	3-3/4	5-1/8	6	112154	18.78	235497	33.91
13/32	3-7/8	5-1/4	6	112165	19.58	235508	35.40
27/64	3-15/16	5-3/8	6	112176	21.65	235519	39.14
7/16	4-1/16	5-1/2	6	112187	22.14	235530	40.03
29/64	4-3/16	5-5/8	6	112198	26.58	235541	48.03
15/32	4-5/16	5-3/4	6	112209	27.08	235552	48.92
31/64	4-3/8	5-7/8	6	112220	27.23	235563	49.19
1/2	4-1/2	6	6	112231	27.23	235574	49.19

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
A	2-5/8	3-7/8	12	113122	8.15	236245	14.70
B	2-3/4	4	12	113133	9.41	236256	16.96
C	2-3/4	4	12	113144	9.41	236267	16.96
D	2-3/4	4	12	113155	10.59	236278	19.10
E	2-3/4	4	12	113166	7.69	236289	13.92
F	2-7/8	4-1/8	6	113177	9.41	236300	16.96
G	2-7/8	4-1/8	6	113188	9.41	236311	16.96
H	2-7/8	4-1/8	6	113199	10.59	236322	19.10
I	2-7/8	4-1/8	6	113210	10.59	236333	19.10
J	2-7/8	4-1/8	6	113221	10.59	236344	19.10
K	2-15/16	4-1/4	6	113232	10.59	236355	19.10
L	2-15/16	4-1/4	6	113243	12.01	236366	21.71
M	3-1/16	4-3/8	6	113254	12.74	236377	23.04

LETTER SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
N	3-1/16	4-3/8	6	113265	12.74	236388	23.04
O	3-3/16	4-1/2	6	113276	14.07	236399	25.46
P	3-5/16	4-5/8	6	113287	14.95	236410	27.05
Q	3-7/16	4-3/4	6	113298	15.53	236421	28.03
R	3-7/16	4-3/4	6	113309	15.53	236432	28.03
S	3-1/2	4-7/8	6	113320	19.01	236443	34.38
T	3-1/2	4-7/8	6	113331	19.01	236454	34.38
U	3-5/8	5	6	113342	19.01	236465	34.38
V	3-5/8	5	6	113353	20.96	236476	37.89
W	3-3/4	5-1/8	6	113364	20.96	236487	37.89
X	3-3/4	5-1/8	6	113375	20.96	236498	37.89
Y	3-7/8	5-1/4	6	113386	22.22	236509	40.15
Z	3-7/8	5-1/4	6	113397	24.17	236520	43.66

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.

All cobalt drills have identification ring on shank.
For coating information see page 6. For technical information, please see pages 254, 255.

M42 Cobalt Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



JOBBER LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "J"

NAS 907 - M42 COBALT



NAS 907 - M42 COBALT
ALTIN COATED



HSS & COBALT DRILLS

WIRE SIZES							WIRE SIZES								
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
#1	2-5/8	3-7/8	12	112242	8.22	235585	14.89	#31	1-5/8	2-3/4	12	112572	3.48	235915	6.32
#2	2-5/8	3-7/8	12	112253	8.22	235596	14.89	#32	1-5/8	2-3/4	12	112583	3.44	235926	6.24
#3	2-1/2	3-3/4	12	112264	7.69	235607	13.92	#33	1-1/2	2-5/8	12	112594	3.33	235937	6.00
#4	2-1/2	3-3/4	12	112275	7.69	235618	13.92	#34	1-1/2	2-5/8	12	112605	3.33	235948	6.00
#5	2-1/2	3-3/4	12	112286	7.69	235629	13.92	#35	1-1/2	2-5/8	12	112616	3.33	235959	6.00
#6	2-1/2	3-3/4	12	112297	7.69	235640	13.92	#36	1-7/16	2-1/2	12	112627	3.29	235970	5.93
#7	2-7/16	3-5/8	12	112308	6.00	235651	10.84	#37	1-7/16	2-1/2	12	112638	3.29	235981	5.93
#8	2-7/16	3-5/8	12	112319	6.00	235662	10.84	#38	1-7/16	2-1/2	12	112649	3.06	235992	5.67
#9	2-7/16	3-5/8	12	112330	6.00	235673	10.84	#39	1-3/8	2-3/8	12	112660	3.06	236003	5.67
#10	2-7/16	3-5/8	12	112341	6.00	235684	10.84	#40	1-3/8	2-3/8	12	112671	3.06	236014	5.67
#11	2-5/16	3-1/2	12	112352	6.00	235695	10.84	#41	1-3/8	2-3/8	12	112682	3.02	236025	5.67
#12	2-5/16	3-1/2	12	112363	6.00	235706	10.84	#42	1-1/4	2-1/4	12	112693	2.98	236036	5.67
#13	2-5/16	3-1/2	12	112374	5.89	235717	10.64	#43	1-1/4	2-1/4	12	112704	2.98	236047	5.67
#14	2-3/16	3-3/8	12	112385	5.89	235728	10.64	#44	1-1/8	2-1/8	12	112715	2.98	236058	5.67
#15	2-3/16	3-3/8	12	112396	5.89	235739	10.64	#45	1-1/8	2-1/8	12	112726	2.98	236069	5.67
#16	2-3/16	3-3/8	12	112407	5.35	235750	9.71	#46	1-1/8	2-1/8	12	112737	2.98	236080	5.67
#17	2-3/16	3-3/8	12	112418	5.24	235761	9.47	#47	1	2	12	112748	2.98	236091	5.67
#18	2-1/8	3-1/4	12	112429	4.78	235772	8.65	#48	1	2	12	112759	2.98	236102	5.67
#19	2-1/8	3-1/4	12	112440	4.67	235783	8.42	#49	1	2	12	112770	2.98	236113	5.67
#20	2-1/8	3-1/4	12	112451	4.67	235794	8.42	#50	1	2	12	112781	2.98	236124	5.67
#21	2-1/8	3-1/4	12	112462	4.63	235805	8.34	#51	1	2	12	112792	2.98	236135	5.67
#22	2	3-1/8	12	112473	4.63	235816	8.34	#52	7/8	1-7/8	12	112803	2.98	236146	5.67
#23	2	3-1/8	12	112484	4.63	235827	8.34	#53	7/8	1-7/8	12	112814	3.33	236157	6.04
#24	2	3-1/8	12	112495	4.63	235838	8.34	#54	7/8	1-7/8	12	112825	3.33	236168	6.04
#25	1-7/8	3	12	112506	4.25	235849	7.64	#55	7/8	1-7/8	12	112836	3.33	236179	6.04
#26	1-7/8	3	12	112517	4.17	235860	7.56	#56	3/4	1-3/4	12	112847	3.75	236190	6.82
#27	1-7/8	3	12	112528	4.17	235871	7.56	#57	3/4	1-3/4	12	112858	3.75	236201	6.82
#28	1-3/4	2-7/8	12	112539	3.90	235882	7.09	#58	11/16	1-5/8	12	112869	3.75	236212	6.82
#29	1-3/4	2-7/8	12	112550	3.79	235893	6.86	#59	11/16	1-5/8	12	112880	3.75	236223	6.82
#30	1-5/8	2-3/4	12	112561	3.60	235904	6.43	#60	11/16	1-5/8	12	112891	3.75	236234	6.82

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.

- ALTIN coating for use in high temperature drilling applications
- Coating allows for increased machining speeds from 50% up to 200%
- Used in drilling Stainless Steels, Nickel-based and Titanium alloys
- Not recoended for Aluminum

All cobalt drills have identification ring on shank.
For coating information see page 6. For technical information, please see pages 254, 255.

MADE IN THE USA



HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

TAPER LENGTH - 118° POINT



OXIDE FINISH

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	OXIDE	LIST PRICE
3/64	1-1/8	2-1/4	12	113683	12.02
1/16	1-3/4	3	12	113694	12.02
5/64	2	3-3/4	12	113705	12.02
3/32	2-1/4	4-1/4	12	113716	11.20
7/64	2-1/2	4-5/8	12	113727	11.70
1/8	2-3/4	5-1/8	12	113738	12.04
9/64	3	5-3/8	12	113749	16.08
5/32	3	5-3/8	12	113760	16.24
11/64	3-3/8	5-3/4	12	113771	17.04
3/16	3-3/8	5-3/4	12	113782	15.87
13/64	3-5/8	6	12	113793	19.36
7/32	3-5/8	6	12	113804	20.87
15/64	3-3/4	6-1/8	12	113815	20.87
1/4	3-3/4	6-1/8	12	113826	18.01
17/64	3-7/8	6-1/4	6	113837	21.84
9/32	3-7/8	6-1/4	6	113848	21.84
19/64	4	6-3/8	6	113859	23.78
5/16	4	6-3/8	6	113870	23.78
21/64	4-1/8	6-1/2	6	113881	23.78
11/32	4-1/8	6-1/2	6	113892	23.78
23/64	4-1/4	6-3/4	6	113903	28.03
3/8	4-1/4	6-3/4	6	113914	28.03
25/64	4-3/8	6-3/4	6	113925	31.90
13/32	4-3/8	7	6	113936	31.90
27/64	4-5/8	7-1/4	6	113947	33.84
7/16	4-5/8	7-1/4	6	113958	33.84
29/64	4-3/4	7-1/2	6	113969	38.51
15/32	4-3/4	7-1/2	6	113980	38.51
31/64	4-3/4	7-3/4	6	113991	40.74
1/2	4-3/4	7-3/4	6	114002	40.74
33/64	4-3/4	8	1	114013	54.12
17/32	4-3/4	8	1	114024	54.12
35/64	4-7/8	8-1/4	1	114035	56.86
9/16	4-7/8	8-1/4	1	114046	56.86

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OAL	PKG. QTY.	OXIDE	LIST PRICE
37/64	4-7/8	8-3/4	1	114057	66.54
19/32	4-7/8	8-3/4	1	114068	66.54
39/64	4-7/8	8-3/4	1	114079	68.94
5/8	4-7/8	8-3/4	1	114090	68.94
41/64	5-1/8	9	1	114101	78.49
21/32	5-1/8	9	1	114112	78.49
43/64	5-3/8	9-1/4	1	114123	92.84
11/16	5-3/8	9-1/4	1	114134	92.84
45/64	5-5/8	9-1/2	1	114145	97.09
23/32	5-5/8	9-1/2	1	114156	97.09
47/64	5-7/8	9-3/4	1	114167	104.41
3/4	5-7/8	9-3/4	1	114178	104.41
49/64	6	9-7/8	1	114189	113.13
25/32	6	9-7/8	1	114200	113.13
51/64	6-1/8	10	1	114211	122.13
13/16	6-1/8	10	1	114222	122.13
53/64	6-1/8	10	1	114233	128.61
27/32	6-1/8	10	1	114244	128.61
55/64	6-1/8	10	1	114255	134.97
7/8	6-1/8	10	1	114266	134.97
57/64	6-1/8	10	1	114277	140.69
29/32	6-1/8	10	1	114288	140.69
59/64	6-1/8	10-3/4	1	114299	152.94
15/16	6-1/8	10-3/4	1	114310	152.94
61/64	6-3/8	11	1	114321	168.81
31/32	6-3/8	11	1	114332	168.81
63/64	6-3/8	11	1	114343	175.96
1	6-3/8	11	1	114354	175.96
1-1/16	6-5/8	11-1/4	1	114376	218.05
1-1/8	7-1/8	11-3/4	1	114398	242.71
1-3/16	7-3/8	12	1	114420	284.46
1-1/4	7-7/8	12-1/2	1	114442	304.66
1-5/16	8-5/8	14-1/4	1	114464	363.53
1-3/8	8-7/8	14-1/2	1	114486	389.88

For technical information, please see pages 254, 255.

HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

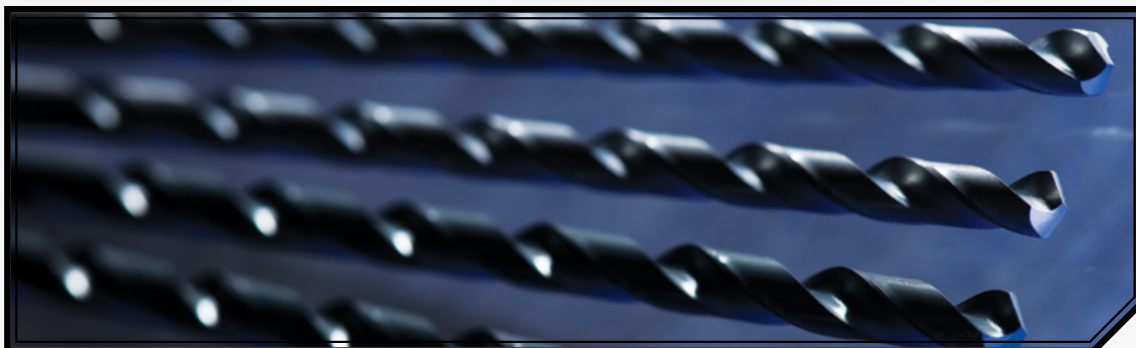


TAPER LENGTH - 118° POINT



OXIDE FINISH

WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	OAL	PKG. QTY.	OXIDE	LIST PRICE	SIZE	FLUTE LENGTH	OAL	PKG. QTY.	OXIDE	LIST PRICE
#1	3-3/4	6-1/8	12	114574	21.88	#21	3-3/8	5-3/4	12	114794	19.23
#2	3-3/4	6-1/8	12	114585	21.88	#22	3-3/8	5-3/4	12	114805	19.23
#3	3-5/8	6	12	114596	21.17	#23	3	5-3/8	12	114816	19.23
#4	3-5/8	6	12	114607	21.17	#24	3	5-3/8	12	114827	19.23
#5	3-5/8	6	12	114618	21.17	#25	3	5-3/8	12	114838	19.23
#6	3-5/8	6	12	114629	21.17	#26	3	5-3/8	12	114849	19.23
#7	3-5/8	6	12	114640	21.17	#27	3	5-3/8	12	114860	19.23
#8	3-5/8	6	12	114651	21.17	#28	3	5-3/8	12	114871	19.23
#9	3-5/8	6	12	114662	21.17	#29	3	5-3/8	12	114882	19.23
#10	3-5/8	6	12	114673	21.17	#30	3	5-3/8	12	114893	19.23
#11	3-5/8	6	12	114684	21.17	#31	2-3/4	5-1/8	12	114904	18.85
#12	3-5/8	6	12	114695	21.17	#32	2-3/4	5-1/8	12	114915	18.85
#13	3-3/8	5-3/4	12	114706	19.23	#33	2-3/4	5-1/8	12	114926	18.85
#14	3-3/8	5-3/4	12	114717	19.23	#34	2-3/4	5-1/8	12	114937	18.85
#15	3-3/8	5-3/4	12	114728	19.23	#35	2-3/4	5-1/8	12	114948	18.85
#16	3-3/8	5-3/4	12	114739	19.23	#36	2-1/2	4-5/8	12	114959	14.10
#17	3-3/8	5-3/4	12	114750	19.23	#37	2-1/2	4-5/8	12	114970	14.10
#18	3-3/8	5-3/4	12	114761	19.23	#38	2-1/2	4-5/8	12	114981	14.10
#19	3-3/8	5-3/4	12	114772	19.23	#39	2-1/2	4-5/8	12	114992	12.37
#20	3-3/8	5-3/4	12	114783	19.23	#40	2-1/2	4-5/8	12	115003	12.37



Highest quality American Made drills outlast the competition

For technical information, please see pages 254, 255.

MADE IN THE USA

HSS & COBALT DRILLS



HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

TAPER SHANK - 118° POINT



OXIDE FINISH

HSS & COBALT DRILLS

FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	MORSE TAPER	FLUTE LENGTH	OAL	OXIDE	LIST PRICE	SIZE	MORSE TAPER	FLUTE LENGTH	OAL	OXIDE	LIST PRICE
3/16	1	2-1/2	5-3/4	115201	42.55	13/16	3	6-1/8	10-3/4	115641	142.63
13/64	1	2-3/4	6	115212	42.55	53/64	3	6-1/8	10-3/4	115652	157.99
7/32	1	2-3/4	6	115223	42.55	27/32	3	6-1/8	10-3/4	115663	153.74
15/64	1	2-7/8	6-1/8	115234	42.55	55/64	3	6-1/8	10-3/4	115674	173.48
1/4	1	2-7/8	6-1/8	115245	42.55	7/8	3	6-1/8	10-3/4	115685	158.41
17/64	1	3	6-1/4	115256	42.55	57/64	3	6-1/8	10-3/4	115696	167.29
9/32	1	3	6-1/4	115267	42.55	29/32	3	6-1/8	10-3/4	115707	167.29
19/64	1	3-1/8	6-3/8	115278	45.07	59/64	3	6-1/8	10-3/4	115718	169.60
5/16	1	3-1/8	6-3/8	115289	47.39	15/16	3	6-1/8	10-3/4	115729	158.96
21/64	1	3-1/4	6-1/2	115300	47.39	61/64	3	6-3/8	11	115740	174.23
11/32	1	3-1/4	6-1/2	115311	47.39	31/32	3	6-3/8	11	115751	173.06
23/64	1	3-1/2	6-3/4	115322	48.36	63/64	3	6-3/8	11	115762	184.88
3/8	1	3-1/2	6-3/4	115333	48.36	1	3	6-3/8	11	115773	175.96
25/64	1	3-5/8	7	115344	57.45	1-1/64	3	6-1/2	11-1/8	115784	204.58
13/32	1	3-5/8	7	115355	57.45	1-1/32	3	6-1/2	11-1/8	115795	203.06
27/64	1	3-7/8	7-1/4	115366	61.87	1-3/64	3	6-5/8	11-1/4	115806	212.74
7/16	1	3-7/8	7-1/4	115377	61.87	1-1/16	3	6-5/8	11-1/4	115817	203.06
29/64	1	4-1/8	7-1/2	115388	61.87	1-5/64	4	6-7/8	12-1/2	115828	241.70
15/32	1	4-1/8	7-1/2	115399	61.87	1-3/32	4	6-7/8	12-1/2	115839	241.70
31/64	2	4-3/8	8-1/4	115410	67.67	1-7/64	4	7-1/8	12-3/4	115850	251.38
1/2	2	4-3/8	8-1/4	115421	63.34	1-1/8	4	7-1/8	12-3/4	115861	251.38
33/64	2	4-5/8	8-1/2	115432	73.02	1-9/64	4	7-1/4	12-7/8	115872	270.74
17/32	2	4-5/8	8-1/2	115443	75.42	1-5/32	4	7-1/4	12-7/8	115883	261.06
35/64	2	4-7/8	8-3/4	115454	79.46	1-11/64	4	7-3/8	13	115894	270.74
9/16	2	4-7/8	8-3/4	115465	77.35	1-3/16	4	7-3/8	13	115905	270.74
37/64	2	4-7/8	8-3/4	115476	84.59	1-13/64	4	7-1/2	13-1/8	115916	290.05
19/32	2	4-7/8	8-3/4	115487	83.16	1-7/32	4	7-1/2	13-1/8	115927	290.05
39/64	2	4-7/8	8-3/4	115498	88.00	1-1/4	4	7-7/8	13-1/2	115949	303.60
5/8	2	4-7/8	8-3/4	115509	84.13	1-5/16	4	8-5/8	14-1/4	115982	373.21
41/64	2	5-1/8	9	115520	96.71	1-3/8	4	8-7/8	14-1/2	116004	398.34
21/32	2	5-1/8	9	115531	94.78	1-7/16	4	9-1/8	14-3/4	116026	437.02
43/64	2	5-3/8	9-1/4	115542	104.41	1-1/2	4	9-3/8	15	116048	458.31
11/16	2	5-3/8	9-1/4	115553	98.61	1-9/16	5	9-5/8	16-5/8	116070	558.85
45/64	2	5-5/8	9-1/2	115564	108.29	1-5/8	5	10	17	116092	603.34
23/32	2	5-5/8	9-1/2	115575	104.62	1-11/16	5	10-1/8	17-1/8	116114	665.25
47/64	2	5-7/8	9-3/4	115586	116.03	1-3/4	5	10-1/8	17-1/8	116136	707.79
3/4	2	5-7/8	9-3/4	115597	115.06	1-13/16	5	10-1/8	17-1/8	116158	759.98
49/64	2	6	9-7/8	115608	138.67	1-7/8	5	10-3/8	17-3/8	116180	792.85
25/32	2	6	9-7/8	115619	137.87	1-15/16	5	10-3/8	17-3/8	116202	854.76
51/64	3	6-1/8	10-3/4	115630	151.80	2	5	10-3/8	17-3/8	116224	885.69

Taper shank drills sold individually.

For technical information, please see pages 254, 255.

HSS Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



EXTRA LENGTH - STRAIGHT SHANK - 118° POINT - 12" O.A.L.



BRIGHT FINISH

FRACTIONAL SIZES					FRACTIONAL SIZES				
SIZE	FLUTE LENGTH	OAL	BRIGHT	LIST PRICE	SIZE	FLUTE LENGTH	OAL	BRIGHT	LIST PRICE
1/8	9	12	117863	47.52	3/8	9	12	118039	63.46
9/64	9	12	117874	68.87	25/64	9	12	118050	96.04
5/32	9	12	117885	62.63	13/32	9	12	118061	96.04
11/64	9	12	117896	53.41	27/64	9	12	118072	96.04
3/16	9	12	117907	53.41	7/16	9	12	118083	82.02
13/64	9	12	117918	64.72	29/64	9	12	118094	100.23
7/32	9	12	117929	57.95	15/32	9	12	118105	90.19
15/64	9	12	117940	57.95	31/64	9	12	118116	92.28
1/4	9	12	117951	59.92	1/2	9	12	118127	92.28
17/64	9	12	117962	62.02	17/32	9	12	118149	116.91
9/32	9	12	117973	62.02	9/16	9	12	118171	116.91
19/64	9	12	117984	64.29	19/32	9	12	118193	146.13
5/16	9	12	117995	64.29	5/8	9	12	118215	141.98
21/64	9	12	118006	68.87	11/16	9	12	118259	150.32
11/32	9	12	118017	68.87	3/4	9	12	118303	169.32
23/64	9	12	118028	68.87					

HSS & COBALT DRILLS

SCREW EXTRACTORS



SIZE	FOR SCREW & BOLT SIZES	PIPE SIZE	PKG. QTY.	ITEM#	LIST PRICE
1	3/16 - 1/4		1	115014	7.90
2	1/4 - 5/16		1	115025	8.43
3	5/16 - 7/16		1	115036	10.22
4	7/16 - 9/16	1/8	1	115047	10.83
5	9/16 - 3/4	1/4	1	115058	13.54
6	3/4-1	3/8	1	115069	29.74
7	1 - 1-3/8	1/2	1	115080	47.87
8	1-3/8 - 1-3/4	3/4	1	115091	65.12
9	1-3/4 - 2-1/8	1	1	115102	113.25
10	2-1/8 - 2-1/2	1-1/4	1	115113	293.88
SET	SIZES 1-5		1	115146	50.88

All tools sold individually.
For technical information, please see pages 254, 255.

MADE IN THE USA



Aircraft Extension Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

6" OVERALL LENGTH - 135° SPLIT POINT



HIGH SPEED STEEL - NAS 907 - TYPE "B"
OXIDE FINISH



M42 COBALT - NAS 907 - TYPE "J"

HSS & COBALT DRILLS

FRACTIONAL SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
3/32	6	1-1/4	12	116433	7.63	116741	12.62
7/64	6	1-1/2	12	116444	7.61	116752	14.31
1/8	6	1-5/8	12	116455	7.48	116763	11.74
9/64	6	1-3/4	12	116466	8.92	116774	16.05
5/32	6	2	12	116477	9.87	116785	16.05
11/64	6	2-1/8	12	116488	10.88	116796	17.67
3/16	6	2-5/16	12	116499	10.77	116807	14.87
13/64	6	2-7/16	12	116510	13.13	116818	21.88
7/32	6	2-1/2	12	116521	13.13	116829	22.44
15/64	6	2-5/8	12	116532	14.59	116840	23.85
1/4	6	2-3/4	12	116543	12.97	116851	23.28
17/64	6	2-7/8	6	116554	33.10	-	-
9/32	6	2-15/16	6	116565	34.22	-	-
19/64	6	3-1/16	6	116576	40.40	-	-
5/16	6	3-3/16	6	116587	43.76	-	-
21/64	6	3-5/16	6	116598	47.13	-	-
11/32	6	3-7/16	6	116609	47.13	-	-
23/64	6	3-1/2	6	116620	52.46	-	-
3/8	6	3-5/8	6	116631	53.30	-	-

WIRE SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
#1	6	2-5/8	12	116642	15.15	116862	24.97
#2	6	2-5/8	12	116653	15.15	116873	24.97
#10	6	2-7/16	12	116664	11.78	116884	17.02
#11	6	2-5/16	12	116675	11.78	116895	16.36
#20	6	2-1/8	12	116686	9.82	116906	15.49
#21	6	2-1/8	12	116697	10.32	116917	15.49
#29	6	1-3/4	12	116708	10.94	116928	17.11
#30	6	1-5/8	12	116719	8.42	116939	11.78
#40	6	1-5/8	12	116730	6.90	116950	10.71

For technical information, please see pages 254, 255.

Aircraft Extension Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



12" OVERALL LENGTH - 135° SPLIT POINT



HIGH SPEED STEEL - NAS 907 - TYPE "B"
OXIDE FINISH



M42 COBALT - NAS 907 - TYPE "J"

HSS & COBALT DRILLS

FRACTIONAL SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1/8	12	1-5/8	12	116961	21.66	118314	35.91
9/64	12	1-3/4	12	116972	21.86	118325	39.55
5/32	12	2	12	116983	21.86	118336	36.47
11/64	12	2-1/8	12	116994	24.63	118347	39.27
3/16	12	2-5/16	12	117005	24.38	118358	38.15
13/64	12	2-7/16	12	117016	27.97	118369	49.93
7/32	12	2-1/2	12	117027	27.68	118380	45.45
15/64	12	2-5/8	12	117038	31.19	118391	48.25
1/4	12	2-3/4	12	117049	33.94	118402	44.13
17/64	12	2-7/8	6	117060	39.27	-	-
9/32	12	2-15/16	6	117071	38.99	-	-
19/64	12	3-1/16	6	117082	43.64	-	-
5/16	12	3-3/16	6	117093	47.77	-	-
21/64	12	3-5/16	6	117104	51.90	-	-
11/32	12	3-7/16	6	117115	51.31	-	-
23/64	12	3-1/2	6	117126	58.14	-	-
3/8	12	3-5/8	6	117137	58.68	-	-
25/64	12	3-3/4	6	117148	65.45	-	-
13/32	12	3-7/8	6	117159	63.10	-	-
27/64	12	3-15/16	6	117170	69.58	-	-
7/16	12	4-1/16	6	117181	69.71	-	-
29/64	12	4-3/16	6	117192	78.64	-	-
15/32	12	4-5/16	6	117203	81.49	-	-
31/64	12	4-3/8	6	117214	84.50	-	-
1/2	12	4-1/2	6	117225	83.59	-	-

WIRE SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
#1	12	2-5/8	12	117236	33.97	118413	53.86
#10	12	2-7/16	12	117247	27.31	118424	41.52
#11	12	2-5/16	12	117258	27.56	118435	40.12
#20	12	2-1/8	12	117269	24.79	118446	37.03
#21	12	2-1/8	12	117280	24.34	118457	37.03
#29	12	1-3/4	12	117291	25.79	118468	38.43
#30	12	1-5/8	12	117302	24.34	118479	35.08
#40	12	1-3/8	12	117313	24.34	118490	38.43

For technical information, please see pages 254, 255.

MADE IN THE USA



Silver & Deming Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HSS & COBALT DRILLS



HIGH SPEED STEEL
1/2" ROUND SHANK - 118° POINT

SIZE	OAL	ITEM#	LIST PRICE
33/64	6	120591	34.42
17/32	6	120602	34.42
35/64	6	120613	36.33
9/16	6	120624	36.33
37/64	6	120635	39.01
19/32	6	120646	39.01
39/64	6	120657	41.00
5/8	6	120668	41.00
41/64	6	120679	42.95
21/32	6	120690	42.95
43/64	6	120701	45.67
11/16	6	120712	45.67
45/64	6	120723	45.86
23/32	6	120734	45.86
47/64	6	120745	50.03

SIZE	OAL	ITEM#	LIST PRICE
3/4	6	120756	50.18
49/64	6	120767	53.20
25/32	6	120778	53.20
51/64	6	120789	55.92
13/16	6	120800	55.92
53/64	6	120811	58.10
27/32	6	120822	58.10
55/64	6	120833	60.01
7/8	6	120844	60.01
57/64	6	120855	62.46
29/32	6	120866	62.46
59/64	6	120877	68.00
15/16	6	120888	68.00
61/64	6	120899	71.29
31/32	6	120910	71.29

SIZE	OAL	ITEM#	LIST PRICE
63/64	6	120921	79.47
1	6	120932	79.47
1-1/32	6	120943	106.63
1-1/16	6	120954	106.63
1-3/32	6	120965	113.71
1-1/8	6	120976	121.47
1-5/32	6	120987	121.47
1-3/16	6	120998	134.47
1-7/32	6	121009	148.82
1-1/4	6	121020	148.82
1-5/16	6	121031	157.42
1-3/8	6	121042	181.32
1-7/16	6	121053	199.38
1-1/2	6	121064	219.07



HIGH SPEED STEEL
1/2" SHANK - 3 FLATS - 118° POINT

SIZE	OAL	ITEM#	LIST PRICE
33/64	6	121075	37.52
17/32	6	121086	37.52
35/64	6	121097	39.89
9/16	6	121108	39.89
37/64	6	121119	42.87
19/32	6	121130	42.87
39/64	6	121141	44.86
5/8	6	121152	44.86
41/64	6	121163	47.85
21/32	6	121174	47.85
43/64	6	121185	49.76

SIZE	OAL	ITEM#	LIST PRICE
11/16	6	121196	49.76
45/64	6	121207	50.41
23/32	6	121218	50.41
47/64	6	121229	54.92
3/4	6	121240	54.92
49/64	6	121251	58.59
25/32	6	121262	58.59
51/64	6	121273	64.21
13/16	6	121284	64.21
53/64	6	121295	66.89
27/32	6	121306	66.89

SIZE	OAL	ITEM#	LIST PRICE
55/64	6	121317	71.37
7/8	6	121328	71.37
57/64	6	121339	74.04
29/32	6	121350	74.04
59/64	6	121361	75.80
15/16	6	121372	75.80
61/64	6	121383	79.36
31/32	6	121394	79.36
63/64	6	121405	86.97
1	6	121416	86.97

All S & D drills have 3" flute length.
For technical information, please see pages 254, 255.

Silver & Deming Drills

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH SPEED STEEL - BLACK & GOLD
1/2" SHANK - 3 FLATS - 118° SPLIT POINT

SIZE	OAL	ITEM#	LIST PRICE
33/64	6	121779	43.94
17/32	6	121790	43.94
35/64	6	121801	46.55
9/16	6	121812	46.55
37/64	6	121823	49.41
19/32	6	121834	49.41
39/64	6	121845	51.36
5/8	6	121856	51.36
41/64	6	121867	54.50
21/32	6	121878	54.50
43/64	6	121889	56.83

SIZE	OAL	ITEM#	LIST PRICE
11/16	6	121900	56.83
45/64	6	121911	59.20
23/32	6	121922	59.20
47/64	6	121933	61.77
3/4	6	121944	61.77
49/64	6	121955	65.21
25/32	6	121966	65.21
51/64	6	121977	69.38
13/16	6	121988	69.38
53/64	6	121999	72.40
27/32	6	122010	72.40

SIZE	OAL	ITEM#	LIST PRICE
55/64	6	122021	74.35
7/8	6	122032	74.35
57/64	6	122043	77.60
29/32	6	122054	77.60
59/64	6	122065	83.41
15/16	6	122076	83.41
61/64	6	122087	89.84
31/32	6	122098	89.84
63/64	6	122109	94.35
1	6	122120	94.35

HSS & COBALT DRILLS



M42 COBALT
1/2" ROUND SHANK - 135° SPLIT POINT

SIZE	OAL	ITEM#	LIST PRICE
33/64	6	121427	68.46
17/32	6	121438	68.46
35/64	6	121449	82.38
9/16	6	121460	82.38
37/64	6	121471	85.17
19/32	6	121482	85.17
39/64	6	121493	87.35
5/8	6	121504	87.35
41/64	6	121515	91.64
21/32	6	121526	91.64
43/64	6	121537	93.51

SIZE	OAL	ITEM#	LIST PRICE
11/16	6	121548	93.51
45/64	6	121559	98.64
23/32	6	121570	98.64
47/64	6	121581	102.92
3/4	6	121592	102.92
49/64	6	121603	107.62
25/32	6	121614	107.62
51/64	6	121625	110.49
13/16	6	121636	110.49
53/64	6	121647	119.40
27/32	6	121658	119.40

SIZE	OAL	ITEM#	LIST PRICE
55/64	6	121669	119.40
7/8	6	121680	119.40
57/64	6	121691	123.95
29/32	6	121702	123.95
59/64	6	121713	129.31
15/16	6	121724	129.31
61/64	6	121735	136.46
31/32	6	121746	136.46
63/64	6	121757	154.85
1	6	121768	154.85

All S & D drills have 3" flute length.
For technical information, please see pages 254, 255.

MADE IN THE USA



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.0135	#80	.0135	3/4	3/8	2	182708	40.00
.0140		.0135	3/4	3/8	2	172346	49.80
.0145	#79	.0145	3/4	3/8	2	182719	40.00
.0150		.0156	3/4	3/8	2	172357	49.80
.0155		.0156	3/4	3/8	2	172368	49.80
.0156	1/64	.0156	3/4	3/8	2	182730	40.00
.0160	#78	.0160	7/8	3/8	2	182741	40.00
.0165		.0180	7/8	3/8	2	172379	49.80
.0170		.0180	7/8	3/8	2	172390	49.80
.0175		.0180	7/8	3/8	2	172401	49.80
.0180	#77	.0180	7/8	3/8	2	182752	40.00
.0185		.0200	7/8	3/8	2	172412	49.80
.0190		.0200	7/8	3/8	2	172423	49.80
.0195		.0200	7/8	3/8	2	172434	49.80
.0200	#76	.0200	7/8	3/8	2	182763	40.00
.0205		.0210	1	1/2	3	172445	45.35
.0210	#75	.0210	1	1/2	3	182774	40.00
.0215		.0225	1	1/2	3	172456	45.35
.0220		.0225	1	1/2	3	172467	45.35
.0225	#74	.0225	1	1/2	3	182785	40.00
.0230		.0240	1-1/8	1/2	3	172478	45.35
.0235		.0240	1-1/8	1/2	3	172489	45.35
.0240	#73	.0240	1-1/8	1/2	3	182796	40.00
.0245		.0250	1-1/8	1/2	3	172500	45.35
.0250	#72	.0250	1-1/8	1/2	3	182807	40.00
.0255		.0260	1-1/4	1/2	3	172511	45.35
.0260	#71	.0260	1-1/4	1/2	3	182818	40.00
.0265		.0280	1-1/4	1/2	3	172522	45.35
.0270		.0280	1-1/4	1/2	3	172533	45.35
.0275		.0280	1-1/4	1/2	3	172544	45.35
.0280	#70	.0280	1-1/4	1/2	3	182829	40.00
.0285		.0292	1-3/8	1/2	3	172555	45.35
.0290		.0292	1-3/8	1/2	3	172566	45.35
.0292	#69	.0292	1-3/8	1/2	3	182840	40.00
.0295		.0310	1-3/8	1/2	3	172577	41.20
.0300		.0310	1-3/8	1/2	3	172588	41.20
.0305		.0310	1-3/8	1/2	3	172599	41.20
.0310	#68	.0310	1-3/8	1/2	3	182851	40.00
.0312	1/32	.0312	1-3/8	1/2	3	182862	31.54
.0315		.0320	1-3/8	1/2	3	172610	41.20
.0320	#67	.0320	1-3/8	1/2	3	182873	33.50
.0325		.0330	1-3/8	1/2	3	172621	41.20
.0330	#66	.0330	1-3/8	1/2	3	182884	33.50
.0335		.0350	1-1/2	1/2	3	172632	41.20

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.0340		.0350	1-1/2	1/2	3	172643	41.20
.0345		.0350	1-1/2	1/2	3	172654	41.20
.0350	#65	.0350	1-1/2	1/2	3	182895	33.50
.0355		.0360	1-1/2	1/2	3	172665	41.20
.0360	#64	.0360	1-1/2	1/2	3	182906	33.50
.0365		.0370	1-1/2	1/2	3	172676	41.20
.0370	#63	.0370	1-1/2	1/2	3	182917	33.50
.0375		.0380	1-1/2	1/2	3	172687	41.20
.0380	#62	.0380	1-1/2	1/2	3	182928	33.50
.0385		.0390	1-1/2	1/2	3	172698	41.20
.0390	#61	.0390	1-1/2	1/2	3	182939	33.50
.0394	1.0mm	.0394	2-1/2	1/2	4	182950	33.50
.0395		.0390	2-1/2	1/2	4	172709	39.20
.0400	#60	.0390	2-1/2	1/2	4	182961	33.50
.0405		.0390	2-1/2	1/2	4	172720	39.20
.0410	#59	.0390	2-1/2	1/2	4	182972	33.50
.0415		.0390	2-1/2	1/2	4	172731	39.20
.0420	#58	.0390	2-1/2	1/2	4	182983	33.50
.0425		.0390	2-1/2	1/2	4	172742	39.20
.0430	#57	.0390	2-1/2	1/2	4	182994	33.50
.0435		.0455	2-1/2	1/2	4	172753	39.20
.0440		.0455	2-1/2	1/2	4	172764	39.20
.0445		.0455	2-1/2	1/2	4	172775	39.20
.0450		.0455	2-1/2	1/2	4	172786	39.20
.0455		.0455	2-1/2	1/2	4	172797	39.20
.0460		.0455	2-1/2	1/2	4	172808	39.20
.0465	#56	.0455	2-1/2	1/2	4	183005	33.50
.0469	3/64	.0455	2-1/2	1/2	4	183016	33.50
.0470		.0510	2-1/2	1/2	4	172819	39.20
.0475		.0510	2-1/2	1/2	4	172830	39.20
.0480		.0510	2-1/2	1/2	4	172841	39.20
.0485		.0510	2-1/2	1/2	4	172852	39.20
.0490		.0510	2-1/2	1/2	4	172863	39.20
.0495		.0510	2-1/2	1/2	4	172874	39.20
.0500		.0510	2-1/2	1/2	4	172885	39.20
.0505		.0510	2-1/2	1/2	4	172896	39.20
.0510		.0510	2-1/2	1/2	4	172907	39.20
.0515		.0510	2-1/2	1/2	4	172918	39.20
.0520	#55	.0510	2-1/2	1/2	4	183027	33.50
.0525		.0510	2-1/2	1/2	4	172929	39.20
.0530		.0510	2-1/2	1/2	4	172940	39.20
.0535		.0510	2-1/2	1/2	4	172951	39.20
.0540		.0510	2-1/2	1/2	4	172962	39.20
.0545		.0510	2-1/2	1/2	4	172973	39.20

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

HSS Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0550	#54	.0510	2-1/2	1/2	4	183038	33.50
.0555		.0510	2-1/2	1/2	4	172984	39.20
.0560		.0510	2-1/2	1/2	4	172995	39.20
.0565		.0510	2-1/2	1/2	4	173006	39.20
.0570		.0510	2-1/2	1/2	4	173017	39.20
.0575		.0510	2-1/2	1/2	4	173028	39.20
.0580		.0510	2-1/2	1/2	4	173039	39.20
.0585		.0510	2-1/2	1/2	4	173050	39.20
.0590		.0510	2-1/2	1/2	4	173061	39.20
.0591	1.5mm	.0510	2-1/2	1/2	4	183049	33.50
.0595	#53	.0585	2-1/2	1/2	4	183060	33.50
.0600		.0585	2-1/2	1/2	4	173072	39.20
.0605		.0585	2-1/2	1/2	4	173083	39.20
.0610		.0585	2-1/2	1/2	4	173094	39.20
.0615		.0585	2-1/2	1/2	4	173105	39.20
.0620		.0585	2-1/2	1/2	4	173116	39.20
.0625	1/16	.0585	2-1/2	1/2	4	183071	30.11
.0630		.0585	2-1/2	1/2	4	173127	35.15
.0635	#52	.0585	2-1/2	1/2	4	183082	30.11
.0640		.0660	3	3/4	4	173138	35.15
.0645		.0660	3	3/4	4	173149	35.15
.0650		.0660	3	3/4	4	173160	35.15
.0655		.0660	3	3/4	4	173171	35.15
.0660		.0660	3	3/4	4	173182	35.15
.0665		.0660	3	3/4	4	173193	35.15
.0670	#51	.0660	3	3/4	4	183093	26.95
.0675		.0660	3	3/4	4	173204	35.15
.0680		.0660	3	3/4	4	173215	35.15
.0685		.0660	3	3/4	4	173226	35.15
.0690		.0660	3	3/4	4	173237	35.15
.0695		.0660	3	3/4	4	173248	35.15
.0700	#50	.0660	3	3/4	4	183104	26.95
.0705		.0660	3	3/4	4	173259	35.15
.0710		.0660	3	3/4	4	173270	35.15
.0715		.0660	3	3/4	4	173281	35.15
.0720		.0660	3	3/4	4	173292	35.15
.0725		.0660	3	3/4	4	173303	35.15
.0730	#49	.0660	3	3/4	4	183115	26.95
.0735		.0720	3	3/4	4	173314	35.15
.0740		.0720	3	3/4	4	173325	35.15
.0745		.0720	3	3/4	4	173336	35.15
.0750		.0720	3	3/4	4	173347	35.15
.0755		.0720	3	3/4	4	173358	35.15
.0760	#48	.0720	3	3/4	4	183126	26.95

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0765		.0720	3	3/4	4	173369	35.15
.0770		.0720	3	3/4	4	173380	35.15
.0775		.0720	3	3/4	4	173391	35.15
.0780		.0720	3	3/4	4	173402	35.15
.0781	5/64	.0720	3	3/4	4	183137	26.95
.0785	#47	.0720	3	3/4	4	183148	26.95
.0787	2.0mm	.0720	3	3/4	4	183159	26.95
.0790		.0771	3	3/4	4	173413	35.15
.0795		.0771	3	3/4	4	173424	35.15
.0800		.0771	3	3/4	4	173435	35.15
.0805		.0771	3	3/4	4	173446	35.15
.0810	#46	.0771	3	3/4	4	183170	26.95
.0815		.0771	3	3/4	4	173457	35.15
.0820	#45	.0771	3	3/4	4	183181	26.95
.0825		.0810	3	3/4	4	173468	35.15
.0830		.0810	3	3/4	4	173479	35.15
.0835		.0810	3	3/4	4	173490	35.15
.0840		.0810	3	3/4	4	173501	35.15
.0845		.0810	3	3/4	4	173512	35.15
.0850		.0810	3	3/4	4	173523	35.15
.0855		.0810	3	3/4	4	173534	35.15
.0860	#44	.0810	3	3/4	4	183192	26.95
.0865		.0810	3	3/4	4	173545	35.15
.0870		.0810	3	3/4	4	173556	35.15
.0875		.0810	3	3/4	4	173567	35.15
.0880		.0810	3	3/4	4	173578	35.15
.0885		.0810	3	3/4	4	173589	35.15
.0890	#43	.0810	3	3/4	4	183203	26.95
.0895		.0880	3	3/4	4	173600	35.15
.0900		.0880	3	3/4	4	173611	35.15
.0905		.0880	3	3/4	4	173622	35.15
.0910		.0880	3	3/4	4	173633	35.15
.0915		.0880	3	3/4	4	173644	35.15
.0920		.0880	3	3/4	4	173655	35.15
.0925		.0880	3	3/4	4	173666	35.15
.0930		.0880	3	3/4	4	173677	35.15
.0935	#42	.0880	3	3/4	4	183214	26.95
.0938	3/32	.0880	3	3/4	4	183225	24.23
.0940		.0928	3-1/2	7/8	4	173688	35.15
.0945		.0928	3-1/2	7/8	4	173699	35.15
.0950		.0928	3-1/2	7/8	4	173710	35.15
.0955		.0928	3-1/2	7/8	4	173721	35.15
.0960	#41	.0928	3-1/2	7/8	4	183236	27.22
.0965		.0928	3-1/2	7/8	4	173732	35.15

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

MADE IN THE USA



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0970		.0928	3-1/2	7/8	4	173743	35.15
.0975		.0928	3-1/2	7/8	4	173754	35.15
.0980	#40	.0928	3-1/2	7/8	4	183247	27.22
.0984	2.5mm	.0928	3-1/2	7/8	4	183258	27.22
.0985		.0928	3-1/2	7/8	4	173765	35.15
.0990		.0928	3-1/2	7/8	4	173776	35.15
.0995	#39	.0928	3-1/2	7/8	4	183269	27.22
.1000		.0950	3-1/2	7/8	4	173787	35.15
.1005		.0950	3-1/2	7/8	4	173798	35.15
.1010		.0950	3-1/2	7/8	4	173809	35.15
.1015	#38	.0950	3-1/2	7/8	4	183280	27.22
.1020		.0950	3-1/2	7/8	4	173820	35.15
.1025		.0950	3-1/2	7/8	4	173831	35.15
.1030		.0950	3-1/2	7/8	4	173842	35.15
.1035		.0950	3-1/2	7/8	4	173853	35.15
.1040	#37	.0950	3-1/2	7/8	4	183291	27.22
.1045		.1030	3-1/2	7/8	4	173864	35.15
.1050		.1030	3-1/2	7/8	4	173875	35.15
.1055		.1030	3-1/2	7/8	4	173886	35.15
.1060		.1030	3-1/2	7/8	4	173897	35.15
.1065	#36	.1030	3-1/2	7/8	4	183302	27.22
.1070		.1030	3-1/2	7/8	4	173908	35.15
.1075		.1030	3-1/2	7/8	4	173919	35.15
.1080		.1030	3-1/2	7/8	4	173930	35.15
.1085		.1030	3-1/2	7/8	4	173941	35.15
.1090		.1030	3-1/2	7/8	4	173952	35.15
.1094	7/64	.1030	3-1/2	7/8	4	183313	28.06
.1095		.1030	3-1/2	7/8	4	173963	30.38
.1100	#35	.1030	3-1/2	7/8	4	183324	28.06
.1105		.1055	3-1/2	7/8	4	173974	30.38
.1110	#34	.1055	3-1/2	7/8	4	183335	28.06
.1115		.1055	3-1/2	7/8	4	173985	30.38
.1120		.1055	3-1/2	7/8	4	173996	30.38
.1125		.1055	3-1/2	7/8	4	174007	30.38
.1130	#33	.1055	3-1/2	7/8	4	183346	28.06
.1135		.1120	3-1/2	7/8	4	174018	30.38
.1140		.1120	3-1/2	7/8	4	174029	30.38
.1145		.1120	3-1/2	7/8	4	174040	30.38
.1150		.1120	3-1/2	7/8	4	174051	30.38
.1155		.1120	3-1/2	7/8	4	174062	30.38
.1160	#32	.1120	3-1/2	7/8	4	183357	28.06
.1165		.1120	3-1/2	7/8	4	174073	30.38
.1170		.1120	3-1/2	7/8	4	174084	30.38
.1175		.1120	3-1/2	7/8	4	174095	30.38

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1180		.1120	3-1/2	7/8	4	174106	30.38
.1181	3.0mm	.1120	3-1/2	7/8	4	183368	28.06
.1185		.1120	3-1/2	7/8	4	174117	30.38
.1190		.1120	3-1/2	7/8	4	174128	30.38
.1195		.1120	3-1/2	7/8	4	174139	30.38
.1200	#31	.1120	3-1/2	7/8	4	183379	28.06
.1205		.1190	3-1/2	7/8	4	174150	30.38
.1210		.1190	3-1/2	7/8	4	174161	30.38
.1215		.1190	3-1/2	7/8	4	174172	30.38
.1220		.1190	3-1/2	7/8	4	174183	30.38
.1225		.1190	3-1/2	7/8	4	174194	30.38
.1230		.1190	3-1/2	7/8	4	174205	30.38
.1235		.1190	3-1/2	7/8	4	174216	30.38
.1240	O/U	.1190	3-1/2	7/8	4	183390	28.06
.1245		.1190	3-1/2	7/8	4	174227	30.38
.1247		.1190	3-1/2	7/8	4	174238	30.38
.1250	1/8	.1190	3-1/2	7/8	4	183401	25.29
.1255		.1190	3-1/2	7/8	4	174249	41.20
.1260	O/U	.1190	3-1/2	7/8	4	183412	28.06
.1265		.1190	3-1/2	7/8	4	174260	41.20
.1270		.1190	3-1/2	7/8	4	174271	41.20
.1275		.1190	3-1/2	7/8	4	174282	41.20
.1280		.1190	3-1/2	7/8	4	174293	41.20
.1285	#30	.1190	3-1/2	7/8	4	183423	28.06
.1290		.1275	4	1	4	174304	41.20
.1295		.1275	4	1	4	174315	41.20
.1300		.1275	4	1	4	174326	41.20
.1305		.1275	4	1	4	174337	41.20
.1310		.1275	4	1	4	174348	41.20
.1315		.1275	4	1	4	174359	41.20
.1320		.1275	4	1	4	174370	41.20
.1325		.1275	4	1	4	174381	41.20
.1330		.1275	4	1	4	174392	41.20
.1335		.1275	4	1	4	174403	41.20
.1340		.1275	4	1	4	174414	41.20
.1345		.1275	4	1	4	174425	41.20
.1350		.1275	4	1	4	174436	41.20
.1355		.1275	4	1	4	174447	41.20
.1360	#29	.1275	4	1	4	183434	33.50
.1365		.1350	4	1	4	174458	41.20
.1370		.1350	4	1	4	174469	41.20
.1375		.1350	4	1	4	174480	41.20
.1378	3.5mm	.1350	4	1	4	183445	33.50
.1380		.1350	4	1	4	174491	41.20

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

HSS Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1385		.1350	4	1	4	174502	41.20
.1390		.1350	4	1	4	174513	41.20
.1395		.1350	4	1	4	174524	41.20
.1400		.1350	4	1	4	174535	41.20
.1405	#28	.1350	4	1	4	183456	33.50
.1406	9/64	.1350	4	1	4	183467	33.50
.1410		.1350	4	1	4	174546	39.20
.1415		.1350	4	1	4	174557	39.20
.1420		.1350	4	1	4	174568	39.20
.1425		.1350	4	1	4	174579	39.20
.1430		.1350	4	1	4	174590	39.20
.1435		.1350	4	1	4	174601	39.20
.1440	#27	.1350	4	1	4	183478	33.50
.1445		.1430	4	1	4	174612	39.20
.1450		.1430	4	1	4	174623	39.20
.1455		.1430	4	1	4	174634	39.20
.1460		.1430	4	1	4	174645	39.20
.1465		.1430	4	1	4	174656	39.20
.1470	#26	.1430	4	1	4	183489	33.50
.1475		.1430	4	1	4	174667	39.20
.1480		.1430	4	1	4	174678	39.20
.1485		.1430	4	1	4	174689	39.20
.1490		.1430	4	1	4	174700	39.20
.1495	#25	.1430	4	1	4	183500	33.50
.1500		.1460	4	1	4	174711	39.20
.1505		.1460	4	1	4	174722	39.20
.1510		.1460	4	1	4	174733	39.20
.1515		.1460	4	1	4	174744	39.20
.1520	#24	.1460	4	1	4	183511	33.50
.1525		.1460	4	1	4	174755	39.20
.1530		.1460	4	1	4	174766	39.20
.1535		.1460	4	1	4	174777	39.20
.1540	#23	.1460	4	1	4	183522	33.50
.1545		.1510	4	1	4	174788	39.20
.1550		.1510	4	1	4	174799	39.20
.1555		.1510	4	1	4	174810	39.20
.1560		.1510	4	1	4	174821	39.20
.1562	5/32	.1510	4	1	4	183533	33.50
.1565		.1510	4	1	6	174832	41.20
.1570	#22	.1510	4	1	6	183544	33.50
.1575	4.0mm	.1510	4	1	6	183555	33.50
.1580		.1530	4-1/2	1-1/8	6	174843	41.20
.1585		.1530	4-1/2	1-1/8	6	174854	41.20
.1590	#21	.1530	4-1/2	1-1/8	6	183566	35.77

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1595		.1530	4-1/2	1-1/8	6	174865	41.20
.1600		.1530	4-1/2	1-1/8	6	174876	41.20
.1605		.1530	4-1/2	1-1/8	6	174887	41.20
.1610	#20	.1530	4-1/2	1-1/8	6	183577	35.77
.1615		.1595	4-1/2	1-1/8	6	174898	41.20
.1620		.1595	4-1/2	1-1/8	6	174909	41.20
.1625		.1595	4-1/2	1-1/8	6	174920	41.20
.1630		.1595	4-1/2	1-1/8	6	174931	41.20
.1635		.1595	4-1/2	1-1/8	6	174942	41.20
.1640		.1595	4-1/2	1-1/8	6	174953	41.20
.1645		.1595	4-1/2	1-1/8	6	174964	41.20
.1650		.1595	4-1/2	1-1/8	6	174975	41.20
.1655		.1595	4-1/2	1-1/8	6	174986	41.20
.1660	#19	.1595	4-1/2	1-1/8	6	183588	35.77
.1665		.1595	4-1/2	1-1/8	6	174997	41.20
.1670		.1595	4-1/2	1-1/8	6	175008	41.20
.1675		.1595	4-1/2	1-1/8	6	175019	41.20
.1680		.1595	4-1/2	1-1/8	6	175030	41.20
.1685		.1595	4-1/2	1-1/8	6	175041	41.20
.1690		.1595	4-1/2	1-1/8	6	175052	41.20
.1695	#18	.1595	4-1/2	1-1/8	6	183599	35.77
.1700		.1645	4-1/2	1-1/8	6	175063	41.20
.1705		.1645	4-1/2	1-1/8	6	175074	41.20
.1710		.1645	4-1/2	1-1/8	6	175085	41.20
.1715		.1645	4-1/2	1-1/8	6	175096	41.20
.1719	11/64	.1645	4-1/2	1-1/8	6	183610	35.77
.1720		.1645	4-1/2	1-1/8	6	175107	38.71
.1725		.1645	4-1/2	1-1/8	6	175118	38.71
.1730	#17	.1645	4-1/2	1-1/8	6	183621	35.77
.1735		.1704	4-1/2	1-1/8	6	175129	38.71
.1740		.1704	4-1/2	1-1/8	6	175140	38.71
.1745		.1704	4-1/2	1-1/8	6	175151	38.71
.1750		.1704	4-1/2	1-1/8	6	175162	38.71
.1755		.1704	4-1/2	1-1/8	6	175173	38.71
.1760		.1704	4-1/2	1-1/8	6	175184	38.71
.1765		.1704	4-1/2	1-1/8	6	175195	38.71
.1770	#16	.1704	4-1/2	1-1/8	6	183632	35.77
.1772	4.5mm	.1704	4-1/2	1-1/8	6	183643	35.77
.1775		.1755	4-1/2	1-1/8	6	175206	38.71
.1780		.1755	4-1/2	1-1/8	6	175217	38.71
.1785		.1755	4-1/2	1-1/8	6	175228	38.71
.1790		.1755	4-1/2	1-1/8	6	175239	38.71
.1795		.1755	4-1/2	1-1/8	6	175250	38.71
.1800	#15	.1755	4-1/2	1-1/8	6	183654	35.77

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

MADE IN THE USA



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.1805		.1755	4-1/2	1-1/8	6	175261	38.71
.1810		.1755	4-1/2	1-1/8	6	175272	38.71
.1815		.1755	4-1/2	1-1/8	6	175283	38.71
.1820	#14	.1755	4-1/2	1-1/8	6	183665	35.77
.1825		.1805	4-1/2	1-1/8	6	175294	38.71
.1830		.1805	4-1/2	1-1/8	6	175305	38.71
.1835		.1805	4-1/2	1-1/8	6	175316	38.71
.1840		.1805	4-1/2	1-1/8	6	175327	38.71
.1845		.1805	4-1/2	1-1/8	6	175338	38.71
.1850	#13	.1805	4-1/2	1-1/8	6	183676	35.77
.1855		.1805	4-1/2	1-1/8	6	175349	38.71
.1860		.1805	4-1/2	1-1/8	6	175360	38.71
.1865	O/U	.1805	4-1/2	1-1/8	6	183687	35.77
.1870		.1805	4-1/2	1-1/8	6	175371	38.71
.1875	3/16	.1805	4-1/2	1-1/8	6	183698	32.16
.1880		.1805	4-1/2	1-1/8	6	175382	48.87
.1885	O/U	.1805	4-1/2	1-1/8	6	183709	35.77
.1890	#12	.1805	4-1/2	1-1/8	6	183720	35.77
.1895		.1860	5	1-1/4	6	175393	48.87
.1900		.1860	5	1-1/4	6	175404	48.87
.1905		.1860	5	1-1/4	6	175415	48.87
.1910	#11	.1860	5	1-1/4	6	183731	40.05
.1915		.1860	5	1-1/4	6	175426	48.87
.1920		.1860	5	1-1/4	6	175437	48.87
.1925		.1860	5	1-1/4	6	175448	48.87
.1930		.1860	5	1-1/4	6	175459	48.87
.1935	#10	.1860	5	1-1/4	6	183742	40.05
.1940		.1895	5	1-1/4	6	175470	48.87
.1945		.1895	5	1-1/4	6	175481	48.87
.1950		.1895	5	1-1/4	6	175492	48.87
.1955		.1895	5	1-1/4	6	175503	48.87
.1960	#9	.1895	5	1-1/4	6	183753	40.05
.1965		.1895	5	1-1/4	6	175514	48.87
.1969	5.0mm	.1895	5	1-1/4	6	183764	40.05
.1970		.1895	5	1-1/4	6	175525	48.87
.1975		.1895	5	1-1/4	6	175536	48.87
.1980		.1895	5	1-1/4	6	175547	48.87
.1985		.1895	5	1-1/4	6	175558	48.87
.1990	#8	.1895	5	1-1/4	6	183775	40.05
.1995		.1945	5	1-1/4	6	175569	48.87
.2000		.1945	5	1-1/4	6	175580	48.87
.2005		.1945	5	1-1/4	6	175591	48.87
.2010	#7	.1895	5	1-1/4	6	183786	40.05
.2015		.1945	5	1-1/4	6	175602	48.87

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
.2020		.1945	5	1-1/4	6	175613	48.87
.2025		.1945	5	1-1/4	6	175624	48.87
.2030		.1945	5	1-1/4	6	175635	48.87
.2031	13/64	.1945	5	1-1/4	6	183797	40.05
.2035		.1945	5	1-1/4	6	175646	47.62
.2040	#6	.1945	5	1-1/4	6	183808	40.05
.2045		.2016	5	1-1/4	6	175657	47.62
.2050		.2016	5	1-1/4	6	175668	47.62
.2055	#5	.2016	5	1-1/4	6	183819	40.05
.2060		.2016	5	1-1/4	6	175679	47.62
.2065		.2016	5	1-1/4	6	175690	47.62
.2070		.2016	5	1-1/4	6	175701	47.62
.2075		.2016	5	1-1/4	6	175712	47.62
.2080		.2016	5	1-1/4	6	175723	47.62
.2085		.2016	5	1-1/4	6	175734	47.62
.2090	#4	.2016	5	1-1/4	6	183830	40.05
.2095		.2075	5	1-1/4	6	175745	47.62
.2100		.2075	5	1-1/4	6	175756	47.62
.2105		.2075	5	1-1/4	6	175767	47.62
.2110		.2075	5	1-1/4	6	175778	47.62
.2115		.2075	5	1-1/4	6	175789	47.62
.2120		.2075	5	1-1/4	6	175800	47.62
.2125		.2075	5	1-1/4	6	175811	47.62
.2130	#3	.2075	5	1-1/4	6	183841	40.05
.2135		.2075	5	1-1/4	6	175822	47.62
.2140		.2075	5	1-1/4	6	175833	47.62
.2145		.2075	5	1-1/4	6	175844	47.62
.2150		.2075	5	1-1/4	6	175855	47.62
.2155		.2075	5	1-1/4	6	175866	47.62
.2160		.2075	5	1-1/4	6	175877	47.62
.2165	5.5mm	.2075	5	1-1/4	6	183852	40.05
.2170		.2075	5	1-1/4	6	175888	47.62
.2175		.2075	5	1-1/4	6	175899	47.62
.2180		.2075	5	1-1/4	6	175910	47.62
.2185		.2075	5	1-1/4	6	175921	47.62
.2188	7/32	.2075	5	1-1/4	6	183863	40.05
.2190		.2173	6	1-1/2	6	175932	48.42
.2195		.2173	6	1-1/2	6	175943	48.42
.2200		.2173	6	1-1/2	6	175954	48.42
.2205		.2173	6	1-1/2	6	175965	48.42
.2210	#2	.2173	6	1-1/2	6	183874	41.16
.2215		.2173	6	1-1/2	6	175976	48.42
.2220		.2173	6	1-1/2	6	175987	48.42
.2225		.2173	6	1-1/2	6	175998	48.42

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

HSS Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2230		.2173	6	1-1/2	6	176009	48.42
.2235		.2173	6	1-1/2	6	176020	48.42
.2240		.2173	6	1-1/2	6	176031	48.42
.2245		.2173	6	1-1/2	6	176042	48.42
.2250		.2173	6	1-1/2	6	176053	48.42
.2255		.2173	6	1-1/2	6	176064	48.42
.2260		.2173	6	1-1/2	6	176075	48.42
.2265		.2173	6	1-1/2	6	176086	48.42
.2270		.2173	6	1-1/2	6	176097	48.42
.2275		.2173	6	1-1/2	6	176108	48.42
.2280	#1	.2173	6	1-1/2	6	183885	41.16
.2285		.2265	6	1-1/2	6	176119	48.42
.2290		.2265	6	1-1/2	6	176130	48.42
.2295		.2265	6	1-1/2	6	176141	48.42
.2300		.2265	6	1-1/2	6	176152	48.42
.2305		.2265	6	1-1/2	6	176163	48.42
.2310		.2265	6	1-1/2	6	176174	48.42
.2315		.2265	6	1-1/2	6	176185	48.42
.2320		.2265	6	1-1/2	6	176196	48.42
.2325		.2265	6	1-1/2	6	176207	48.42
.2330		.2265	6	1-1/2	6	176218	48.42
.2335		.2265	6	1-1/2	6	176229	48.42
.2340	A	.2265	6	1-1/2	6	183896	41.16
.2344	15/64	.2265	6	1-1/2	6	183907	41.16
.2345		.2265	6	1-1/2	6	176240	43.65
.2350		.2265	6	1-1/2	6	176251	43.65
.2355		.2265	6	1-1/2	6	176262	43.65
.2360		.2265	6	1-1/2	6	176273	43.65
.2362	6.0mm	.2265	6	1-1/2	6	183918	43.39
.2365		.2329	6	1-1/2	6	176284	43.65
.2370		.2329	6	1-1/2	6	176295	43.65
.2375		.2329	6	1-1/2	6	176306	43.65
.2380	B	.2329	6	1-1/2	6	183929	43.39
.2385		.2329	6	1-1/2	6	176317	43.65
.2390		.2329	6	1-1/2	6	176328	43.65
.2395		.2329	6	1-1/2	6	176339	43.65
.2400		.2329	6	1-1/2	6	176350	43.65
.2405		.2329	6	1-1/2	6	176361	43.65
.2410		.2329	6	1-1/2	6	176372	43.65
.2415		.2329	6	1-1/2	6	176383	43.65
.2420	C	.2329	6	1-1/2	6	183940	43.39
.2425		.2329	6	1-1/2	6	176394	43.65
.2430		.2329	6	1-1/2	6	176405	43.65
.2435		.2329	6	1-1/2	6	176416	43.65

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2440		.2329	6	1-1/2	6	176427	43.65
.2445		.2329	6	1-1/2	6	176438	43.65
.2450		.2329	6	1-1/2	6	176449	43.65
.2455		.2329	6	1-1/2	6	176460	43.65
.2460	D	.2329	6	1-1/2	6	183951	43.39
.2465		.2405	6	1-1/2	6	176471	43.65
.2470		.2405	6	1-1/2	6	176482	43.65
.2475		.2405	6	1-1/2	6	176493	43.65
.2480		.2405	6	1-1/2	6	176504	43.65
.2485		.2405	6	1-1/2	6	176515	43.65
.2490	O/U	.2405	6	1-1/2	6	183962	40.60
.2495		.2405	6	1-1/2	6	176526	43.65
.2500	1/4	.2405	6	1-1/2	6	183973	38.61
.2505		.2405	6	1-1/2	6	176537	55.68
.2510	O/U	.2405	6	1-1/2	6	183984	40.60
.2515		.2405	6	1-1/2	6	176548	55.68
.2520		.2405	6	1-1/2	6	176559	55.68
.2525		.2405	6	1-1/2	6	176570	55.68
.2530		.2405	6	1-1/2	6	176581	55.68
.2535		.2405	6	1-1/2	6	176592	55.68
.2540		.2405	6	1-1/2	6	176603	55.68
.2545		.2405	6	1-1/2	6	176614	55.68
.2550		.2405	6	1-1/2	6	176625	55.68
.2555		.2405	6	1-1/2	6	176636	55.68
.2559	6.5mm	.2405	6	1-1/2	6	183995	43.39
.2560		.2485	6	1-1/2	6	176647	55.68
.2565		.2485	6	1-1/2	6	176658	55.68
.2570	F	.2485	6	1-1/2	6	184006	43.39
.2575		.2485	6	1-1/2	6	176669	55.68
.2580		.2485	6	1-1/2	6	176680	55.68
.2585		.2485	6	1-1/2	6	176691	55.68
.2590		.2485	6	1-1/2	6	176702	55.68
.2595		.2485	6	1-1/2	6	176713	55.68
.2600		.2485	6	1-1/2	6	176724	55.68
.2605		.2485	6	1-1/2	6	176735	55.68
.2610	G	.2485	6	1-1/2	6	184017	43.39
.2615		.2485	6	1-1/2	6	176746	55.68
.2620		.2485	6	1-1/2	6	176757	55.68
.2625		.2485	6	1-1/2	6	176768	55.68
.2630		.2485	6	1-1/2	6	176779	55.68
.2635		.2485	6	1-1/2	6	176790	55.68
.2640		.2485	6	1-1/2	6	176801	55.68
.2645		.2485	6	1-1/2	6	176812	55.68
.2650		.2485	6	1-1/2	6	176823	55.68

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.0002, -0.0000	+0.0003, -0.0000	+0.0001, +0.0004	+0.0002, +0.0006

MADE IN THE USA



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2655		.2485	6	1-1/2	6	176834	55.68
.2656	17/64	.2485	6	1-1/2	6	184028	48.33
.2660	H	.2485	6	1-1/2	6	184039	48.33
.2665		.2485	6	1-1/2	6	176845	55.68
.2670		.2485	6	1-1/2	6	176856	55.68
.2675		.2485	6	1-1/2	6	176867	55.68
.2680		.2485	6	1-1/2	6	176878	55.68
.2685		.2485	6	1-1/2	6	176889	55.68
.2690		.2485	6	1-1/2	6	176900	55.68
.2695		.2485	6	1-1/2	6	176911	55.68
.2700		.2485	6	1-1/2	6	176922	55.68
.2705		.2485	6	1-1/2	6	176933	55.68
.2710		.2485	6	1-1/2	6	176944	55.68
.2715		.2485	6	1-1/2	6	176955	55.68
.2720	I	.2485	6	1-1/2	6	184050	48.33
.2725		.2485	6	1-1/2	6	176966	55.68
.2730		.2485	6	1-1/2	6	176977	55.68
.2735		.2485	6	1-1/2	6	176988	55.68
.2740		.2485	6	1-1/2	6	176999	55.68
.2745		.2485	6	1-1/2	6	177010	55.68
.2750		.2485	6	1-1/2	6	177021	55.68
.2755		.2485	6	1-1/2	6	177032	55.68
.2756	7.0mm	.2485	6	1-1/2	6	184061	48.33
.2760		.2485	6	1-1/2	6	177043	55.68
.2765		.2485	6	1-1/2	6	177054	55.68
.2770	J	.2485	6	1-1/2	6	184072	48.33
.2775		.2485	6	1-1/2	6	177065	55.68
.2780		.2485	6	1-1/2	6	177076	55.68
.2785		.2485	6	1-1/2	6	177087	55.68
.2790		.2485	6	1-1/2	6	177098	55.68
.2795		.2485	6	1-1/2	6	177109	55.68
.2800		.2485	6	1-1/2	6	177120	55.68
.2805		.2485	6	1-1/2	6	177131	55.68
.2810	K	.2485	6	1-1/2	6	184083	48.33
.2812	9/32	.2485	6	1-1/2	6	184094	45.88
.2815		.2792	6	1-1/2	6	177142	55.68
.2820		.2792	6	1-1/2	6	177153	55.68
.2825		.2792	6	1-1/2	6	177164	55.68
.2830		.2792	6	1-1/2	6	177175	55.68
.2835		.2792	6	1-1/2	6	177186	55.68
.2840		.2792	6	1-1/2	6	177197	55.68
.2845		.2792	6	1-1/2	6	177208	55.68
.2850		.2792	6	1-1/2	6	177219	55.68
.2855		.2792	6	1-1/2	6	177230	55.68

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2860		.2792	6	1-1/2	6	177241	55.68
.2865		.2792	6	1-1/2	6	177252	55.68
.2870		.2792	6	1-1/2	6	177263	55.68
.2875		.2792	6	1-1/2	6	177274	55.68
.2880		.2792	6	1-1/2	6	177285	55.68
.2885		.2792	6	1-1/2	6	177296	55.68
.2890		.2792	6	1-1/2	6	177307	55.68
.2895		.2792	6	1-1/2	6	177318	55.68
.2900	L	.2792	6	1-1/2	6	184105	48.33
.2905		.2792	6	1-1/2	6	177329	55.68
.2910		.2792	6	1-1/2	6	177340	55.68
.2915		.2792	6	1-1/2	6	177351	55.68
.2920		.2792	6	1-1/2	6	177362	55.68
.2925		.2792	6	1-1/2	6	177373	55.68
.2930		.2792	6	1-1/2	6	177384	55.68
.2935		.2792	6	1-1/2	6	177395	55.68
.2940		.2792	6	1-1/2	6	177406	55.68
.2945		.2792	6	1-1/2	6	177417	55.68
.2950	M	.2792	6	1-1/2	6	184116	48.33
.2953	7.5mm	.2792	6	1-1/2	6	184127	48.33
.2955		.2792	6	1-1/2	6	177428	55.68
.2960		.2792	6	1-1/2	6	177439	55.68
.2965		.2792	6	1-1/2	6	177450	55.68
.2969	19/64	.2792	6	1-1/2	6	184138	48.33
.2970		.2792	6	1-1/2	6	177461	49.85
.2975		.2792	6	1-1/2	6	177472	49.85
.2980		.2792	6	1-1/2	6	177483	49.85
.2985		.2792	6	1-1/2	6	177494	49.85
.2990		.2792	6	1-1/2	6	177505	49.85
.2995		.2792	6	1-1/2	6	177516	49.85
.3000		.2792	6	1-1/2	6	177527	49.85
.3005		.2792	6	1-1/2	6	177538	49.85
.3010		.2792	6	1-1/2	6	177549	49.85
.3015		.2792	6	1-1/2	6	177560	49.85
.3020	N	.2792	6	1-1/2	6	184149	48.33
.3025		.2792	6	1-1/2	6	177571	49.85
.3030		.2792	6	1-1/2	6	177582	49.85
.3035		.2792	6	1-1/2	6	177593	49.85
.3040		.2792	6	1-1/2	6	177604	49.85
.3045		.2792	6	1-1/2	6	177615	49.85
.3050		.2792	6	1-1/2	6	177626	49.85
.3055		.2792	6	1-1/2	6	177637	49.85
.3060		.2792	6	1-1/2	6	177648	49.85
.3065		.2792	6	1-1/2	6	177659	49.85

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.0002, -0.0000	+0.0003, -0.0000	+0.0001, +0.0004	+0.0002, +0.0006

HSS Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3070		.2792	6	1-1/2	6	177670	49.85
.3075		.2792	6	1-1/2	6	177681	49.85
.3080		.2792	6	1-1/2	6	177692	49.85
.3085		.2792	6	1-1/2	6	177703	49.85
.3090		.2792	6	1-1/2	6	177714	49.85
.3095		.2792	6	1-1/2	6	177725	49.85
.3100		.2792	6	1-1/2	6	177736	49.85
.3105		.2792	6	1-1/2	6	177747	49.85
.3110		.2792	6	1-1/2	6	177758	49.85
.3115	O/U	.2792	6	1-1/2	6	184160	45.88
.3120		.2792	6	1-1/2	6	177769	49.85
.3125	5/16	.2792	6	1-1/2	6	184171	43.56
.3130		.2792	6	1-1/2	6	177780	58.71
.3135	O/U	.2792	6	1-1/2	6	184182	45.88
.3140		.2792	6	1-1/2	6	177791	58.71
.3145		.2792	6	1-1/2	6	177802	58.71
.3150	8.0mm	.2792	6	1-1/2	6	184193	48.33
.3155		.2792	6	1-1/2	6	177813	58.71
.3160	O	.2792	6	1-1/2	6	184204	48.33
.3165		.2792	6	1-1/2	6	177824	58.71
.3170		.2792	6	1-1/2	6	177835	58.71
.3175		.2792	6	1-1/2	6	177846	58.71
.3180		.2792	6	1-1/2	6	177857	58.71
.3185		.2792	6	1-1/2	6	177868	58.71
.3190		.2792	6	1-1/2	6	177879	58.71
.3195		.2792	6	1-1/2	6	177890	58.71
.3200		.2792	6	1-1/2	6	177901	58.71
.3205		.2792	6	1-1/2	6	177912	58.71
.3210		.2792	6	1-1/2	6	177923	58.71
.3215		.2792	6	1-1/2	6	177934	58.71
.3220		.2792	6	1-1/2	6	177945	58.71
.3225		.2792	6	1-1/2	6	177956	58.71
.3230	P	.2792	6	1-1/2	6	184215	51.67
.3235		.2792	6	1-1/2	6	177967	58.71
.3240		.2792	6	1-1/2	6	177978	58.71
.3245		.2792	6	1-1/2	6	177989	58.71
.3250		.2792	6	1-1/2	6	178000	58.71
.3255		.2792	6	1-1/2	6	178011	58.71
.3260		.2792	6	1-1/2	6	178022	58.71
.3265		.2792	6	1-1/2	6	178033	58.71
.3270		.2792	6	1-1/2	6	178044	58.71
.3275		.2792	6	1-1/2	6	178055	58.71
.3280		.2792	6	1-1/2	6	178066	58.71
.3281	21/64	.2792	6	1-1/2	6	184226	51.67

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3285		.2792	6	1-1/2	6	178077	58.71
.3290		.2792	6	1-1/2	6	178088	58.71
.3295		.2792	6	1-1/2	6	178099	58.71
.3300		.2792	6	1-1/2	6	178110	58.71
.3305		.2792	6	1-1/2	6	178121	58.71
.3310		.2792	6	1-1/2	6	178132	58.71
.3315		.2792	6	1-1/2	6	178143	58.71
.3320	Q	.2792	6	1-1/2	6	184237	51.67
.3325		.2792	6	1-1/2	6	178154	58.71
.3330		.2792	6	1-1/2	6	178165	58.71
.3335		.2792	6	1-1/2	6	178176	58.71
.3340		.2792	6	1-1/2	6	178187	58.71
.3345		.2792	6	1-1/2	6	178198	58.71
.3346	8.5mm	.2792	6	1-1/2	6	184248	51.67
.3350		.2792	6	1-1/2	6	178209	58.71
.3355		.2792	6	1-1/2	6	178220	58.71
.3360		.2792	6	1-1/2	6	178231	58.71
.3365		.2792	6	1-1/2	6	178242	58.71
.3370		.2792	6	1-1/2	6	178253	58.71
.3375		.2792	6	1-1/2	6	178264	58.71
.3380		.2792	6	1-1/2	6	178275	58.71
.3385		.2792	6	1-1/2	6	178286	58.71
.3390	R	.2792	6	1-1/2	6	184259	51.67
.3395		.2792	6	1-1/2	6	178297	58.71
.3400		.2792	6	1-1/2	6	178308	58.71
.3405		.2792	6	1-1/2	6	178319	58.71
.3410		.2792	6	1-1/2	6	178330	58.71
.3415		.2792	6	1-1/2	6	178341	58.71
.3420		.2792	6	1-1/2	6	178352	58.71
.3425		.2792	6	1-1/2	6	178363	58.71
.3430		.2792	6	1-1/2	6	178374	58.71
.3435		.2792	6	1-1/2	6	178385	58.71
.3438	11/32	.2792	6	1-1/2	6	184270	51.67
.3440		.3105	7	1-3/4	6	178396	59.56
.3445		.3105	7	1-3/4	6	178407	59.56
.3450		.3105	7	1-3/4	6	178418	59.56
.3455		.3105	7	1-3/4	6	178429	59.56
.3460		.3105	7	1-3/4	6	178440	59.56
.3465		.3105	7	1-3/4	6	178451	59.56
.3470		.3105	7	1-3/4	6	178462	59.56
.3475		.3105	7	1-3/4	6	178473	59.56
.3480	S	.3105	6	1-3/4	6	184281	52.21
.3485		.3105	7	1-3/4	6	178484	59.56
.3490		.3105	7	1-3/4	6	178495	59.56

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.0002, -0.0000	+0.0003, -0.0000	+0.0001, +0.0004	+0.0002, +0.0006

MADE IN THE USA



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3495		.3105	7	1-3/4	6	178506	59.56
.3500		.3105	7	1-3/4	6	178517	59.56
.3505		.3105	7	1-3/4	6	178528	59.56
.3510		.3105	7	1-3/4	6	178539	59.56
.3515		.3105	7	1-3/4	6	178550	59.56
.3520		.3105	7	1-3/4	6	178561	59.56
.3525		.3105	7	1-3/4	6	178572	59.56
.3530		.3105	7	1-3/4	6	178583	59.56
.3535		.3105	7	1-3/4	6	178594	59.56
.3540		.3105	7	1-3/4	6	178605	59.56
.3543	9.0mm	.3105	7	1-3/4	6	184292	52.21
.3545		.3105	7	1-3/4	6	178616	59.56
.3550		.3105	7	1-3/4	6	178627	59.56
.3555		.3105	7	1-3/4	6	178638	59.56
.3560		.3105	7	1-3/4	6	178649	59.56
.3565		.3105	7	1-3/4	6	178660	59.56
.3570		.3105	7	1-3/4	6	178671	59.56
.3575		.3105	7	1-3/4	6	178682	59.56
.3580	T	.3105	7	1-3/4	6	184303	52.21
.3585		.3105	7	1-3/4	6	178693	59.56
.3590		.3105	7	1-3/4	6	178704	59.56
.3594	23/64	.3105	7	1-3/4	6	184314	52.21
.3595		.3105	7	1-3/4	6	178715	53.36
.3600		.3105	7	1-3/4	6	178726	53.36
.3605		.3105	7	1-3/4	6	178737	53.36
.3610		.3105	7	1-3/4	6	178748	53.36
.3615		.3105	7	1-3/4	6	178759	53.36
.3620		.3105	7	1-3/4	6	178770	53.36
.3625		.3105	7	1-3/4	6	178781	53.36
.3630		.3105	7	1-3/4	6	178792	53.36
.3635		.3105	7	1-3/4	6	178803	53.36
.3640		.3105	7	1-3/4	6	178814	53.36
.3645		.3105	7	1-3/4	6	178825	53.36
.3650		.3105	7	1-3/4	6	178836	53.36
.3655		.3105	7	1-3/4	6	178847	53.36
.3660		.3105	7	1-3/4	6	178858	53.36
.3665		.3105	7	1-3/4	6	178869	53.36
.3670		.3105	7	1-3/4	6	178880	53.36
.3675		.3105	7	1-3/4	6	178891	53.36
.3680	U	.3105	7	1-3/4	6	184325	52.21
.3685		.3105	7	1-3/4	6	178902	53.36
.3690		.3105	7	1-3/4	6	178913	53.36
.3695		.3105	7	1-3/4	6	178924	53.36
.3700		.3105	7	1-3/4	6	178935	53.36

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3705		.3105	7	1-3/4	6	178946	53.36
.3710		.3105	7	1-3/4	6	178957	53.36
.3715		.3105	7	1-3/4	6	178968	53.36
.3720		.3105	7	1-3/4	6	178979	53.36
.3725		.3105	7	1-3/4	6	178990	53.36
.3730		.3105	7	1-3/4	6	179001	53.36
.3735		.3105	7	1-3/4	6	179012	53.36
.3740	O/U	.3105	7	1-3/4	6	184336	49.58
.3745		.3105	7	1-3/4	6	179023	53.36
.3750	3/8	.3105	7	1-3/4	6	184347	46.91
.3755		.3105	7	1-3/4	6	179034	64.23
.3760	O/U	.3105	7	1-3/4	6	184358	49.58
.3765		.3105	7	1-3/4	6	179045	64.23
.3770	V	.3105	7	1-3/4	6	184369	56.75
.3775		.3105	7	1-3/4	6	179056	64.23
.3780		.3105	7	1-3/4	6	179067	64.23
.3785		.3105	7	1-3/4	6	179078	64.23
.3790		.3105	7	1-3/4	6	179089	64.23
.3795		.3105	7	1-3/4	6	179100	64.23
.3800		.3105	7	1-3/4	6	179111	64.23
.3805		.3105	7	1-3/4	6	179122	64.23
.3810		.3105	7	1-3/4	6	179133	64.23
.3815		.3105	7	1-3/4	6	179144	64.23
.3820		.3105	7	1-3/4	6	179155	64.23
.3825		.3105	7	1-3/4	6	179166	64.23
.3830		.3105	7	1-3/4	6	179177	64.23
.3835		.3105	7	1-3/4	6	179188	64.23
.3840		.3105	7	1-3/4	6	179199	64.23
.3845		.3105	7	1-3/4	6	179210	64.23
.3850		.3105	7	1-3/4	6	179221	64.23
.3855		.3105	7	1-3/4	6	179232	64.23
.3860	W	.3105	7	1-3/4	6	184380	56.75
.3865		.3105	7	1-3/4	6	179243	64.23
.3870		.3105	7	1-3/4	6	179254	64.23
.3875		.3105	7	1-3/4	6	179265	64.23
.3880		.3105	7	1-3/4	6	179276	64.23
.3885		.3105	7	1-3/4	6	179287	64.23
.3890		.3105	7	1-3/4	6	179298	64.23
.3895		.3105	7	1-3/4	6	179309	64.23
.3900		.3105	7	1-3/4	6	179320	64.23
.3905		.3105	7	1-3/4	6	179331	64.23
.3906	25/64	.3105	7	1-3/4	6	184391	56.75
.3910		.3105	7	1-3/4	6	179342	65.88
.3915		.3105	7	1-3/4	6	179353	65.88

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

HSS Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3920		.3105	7	1-3/4	6	179364	65.88
.3925		.3105	7	1-3/4	6	179375	65.88
.3930		.3105	7	1-3/4	6	179386	65.88
.3935		.3105	7	1-3/4	6	179397	65.88
.3937	10mm	.3105	7	1-3/4	6	184402	56.75
.3940		.3105	7	1-3/4	6	179408	65.88
.3945		.3105	7	1-3/4	6	179419	65.88
.3950		.3105	7	1-3/4	6	179430	65.88
.3955		.3105	7	1-3/4	6	179441	65.88
.3960		.3105	7	1-3/4	6	179452	65.88
.3965		.3105	7	1-3/4	6	179463	65.88
.3970	X	.3105	7	1-3/4	6	184413	56.75
.3975		.3105	7	1-3/4	6	179474	65.88
.3980		.3105	7	1-3/4	6	179485	65.88
.3985		.3105	7	1-3/4	6	179496	65.88
.3990		.3105	7	1-3/4	6	179507	65.88
.3995		.3105	7	1-3/4	6	179518	65.88
.4000		.3105	7	1-3/4	6	179529	65.88
.4005		.3105	7	1-3/4	6	179540	65.88
.4010		.3105	7	1-3/4	6	179551	65.88
.4015		.3105	7	1-3/4	6	179562	65.88
.4020		.3105	7	1-3/4	6	179573	65.88
.4025		.3105	7	1-3/4	6	179584	65.88
.4030		.3105	7	1-3/4	6	179595	65.88
.4035		.3105	7	1-3/4	6	179606	65.88
.4040	Y	.3105	7	1-3/4	6	184424	58.89
.4045		.3105	7	1-3/4	6	179617	65.88
.4050		.3105	7	1-3/4	6	179628	65.88
.4055		.3105	7	1-3/4	6	179639	65.88
.4060		.3105	7	1-3/4	6	179650	65.88
.4062	13/32	.3105	7	1-3/4	6	184435	58.89
.4065		.3730	7	1-3/4	6	179661	65.88
.4070		.3730	7	1-3/4	6	179672	65.88
.4075		.3730	7	1-3/4	6	179683	65.88
.4080		.3730	7	1-3/4	6	179694	65.88
.4085		.3730	7	1-3/4	6	179705	65.88
.4090		.3730	7	1-3/4	6	179716	65.88
.4095		.3730	7	1-3/4	6	179727	65.88
.4100		.3730	7	1-3/4	6	179738	65.88
.4105		.3730	7	1-3/4	6	179749	65.88
.4110		.3730	7	1-3/4	6	179760	65.88
.4115		.3730	7	1-3/4	6	179771	65.88
.4120		.3730	7	1-3/4	6	179782	65.88
.4125		.3730	7	1-3/4	6	179793	65.88

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4130	Z	.3730	7	1-3/4	6	184446	58.89
.4134	10.5mm	.3730	7	1-3/4	6	184457	59.47
.4135		.3730	7	1-3/4	6	179804	65.88
.4140		.3730	7	1-3/4	6	179815	65.88
.4145		.3730	7	1-3/4	6	179826	65.88
.4150		.3730	7	1-3/4	6	179837	65.88
.4155		.3730	7	1-3/4	6	179848	65.88
.4160		.3730	7	1-3/4	6	179859	65.88
.4165		.3730	7	1-3/4	6	179870	65.88
.4170		.3730	7	1-3/4	6	179881	65.88
.4175		.3730	7	1-3/4	6	179892	65.88
.4180		.3730	7	1-3/4	6	179903	65.88
.4185		.3730	7	1-3/4	6	179914	65.88
.4190		.3730	7	1-3/4	6	179925	65.88
.4195		.3730	7	1-3/4	6	179936	65.88
.4200		.3730	7	1-3/4	6	179947	65.88
.4205		.3730	7	1-3/4	6	179958	65.88
.4210		.3730	7	1-3/4	6	179969	65.88
.4215		.3730	7	1-3/4	6	179980	65.88
.4219	27/64	.3730	7	1-3/4	6	184468	58.89
.4220		.3730	7	1-3/4	6	179991	61.78
.4225		.3730	7	1-3/4	6	180002	61.78
.4230		.3730	7	1-3/4	6	180013	61.78
.4235		.3730	7	1-3/4	6	180024	61.78
.4240		.3730	7	1-3/4	6	180035	61.78
.4245		.3730	7	1-3/4	6	180046	61.78
.4250		.3730	7	1-3/4	6	180057	61.78
.4255		.3730	7	1-3/4	6	180068	61.78
.4260		.3730	7	1-3/4	6	180079	61.78
.4265		.3730	7	1-3/4	6	180090	61.78
.4270		.3730	7	1-3/4	6	180101	61.78
.4275		.3730	7	1-3/4	6	180112	61.78
.4280		.3730	7	1-3/4	6	180123	61.78
.4285		.3730	7	1-3/4	6	180134	61.78
.4290		.3730	7	1-3/4	6	180145	61.78
.4295		.3730	7	1-3/4	6	180156	61.78
.4300		.3730	7	1-3/4	6	180167	61.78
.4305		.3730	7	1-3/4	6	180178	61.78
.4310		.3730	7	1-3/4	6	180189	61.78
.4315		.3730	7	1-3/4	6	180200	61.78
.4320		.3730	7	1-3/4	6	180211	61.78
.4325		.3730	7	1-3/4	6	180222	61.78
.4330		.3730	7	1-3/4	6	180233	61.78
.4331	11.0mm	.3730	7	1-3/4	6	184479	58.89

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

MADE IN THE USA



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4335		.3730	7	1-3/4	6	180244	61.78
.4340		.3730	7	1-3/4	6	180255	61.78
.4345		.3730	7	1-3/4	6	180266	61.78
.4350		.3730	7	1-3/4	6	180277	61.78
.4355		.3730	7	1-3/4	6	180288	61.78
.4360		.3730	7	1-3/4	6	180299	61.78
.4365	O/U	.3730	7	1-3/4	6	184490	55.95
.4370		.3730	7	1-3/4	6	180310	61.78
.4375	7/16	.3730	7	1-3/4	6	184501	55.95
.4380		.3730	7	1-3/4	6	180321	70.07
.4385	O/U	.3730	7	1-3/4	6	184512	55.95
.4390		.3730	7	1-3/4	6	180332	70.07
.4395		.3730	7	1-3/4	6	180343	70.07
.4400		.3730	7	1-3/4	6	180354	70.07
.4405		.3730	7	1-3/4	6	180365	70.07
.4410		.3730	7	1-3/4	6	180376	70.07
.4415		.3730	7	1-3/4	6	180387	70.07
.4420		.3730	7	1-3/4	6	180398	70.07
.4425		.3730	7	1-3/4	6	180409	70.07
.4430		.3730	7	1-3/4	6	180420	70.07
.4435		.3730	7	1-3/4	6	180431	70.07
.4440		.3730	7	1-3/4	6	180442	70.07
.4445		.3730	7	1-3/4	6	180453	70.07
.4450		.3730	7	1-3/4	6	180464	70.07
.4455		.3730	7	1-3/4	6	180475	70.07
.4460		.3730	7	1-3/4	6	180486	70.07
.4465		.3730	7	1-3/4	6	180497	70.07
.4470		.3730	7	1-3/4	6	180508	70.07
.4475		.3730	7	1-3/4	6	180519	70.07
.4480		.3730	7	1-3/4	6	180530	70.07
.4485		.3730	7	1-3/4	6	180541	70.07
.4490		.3730	7	1-3/4	6	180552	70.07
.4495		.3730	7	1-3/4	6	180563	70.07
.4500		.3730	7	1-3/4	6	180574	70.07
.4505		.3730	7	1-3/4	6	180585	70.07
.4510		.3730	7	1-3/4	6	180596	70.07
.4515		.3730	7	1-3/4	6	180607	70.07
.4520		.3730	7	1-3/4	6	180618	70.07
.4525		.3730	7	1-3/4	6	180629	70.07
.4528	11.5mm	.3730	7	1-3/4	6	184523	64.14
.4530		.3730	7	1-3/4	6	180640	70.07
.4531	29/64	.3730	7	1-3/4	6	184534	64.14
.4535		.3730	7	1-3/4	6	180651	70.07
.4540		.3730	7	1-3/4	6	180662	70.07

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4545		.3730	7	1-3/4	6	180673	70.07
.4550		.3730	7	1-3/4	6	180684	70.07
.4555		.3730	7	1-3/4	6	180695	70.07
.4560		.3730	7	1-3/4	6	180706	70.07
.4565		.3730	7	1-3/4	6	180717	70.07
.4570		.3730	7	1-3/4	6	180728	70.07
.4575		.3730	7	1-3/4	6	180739	70.07
.4580		.3730	7	1-3/4	6	180750	70.07
.4585		.3730	7	1-3/4	6	180761	70.07
.4590		.3730	7	1-3/4	6	180772	70.07
.4595		.3730	7	1-3/4	6	180783	70.07
.4600		.3730	7	1-3/4	6	180794	70.07
.4605		.3730	7	1-3/4	6	180805	70.07
.4610		.3730	7	1-3/4	6	180816	70.07
.4615		.3730	7	1-3/4	6	180827	70.07
.4620		.3730	7	1-3/4	6	180838	70.07
.4625		.3730	7	1-3/4	6	180849	70.07
.4630		.3730	7	1-3/4	6	180860	70.07
.4635		.3730	7	1-3/4	6	180871	70.07
.4640		.3730	7	1-3/4	6	180882	70.07
.4645		.3730	7	1-3/4	6	180893	70.07
.4650		.3730	7	1-3/4	6	180904	70.07
.4655		.3730	7	1-3/4	6	180915	70.07
.4660		.3730	7	1-3/4	6	180926	70.07
.4665		.3730	7	1-3/4	6	180937	70.07
.4670		.3730	7	1-3/4	6	180948	70.07
.4675		.3730	7	1-3/4	6	180959	70.07
.4680		.3730	7	1-3/4	6	180970	75.84
.4685		.3730	7	1-3/4	6	180981	70.07
.4688	15/32	.3730	7	1-3/4	6	184545	64.14
.4690		.4355	8	2	6	180992	70.07
.4695		.4355	8	2	6	181003	70.07
.4700		.4355	8	2	6	181014	70.07
.4705		.4355	8	2	6	181025	70.07
.4710		.4355	8	2	6	181036	70.07
.4715		.4355	8	2	6	181047	70.07
.4720		.4355	8	2	6	181058	70.07
.4724	12.0mm	.4355	8	2	6	184556	64.14
.4725		.4355	8	2	6	181069	70.07
.4730		.4355	8	2	6	181080	70.07
.4735		.4355	8	2	6	181091	70.07
.4740		.4355	8	2	6	181102	70.07
.4745		.4355	8	2	6	181113	70.07
.4750		.4355	8	2	6	181124	70.07

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

HSS Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



HSS & COBALT REAMERS

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4755		.4355	8	2	6	181135	70.07
.4760		.4355	8	2	6	181146	70.07
.4765		.4355	8	2	6	181157	70.07
.4770		.4355	8	2	6	181168	70.07
.4775		.4355	8	2	6	181179	70.07
.4780		.4355	8	2	6	181190	70.07
.4785		.4355	8	2	6	181201	70.07
.4790		.4355	8	2	6	181212	70.07
.4795		.4355	8	2	6	181223	70.07
.4800		.4355	8	2	6	181234	70.07
.4805		.4355	8	2	6	181245	70.07
.4810		.4355	8	2	6	181256	70.07
.4815		.4355	8	2	6	181267	70.07
.4820		.4355	8	2	6	181278	70.07
.4825		.4355	8	2	6	181289	70.07
.4830		.4355	8	2	6	181300	70.07
.4835		.4355	8	2	6	181311	70.07
.4840		.4355	8	2	6	181322	70.07
.4844	31/64	.4355	8	2	6	184567	64.14
.4845		.4355	8	2	6	181333	65.88
.4850		.4355	8	2	6	181344	65.88
.4855		.4355	8	2	6	181355	65.88
.4860		.4355	8	2	6	181366	65.88
.4865		.4355	8	2	6	181377	65.88
.4870		.4355	8	2	6	181388	65.88
.4875		.4355	8	2	6	181399	65.88
.4880		.4355	8	2	6	181410	65.88
.4885		.4355	8	2	6	181421	65.88
.4890		.4355	8	2	6	181432	65.88
.4895		.4355	8	2	6	181443	65.88
.4900		.4355	8	2	6	181454	65.88
.4905		.4355	8	2	6	181465	65.88
.4910		.4355	8	2	6	181476	65.88
.4915		.4355	8	2	6	181487	65.88
.4920	12.5mm	.4355	8	2	6	184578	64.14
.4925		.4355	8	2	6	181509	65.88
.4930		.4355	8	2	6	181520	65.88
.4935		.4355	8	2	6	181531	65.88
.4940		.4355	8	2	6	181542	65.88
.4945		.4355	8	2	6	181553	65.88
.4950		.4355	8	2	6	181564	65.88
.4955		.4355	8	2	6	181575	65.88
.4960		.4355	8	2	6	181586	65.88

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4965		.4355	8	2	6	181597	65.88
.4970		.4355	8	2	6	181608	65.88
.4975		.4355	8	2	6	181619	65.88
.4980		.4355	8	2	6	181630	65.88
.4985		.4355	8	2	6	181641	65.88
.4990	O/U	.4355	8	2	6	184589	60.89
.4995		.4355	8	2	6	181652	65.88
.5000	1/2	.4355	8	2	6	184600	60.89
.5005		.4355	8	2	6	181663	88.64
.5010	O/U	.4355	8	2	6	184611	60.89
.5015		.4355	8	2	6	181674	88.64
.5020		.4355	8	2	6	181685	88.64
.5025		.4355	8	2	6	181696	88.64
.5030		.4355	8	2	6	181707	88.64
.5035		.4355	8	2	6	181718	88.64
.5040		.4355	8	2	6	181729	88.64
.5045		.4355	8	2	6	181740	88.64
.5050		.4355	8	2	6	181751	88.64
.5060		.4355	8	2	6	181762	88.64
.5070		.4355	8	2	6	181773	88.64
.5080		.4355	8	2	6	181784	88.64
.5090		.4355	8	2	6	181795	88.64
.5100		.4355	8	2	6	181806	88.64
.5118	13.0mm	.4355	8	2	6	184622	79.47
.5156	33/64	.4355	8	2	6	184633	79.47
.5312	17/32	.4355	8	2	6	184644	75.68
.5315	13.5mm	.4355	8	2	6	184655	79.47
.5469	35/64	.4355	8	2	8	184666	79.47
.5512	14.0mm	.4355	8	2	8	184677	79.47
.5600		.4355	8	2	8	181817	86.82
.5605		.4355	8	2	8	181828	86.82
.5610		.4355	8	2	8	181839	86.82
.5615	O/U	.4355	8	2	8	184688	79.47
.5620		.4355	8	2	8	181850	86.82
.5625	9/16	.4355	8	2	8	184699	75.68
.5630		.4355	8	2	8	181861	99.69
.5635	O/U	.4355	8	2	8	184710	79.47
.5640		.4355	8	2	8	181872	99.69
.5645		.4355	8	2	8	181883	99.69
.5650		.4355	8	2	8	181894	99.69
.5655		.4355	8	2	8	181905	99.69
.5709	14.5mm	.4355	8	2	8	184721	79.47
.5781	37/64	.4355	8	2	8	184732	79.47
.5906	15.0mm	.4355	8	2	8	184743	79.47

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

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HSS Reamers

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CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



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DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.5938	19/32	.4355	8	2	8	184754	75.68
.6094	39/64	.5615	9	2-1/4	8	184765	92.74
.6102	15.5mm	.5615	9	2-1/4	8	184776	92.74
.6220		.5615	9	2-1/4	8	181916	105.36
.6225		.5615	9	2-1/4	8	181927	101.27
.6230		.5615	9	2-1/4	8	181938	100.14
.6235		.5615	9	2-1/4	8	181949	100.14
.6240	O/U	.5615	9	2-1/4	8	184787	92.74
.6245		.5615	9	2-1/4	8	181960	100.14
.6250	5/8	.5615	9	2-1/4	8	184798	88.64
.6255		.5615	9	2-1/4	8	181971	115.33
.6260	O/U	.5615	9	2-1/4	8	184809	95.45
.6265		.5615	9	2-1/4	8	181982	115.33
.6270		.5615	9	2-1/4	8	181993	115.33
.6275		.5615	9	2-1/4	8	182004	115.33
.6280		.5615	9	2-1/4	8	182015	115.03
.6299	16.0mm	.5615	9	2-1/4	8	184820	95.45
.6300		.5615	9	2-1/4	8	182697	115.03
.6406	41/64	.5615	9	2-1/4	8	184831	95.36
.6496	16.5mm	.5615	9	2-1/4	8	184842	100.04
.6562	21/32	.5615	9	2-1/4	8	184853	102.76
.6693	17.0mm	.5615	9	2-1/4	8	184864	107.84
.6719	43/64	.5615	9	2-1/4	8	184875	107.84
.6845		.5615	9	2-1/4	8	182026	115.03
.6850		.5615	9	2-1/4	8	182037	115.03
.6855		.5615	9	2-1/4	8	182048	115.03
.6860		.5615	9	2-1/4	8	182059	115.03
.6865	O/U	.5615	9	2-1/4	8	184886	107.79
.6870		.5615	9	2-1/4	8	182070	115.03
.6875	11/16	.5615	9	2-1/4	8	184897	102.62
.6880		.5615	9	2-1/4	8	182081	127.05
.6885	O/U	.5615	9	2-1/4	8	184908	115.89
.6890	17.5mm	.5615	9	2-1/4	8	184919	115.89
.6895		.5615	9	2-1/4	8	182092	133.34
.6900		.5615	9	2-1/4	8	182103	127.05
.6905		.5615	9	2-1/4	8	182114	128.94
.7031	45/64	.5615	9	2-1/4	8	184930	115.71
.7087	18.0mm	.5615	9	2-1/4	8	184941	115.71
.7188	23/32	.5615	9	2-1/4	8	184952	114.61
.7283	18.5mm	.6240	9-1/2	2-1/2	8	184963	120.11
.7344	47/64	.6240	9-1/2	2-1/2	8	184974	133.30
.7470		.6240	9-1/2	2-1/2	8	182125	134.67
.7475		.6240	9-1/2	2-1/2	8	182136	141.30
.7480	19.0mm	.6240	9-1/2	2-1/2	8	184985	133.21

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.7485		.6240	9-1/2	2-1/2	8	182147	141.30
.7490	O/U	.6240	9-1/2	2-1/2	8	184996	133.21
.7495		.6240	9-1/2	2-1/2	8	182158	134.67
.7500	3/4	.6240	9-1/2	2-1/2	8	185007	114.93
.7505		.6240	9-1/2	2-1/2	8	182169	142.19
.7510	O/U	.6240	9-1/2	2-1/2	8	185018	128.07
.7515		.6240	9-1/2	2-1/2	8	182180	146.22
.7520		.6240	9-1/2	2-1/2	8	182191	146.22
.7525		.6240	9-1/2	2-1/2	8	182202	146.22
.7530		.6240	9-1/2	2-1/2	8	182213	146.22
.7540		.6240	9-1/2	2-1/2	8	182224	146.22
.7550		.6240	9-1/2	2-1/2	8	182235	146.22
.7656	49/64	.6240	9-1/2	2-1/2	8	185029	127.88
.7677	19.5mm	.6240	9-1/2	2-1/2	8	185040	127.88
.7812	25/32	.6240	9-1/2	2-1/2	8	185051	123.89
.7874	20mm	.6240	9-1/2	2-1/2	8	185062	136.98
.7969	51/64	.6240	9-1/2	2-1/2	8	185073	136.98
.8071	20.5mm	.6240	9-1/2	2-1/2	8	185084	136.89
.8095		.6240	9-1/2	2-1/2	8	182246	145.82
.8100		.6240	9-1/2	2-1/2	8	182257	145.82
.8105		.6240	9-1/2	2-1/2	8	182268	145.82
.8110		.6240	9-1/2	2-1/2	8	182279	145.82
.8115	O/U	.6240	9-1/2	2-1/2	8	185095	136.89
.8120		.6240	9-1/2	2-1/2	8	182290	145.82
.8125	13/16	.6240	9-1/2	2-1/2	8	185106	123.70
.8130		.6240	9-1/2	2-1/2	8	182301	160.69
.8135	O/U	.6240	9-1/2	2-1/2	8	185117	136.89
.8140		.6240	9-1/2	2-1/2	8	182312	168.76
.8145		.6240	9-1/2	2-1/2	8	182323	168.76
.8150		.6240	9-1/2	2-1/2	8	182334	160.84
.8155		.6240	9-1/2	2-1/2	8	182345	160.84
.8268	21.0mm	.6240	9-1/2	2-1/2	8	185128	136.75
.8281	53/64	.6240	9-1/2	2-1/2	8	185139	136.75
.8438	27/32	.6240	9-1/2	2-1/2	8	185150	146.58
.8465	21.5mm	.7490	10	2-5/8	8	185161	159.58
.8594	55/64	.7490	10	2-5/8	8	185172	159.58
.8661	22.0mm	.7490	10	2-5/8	8	185183	159.49
.8720		.6240	10	2-5/8	8	182356	164.42
.8725		.6240	10	2-5/8	8	182367	164.42
.8730		.6240	10	2-5/8	8	182378	164.42
.8735		.6240	10	2-5/8	8	182389	164.42
.8740	O/U	.7490	10	2-5/8	8	185194	159.49
.8745		.7490	10	2-5/8	8	182400	164.42
.8750	7/8	.7490	10	2-5/8	8	185205	149.76

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

HSS Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE STOCKED INTERMEDIATE & STANDARD SIZES



DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.8755		.7490	10	2-5/8	8	182411	179.60
.8760	O/U	.7490	10	2-5/8	8	185216	163.04
.8765		.7490	10	2-5/8	8	182422	179.60
.8770		.7490	10	2-5/8	8	182433	179.60
.8775		.7490	10	2-5/8	8	182444	179.60
.8780		.7490	10	2-5/8	8	182455	179.60
.8858	22.5mm	.7490	10	2-5/8	8	185227	162.81
.8906	57/64	.7490	10	2-5/8	8	185238	162.81
.9055	23.0mm	.7490	10	2-5/8	8	185249	162.81
.9062	29/32	.7490	10	2-5/8	8	185260	161.42
.9219	59/64	.7490	10	2-5/8	8	185271	174.42
.9252	23.5mm	.7490	10	2-5/8	8	185282	174.42
.9340		.7490	10	2-5/8	8	182466	179.02
.9345		.7490	10	2-5/8	8	182477	179.02
.9350		.7490	10	2-5/8	8	182488	179.02
.9355		.7490	10	2-5/8	8	182499	179.02
.9360		.7490	10	2-5/8	8	182510	179.02
.9365	O/U	.7490	10	2-5/8	8	185293	174.19
.9370		.7490	10	2-5/8	8	182521	179.02
.9375	15/16	.7490	10	2-5/8	8-10	185304	161.10
.9380		.7490	10	2-5/8	8	182532	196.90
.9385	O/U	.7490	10	2-5/8	8-10	185315	174.19
.9390		.7490	10	2-5/8	8	182543	206.64
.9395		.7490	10	2-5/8	8	182554	206.64
.9400		.7490	10	2-5/8	8	182565	206.64
.9405		.7490	10	2-5/8	8	182576	206.64
.9449	24.0mm	.7490	10	2-5/8	8-10	185326	174.19
.9531	61/64	.7490	10	2-5/8	8-10	185337	174.19
.9646	24.5mm	.7490	10	2-5/8	8-10	185348	174.05
.9688	31/32	.7490	10	2-5/8	8-10	185359	189.66
.9843	25.0mm	.8740	10-1/2	2-3/4	8-10	185370	184.67
.9844	63/64	.8740	10-1/2	2-3/4	8-10	185381	184.67
.9970		.8740	10-1/2	2-3/4	8	182587	200.12
.9975		.8740	10-1/2	2-3/4	8	182598	209.96
.9980		.8740	10-1/2	2-3/4	8	182609	200.12

DEC. EQUIV.	SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.9985		.8740	10-1/2	2-3/4	8	182620	200.12
.9990	O/U	.8740	10-1/2	2-3/4	8-10	185392	184.67
.9995		.8740	10-1/2	2-3/4	8	182631	200.12
1.0000	1	.8740	10-1/2	2-3/4	8-10	185403	182.07
1.0001	O/U	.8740	10-1/2	2-3/4	8-10	185414	195.21
1.0005		.8740	10-1/2	2-3/4	8	182642	293.30
1.0015		.8740	10-1/2	2-3/4	8	182653	279.22
1.0020		.8740	10-1/2	2-3/4	8	182664	279.22
1.0025		.8740	10-1/2	2-3/4	8	182675	279.48
1.0030		.8740	10-1/2	2-3/4	8	182686	279.48
1.0312	1-1/32	.8740	10-1/2	2-3/4	8-10	185425	254.67
1.0625	1-1/16	.8740	10-1/2	2-3/4	8-10	185436	201.78
1.0938	1-3/32	.8740	11	2-7/8	8-10	185447	266.96
1.1250	1-1/8	.8740	11	2-7/8	8-10	185458	213.93
1.1562	1-5/32	.9990	11	2-7/8	8-12	185469	303.95
1.1875	1-3/16	.9990	11	2-7/8	8-12	185480	250.60
1.2188	1-7/32	.9990	11-1/2	3	8-12	185491	318.40
1.2500	1-1/4	.9990	11-1/2	3	8-12	185502	265.06
1.2812	1-9/32	.9990	11-1/2	3	8-12	185513	363.17
1.3125	1-5/16	.9990	11-1/2	3	8-12	185524	309.78
1.3438	1-11/32	.9990	12	3-1/4	8-12	185535	375.83
1.3750	1-3/8	.9990	12	3-1/4	8-12	185546	324.74
1.4062	1-13/32	1.2490	12	3-1/4	8-12	185557	400.17
1.4375	1-7/16	1.2490	12	3-1/4	8-12	185568	347.44
1.4688	1-15/32	1.2490	12-1/2	3-1/2	8-12	185579	426.98
1.5000	1-1/2	1.2490	12-1/2	3-1/2	8-12	185590	373.53
1.5625	1-9/16	1.2490	13	3-1/2	10-	192124	536.67
1.6250	1-5/8	1.2490	13	3-1/2	10-	192135	536.67
1.6875	1-11/16	1.2490	13-1/2	4	10-	192146	616.34
1.7500	1-3/4	1.2490	13-1/2	4	10-	192157	667.97
1.8125	1-13/16	1.4990	14	4	10-	192168	772.66
1.8750	1-7/8	1.4990	14	4	10-	192179	709.87
1.9375	1-15/16	1.4990	14	4	10-	192190	832.46
2.0000	2	1.4990	14	4	10-	192201	905.97

HSS & COBALT REAMERS

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.0002, -0.0000	+0.0003, -0.0000	+0.0001, +0.0004	+0.0002, +0.0006



M42 Cobalt Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE



HSS & COBALT REAMERS

SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
#80	.0135	3/4	3/8	2	185920	44.28
#79	.0145	3/4	3/8	2	185931	44.28
1/64	.0156	3/4	3/8	2	185942	44.28
#78	.0160	7/8	3/8	2	185953	44.28
#77	.0180	7/8	3/8	2	185964	44.28
#76	.0200	7/8	3/8	2	185975	44.28
#75	.0210	1	1/2	3	185986	44.28
#74	.0225	1	1/2	3	185997	44.28
#73	.0240	1-1/8	1/2	3	186008	44.28
#72	.0250	1-1/8	1/2	3	186019	44.28
#71	.0260	1-1/4	1/2	3	186030	44.28
#70	.0280	1-1/4	1/2	3	186041	44.28
#69	.0292	1-3/8	1/2	3	186052	44.28
#68	.0310	1-3/8	1/2	3	186063	44.28
1/32	.0312	1-3/8	1/2	3	186074	36.44
#67	.0320	1-3/8	1/2	3	186085	36.44
#66	.0330	1-3/8	1/2	3	186096	36.44
#65	.0350	1-1/2	1/2	3	186107	36.44
#64	.0360	1-1/2	1/2	3	186118	36.44
#63	.0370	1-1/2	1/2	3	186129	36.44
#62	.0380	1-1/2	1/2	3	186140	36.44
#61	.0390	1-1/2	1/2	3	186151	36.44
1.0mm	.0394	2-1/2	1/2	4	186162	35.86
#60	.0390	2-1/2	1/2	4	186173	35.86
#59	.0390	2-1/2	1/2	4	186184	35.86
#58	.0390	2-1/2	1/2	4	186195	35.86
#57	.0390	2-1/2	1/2	4	186206	35.86
#56	.0455	2-1/2	1/2	4	186217	35.86
3/64	.0455	2-1/2	1/2	4	186228	35.86
#55	.0510	2-1/2	1/2	4	186239	35.86
#54	.0510	2-1/2	1/2	4	186250	35.86
1.5mm	.0510	2-1/2	1/2	4	186261	35.86
#53	.0585	2-1/2	1/2	4	186272	35.86
1/16	.0585	2-1/2	1/2	4	186283	35.86
#52	.0585	2-1/2	1/2	4	186294	35.86
#51	.0660	3	3/4	4	186305	28.87
#50	.0660	3	3/4	4	186316	28.87
#49	.0660	3	3/4	4	186327	28.87
#48	.0720	3	3/4	4	186338	28.87
5/64	.0720	3	3/4	4	186349	28.87
#47	.0720	3	3/4	4	186360	28.87
2.0mm	.0720	3	3/4	4	186371	28.87
#46	.0771	3	3/4	4	186382	28.87
#45	.0771	3	3/4	4	186393	28.87
#44	.0810	3	3/4	4	186404	28.87
#43	.0810	3	3/4	4	186415	28.87
#42	.0880	3	3/4	4	186426	28.87
3/32	.0880	3	3/4	4	186437	28.87

SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	# OF FLUTES	ITEM #	LIST PRICE
#41	.0928	3-1/2	7/8	4	186448	29.09
#40	.0928	3-1/2	7/8	4	186459	29.09
2.5mm	.0928	3-1/2	7/8	4	186470	29.09
#39	.0928	3-1/2	7/8	4	186481	29.09
#38	.0950	3-1/2	7/8	4	186492	29.09
#37	.0950	3-1/2	7/8	4	186503	29.09
#36	.1030	3-1/2	7/8	4	186514	29.09
7/64	.1030	3-1/2	7/8	4	186525	29.98
#35	.1030	3-1/2	7/8	4	186536	29.98
#34	.1055	3-1/2	7/8	4	186547	29.98
#33	.1055	3-1/2	7/8	4	186558	29.98
#32	.1120	3-1/2	7/8	4	186569	29.98
3.0mm	.1120	3-1/2	7/8	4	186580	29.98
#31	.1120	3-1/2	7/8	4	186591	29.98
.124 O/U	.1190	3-1/2	7/8	4	186602	29.98
1/8	.1190	3-1/2	7/8	4	186613	27.00
.126 O/U	.1190	3-1/2	7/8	4	186624	29.98
#30	.1190	3-1/2	7/8	4	186635	29.98
#29	.1275	4	1	4	186646	35.86
3.5mm	.1350	4	1	4	186657	35.86
#28	.1350	4	1	4	186668	35.86
9/64	.1350	4	1	4	186679	35.86
#27	.1350	4	1	4	186690	35.86
#26	.1430	4	1	4	186701	35.86
#25	.1430	4	1	4	186712	35.86
#24	.1460	4	1	4	186723	35.86
#23	.1460	4	1	4	186734	35.86
5/32	.1510	4	1	4	186745	35.86
#22	.1510	4	1	6	186756	35.86
4.0mm	.1510	4	1	6	186767	35.86
#21	.1530	4-1/2	1-1/8	6	186778	38.26
#20	.1530	4-1/2	1-1/8	6	186789	38.26
#19	.1595	4-1/2	1-1/8	6	186800	38.26
#18	.1595	4-1/2	1-1/8	6	186811	38.26
11/64	.1645	4-1/2	1-1/8	6	186822	38.26
#17	.1645	4-1/2	1-1/8	6	186833	38.26
#16	.1704	4-1/2	1-1/8	6	186844	38.26
4.5mm	.1704	4-1/2	1-1/8	6	186855	38.26
#15	.1755	4-1/2	1-1/8	6	186866	38.26
#14	.1755	4-1/2	1-1/8	6	186877	38.26
#13	.1805	4-1/2	1-1/8	6	186888	38.26
.1865 O/U	.1805	4-1/2	1-1/8	6	186899	38.26
3/16	.1805	4-1/2	1-1/8	6	186910	36.97
.1885 O/U	.1805	4-1/2	1-1/8	6	186921	38.26
#12	.1805	4-1/2	1-1/8	6	186932	38.26
#11	.1860	5	1-1/4	6	186943	46.24
#10	.1860	5	1-1/4	6	186954	46.24
#9	.1895	5	1-1/4	6	186965	46.24

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004

M42 Cobalt Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



CHUCKING STRAIGHT SHANK - STRAIGHT FLUTE



SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	#OF FLUTES	ITEM #	LIST PRICE
5.0mm	.1895	5	1-1/4	6	186976	46.24
#8	.1895	5	1-1/4	6	186987	46.24
#7	.1895	5	1-1/4	6	186998	46.24
13/64	.1945	5	1-1/4	6	187009	46.24
#6	.1945	5	1-1/4	6	187020	46.24
#5	.2016	5	1-1/4	6	187031	46.24
#4	.2016	5	1-1/4	6	187042	46.24
#3	.2075	5	1-1/4	6	187053	46.24
5.5mm	.2075	5	1-1/4	6	187064	46.24
7/32	.2075	5	1-1/4	6	187075	46.24
#2	.2173	6	1-1/2	6	187086	47.57
#1	.2173	6	1-1/2	6	187097	47.57
A	.2265	6	1-1/2	6	187108	47.57
15/64	.2265	6	1-1/2	6	187119	47.57
6.0mm	.2265	6	1-1/2	6	187130	47.80
B	.2329	6	1-1/2	6	187141	47.80
C	.2329	6	1-1/2	6	187152	47.80
D	.2329	6	1-1/2	6	187163	43.43
.249 O/U	.2405	6	1-1/2	6	187174	42.99
1/4	.2405	6	1-1/2	6	187185	40.62
.251 O/U	.2405	6	1-1/2	6	187196	43.03
6.5mm	.2405	6	1-1/2	6	187207	47.80
F	.2485	6	1-1/2	6	187218	47.80
G	.2485	6	1-1/2	6	187229	47.80
17/64	.2485	6	1-1/2	6	187240	64.81
H	.2485	6	1-1/2	6	187251	64.81
I	.2485	6	1-1/2	6	187262	64.81
7.0mm	.2485	6	1-1/2	6	187273	64.81
J	.2485	6	1-1/2	6	187284	64.81
K	.2485	6	1-1/2	6	187295	64.81
9/32	.2485	6	1-1/2	6	187306	61.56
L	.2792	6	1-1/2	6	187317	64.81
M	.2792	6	1-1/2	6	187328	64.81
7.5mm	.2792	6	1-1/2	6	187339	64.81
19/64	.2792	6	1-1/2	6	187350	64.81
N	.2792	6	1-1/2	6	187361	64.81
.3115 O/U	.2792	6	1-1/2	6	187372	61.56
5/16	.2792	6	1-1/2	6	187383	58.31
.3135 O/U	.2792	6	1-1/2	6	187394	61.56
8.0mm	.2792	6	1-1/2	6	187405	64.81
O	.2792	6	1-1/2	6	187416	64.81
P	.2792	6	1-1/2	6	187427	69.85
21/64	.2792	6	1-1/2	6	187438	69.85
Q	.2792	6	1-1/2	6	187449	69.85
8.5mm	.2792	6	1-1/2	6	187460	69.85
R	.2792	6	1-1/2	6	187471	69.85
11/32	.2792	6	1-1/2	6	187482	69.85

SIZE	SHANK DIA.	OVERALL LENGTH	FLUTE LENGTH	#OF FLUTES	ITEM #	LIST PRICE
S	.3105	6	1-3/4	6	187493	71.00
9.0mm	.3105	7	1-3/4	6	187504	71.00
T	.3105	7	1-3/4	6	187515	71.00
23/64	.3105	7	1-3/4	6	187526	71.00
U	.3105	7	1-3/4	6	187537	71.00
9.5mm-o/u	.3105	7	1-3/4	6	187548	67.40
3/8	.3105	7	1-3/4	6	187559	63.88
.376 O/U	.3105	7	1-3/4	6	187570	67.40
V	.3105	7	1-3/4	6	187581	86.55
W	.3105	7	1-3/4	6	187592	86.55
25/64	.3105	7	1-3/4	6	187603	86.55
10.0mm	.3105	7	1-3/4	6	187614	86.55
X	.3105	7	1-3/4	6	187625	86.55
Y	.3105	7	1-3/4	6	187636	86.55
13/32	.3105	7	1-3/4	6	187647	86.55
Z	.3730	7	1-3/4	6	187658	86.55
10.5mm	.3730	7	1-3/4	6	187669	86.55
27/64	.3730	7	1-3/4	6	187680	86.55
11.0mm	.3730	7	1-3/4	6	187691	86.55
.4365 O/U	.3730	7	1-3/4	6	187702	86.55
7/16	.3730	7	1-3/4	6	187713	86.55
.4385 O/U	.3730	7	1-3/4	6	187724	86.55
11.5mm	.3730	7	1-3/4	6	187735	99.20
29/64	.3730	7	1-3/4	6	187746	99.20
15/32	.3730	7	1-3/4	6	187757	99.20
12.0mm	.4355	8	2	6	187768	99.20
31/64	.4355	8	2	6	187779	99.20
12.5mm	.4355	8	2	6	187790	99.20
.499 O/U	.4355	8	2	6	187801	99.20
1/2	.4355	8	2	6	187812	99.20
.501 O/U	.4355	8	2	6	187823	99.20
17/32	.4355	8	2	6	187834	111.27
9/16	.4355	8	2	8	187845	111.27
19/32	.4355	8	2	8	187856	111.27
5/8	.5615	9	2-1/4	8	187867	129.85
21/32	.5615	9	2-1/4	8	187878	150.35
11/16	.5615	9	2-1/4	8	187889	149.80
23/32	.5615	9	2-1/4	8	187900	167.62
3/4	.6240	9	2-1/2	8	187911	167.58
25.32	.6240	9	2-1/2	8	187922	181.08
13/16	.6240	9	2-1/2	8	187933	180.17
27/32	.6240	9-1/2	2-1/2	8	187944	214.18
7/8	.7490	10	2-5/8	8	187955	218.39
29/32	.7490	10	2-5/8	8	187966	235.84
15/16	.7490	10	2-5/8	8-10	187977	234.97
31/32	.7490	10	2-5/8	8-10	187988	263.97
1	.8740	10-1/2	2-3/4	8-10	187999	265.76

HSS & COBALT REAMERS

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"
+ .0002, - .0000	+ .0003, - .0000	+ .0001, + .0004

MADE IN THE USA



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING
STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL

SPECIAL SIZES - QUANTITY PRICING

SIZE RANGE	1	2	3-5	6-7	8-11	12-17	18-23	24-35	36-47	48-59	60-71	72-95	96+
.0135 - .0195	239.84	156.74	116.80	77.08	69.63	59.18	53.55	49.81	48.51	44.45	43.10	42.54	41.54
.0196 - .0290	218.06	142.49	106.26	70.06	63.27	55.46	48.66	45.35	42.04	40.36	40.18	40.12	39.97
.0291 - .0390	198.22	129.32	96.55	63.64	57.50	50.47	44.29	41.21	38.18	36.71	35.67	35.17	34.33
.0391 - .0624	179.17	119.28	96.55	61.38	55.34	47.96	42.20	39.20	36.16	33.94	33.41	33.29	33.07
.0626 - .1093	188.65	120.76	93.13	58.03	50.86	42.17	38.18	35.15	32.20	30.38	29.65	29.11	28.12
.1095 - .1249	186.15	118.15	87.54	50.71	44.53	40.74	33.41	30.38	29.94	29.46	28.96	28.42	28.20
.1251 - .1405	198.22	129.32	87.31	63.64	59.94	50.47	44.29	41.21	38.18	36.71	35.77	35.17	33.99
.1407 - .1561	195.22	127.27	96.66	61.71	55.34	48.33	42.20	39.20	37.00	36.16	35.34	34.51	33.64
.1563 - .1718	198.22	123.71	96.10	63.64	57.64	50.47	44.29	41.21	38.18	37.59	37.00	36.71	35.99
.1720 - .1874	190.11	118.67	96.04	59.28	53.27	47.61	41.89	38.71	38.30	37.72	37.18	36.23	35.77
.1876 - .2030	203.57	135.62	106.43	71.24	65.16	57.93	51.81	48.86	45.53	43.10	42.17	41.89	41.55
.2032 - .2187	203.57	135.62	105.28	70.14	64.10	56.74	50.55	47.63	44.53	41.89	41.36	40.87	40.67
.2189 - .2343	204.38	136.69	106.14	71.03	64.93	57.64	51.47	48.41	45.42	43.59	42.94	42.54	42.20
.2345 - .2499	204.38	136.69	101.04	65.91	59.76	52.72	46.70	43.65	40.41	40.18	39.64	39.23	39.06
.2501 - .2968	212.27	144.31	113.69	78.57	72.55	64.80	58.71	55.68	52.46	49.73	49.25	48.82	48.33
.2970 - .3124	206.37	138.48	107.83	72.59	66.50	59.18	52.95	49.84	49.63	49.20	48.96	48.63	48.33
.3126 - .3437	216.80	147.79	116.99	75.78	73.47	67.78	61.88	58.71	55.41	53.00	52.46	52.11	51.68
.3439 - .3593	216.49	148.59	117.87	82.70	76.56	71.86	61.88	59.55	56.53	53.82	53.27	52.84	52.46
.3595 - .3749	210.28	142.16	111.54	76.16	70.14	62.72	56.66	53.36	53.08	53.00	52.64	52.37	52.18
.3751 - .3905	220.10	152.26	121.81	86.32	80.23	73.55	67.29	64.23	61.26	58.03	57.71	57.22	56.74
.3907 - .4218	222.87	154.89	124.17	89.02	82.94	74.93	68.87	65.89	62.77	60.03	59.46	59.18	59.02
.4220 - .4374	218.66	150.83	119.96	84.94	78.89	71.03	64.80	61.78	61.26	61.05	60.79	59.53	58.88
.4376 - .4843	228.79	160.78	130.13	95.00	88.90	80.58	71.51	70.06	68.53	66.40	65.91	65.16	64.58
.4845 - .4999	223.40	155.44	124.75	89.46	83.53	75.26	66.08	65.89	65.35	65.10	64.58	64.36	64.15
.5001 - .5311	324.18	201.36	160.52	119.41	109.31	98.96	92.21	88.64	85.23	83.66	82.59	81.92	81.11
.5313 - .5624	322.37	199.47	158.55	117.51	107.42	97.03	90.38	86.83	83.33	81.64	80.62	79.87	79.50
.5626 - .5937	335.05	212.15	171.15	130.13	122.33	109.76	106.17	99.68	96.04	94.48	93.38	92.69	91.74
.5939 - .6249	335.52	212.49	171.53	130.53	120.43	110.19	103.38	100.13	96.44	94.90	93.74	93.13	92.72
.6251 - .6874	347.49	224.59	183.61	142.60	132.37	127.05	115.26	111.86	108.49	106.73	105.71	105.14	104.81
.6876 - .7187	358.73	235.94	194.91	153.41	143.41	133.39	126.63	123.31	119.92	118.15	117.03	116.22	115.54
.7189 - .7499	363.26	240.37	199.62	158.47	148.42	138.11	131.19	131.01	130.87	130.75	130.27	130.01	129.57
.7501 - .8124	377.58	254.77	213.97	172.87	162.68	152.47	145.63	142.19	138.79	137.09	136.09	135.31	134.40
.8126 - .8437	392.06	269.09	228.34	187.28	177.03	166.95	160.00	156.57	153.23	151.45	150.34	149.74	148.89
.8439 - .8749	395.69	272.82	231.78	190.76	180.58	170.39	163.46	160.62	159.13	154.89	153.79	153.14	150.24
.8751 - .9374	410.56	287.66	246.71	205.69	195.54	185.44	178.43	175.02	171.71	171.18	170.89	170.63	170.31
.9376 - .9687	427.61	302.91	263.79	222.87	212.65	202.43	195.54	192.12	188.75	187.18	185.90	185.50	184.47
.9689 - .9999	431.16	308.31	267.38	226.29	216.21	205.94	199.18	195.82	192.24	190.62	189.52	188.75	187.98
1.0001 - 1.0624	462.72	345.63	333.40	321.17	308.80	296.56	284.27	271.99	259.78	258.17	252.26	250.20	248.08
1.0626 - 1.1249	488.63	372.17	358.73	345.24	331.75	318.29	304.88	291.42	277.98	264.55	263.30	261.99	260.50
1.1251 - 1.1874	521.82	407.04	393.07	379.73	366.33	352.97	340.00	326.26	315.34	299.48	286.09	272.78	259.37
1.1876 - 1.2499	550.84	434.41	419.83	405.37	390.91	376.46	361.96	347.49	333.03	318.58	304.11	289.61	275.18
1.2501 - 1.3749	626.56	504.64	488.88	473.48	458.11	440.40	427.32	412.02	396.53	381.14	377.18	373.25	370.03
1.3751 - 1.4999	693.10	575.10	557.92	540.80	523.61	506.42	489.36	472.12	455.03	437.80	433.14	426.78	419.50

For technical information, please see page 256.

THRU 1/2" DIAMETER	ABOVE 1/2" TO 5/8"	ABOVE 5/8" TO 1-1/2"
+ .0002, - .0000	+ .0003, - .0000	+ .0001, + .0004

HSS & COBALT REAMERS

M42 Cobalt Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING
STRAIGHT SHANK - STRAIGHT FLUTE



M42 COBALT

SPECIAL SIZES - QUANTITY PRICING

SIZE RANGE	1	2	3-5	6-7	8-11	12-17	18-23	24-35	36-47	48-59	60-71	72-95	96+
.0135 - .0195	346.47	183.16	135.76	88.61	76.79	64.90	57.08	53.11	49.17	47.22	46.07	44.45	44.29
.0196 - .0290	315.02	166.42	123.42	80.55	69.81	59.02	51.81	48.27	44.74	44.53	44.47	44.45	44.29
.0291 - .0390	286.40	151.40	112.24	73.16	63.40	56.73	47.12	43.92	40.67	39.06	38.10	37.40	36.53
.0391 - .0624	260.74	149.11	110.00	70.86	61.08	51.33	44.87	41.60	38.34	36.72	36.51	36.21	35.88
.0626 - .1093	262.54	145.76	106.67	67.54	57.85	47.97	41.54	38.26	34.98	33.41	33.21	33.07	32.79
.1095 - .1249	256.53	139.69	100.69	61.57	51.80	42.08	35.55	33.63	31.71	31.16	30.72	30.32	29.96
.1251 - .1405	268.14	151.33	111.78	73.16	63.40	53.67	47.12	43.92	40.67	39.06	38.10	37.40	36.53
.1407 - .1561	265.91	149.11	110.00	70.86	61.08	51.33	44.87	41.60	38.34	36.72	36.23	36.10	35.84
.1563 - .1718	268.38	151.45	112.35	73.35	63.60	53.82	47.36	44.07	40.78	39.14	38.85	38.58	38.26
.1720 - .1874	266.41	149.68	110.51	71.51	63.39	51.98	45.43	42.20	38.93	38.85	38.62	38.34	38.32
.1876 - .2030	277.33	160.52	121.33	82.31	72.58	62.72	56.31	53.02	49.74	48.10	47.12	46.52	46.27
.2032 - .2343	276.16	159.40	120.33	81.20	71.51	61.78	55.19	53.49	51.77	51.22	50.90	50.47	49.69
.2345 - .2499	271.41	154.89	115.82	76.79	66.97	57.20	50.71	50.41	50.08	49.69	49.21	48.33	47.72
.2501 - .2968	295.61	178.84	139.61	100.69	90.86	81.14	74.46	71.29	68.08	66.45	65.96	65.00	64.80
.2970 - .3124	288.17	171.27	132.20	93.13	83.28	73.57	67.13	66.72	66.30	65.99	65.43	65.34	64.88
.3126 - .3437	299.28	182.37	143.26	104.24	94.48	84.66	78.20	74.92	71.60	71.32	70.93	70.26	69.87
.3439 - .3593	299.81	183.03	143.91	104.85	95.12	85.39	78.79	75.63	72.42	71.91	71.49	71.32	70.86
.3595 - .3749	292.96	176.11	137.04	97.89	88.14	78.36	71.86	71.69	71.49	71.24	35.77	71.08	70.80
.3751 - .3905	319.99	203.21	164.15	125.07	115.26	105.53	98.74	95.62	92.51	90.86	89.86	89.27	88.43
.3907 - .4218	324.08	207.38	168.20	129.14	119.43	109.62	103.10	99.87	96.64	95.12	93.91	93.32	92.51
.4220 - .4374	317.72	200.92	161.84	122.75	113.05	103.24	96.68	93.47	90.19	88.64	87.62	86.99	86.19
.4376 - .4843	333.16	216.40	177.30	138.25	128.49	118.69	112.31	109.04	105.77	104.09	103.10	102.49	101.63
.4845 - .4999	324.75	207.89	168.85	129.76	119.92	110.22	103.75	101.99	100.21	99.94	99.58	99.37	99.21
.5001 - .5311	342.67	224.18	185.50	143.25	139.27	135.55	131.87	128.17	124.47	120.77	117.03	113.34	109.69
.5313 - .5624	345.24	227.95	190.61	147.83	143.48	139.27	135.11	130.96	126.79	122.63	118.46	114.30	110.12
.5626 - .5937	351.78	233.83	195.38	152.37	147.62	142.97	138.34	145.45	129.11	124.47	119.83	115.19	110.53
.5939 - .6249	362.90	245.55	208.24	165.10	160.67	156.57	152.47	148.37	144.28	140.07	135.99	131.87	127.77
.6251 - .6874	374.45	256.64	221.24	177.88	173.87	170.09	166.33	162.55	158.74	155.01	152.69	147.37	143.67
.6876 - .7187	385.83	267.86	230.11	186.54	183.29	180.26	177.03	174.09	171.15	168.16	165.10	164.15	163.86
.7189 - .7499	399.44	282.77	247.60	203.67	198.91	194.21	189.56	184.93	180.26	175.58	170.89	166.24	161.52
.7501 - .8124	420.53	302.90	266.18	223.73	209.74	205.25	200.73	196.25	191.79	187.28	182.74	178.27	173.79
.8126 - .8437	441.69	325.34	286.83	247.23	235.50	231.46	227.61	223.73	219.80	215.85	211.94	208.08	204.18
.8439 - .8749	464.66	346.92	309.11	267.43	251.85	246.53	241.35	236.16	230.93	225.74	220.48	215.36	210.13
.8751 - .9374	483.20	365.00	327.61	283.97	268.14	262.81	257.59	252.31	247.05	241.81	236.50	234.20	231.77
.9376 - .9687	507.96	387.30	350.37	307.84	301.42	295.70	289.61	283.64	277.54	271.46	265.45	262.42	259.59
.9689 - .9999	525.64	408.02	371.83	330.24	321.99	313.86	305.79	297.78	289.77	281.79	273.75	265.67	257.63
1.0001 - 1.0624	565.60	447.83	409.62	367.11	358.09	350.96	339.96	330.96	321.95	312.88	303.84	294.73	285.79
1.0626 - 1.1249	605.92	488.62	451.17	409.64	397.74	386.27	374.70	363.20	351.63	340.19	328.65	317.13	305.64
1.1251 - 1.1874	645.00	525.64	491.56	445.94	435.59	425.45	415.37	405.22	395.11	384.93	374.76	364.69	354.50
1.1876 - 1.2499	685.87	570.35	533.53	489.06	475.92	463.58	451.18	438.90	426.62	414.28	401.97	389.60	377.37
1.2501 - 1.3749	727.07	607.26	567.69	527.34	519.34	503.49	493.34	483.34	473.37	463.37	453.37	443.37	433.37
1.3751 - 1.4999	767.42	649.41	612.60	569.91	564.28	559.01	553.69	550.32	546.94	545.79	544.84	543.53	542.44

For technical information, please see page 256.

THRU 1/2" DIAMETER	ABOVE 1/2" TO 5/8"	ABOVE 5/8" TO 1-1/2"
+0.002, -0.000	+0.003, -0.000	+0.001, +0.004

MADE IN THE USA

HSS & COBALT REAMERS



HSS & M42 Cobalt Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING

STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HSS & COBALT REAMERS

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
1.0mm	.0394	1/2	4	2-1/2	.0394	188252	38.53	190188	42.14
#60	.0400	1/2	4	2-1/2	.0390	188263	38.53	190199	42.14
#59	.0410	1/2	4	2-1/2	.0390	188274	38.53	190210	42.14
#58	.0420	1/2	4	2-1/2	.0390	188285	38.53	190221	42.14
#57	.0430	1/2	4	2-1/2	.0390	188296	38.53	190232	42.14
#56	.0465	1/2	4	2-1/2	.0455	188307	38.53	190243	42.14
3/64	.0469	1/2	4	2-1/2	.0455	188318	38.53	190254	42.14
#55	.0520	1/2	4	2-1/2	.0510	188329	38.53	190265	42.14
#54	.0550	1/2	4	2-1/2	.0510	188340	38.53	190276	42.14
1.5mm	.0591	1/2	4	2-1/2	.0510	188351	38.53	190287	42.14
#53	.0595	1/2	4	2-1/2	.0585	188362	38.53	190298	42.14
1/16	.0625	1/2	4	2-1/2	.0585	188373	38.53	190309	42.14
#52	.0635	1/2	4	2-1/2	.0585	188384	38.53	190320	42.14
#51	.0670	3/4	4	3	.0660	188395	31.00	190331	33.94
#50	.0700	3/4	4	3	.0660	188406	31.00	190342	33.94
#49	.0730	3/4	4	3	.0660	188417	31.00	190353	33.94
#48	.0760	3/4	4	3	.0720	188428	31.00	190364	33.94
5/64	.0781	3/4	4	3	.0720	188439	31.00	190375	33.94
#47	.0785	3/4	4	3	.0720	188450	31.00	190386	33.94
2.0mm	.0787	3/4	4	3	.0720	188461	31.00	190397	33.94
#46	.0810	3/4	4	3	.0771	188472	31.00	190408	33.94
#45	.0820	3/4	4	3	.0771	188483	31.00	190419	33.94
#44	.0860	3/4	4	3	.0810	188494	31.00	190430	33.94
#43	.0890	3/4	4	3	.0810	188505	31.00	190441	33.94
#42	.0935	3/4	4	3	.0880	188516	31.00	190452	33.94
3/32	.0938	3/4	4	3	.0880	188527	30.74	190463	33.94
#41	.0960	7/8	4	3-1/2	.0928	188538	31.23	190474	34.25
#40	.0980	7/8	4	3-1/2	.0928	188549	31.23	190485	34.25
2.5mm	.0984	7/8	4	3-1/2	.0928	188560	31.23	190496	34.25
#39	.0995	7/8	4	3-1/2	.0928	188571	31.23	190507	34.25
#38	.1015	7/8	4	3-1/2	.0950	188582	31.23	190518	34.25
#37	.1040	7/8	4	3-1/2	.0950	188593	31.23	190529	34.25
#36	.1065	7/8	4	3-1/2	.1030	188604	31.23	190540	34.25
7/64	.1094	7/8	4	3-1/2	.1030	188615	32.16	190551	35.32
#35	.1100	7/8	4	3-1/2	.1030	188626	32.16	190562	35.32
#34	.1110	7/8	4	3-1/2	.1055	188637	32.16	190573	35.32
#33	.1130	7/8	4	3-1/2	.1055	188648	32.16	190584	35.32
#32	.1160	7/8	4	3-1/2	.1120	188659	32.16	190595	35.32
3.0mm	.1181	7/8	4	3-1/2	.1120	188670	32.16	190606	35.32
#31	.1200	7/8	4	3-1/2	.1120	188681	32.16	190617	35.32
o/u	.1240	7/8	4	3-1/2	.1190	188692	32.16	190628	35.32
1/8	.1250	7/8	4	3-1/2	.1190	188703	29.00	190639	31.76
o/u	.1260	7/8	4	3-1/2	.1190	188714	32.16	190650	35.32
#30	.1285	7/8	4	3-1/2	.1190	188725	32.16	190661	35.32
#29	.1360	1	4	4	.1275	188736	38.53	190672	42.18
3.5mm	.1378	1	4	4	.1350	188747	38.53	190683	42.18

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

HSS & M42 Cobalt Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING

STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
#28	.1405	1	4	4	.1350	188758	38.53	190694	42.18
9/64	.1406	1	4	4	.1350	188769	38.53	190705	42.18
#27	.1440	1	4	4	.1350	188780	38.53	190716	42.18
#26	.1470	1	4	4	.1430	188791	38.53	190727	42.18
#25	.1495	1	4	4	.1430	188802	38.53	190738	42.18
#24	.1520	1	4	4	.1460	188813	40.09	190749	42.18
#23	.1540	1	4	4	.1460	188824	40.09	190760	42.18
5/32	.1562	1	4	4	.1510	188835	40.09	190771	42.18
#22	.1570	1	6	4	.1510	188846	40.09	190782	42.18
4.0mm	.1575	1	6	4	.1510	188857	40.09	190793	42.18
#21	.1590	1-1/8	6	4-1/2	.1530	188868	41.11	190804	45.03
#20	.1610	1-1/8	6	4-1/2	.1530	188879	41.11	190815	45.03
#19	.1660	1-1/8	6	4-1/2	.1595	188890	41.11	190826	45.03
#18	.1695	1-1/8	6	4-1/2	.1595	188901	41.11	190837	45.03
11/64	.1719	1-1/8	6	4-1/2	.1645	188912	41.11	190848	45.03
#17	.1730	1-1/8	6	4-1/2	.1645	188923	41.11	190859	45.03
#16	.1770	1-1/8	6	4-1/2	.1704	188934	41.11	190870	45.03
4.5mm	.1772	1-1/8	6	4-1/2	.1704	188945	41.11	190881	45.03
#15	.1800	1-1/8	6	4-1/2	.1755	188956	41.11	190892	45.03
#14	.1820	1-1/8	6	4-1/2	.1755	188967	41.11	190903	45.03
#13	.1850	1-1/8	6	4-1/2	.1805	188978	41.11	190914	45.03
o/u	.1865	1-1/8	6	4-1/2	.1805	188989	41.11	190925	45.03
3/16	.1875	1-1/8	6	4-1/2	.1805	189000	39.07	190936	42.76
o/u	.1885	1-1/8	6	4-1/2	.1805	189011	41.11	190947	45.03
#12	.1890	1-1/8	6	4-1/2	.1805	189022	41.11	190958	45.03
#11	.1910	1-1/4	6	5	.1860	189033	46.06	190969	50.47
#10	.1935	1-1/4	6	5	.1860	189044	46.06	190980	50.47
#9	.1960	1-1/4	6	5	.1895	189055	46.06	190991	50.47
5.0mm	.1969	1-1/4	6	5	.1895	189066	46.06	191002	50.47
#8	.1990	1-1/4	6	5	.1895	189077	46.06	191013	50.47
#7	.2010	1-1/4	6	5	.1895	189088	46.06	191024	50.47
13/64	.2031	1-1/4	6	5	.1945	189099	46.06	191035	50.47
#6	.2040	1-1/4	6	5	.1945	189110	46.06	191046	50.47
#5	.2055	1-1/4	6	5	.2016	189121	46.06	191057	50.47
#4	.2090	1-1/4	6	5	.2016	189132	46.06	191068	50.47
#3	.2130	1-1/4	6	5	.2075	189143	46.06	191079	50.47
5.5mm	.2165	1-1/4	6	5	.2075	189154	46.06	191090	50.47
7/32	.2188	1-1/4	6	5	.2075	189165	46.06	191101	50.47
#2	.2210	1-1/2	6	6	.2173	189176	47.35	191112	51.89
#1	.2280	1-1/2	6	6	.2173	189187	47.35	191123	51.89
A	.2340	1-1/2	6	6	.2265	189198	47.35	191134	51.89
15/64	.2344	1-1/2	6	6	.2265	189209	47.35	191145	51.89
6.0mm	.2362	1-1/2	6	6	.2265	189220	47.66	191156	54.61
B	.2380	1-1/2	6	6	.2329	189231	47.66	191167	54.61
C	.2420	1-1/2	6	6	.2329	189242	47.66	191178	54.61
D	.2460	1-1/2	6	6	.2329	189253	47.66	191189	49.67

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

MADE IN THE USA

HSS & COBALT REAMERS



HSS & M42 Cobalt Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING

STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HSS & COBALT REAMERS

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
o/u	.2490	1-1/2	6	6	.2405	189264	50.87	191200	58.49
1/4	.2500	1-1/2	6	6	.2405	189275	42.49	191211	46.42
o/u	.2510	1-1/2	6	6	.2405	189286	50.87	191222	58.49
6.5mm	.2559	1-1/2	6	6	.2405	189297	47.66	191233	54.61
F	.2570	1-1/2	6	6	.2485	189308	47.66	191244	54.61
G	.2610	1-1/2	6	6	.2485	189319	47.66	191255	54.61
17/64	.2656	1-1/2	6	6	.2485	189330	53.19	191266	67.44
H	.2660	1-1/2	6	6	.2485	189341	53.19	191277	67.44
I	.2720	1-1/2	6	6	.2485	189352	53.19	191288	67.44
7.0mm	.2756	1-1/2	6	6	.2485	189363	53.19	191299	67.44
J	.2770	1-1/2	6	6	.2485	189374	53.19	191310	67.44
K	.2810	1-1/2	6	6	.2485	189385	53.19	191321	67.44
9/32	.2812	1-1/2	6	6	.2485	189396	50.47	191332	64.10
L	.2900	1-1/2	6	6	.2792	189407	53.19	191343	67.44
M	.2950	1-1/2	6	6	.2792	189418	53.19	191354	67.44
7.5mm	.2953	1-1/2	6	6	.2792	189429	53.19	191365	67.44
19/64	.2969	1-1/2	6	6	.2792	189440	53.19	191376	67.44
N	.3020	1-1/2	6	6	.2792	189451	53.19	191387	67.44
o/u	.3115	1-1/2	6	6	.2792	189462	50.47	191398	64.10
5/16	.3125	1-1/2	6	6	.2792	189473	47.84	191409	60.71
o/u	.3135	1-1/2	6	6	.2792	189484	50.47	191420	64.10
8.0mm	.3150	1-1/2	6	6	.2792	189495	53.19	191431	67.44
O	.3160	1-1/2	6	6	.2792	189506	53.19	191442	67.44
P	.3230	1-1/2	6	6	.2792	189517	56.88	191453	72.65
21/64	.3281	1-1/2	6	6	.2792	189528	56.88	191464	72.65
Q	.3320	1-1/2	6	6	.2792	189539	56.88	191475	72.65
8.5mm	.3346	1-1/2	6	6	.2792	189550	56.88	191486	72.65
R	.3390	1-1/2	6	6	.2792	189561	56.88	191497	72.65
11/32	.3438	1-1/2	6	6	.2792	189572	56.88	191508	72.65
S	.3480	1-3/4	6	6	.3105	189583	57.37	191519	73.63
9.0mm	.3543	1-3/4	6	7	.3105	189594	57.37	191530	73.63
T	.3580	1-3/4	6	7	.3105	189605	57.37	191541	73.63
23/64	.3594	1-3/4	6	7	.3105	189616	57.37	191552	73.63
U	.3680	1-3/4	6	7	.3105	189627	57.37	191563	73.63
9.5mm-o/u	.3740	1-3/4	6	7	.3105	189638	54.52	191574	69.89
3/8	.3750	1-3/4	6	7	.3105	189649	51.67	191585	66.28
o/u	.3760	1-3/4	6	7	.3105	189660	54.52	191596	69.89
V	.3770	1-3/4	6	7	.3105	189671	62.45	191607	92.74
W	.3860	1-3/4	6	7	.3105	189682	62.45	191618	92.74
25/64	.3906	1-3/4	6	7	.3105	189693	62.45	191629	92.74
10.0mm	.3937	1-3/4	6	7	.3105	189704	62.45	191640	92.74
X	.3970	1-3/4	6	7	.3105	189715	62.45	191651	92.74
Y	.4040	1-3/4	6	7	.3105	189726	64.77	191662	92.74
13/32	.4062	1-3/4	6	7	.3105	189737	64.77	191673	92.74
Z	.4130	1-3/4	6	7	.3730	189748	64.77	191684	92.74
10.5mm	.4134	1-3/4	6	7	.3730	189759	64.77	191695	92.74

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

HSS & M42 Cobalt Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CHUCKING

STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
27/64	.4219	1-3/4	6	7	.3730	189770	64.77	191706	92.74
11.0mm	.4331	1-3/4	6	7	.3730	189781	64.77	191717	92.74
o/u	.4365	1-3/4	6	7	.3730	189792	64.77	191728	92.74
7/16	.4375	1-3/4	6	7	.3730	189803	61.52	191739	88.07
o/u	.4385	1-3/4	6	7	.3730	189814	64.77	191750	92.74
11.5mm	.4528	1-3/4	6	7	.3730	189825	70.60	191761	106.28
29/64	.4531	1-3/4	6	7	.3730	189836	70.60	191772	106.28
15/32	.4688	1-3/4	6	7	.3730	189847	70.60	191783	106.28
12.0mm	.4724	2	6	8	.4355	189858	70.60	191794	106.28
31/64	.4844	2	6	8	.4355	189869	70.60	191805	106.28
12.5mm	.4921	2	6	8	.4355	189880	70.60	191816	106.28
o/u	.4990	2	6	8	.4355	189891	70.60	191827	106.28
1/2	.5000	2	6	8	.4355	189902	66.95	191838	100.94
o/u	.5010	2	6	8	.4355	189913	70.60	-	-
17/32	.5312	2	6	8	.4355	189924	83.25	-	-
9/16	.5625	2	8	8	.4355	189935	83.25	-	-
19/32	.5938	2	8	8	.4355	189946	83.25	-	-
5/8	.6250	2-1/4	8	9	.5615	189957	97.15	-	-
21/32	.6562	2-1/4	8	9	.5615	189968	105.20	-	-
11/16	.6875	2-1/4	8	9	.5615	189979	113.08	-	-
23/32	.7188	2-1/4	8	9	.5615	189990	132.47	-	-
3/4	.7500	2-1/2	8	9-1/2	.6240	190001	125.96	-	-
25/32	.7812	2-1/2	8	9-1/2	.6240	190012	136.51	-	-
13/16	.8125	2-1/2	8	9-1/2	.6240	190023	136.33	-	-
27/32	.8438	2-1/2	8	9-1/2	.6240	190034	169.43	-	-
7/8	.8750	2-5/8	8	10	.7490	190045	160.94	-	-
29/32	.9062	2-5/8	8	10	.7490	190056	186.67	-	-
15/16	.9375	2-5/8	8	10	.7490	190067	177.57	-	-
31/32	.9688	2-5/8	8	10	.7490	190078	199.17	-	-
1	1.0000	2-3/4	8	10-1/2	.8740	190089	200.70	-	-
1-1/16	1.0625	2-3/4	8	10-1/2	.8740	190100	222.36	-	-
1-1/8	1.1250	2-7/8	8	11	.8740	190111	235.90	-	-
1-3/16	1.1875	2-7/8	8	11	.9990	190122	276.23	-	-
1-1/4	1.2500	3	8	11-1/2	.9990	190133	292.27	-	-
1-5/16	1.3125	3	10	11-1/2	.9990	190144	341.52	-	-
1-3/8	1.3750	3-1/4	10	12	.9990	190155	358.22	-	-
1-7/16	1.4375	3-1/4	10	12	1.2490	190166	383.24	-	-
1-1/2	1.5000	3-1/2	10	12-1/2	1.2490	190177	411.96	-	-
1-9/16	1.5625	3-1/2	12	13	1.2490	192036	587.49	-	-
1-5/8	1.6250	3-1/2	12	13	1.2490	192047	590.48	-	-
1-11/16	1.6875	4	12	13-1/2	1.2490	192058	672.48	-	-
1-3/4	1.7500	4	12	13-1/2	1.2490	192069	678.02	-	-
1-13/16	1.8125	4	12	14	1.4990	192080	780.89	-	-
1-7/8	1.8750	4	12	14	1.4990	192091	780.89	-	-
1-15/16	1.9375	4	12	14	1.4990	192102	914.19	-	-
2	2.0000	4	12	14	1.4990	192113	914.19	-	-

HSS & COBALT REAMERS

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

MADE IN THE USA



HSS & M42 Cobalt Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

DOWEL PIN

STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL

M42 COBALT

STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT

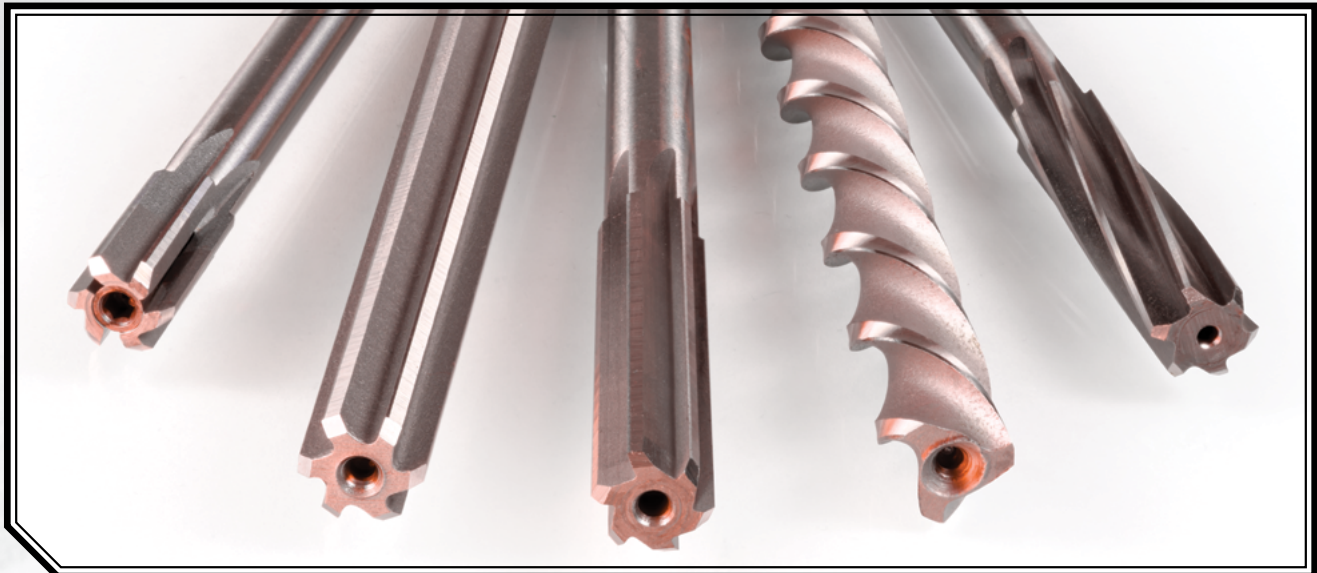


HIGH SPEED STEEL

M42 COBALT

HSS & COBALT REAMERS

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	STRAIGHT FLUTE				RIGHT HAND SPIRAL			
					HSS	LIST PRICE	M42	LIST PRICE	HSS	LIST PRICE	M42	LIST PRICE
.1230	7/8	4	3-1/2	.1190	185601	28.06	188098	30.27	192212	32.16	192366	33.54
.1247	7/8	4	3-1/2	.1190	185612	28.06	188109	29.04	192223	32.16	192377	33.54
.1855	1-1/8	6	4-1/2	.1805	185623	35.81	188120	36.48	192234	41.11	192388	44.73
.1870	1-1/8	6	4-1/2	.1805	185634	35.81	188131	36.48	192245	41.11	192399	44.68
.2480	1-1/2	6	6	.2405	185645	39.07	188142	40.94	192256	42.94	192410	46.82
.2495	1-1/2	6	6	.2405	185656	39.07	188153	40.94	192267	42.94	192421	46.82
.3105	1-1/2	6	6	.2792	185667	45.88	188164	58.62	192278	50.51	192432	62.01
.3120	1-1/2	6	6	.2792	185678	45.88	188175	58.62	192289	50.51	192443	60.80
.3730	1-3/4	6	7	.3105	185689	49.53	188186	64.23	192300	54.52	192454	66.59
.3745	1-3/4	6	7	.3105	185700	49.53	188197	64.23	192311	54.52	192465	66.59
.4355	1-3/4	6	7	.3730	185711	55.90	188208	82.41	192322	64.77	192476	91.47
.4370	1-3/4	6	7	.3730	185722	55.90	188219	82.41	192333	64.77	192487	91.47
.4980	2	6	8	.4355	185733	60.89	188230	94.52	192344	70.56	192498	101.25
.4995	2	6	8	.4355	185744	60.89	188241	94.52	192355	70.56	192509	104.53



Huge assortment of HSS and M42 Cobalt Reamers for precision machining

For technical information, please see page 256.

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.0002, -0.0000	+0.0003, -0.0000	+0.0001, +0.0004	+0.0002, +0.0006

HSS Reamers



PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

EXPANSION

STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL

END VIEW

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
3/8	3/4	6	7	5/16	194456	170.21
13/32	3/4	6	7	5/16	194467	190.03
7/16	7/8	6	7	3/8	194478	181.30
15/32	7/8	6	8	27/64	194489	197.14
1/2	1	6	8	7/16	194500	191.63
17/32	1	6	8	7/16	194511	213.32
9/16	1-1/8	6	8	7/16	194522	207.98
19/32	1-1/8	6	8	7/16	194533	211.10
5/8	1-1/4	6	9	9/16	194544	217.29
21/32	1-1/4	6	9	9/16	194555	232.04
11/16	1-1/4	6	9	9/16	194566	245.13
23/32	1-1/4	6	9	9/16	194577	261.16
3/4	1-3/8	6	9-1/2	5/8	194588	257.22
25/32	1-3/8	8	9-1/2	5/8	194599	272.19
13/16	1-3/8	8	9-1/2	5/8	194610	296.63
27/32	1-3/8	8	9-1/2	5/8	194621	297.70
7/8	1-1/2	8	10	3/4	194632	303.08

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
29/32	1-1/2	8	10	3/4	194643	335.05
15/16	1-1/2	8	10	3/4	194654	350.63
31/32	1-1/2	8	10	3/4	194665	366.47
1	1-5/8	8	10-1/2	7/8	194676	368.17
1-1/32	1-5/8	8	10-1/2	7/8	194687	537.67
1-1/16	1-5/8	8	10-1/2	7/8	194698	427.11
1-3/32	1-5/8	8	10-1/2	7/8	194709	426.20
1-1/8	1-3/4	8	11	7/8	194720	445.18
1-5/32	1-3/4	8	11	7/8	194731	473.62
1-3/16	1-3/4	8	11	1	194742	468.56
1-7/32	1-3/4	8	11	1	194753	509.89
1-1/4	1-7/8	8	11-1/2	1	194764	504.57
1-5/16	1-7/8	8	11-1/2	1	194775	521.22
1-3/8	2	8	12	1	194786	540.31
1-7/16	2	8	12	1-1/4	194797	588.99
1-1/2	2-1/8	8	12-1/2	1-1/4	194808	584.69

HSS & COBALT REAMERS

EXPANSION

TAPER SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL

END VIEW

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	MORSE TAPER #	ITEM#	LIST PRICE
3/8	3/4	6	7	1	194819	202.43
13/32	3/4	6	7	1	194830	223.93
7/16	7/8	6	7	1	194841	214.24
15/32	7/8	6	8	1	194852	219.38
1/2	1	6	8	1	194863	213.50
17/32	1	6	8	1	194874	221.97
9/16	1-1/8	6	8	1	194885	225.40
19/32	1-1/8	6	8	1	194896	245.33
5/8	1-1/4	6	9	2	194907	241.77
21/32	1-1/4	6	9	2	194918	267.75
11/16	1-1/4	6	9	2	194929	269.28
23/32	1-1/4	6	9	2	194940	287.21
3/4	1-3/8	6	9-1/2	2	194951	281.95
25/32	1-3/8	8	9-1/2	2	194962	294.90
13/16	1-3/8	8	9-1/2	2	194973	299.19
27/32	1-3/8	8	9-1/2	2	194984	332.29
7/8	1-1/2	8	10	2	194995	328.97

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	MORSE TAPER #	ITEM#	LIST PRICE
29/32	1-1/2	8	10	2	195006	363.33
15/16	1-1/2	8	10	3	195017	372.26
31/32	1-1/2	8	10	3	195028	387.94
1	1-5/8	8	10-1/2	3	195039	390.81
1-1/32	1-5/8	8	10-1/2	3	195050	405.72
1-1/16	1-5/8	8	10-1/2	3	195061	425.08
1-3/32	1-5/8	8	10-1/2	3	195072	466.14
1-1/8	1-3/4	8	11	3	195083	459.32
1-5/32	1-3/4	8	11	3	195094	501.98
1-3/16	1-3/4	8	11	3	195105	521.86
1-7/32	1-3/4	8	11	3	195116	542.03
1-1/4	1-7/8	8	11-1/2	4	195127	539.75
1-5/16	1-7/8	8	11-1/2	4	195138	588.60
1-3/8	2	8	12	4	195149	583.78
1-7/16	2	8	12	4	195160	617.64
1-1/2	2-1/8	8	12-1/2	4	195171	638.62

For technical information, please see page 256.

THRU 1/2" DIAMETER	ABOVE 1/2" TO 5/8"	ABOVE 5/8" TO 1-1/2"
+0.002, -0.000	+0.003, -0.000	+0.001, +0.004

MADE IN THE USA



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HAND STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL

SIZE	DECIMAL EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
1/16	.0625	1	4	2	.0625	196997	79.42
5/64	.0781	1	4	2	.0781	197008	79.42
3/32	.0938	1-1/4	4	2-1/2	.0938	197019	79.42
7/64	.1094	1-1/4	4	2-1/2	.1094	197030	79.42
1/8	.1250	1-1/2	4	3	.1250	197041	74.88
9/64	.1406	1-5/8	4	3-1/4	.1406	197052	74.88
5/32	.1562	1-5/8	4	3-1/4	.1562	197063	80.94
11/64	.1719	1-3/4	6	3-1/2	.1719	197074	80.94
3/16	.1875	1-3/4	6	3-1/2	.1875	197085	79.42
13/64	.2031	1-7/8	6	3-3/4	.2031	197096	79.42
7/32	.2188	1-7/8	6	3-3/4	.2188	197107	87.53
15/64	.2344	2	6	4	.2344	197118	87.53
1/4	.2500	2	6	4	.2500	197129	87.00
17/64	.2656	2-1/8	6	4-1/4	.2656	197140	87.53
9/32	.2812	2-1/8	6	4-1/4	.2812	197151	94.17
19/64	.2969	2-1/4	6	4-1/2	.2969	197162	94.17
5/16	.3125	2-1/4	6	4-1/2	.3125	197173	92.07
11/32	.3438	2-3/8	6	4-3/4	.3438	197184	106.86
3/8	.3750	2-1/2	6	5	.3750	197195	104.32
13/32	.4062	2-5/8	6	5-1/4	.4062	197206	121.07
7/16	.4375	2-3/4	6	5-1/2	.4375	197217	118.62
15/32	.4688	2-7/8	6	5-3/4	.4688	197228	131.23
1/2	.5000	3	6	6	.5000	197239	126.15
17/32	.5312	3-1/8	8	6-1/4	.5312	197250	136.31
9/16	.5625	3-1/4	8	6-1/2	.5625	197261	145.80
19/32	.5938	3-3/8	8	6-3/4	.5938	197272	162.05
5/8	.6250	3-1/2	8	7	.6250	197283	157.11
21/32	.6562	3-11/16	8	7-3/8	.6562	197294	179.38
11/16	.6875	3-7/8	8	7-3/4	.6875	197305	175.03
23/32	.7188	4-1/16	8	8-1/8	.7188	197316	191.56
3/4	.7500	4-3/16	8	8-3/8	.7500	197327	184.06
25/32	.7812	4-3/8	8	8-3/4	.7812	197338	201.97
13/16	.8125	4-9/16	8	9-1/8	.8125	197349	184.06
27/32	.8438	4-11/16	8	9-3/8	.8438	197360	221.12
7/8	.8750	4-7/8	8	9-3/4	.8750	197371	223.04
29/32	.9062	5	8	10	.9062	197382	246.47
15/16	.9375	5-1/8	8	10-1/4	.9375	197393	223.21
31/32	.9688	5-5/16	8	10-5/8	.9688	197404	271.37
1	1.0000	5-7/16	8	10-7/8	1.0000	197415	270.16
1-1/8	1.1250	5-13/16	8	11-5/8	1.1250	197426	353.06
1-1/4	1.2500	6-1/8	8	12-1/4	1.2500	197437	433.55
1-3/8	1.3750	6-5/16	10	12-5/8	1.3750	197448	512.44
1-1/2	1.5000	6-1/2	10	13	1.5000	197459	604.83

For technical information, please see page 256.

THRU 1/2" DIAMETER	ABOVE 1/2" TO 5/8"	ABOVE 5/8" TO 1-1/2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004

HSS & COBALT REAMERS

HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



TAPER PIPE LEFT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL

SIZE	DIAMETER SMALL END	DIAMETER LARGE END	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIAMETER	SIZE OF SQUARE	ITEM#	LIST PRICE
1/16	.2320	0.2750	3/4	6	2-1/8	.3125	.235	197470	103.88
1/8	.3160	0.3620	3/4	6	2-1/8	.4375	.328	197481	96.84
1/4	.4060	0.4720	1-1/16	6	2-7/16	.5625	.421	197492	110.87
3/8	.5400	0.6060	1-1/16	6	2-9/16	.7000	.531	197503	125.53
1/2	.6650	0.7510	1-3/8	6	3-1/8	.6875	.515	197514	158.58
3/4	.8760	0.9620	1-3/8	8	3-1/4	.9063	.679	197525	219.87
1	1.1030	1.2120	1-3/4	8	3-3/4	1.1250	.843	197536	323.53
1-1/4	1.4440	1.5530	1-3/4	10	4	1.3125	.984	197547	544.92
1-1/2	1.6840	1.7930	1-3/4	12	4-1/4	1.5000	1.125	197558	689.02
2	2.1590	2.2680	1-3/4	12	4-1/2	1.8750	1.406	197569	920.34

TAPER PIN HIGH SPEED STEEL



STRAIGHT FLUTE



LEFT HAND SPIRAL
RIGHT HAND CUT



LEFT HAND HELICAL
RIGHT HAND CUT

SIZE	DIAMETER SMALL END	DIAMETER LARGE END	# OF FLUTES	STRAIGHT	LIST PRICE	LH-SPIRAL	LIST PRICE	LH-HELICAL	LIST PRICE
7/0	.0497	0.0666	4	196117	83.08	196579	86.19	196348	77.06
6/0	.0611	0.0806	4	196128	83.08	196590	86.19	196359	72.56
5/0	.0719	0.0966	4	196139	75.73	196601	83.08	196370	75.28
4/0	.0869	0.1142	4	196150	75.73	196612	83.08	196381	75.28
3/0	.1029	0.1302	4	196161	75.73	196623	83.08	196392	67.98
2/0	.1137	0.1462	4	196172	67.71	196634	72.56	196403	68.78
0	.1287	0.1638	4	196183	65.12	196645	69.36	196414	70.43
1	.1447	0.1798	6	196194	63.08	196656	70.43	196425	71.49
2	.1605	0.2008	6	196205	63.08	196667	70.43	196436	80.94
3	.1813	0.2294	6	196216	63.08	196678	70.43	196447	83.66
4	.2071	0.2604	6	196227	70.43	196689	76.80	196458	94.17
5	.2409	0.2994	6	196238	75.73	196700	81.92	196469	103.03
6	.2773	0.3540	6	196249	91.41	196711	100.94	196480	120.94
7	.3297	0.4220	6	196260	117.73	196722	127.62	196491	149.27
8	.3971	0.5050	6	196271	152.58	196733	166.94	196502	175.15
9	.4805	0.6066	6	196282	182.95	196744	199.16	196513	192.43
10	.5799	0.7216	6	196293	200.85	196755	220.76	196524	244.33
11	.7060	0.8780	8	196304	214.04	196766	235.51	196535	270.74
12	.8420	1.0500	8	196315	331.19	196777	364.29	196546	400.90
13	1.0090	1.2590	10	196326	642.38	196788	706.61	196557	1098.08
14	1.2500	1.5420	10	196337	1029.30	196799	1142.31	196568	1254.29

For technical information, please see page 256.

MADE IN THE USA

HSS & COBALT REAMERS



HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

CAPSCREW COUNTERBORES



HSS & COBALT REAMERS

STANDARD TOLERANCE

SIZE	PILOT SIZE	PILOT LENGTH	FLUTE SIZE	BODY LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE
4	.1120	1/8	0.1830	9/16	3-7/8	195655	49.70
5	.1250	5/32	0.2050	5/8	4-1/8	195666	49.60
6	.1380	3/16	0.2270	3/4	4-5/8	195677	50.47
8	.1640	7/32	0.2700	3/4	5	195688	54.08
10	.1900	1/4	0.3120	7/8	5-1/4	195699	55.24
1/4	.2500	9/32	0.3800	1	5-5/8	195710	58.09
5/16	.3125	5/16	0.4740	1	6-1/8	195721	72.56
3/8	.3750	3/8	0.5690	1-1/4	6-1/2	195732	79.25
7/16	.4370	7/16	0.6610	1-1/4	7	195743	95.33
1/2	.5000	1/2	0.7550	1-1/2	7-1/2	195754	112.13
5/8	.6250	5/8	0.9430	1-1/2	7-5/8	195765	183.06
3/4	.7500	3/4	1.1310	1-5/8	7-3/4	195776	211.69
7/8	.8750	7/8	1.3200	1-7/8	8	195787	256.32
1	1.0000	1	1.5080	2	8-1/2	195798	339.97

1/64 O/S TOLERANCE

SIZE	PILOT SIZE	PILOT LENGTH	FLUTE SIZE	BODY LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE
4	.1270	1/8	0.1990	9/16	3-7/8	195809	47.66
5	.1400	5/32	0.2210	5/8	4-1/8	195820	49.56
6	.1530	3/16	0.2430	3/4	4-5/8	195831	50.47
8	.1790	7/32	0.2860	3/4	5	195842	54.08
10	.2050	1/4	0.3280	7/8	5-1/4	195853	55.24
1/4	.2650	9/32	0.3960	1	5-5/8	195864	58.09
5/16	.3280	5/16	0.4890	1	6-1/8	195875	72.56
3/8	.3900	3/8	0.5850	1-1/4	6-1/2	195886	79.25
7/16	.4520	7/16	0.6760	1-1/4	7	195897	95.33
1/2	.5150	1/2	0.7710	1-1/2	7-1/2	195908	111.99
5/8	.6400	5/8	0.9590	1-1/2	7-5/8	195919	192.11
3/4	.7650	3/4	1.1470	1-5/8	7-3/4	195930	211.47
7/8	.8910	7/8	1.3360	1-7/8	8	195941	268.83
1	1.0150	1	1.5240	2	8-1/2	195952	339.97

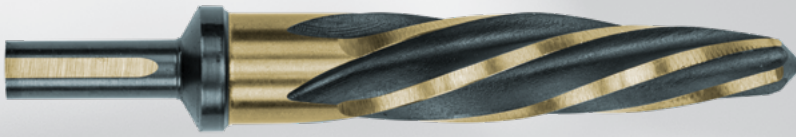
1/32 O/S TOLERANCE

SIZE	PILOT SIZE	PILOT LENGTH	FLUTE SIZE	BODY LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE
4	.1430	1/8	0.2150	9/16	3-7/8	195963	47.66
5	.1560	5/32	0.2370	5/8	4-1/8	195974	47.66
6	.1690	3/16	0.2590	3/4	4-5/8	195985	50.47
8	.1950	7/32	0.3020	3/4	5	195996	54.08
10	.2180	1/4	0.3440	7/8	5-1/4	196007	55.24
1/4	.2810	9/32	0.4120	1	5-5/8	196018	58.09
5/16	.3430	5/16	0.5040	1	6-1/8	196029	72.56
3/8	.4060	3/8	0.6010	1-1/4	6-1/2	196040	79.25
7/16	.4680	7/16	0.6910	1-1/4	7	196051	95.33
1/2	.5310	1/2	0.7870	1-1/2	7-1/2	196062	111.99
5/8	.6560	5/8	0.9750	1-1/2	7-5/8	196073	182.97
3/4	.7810	3/4	1.1630	1-5/8	7-3/4	196084	211.33
7/8	.9060	7/8	1.3520	1-7/8	8	196095	255.82
1	1.0310	1	1.5400	2	8-1/2	196106	323.38

For technical information, please see page 256.

HSS Reamers

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



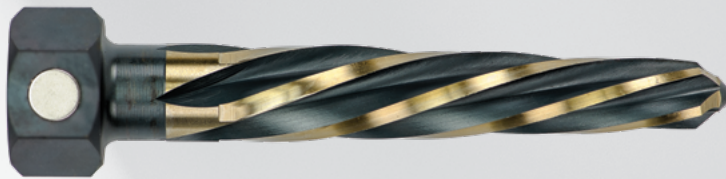
CONSTRUCTION

HIGH SPEED STEEL
LEFT HAND SPIRAL
RIGHT HAND CUT

BLACK & GOLD
3 FLATS

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
3/8	2-1/2	5	4-5/8	3/8	196876	86.46
7/16	3-1/4	5	5-3/8	7/16	196887	93.30
1/2	3-3/4	5	5-7/8	1/2	196898	103.26
9/16	3-3/4	5	5-7/8	1/2	196909	107.47
5/8	4-1/4	5	6-3/8	1/2	196920	119.53
11/16	4-1/4	5	6-3/8	1/2	196931	143.40
3/4	4-1/2	5	6-7/8	1/2	196942	150.90
13/16	4-1/2	5	6-7/8	1/2	196953	150.90
7/8	4-1/2	5	6-7/8	1/2	196964	171.16
15/16	4-1/2	5	6-7/8	1/2	196975	171.16
1	4-1/2	5	6-7/8	1/2	196986	195.44
1-1/16	4-1/2	5	6-7/8	1/2	197580	229.92

HSS & COBALT REAMERS



SAFETY MAGNETIC HEX SHANK

HIGH SPEED STEEL
LEFT HAND SPIRAL
RIGHT HAND CUT

BLACK & GOLD
Magnetic Hex Shank has been designed to protect against danger and loss
See OSHA 29CFR Part 1926.759 (falling object protection)

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	HEX SHANK DIA.	ITEM#	LIST PRICE
9/16	4	5	5-1/2	1-1/16	198196	182.24
11/16	4-1/2	5	6-3/8	1-1/16	198207	220.37
13/16	5	5	7	1-1/4	198218	263.52
15/16	5	5	7	1-7/16	198229	297.76
1-1/16	5	5	7	1-5/8	198240	394.39
1-3/16	5	5	7	1-13/16	232956	508.03
1-5/16	5	5	7-7/8	2	232967	606.88



BRIDGE

HIGH SPEED STEEL
LEFT HAND SPIRAL
RIGHT HAND CUT

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	MORSE TAPER #	SMALL DIA.	ITEM#	LIST PRICE
7/16	5-1/8	5	9	2	.3050	198042	125.01
1/2	5-1/8	5	9	2	.3125	198053	137.26
9/16	5-1/8	5	9	2	.3430	196810	132.21
5/8	6-1/8	5	10	2	.3750	198064	145.04
11/16	7-1/8	5	11-3/4	3	.3906	196821	152.69
3/4	7-3/8	5	12	3	.5000	196832	209.61
13/16	7-3/8	5	12	3	.5000	196843	208.20
7/8	7-3/8	5	12	3	.5625	198075	228.08
15/16	7-3/8	5	12	3	.6250	196854	242.78
1	7-3/8	5	12	3	.6875	198086	263.72
1-1/16	7-3/8	5	12	3	.7500	196865	272.70
1-1/8	7-3/8	5	12	3	.8125	198097	333.95
1-3/16	7-3/8	5	12	3	.8750	198108	429.30
1-1/4	7-3/8	5	13	4	.9375	198119	489.24
1-5/16	7-3/8	5	13	4	1.000	198130	578.97

For technical information, please see page 256.

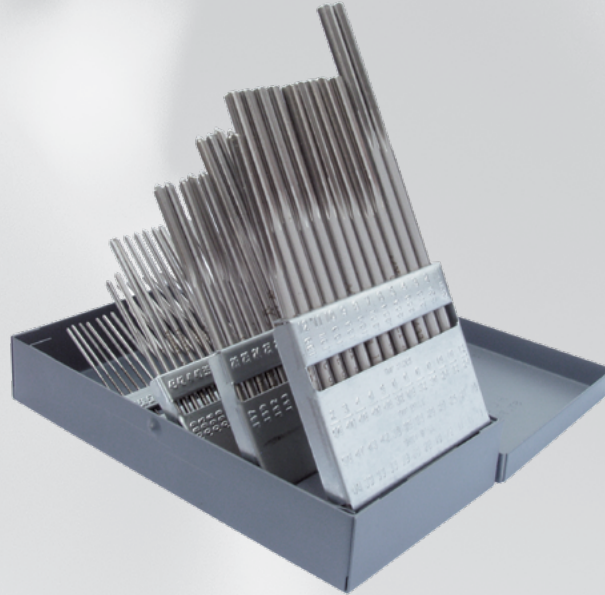
MADE IN THE USA



HSS Reamer Sets

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HSS & COBALT REAMERS



ITEM# 185799
60 PC #1 - #60
HIGH SPEED STEEL

DESCRIPTION	FLUTE STYLE	ITEM#	LIST PRICE
10PC • #4 - 1/2" • Standard • Ctr Bore Set • HSS	RH Spiral	185887	706.44
10PC • #4 - 1/2" • 1/64" OS • Ctr Bore Set • HSS	RH Spiral	185898	706.44
10PC • #4 - 1/2" • 1/32" OS • Ctr Bore Set • HSS	RH Spiral	185909	706.44
14PC • Dowel Pin • .1230 - .4995 • HSS	Straight	185755	833.53
14PC • O/U • .1240 - .5010 • HSS	Straight	185843	718.69
20PC • #61 - #80 • HSS	Straight	185865	842.43
26PC • A-Z • HSS	Straight	185821	1,282.22
29PC • 1/16" - 1/2" by 64ths • HSS	Straight	185777	1,385.66
60PC • #1 - #60 • HSS	Straight	185799	2,055.70

For technical information, please see page 256.

M42 Cobalt Reamer Sets

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HSS & COBALT REAMERS



ITEM# 185788
29 PC 1/16" - 1/2" BY 64ths
M42 COBALT

DESCRIPTION	FLUTE STYLE	ITEM#	LIST PRICE
14PC • Dowel Pin • .1230 - .4995 • M42 Cobalt	Straight	185766	942.70
14PC • O/U • .1240 - .5010 • M42 Cobalt	Straight	185854	900.83
26PC • A-Z • M42 Cobalt	Straight	185832	1,784.87
29PC • 1/16" - 1/2" by 64ths • M42 Cobalt	Straight	185788	1,815.20
60PC • #1 - #60 • M42 Cobalt	Straight	185810	2,231.92

For technical information, please see page 256.

MADE IN THE USA



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

End Mill Geometry

Core Diameter: The diameter measured tangent from bottom of all flutes. This diameter dictates the strength of your end mill.

Cutting Diameter: Measured from margin-to-margin on cutting end of tool. An even number of flutes can be measured 180° apart.

Dish Angle: Angle perpendicular to centerline of tool and allows proper end cut characteristics and reduces full diameter contact.

Flute Wash: Amount of non-cutting flute area past the length of cut.

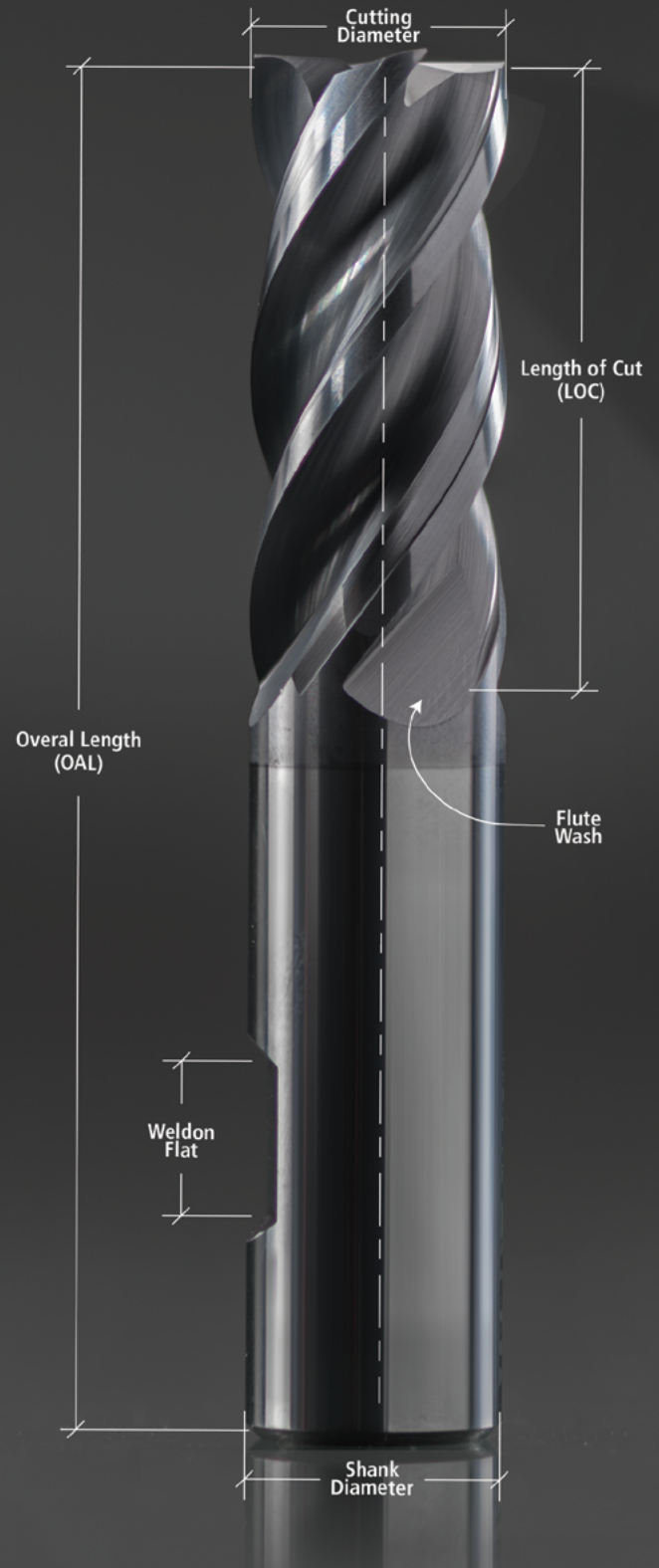
Gash Angle: The secondary cuts on a tool to provide chip space at corners and ends. The space forming the end cutting edge, which is used when feeding axially.

Helix Angle: This is the angle formed by a line tangent to the angle of the flute grind and parallel to the centerline of the tool.

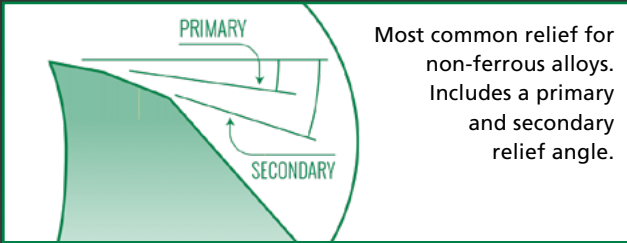
Land: The narrow surface of a profile sharpened cutter tooth immediately behind the cutting edge.

Length of Cut (LOC): This is the actual cutting depth of the tool in the axial direction.

Overall Length (OAL): A measurement taken from end-to-end of the tool.

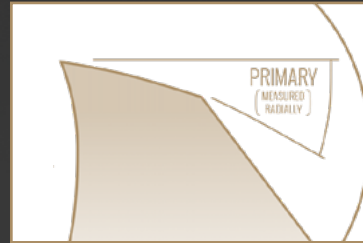


TECHNICAL INFORMATION



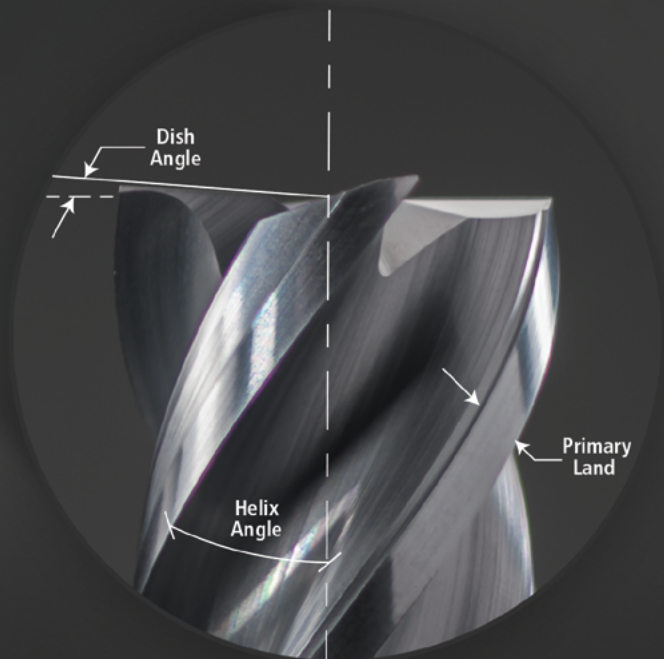
Most common relief for non-ferrous alloys. Includes a primary and secondary relief angle.

GENERAL PURPOSE - STANDARD RELIEF



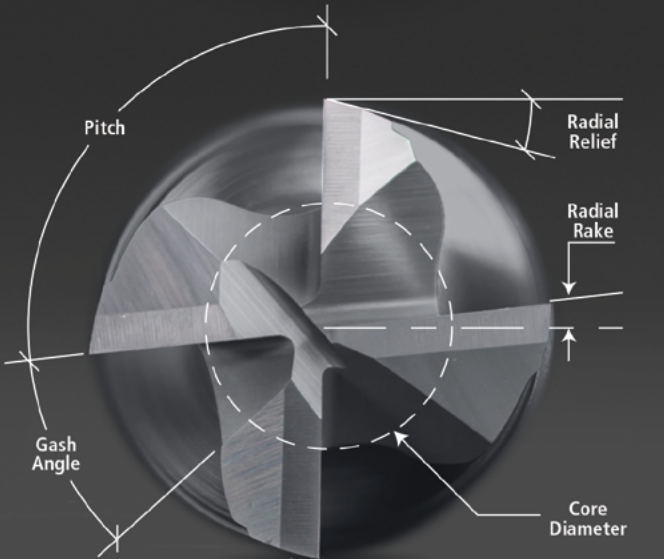
A powerful edge design for ferrous and tough material cutting. This design includes a primary relief measured radially along its edge.

HIGH PERFORMANCE - ECCENTRIC RELIEF



Radial Relief: Area where cutting face is relieved behind the cutting edge in order to avoid rubbing while maintaining maximum edge strength. We offer 2 types of Radial Relief:

1. **Standard Relief**- General purpose relief shape consisting of a primary and secondary grind behind the cutting edge.
2. **Eccentric Relief** - A strong high performance edge design for ferrous and tough material cutting consisting of a primary relief measured radially along its edge.



Pitch: This is an equal angular measurement from flute-to-flute. If the tool is a variable index style then this spacing is unequal.

Radial Rake: The angle of the rake face measured from center of the tool.

Shank Diameter: The end of the tool that is held in the holder and requires a high degree of accuracy and concentricity.

Weldon Flat: The flat on the shank provides positive driving surface for the end mill.



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

TECHNICAL INFORMATION

Standard Milling Calculations

Surface Feet Per Minute	$SFM = RPM \times D \times .262$
Revolutions Per Minute	$RPM = \frac{SFM \times 3.82}{D}$
Inches Per Minute	$IPM = RPM \times IPT \times Z$
Inches Per Tooth	$IPT = \frac{IPR}{Z}$
Inches Per Revolution	$IPR = \frac{IPM}{RPM}$
Metal Removal Rate (cu. in./min.)	$MRR = RDOC \times ADOC \times IPM$
Inches Per Tooth (Chip Thinning Adjustment)	$IPT_{adj} = \frac{CT \times D}{2 \times \sqrt{(D \times RDOC) - RDOC}}$
Feed Rate Adjustment - Inside Arc	$F_i = \frac{IPM \times (r_i + R)}{r_i}$
Feed Rate Adjustment - Outside Arc	$F_o = \frac{IPM \times (r_o + R)}{r_o}$
Chip Thickness	$CT = \frac{2 \times IPT \times \sqrt{(D \times RDOC) - RDOC}}{D}$
Ball Nose Velocity Adjustment	$V_{adj} = \frac{SFM \times 3.82}{D_{eff}}$
Ball Nose "Effective Diameter"	$D_{eff} = 2 \times \sqrt{ADOC \times (D - ADOC)}$

D	Tool Cutting Diameter	r_i	Part Radius (inside arc)	RDOC	Radial Depth of Cut
Z	Number of Flutes	r_o	Part Radius (outside arc)	ADOC	Axial Depth of Cut



HIGH PERFORMANCE CARBIDE END MILLS

VI-PRO

VARIABLE INDEX GEOMETRY

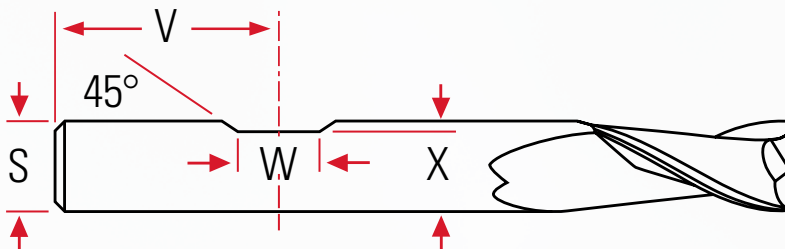
- Running at higher SFM; heavier chip loads than conventional end mills
- Speed and feed chart parameters are for 4 flute full diameter slotting
- Slotting depth up to 1 x diameter
- Tool holding important for maximizing tool life. Minimize TIR
- Max ramp angle recommended 3° or less



Benefits of Post polishing

ALCRO-MAX by nature of the coating process leaves tiny “droplets” of the coating on the surface of the tool. Proven results have shown that the removal of these droplets provide a smoother tool surface which results in a better cut. Perhaps the most important benefit, is that the tool is able to run at faster feed rates due to the smoothness of the flute area. This results in better chip evacuation and cooler temperatures resulting in longer tool life.

VI-PRO Weldon Flat specifications



STUB LENGTH				
S SHANK DIAMETER	V	W		X
		MIN	MAX	
1/2"	.750"	.330"	.332"	.440"
5/8"	.750"	.400"	.402"	.560"
3/4"	.750"	.455"	.457"	.675"

REGULAR LENGTH				
S SHANK DIAMETER	V	W		X
		MIN	MAX	
1/2" (1-1/4" LOC)	.750"	.330"	.332"	.440"
1/2"	.875"	.330"	.332"	.440"
5/8"	.875"	.400"	.402"	.560"
3/4"	.875"	.455"	.457"	.675"
1"	.875"	.515"	.517"	.925"

LONG LENGTH				
S SHANK DIAMETER	V	W		X
		MIN	MAX	
1/2" (2" LOC)	.875"	.330"	.332"	.440"
1/2"	1.250"	.330"	.332"	.440"
5/8"	1.250"	.400"	.402"	.560"
3/4"	1.250"	.455"	.457"	.675"
1"	1.250"	.515"	.517"	.925"

EXTRA LONG LENGTH				
S SHANK DIAMETER	V	W		X
		MIN	MAX	
1/2"	1.5"	.330"	.332"	.440"
5/8"	1.5"	.400"	.402"	.560"
3/4"	1.5"	.455"	.457"	.675"
1"	1.5"	.515"	.517"	.925"
-	-	-	-	-



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HIGH PERFORMANCE CARBIDE END MILLS



4 FLUTE

SFM

MATERIAL / TYPE	Rc HARDNESS	4 FLUTE STUB LENGTH	4 FLUTE REG LENGTH	4 FLUTE LONG LENGTH	4 FLUTE EXTRA LONG
COBALT BASE ALLOYS					
STELLITE, HS-21,	UNDER 32	275 - 350	275 - 350	200 - 275	200 - 275
HAYNES 25/188, X-40, L-605	OVER 32	175 - 250	175 - 250	125 - 175	125 - 175
NICKEL BASE ALLOYS					
INCONEL-625/718, WASPALLOY,	UNDER 32	200 - 300	200 - 300	150 - 200	150 - 200
RENE, HASTELLOY	OVER 32	125 - 200	125 - 200	90 - 125	90 - 125
IRON BASE ALLOYS					
INCOLOY 800-802, MULTIMET N-155,	UNDER 32	250 - 350	250 - 350	200 - 300	200 - 300
TIMKIN 16-25-6, CARPENTER 22-b3	OVER 32	200 - 250	200 - 250	150 - 200	150 - 200
MONEL					
MONEL-65% NICKEL	-	275 - 350	275 - 350	200 - 300	200 - 300
TITANIUM ALLOYS					
COMMERCIALLY PURE, 6Al-4V,	-	-	-	-	-
ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	-	250 - 400	250 - 400	150 - 300	150 - 300
STAINLESS STEEL (PRECIPITATION)					
12/8, 15/5, 17/4, AM-350/355	UNDER 32	250 - 300	250 - 300	175 - 210	175 - 210
	OVER 32	200 - 250	200 - 250	140 - 175	140 - 175
STAINLESS STEEL (AUSTENITIC)					
200 SERIES, 302, 303, 304, 316	-	290 - 375	290 - 375	200 - 260	200 - 260
STAINLESS STEEL (AUSTENITIC)					
304L, 316L	UNDER 32	250 - 300	250 - 300	175 - 210	175 - 210
	OVER 32	200 - 250	200 - 250	140 - 175	140 - 175
STAINLESS STEEL (MARTENSITIC)					
403, 410, 416, 440	-	250 - 300	250 - 300	175 - 210	175 - 210
HIGH STRENGTH TOOL STEELS					
4140, 4340, 6150, 5210, A2,	UNDER 32	250 - 350	250 - 350	175 - 210	175 - 210
D2, P20, H11, H13, S2, 01	OVER 32	150 - 200	150 - 200	100 - 140	100 - 140
CARBON STEELS					
1000's, 1100's, 1300's	-	560 - 595	560 - 595	300 - 500	300 - 500
DUCTILE					
DUCTILE CAST IRONS	-	560 - 595	560 - 595	400 - 500	400 - 500
CAST IRONS					
GRAY CAST IRONS	-	560 - 595	560 - 595	400 - 500	400 - 500

Speed and feed chart parameters are for 4 flute full diameter slotting

Recommended slotting up to 1 x Diameter

Tool holding important for maximizing tool life. Minimize TIR

Max ramp angle recommended 3° or less

TECHNICAL INFORMATION

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH PERFORMANCE CARBIDE END MILLS



4 FLUTE

I.P.T. (INCH PER TOOTH)

MATERIAL / TYPE	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
COBALT BASE ALLOYS										
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
NICKEL BASE ALLOYS										
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
IRON BASE ALLOYS										
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
MONEL										
MONEL-65% NICKEL	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
TITANIUM ALLOYS										
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
STAINLESS STEEL (PRECIPITATION)										
12/8, 15/5, 17/4, AM-350/355	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENITIC)										
200 SERIES, 302, 303, 304, 316	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENITIC)										
304L, 316L	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (MARTENSITIC)										
403, 410, 416, 440	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
HIGH STRENGTH TOOL STEELS										
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
CARBON STEELS										
1000's, 1100's, 1300'S	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
DUCTILE										
DUCTILE CAST IRONS	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
CAST IRONS										
GRAY CAST IRONS	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

Chip Thinning recommended for 4 Flute to optimize tool life:

- 5% of Diameter Radial engaged: Multiply Feed 3X
- 10% of Diameter Radial engaged: Multiply Feed 2X
- 20% of Diameter Radial engaged: Multiply Feed 1.5X

TECHNICAL INFORMATION



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HIGH PERFORMANCE CARBIDE END MILLS



5 FLUTE

SFM

SEMI-ROUGHING & FINISH PASSES, UP TO 25% OF DIAMETER

MATERIAL / TYPE	Rc HARDNESS	5 FLUTE STUB LENGTH	5 FLUTE REG LENGTH	5 FLUTE LONG LENGTH	5 FLUTE EXTRA LONG
COBALT BASE ALLOYS					
STELLITE, HS-21,	UNDER 32	550 - 570	550 - 570	385 - 400	385 - 400
HAYNES 25/188, X-40, L-605	OVER 32	200 - 225	200 - 225	140 - 160	140 - 160
NICKEL BASE ALLOYS					
INCONEL-625/718, WASPALLOY,	UNDER 32	550 - 570	550 - 570	385 - 400	385 - 400
RENE, HASTELLOY	OVER 32	200 - 225	200 - 225	140 - 160	140 - 160
IRON BASE ALLOYS					
INCOLOY 800-802, MULTIMET N-155,	UNDER 32	550 - 570	550 - 570	385 - 400	385 - 400
TIMKIN 16-25-6, CARPENTER 22-b3	OVER 32	200 - 225	200 - 225	140 - 160	140 - 160
MONEL					
MONEL-65% NICKEL	-	550 - 570	550 - 570	385 - 400	385 - 400
TITANIUM ALLOYS					
COMMERCIALLY PURE, 6Al-4V,	-	-	-	-	-
ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	-	550 - 570	550 - 570	385 - 400	385 - 400
STAINLESS STEEL (PRECIPITATION)					
12/8, 15/5, 17/4, AM-350/355	UNDER 32	600 - 625	600 - 625	420 - 440	420 - 440
	OVER 32	550 - 570	550 - 570	385 - 400	385 - 400
STAINLESS STEEL (AUSTENITIC)					
200 SERIES, 302, 303, 304, 316	-	600 - 625	600 - 625	420 - 440	420 - 440
STAINLESS STEEL (AUSTENITIC)					
304L, 316L	UNDER 32	600 - 625	600 - 625	420 - 440	420 - 440
	OVER 32	550 - 570	550 - 570	385 - 400	385 - 400
STAINLESS STEEL (MARTENSITIC)					
403, 410, 416, 440	-	600 - 625	600 - 625	420 - 440	420 - 440
HIGH STRENGTH TOOL STEELS					
4140, 4340, 6150, 5210, A2,	UNDER 32	600 - 625	600 - 625	420 - 440	420 - 440
D2, P20, H11, H13, S2, 01	OVER 32	550 - 570	550 - 570	385 - 400	385 - 400
CARBON STEELS					
1000's, 1100's, 1300's	-	800 - 850	800 - 850	560 - 595	560 - 595
DUCTILE					
DUCTILE CAST IRONS	-	800 - 850	800 - 850	560 - 595	560 - 595
CAST IRONS					
GRAY CAST IRONS	-	800 - 850	800 - 850	560 - 595	560 - 595

TECHNICAL INFORMATION

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH PERFORMANCE CARBIDE END MILLS



5 FLUTE

I.P.T. (INCH PER TOOTH)

MATERIAL / TYPE	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
COBALT BASE ALLOYS										
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
NICKEL BASE ALLOYS										
INCONEL-625/718, WASSPALLOY, RENE, HASTELLOY	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
IRON BASE ALLOYS										
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
MONEL										
MONEL-65% NICKEL	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
TITANIUM ALLOYS										
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
STAINLESS STEEL (PRECIPITATION)										
12/8, 15/5, 17/4, AM-350/355	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENITIC)										
200 SERIES, 302, 303, 304, 316	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENITIC)										
304L, 316L	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (MARTENSITIC)										
403, 410, 416, 440	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
HIGH STRENGTH TOOL STEELS										
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, 01	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
CARBON STEELS										
1000's, 1100's, 1300's	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
DUCTILE										
DUCTILE CAST IRONS	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
CAST IRONS										
GRAY CAST IRONS	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

Chip Thinning recommended for optimized tool life:

5% of Diameter Radial engaged: Multiply Feed 3X

10% of Diameter Radial engaged: Multiply Feed 2X

TECHNICAL INFORMATION

MADE IN THE USA



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HIGH PERFORMANCE CARBIDE END MILLS



6 FLUTE

SFM
FINISHING PASSES ONLY, UP TO 10% OF DIAMETER

MATERIAL / TYPE	Rc HARDNESS	6 FLUTE REG LENGTH	6 FLUTE LONG LENGTH
COBALT BASE ALLOYS			
STELLITE, HS-21,	UNDER 32	550 - 570	385 - 400
HAYNES 25/188, X-40, L-605	OVER 32	200 - 225	140 - 160
NICKEL BASE ALLOYS			
INCONEL-625/718, WASPALLOY,	UNDER 32	550 - 570	385 - 400
RENE, HASTELLOY	OVER 32	200 - 225	140 - 160
IRON BASE ALLOYS			
INCOLOY 800-802, MULTIMET N-155,	UNDER 32	550 - 570	385 - 400
TIMKIN 16-25-6, CARPENTER 22-b3	OVER 32	200 - 225	140 - 160
MONEL			
MONEL-65% NICKEL	-	550 - 570	385 - 400
TITANIUM ALLOYS			
COMMERCIALLY PURE, 6Al-4V,	-	-	-
ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	-	550 - 570	385 - 400
STAINLESS STEEL (PRECIPITATION)			
12/8, 15/5, 17/4, AM-350/355	UNDER 32	600 - 625	420 - 440
	OVER 32	550 - 570	385 - 400
STAINLESS STEEL (AUSTENITIC)			
200 SERIES, 302, 303, 304, 316	-	600 - 625	420 - 440
STAINLESS STEEL (AUSTENITIC)			
304L, 316L	UNDER 32	600 - 625	420 - 440
	OVER 32	550 - 570	385 - 400
STAINLESS STEEL (MARTENSITIC)			
403, 410, 416, 440	-	600 - 625	420 - 440
HIGH STRENGTH TOOL STEELS			
4140, 4340, 6150, 5210, A2,	UNDER 32	600 - 625	420 - 440
D2, P20, H11, H13, S2, 01	OVER 32	550 - 570	385 - 400
CARBON STEELS			
1000's, 1100's, 1300'S	-	800 - 850	560 - 595
DUCTILE			
DUCTILE CAST IRONS	-	800 - 850	560 - 595
CAST IRONS			
GRAY CAST IRONS	-	800 - 850	560 - 595

TECHNICAL INFORMATION

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



HIGH PERFORMANCE CARBIDE END MILLS



6 FLUTE

I.P.T. (INCH PER TOOTH)

MATERIAL / TYPE	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
COBALT BASE ALLOYS							
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
NICKEL BASE ALLOYS							
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
IRON BASE ALLOYS							
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
MONEL							
MONEL-65% NICKEL	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
TITANIUM ALLOYS							
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	.0014 - .0016	.0015 - .0017	.0017 - .0019	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
STAINLESS STEEL (PRECIPITATION)							
12/8, 15/5, 17/4, AM-350/355	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENITIC)							
200 SERIES, 302, 303, 304, 316	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (AUSTENITIC)							
304L, 316L	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
STAINLESS STEEL (MARTENSITIC)							
403, 410, 416, 440	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
HIGH STRENGTH TOOL STEELS							
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
CARBON STEELS							
1000's, 1100's, 1300's	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
DUCTILE							
DUCTILE CAST IRONS	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
CAST IRONS							
GRAY CAST IRONS	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

Chip Thinning recommended for optimized tool life:

5% of Diameter Radial engaged: Multiply Feed 3X
 10% of Diameter Radial engaged: Multiply Feed 2X

TECHNICAL INFORMATION

MADE IN THE USA



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HIGH PERFORMANCE THREAD MILLS - CARBIDE

TECHNICAL INFORMATION

MATERIAL	GRADES	SFM	1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4
			(.0625)	(.1250)	(.1875)	(.2500)	(.3125)	(.3750)	(.5000)	(.6250)	(.7500)
			IPT	IPT	IPT	IPT	IPT	IPT	IPT	IPT	IPT
ALLOYS											
COBALT BASE	STELLITE, HS-21, HAYNES 25/188,	50-90	.00015-.00025	.0002-.0005	.0003-.0005	.0004-.0006	.0006-.0009	.0008-.0015	.0010-.0020	.0014-.0028	.0018-.0030
IRON BASE	INCOLOY 800-802, MULTMET N-15, TIMKIN 16-25-6, CARPENTER 22-B3, TIMKIN 16-25-6, CARPENTER 22-B3	50-90	.00015-.00025	.0002-.0005	.0003-.0005	.0004-.0006	.0006-.0009	.0008-.0015	.0010-.0020	.0014-.0028	.0018-.0030
NICKEL BASE	INCONEL 625/718, INCO 700, 713C, 718, MONEL 400-401, 404, K401, RENE, RENE 41 & 95 HASTELLOY, WASPOLOY, UDIMET 500 & 700	60-100	.0002-.0003	.0003-.0006	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.0015-.0025	.002-.003	.0025-.0040
TITANIUM	COMMERCIALLY PURE, 6AL-4V, ASTM 1/2/3, 6AL-25N-4ZR-2MO-SI, TI-8AL-1MO, TI-8AL-4MO	80-150	.0002-.0005	.0003-.0006	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.0015-.0025	.0025-.0035	.0030-.0045
ALUMINUM											
ALUMINUM ALLOYS	2014, 2024, 6061, 7075	800-1400	.0002-.0004	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055	.005-.007	.006-.010
HIGH SILICON	A380, A390	475-750	.00015-.00022	.00035-.00040	.00075-.0008	.0010-.0020	.0015-.0025	.0018-.0028	.0023-0.0030	.0028-.0031	.0035-.0050
BRASS/BRONZE											
	ALUMINUM BRONZE, LOW SILICON BRONZE	550-800	.0002-.0005	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055	.005-.007	.006-.010
CAST IRON											
DUCTILE	A536, J434, 60-40-18	200-300	.00025-.00035	.0003-.0006	.0005-.0010	.0008-.0015	.001-.002	.0015-.0025	.002-.003	.003-.004	.0030-.0050
GRAY	A48, A436, A319, CLASS 20, G4000	250-350	.00025-.00035	.0004-.0008	.0007-.0013	.0007-.0013	.0015-.002	.002-.003	.002-.004	.003-.005	.0040-.0060
MALLEABLE	A220, A602, J158	200-300	.00025-.00035	.0003-.0006	.0005-.0010	.0008-.0015	.001-.002	.0015-.0025	.002-.003	.003-.004	.0030-.0050
COMPOSITES											
	G-10, FIBERGLASS, GRAPHITE, GRAPHITE EPOXY, PLASTICS	800-1400	.0003-.0005	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055	.005-.007	.0060-.0100
COPPER											
		450-1000	.00025-.00035	.0003-.0006	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.002-.003	.003-.004	.0035-.0050
MAGNESIUM											
		800-1400	.0003-.0005	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055	.005-.007	.0060-.0100
STAINLESS STEEL											
AUSTENITIC	301-304L, 310, 316L, 321, 347	100-250	.00015-.00025	.00025-.00055	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.002-.003	.003-.004	.0035-.0050
MARTENSITIC	403, 410, 416, 420, 430, 431, 440	150-250	.0002-.0003	.0004-.0008	.0006-.001	.001-.0015	.0015-.002	.0015-.003	.002-.0035	.003-.004	.0030-.0040
PRECIPITATION HARDENING	12/8, 15/5, 17/4, AM-350/355/363, PH13-8MO, PH14-8/MO	100-250	.00015-.00025	.00025-.00055	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.002-.003	.003-.004	.0035-.0050
STEELALLOY											
HIGH STRENGTH TOOL STEEL	A2, D2, P20, H11, H13,	250-400	.00015-.0003	.0003-.0006	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.002-.003	.003-.004	.0035-.0050
LOW CARBON	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	350-500	.0002-.0004	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055	.005-.007	.0060-.0080
MEDIUM CARBON	1040-1095, 1140-1151, 1330-1345	300-450	.0002-.0004	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055	.005-.007	.0060-.0080



GENERAL PURPOSE END MILLS - CARBIDE

Trouble Shooting Guide

PROBLEM	CAUSE	SOLUTION
Premature Wear	<ul style="list-style-type: none"> • Cutting speed is too fast • Hard/Abrasive work-piece material • Speed and/or feed is too light • Helix angle is incorrect for application • Re-cutting chips 	<ul style="list-style-type: none"> • Decrease spindle speed • Use coatings (TiCN, AlTiN) • Increase speed and/or feed • Select tool with appropriate helix angle • Adjust speed & feed, axial and/or radial D.O.C., Increase coolant pressure and/or air to clear chips.
Edge Chipping	<ul style="list-style-type: none"> • Feed rate too aggressive • Feed rate too aggressive on initial cut • D.O.C. too aggressive • Tool rigidity • Work-piece rigidity • Machine tool rigidity 	<ul style="list-style-type: none"> • Reduce feed rate • Reduce feed rate on initial pass • Decrease axial and/or radial D.O.C. • Change tool holder, hold shank deeper and/or use shorter tool • Re-fixture work-piece and/or improve setup • Check spindle for run-out
Breakage	<ul style="list-style-type: none"> • Feed rate too aggressive • D.O.C. too aggressive • Excessive tool overhang • Chip packing • Excessive wear 	<ul style="list-style-type: none"> • Reduce feed rate • Reduce axial and/or radial D.O.C. • Hold shank deeper, use shorter endmill • Adjust speed and/or feed, select endmill with fewer flutes, increase coolant pressure and/or air • Re-grind tool sooner
Chip Packing	<ul style="list-style-type: none"> • Speed and/or feed too aggressive • Flute gullet too small for chips • Insufficient coolant volume and/or pressure 	<ul style="list-style-type: none"> • Reduce speed and/or feed • Use endmill with less flutes • Increase coolant and/or air pressure, reposition nozzle to point of cut
Chattering	<ul style="list-style-type: none"> • Speed and/or feed too aggressive • Tool rigidity • Work-piece rigidity • Machine tool rigidity • D.O.C. too aggressive • Wrong tool geometry 	<ul style="list-style-type: none"> • Reduce speed and/or feed • Change tool holder, hold shank deeper and/or use shorter tool • Re-fixture work-piece and/or improve setup • Check spindle for run-out • Reduce axial and/or radial D.O.C.
Burs	<ul style="list-style-type: none"> • Incorrect speed & feed • Helix angle is incorrect for application • Primary cutting edge(s) are dull 	<ul style="list-style-type: none"> • Adjust speed & feed • Change to correct helix angle, use climb milling • Re-grind tool sooner
Poor Finish	<ul style="list-style-type: none"> • Feed rate too aggressive • Speed is too slow • D.O.C. too aggressive • Excessive wear 	<ul style="list-style-type: none"> • Reduce feed rate • Increase spindle speed (RPM) • Reduce axial and/or radial D.O.C. • Re-grind tool sooner
Poor Dimensional Accuracy	<ul style="list-style-type: none"> • D.O.C. too aggressive • Tool Rigidity • Machine tool rigidity 	<ul style="list-style-type: none"> • Reduce axial and/or radial D.O.C. • Use tool with more flutes • Check, inspect & repair machine tool, tool holder and fixtures



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

GENERAL PURPOSE BURS - CARBIDE

SELECTION BY CUT

SINGLE CUT:

Provides the best surface finish and largest contact patch on the work piece.

Demands greater operator skill since the single flute direction pulls the bur into the work piece.

DOUBLE CUT:

Most popular geometry as the dual flute direction reduces the contact patch on the work piece and therefore provides easier operator control while still maintaining a good surface finish.

ALUMINUM CUT:

These burs employ a coarser flute which results in improved cutting performance for aluminum and aluminum alloys.

CARBIDE BURS - SPEEDS

CUTTING DIA.	SUGGESTED RPM	MAXIMUM RPM
1/16	55,000 – 85,000	90,000
1/8	35,000 – 65,000	80,000
3/16	30,000 – 55,000	70,000
1/4	25,000 – 50,000	70,000
5/16	20,000 – 40,000	67,000
3/8	18,000 – 40,000	63,000
7/16	16,000 – 38,000	58,000
1/2	14,000 – 36,000	50,000
5/8	12,000 – 25,000	40,000
3/4	10,000 – 20,000	33,000
1	7,500 – 20,000	25,000

When using double cut: Reduce speeds by 25% approximately For stainless steel material: Increase speeds by 50% approximately.

TECHNICAL INFORMATION



GENERAL PURPOSE END MILLS - CARBIDE

GENERAL RECOMMENDATIONS

All speed and feed recommendations should be considered only as a starting point. The suggested speed & feed values are recommended for uncoated tools only. When various coatings are applied, SFM may be increased accordingly. These general percentages are as follows under optimal conditions:

TICN = +25% ZRN = +30% ALTIN = +40%

RIGIDITY

Maximize rigidity to reduce chatter and increase tool life. Ways to improve rigidity include choosing the largest diameter possible to perform your milling task, use the shortest LOC (Length of Cut) available, and always use the tool holder which offers the shortest gage line (Shortest Tool Holder Length).

CHATTER

If chatter is present increase feed or reduce speed.

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



GENERAL PURPOSE ROUGHING END MILLS - CARBIDE

MATERIAL	GRADES	STUB & REGULAR		LONG LENGTH		1/4	3/8	1/2	5/8	3/4	1
		SFM	SFM	SFM	SFM	(.2500)	(.3750)	(.5000)	(.0625)	(.7500)	(1.000)
		UNCOATED	ALTiN	UNCOATED	ALTiN	IPT	IPT	IPT	IPT	IPT	IPT
ALLOYS											
COBALT BASE	STELLITE, HS-21, HAYNES 25/188	25-45	45-75	20-35	35-60	.0009-.0012	.0012-.0015	.0015-.0018	.0018-.0021	.0021-.0025	.0025-.0027
COBALT BASE >32HRC	X40, L605	25-45	45-75	20-35	35-60	.0009-.0012	.0012-.0015	.0015-.0018	.0018-.0021	.0021-.0025	.0025-.0027
IRON BASE	INCOLOY 800-802, MULTMET N-155	25-45	45-75	20-35	35-60	.0009-.0012	.0012-.0015	.0015-.0018	.0018-.0021	.0021-.0025	.0025-.0027
IRON BASE >32HRC	TIMKIN 16-25-6, CARPENTER 22-B3	25-45	45-75	20-35	35-60	.0009-.0012	.0012-.0015	.0015-.0018	.0018-.0021	.0021-.0025	.0025-.0027
NICKEL BASE	INCONEL 625/718, INCO 700, 713C, 718	40-85	65-145	30-65	50-115	.0009-.0012	.0012-.0015	.0015-.0018	.0018-.0021	.0021-.0025	.0025-.0027
NICKEL BASE >32HRC	MONEL 400-401, 404, K401, RENE, RENE 41 & 95 HASTELLOY, WASPOLOY, UDIMET 500 & 700	30-65	55-110	25-50	45-90	.0009-.0012	.0012-.0015	.0015-.0018	.0018-.0021	.0021-.0025	.0025-.0027
TITANIUM	COMMERCIAL PURE, 6AL-4VASTM 1/2/3, 6AL-25N-4ZR-2MO-SiTi-8AL-1MO, Ti-8AL-4MO	75-130	125-215	60-100	100-170	.0009-.0012	.0012-.0015	.0015-.0018	.0018-.0021	.0021-.0025	.0025-.0027
ALUMINUM											
ALUMINUM ALLOYS		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HIGH SILICON		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BRASS/BRONZE											
	ALUMINUM BRONZE, LOW SILICON BRONZE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CAST IRON											
DUCTILE	A536, J434, 60-40-18	200-250	300-350	140-175	210-250	.0005-.0015	.0015-.002	.002-.0025	.0025-.003	.003-.0035	.0035-.004
GRAY	A48, A436, A319, CLASS 20, G4000	250-300	450-500	175-210	315-350	.0005-.0015	.0015-.002	.002-.0025	.0025-.003	.003-.0035	.0035-.004
MALLEABLE	A220, A602, J158	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COMPOSITES											
	G-10, FIBERGLASS, GRAPHITE, GRAPHITE EPOXY, PLASTICS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COPPER											
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MAGNESIUM											
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STAINLESS STEEL											
AUSTENITIC	301-304L, 310, 316L, 321, 347	150-300	250-500	120-240	200-400	.0010-.0015	.0015-.0020	.0020-.0025	.0025-.0030	.0030-.0035	.0035-.0040
MARTENSITIC	403, 410, 416, 420, 430,	135-255	225-430	110-200	180-340	.0015-.0020	.0020-.0030	.0030-.0035	.0035-.0040	.0038-.0042	.0040-.0045
PRECIPITATION HARDENING	12/8, 15/5, 17/4, AM-350/355/363, PH13-8MO, PH14-8/MO	135-255	225-430	110-200	180-340	.0015-.0020	.0020-.0030	.0030-.0035	.0035-.0040	.0038-.0042	.0040-.0045
STEELALLOY											
HIGH STRENGTH TOOL STEEL	A2, D2, P20, H11, H13,	200-230	250-320	140-160	180-210	.0003-.001	.001-.0015	.0015-.002	.002-.003	.003-.0035	.0035-.004
HIGH STRENGTH TOOL STEEL >32 HRC		180-220	240-280	130-150	170-190	.0003-.001	.001-.0015	.0015-.002	.002-.003	.003-.0035	.0035-.004
LOW CARBON	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	210-345	350-575	165-275	280-460	.0015-.0020	.0020-.0030	.0030-.0035	.0035-.0040	.0038-.0042	.0040-.0045
LOW CARBON >32HRC		125-190	210-320	100-150	165-255	.0011-.0015	.0015-.0020	.0020-.0025	.0023-.0025	.0025-.0030	.0028-.0032
MEDIUM CARBON	1040-1095, 1140-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4330-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100	210-345	350-575	165-275	280-460	.0015-.0020	.0020-.0030	.0030-.0035	.0035-.0040	.0038-.0042	.0040-.0045
MEDIUM CARBON >32 HRC		180-220	240-280	130-150	170-190	.0003-.001	.001-.0015	.0015-.002	.002-.003	.003-.0035	.0035-.004

TECHNICAL INFORMATION



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

GENERAL PURPOSE 45° & 60° HELIX END MILLS - CARBIDE

THESE VALUES ARE FOR UNCOATED TOOLS
FOR COATED TOOLS INCREASE SFM: ZRN = +30% ALTIN = +40%

SFM FOR GENERAL PURPOSE CARBIDE END MILLS

MATERIAL / TYPE	Rc HARDNESS	2 Fl, 3 Fl 45° Helix Aluminum	3 Flute 45° & 60° Helix	5 Flute 45° Helix
COBALT BASE ALLOYS				
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32 OVER 32	- -	200 - 275 125 - 175	250 - 300 150 - 200
NICKEL BASE ALLOYS				
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32 OVER 32	- -	150 - 200 90 - 125	250 - 300 150 - 200
IRON BASE ALLOYS				
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32 OVER 32	- -	250 - 300 150 - 200	250 - 300 150 - 200
MONEL				
MONEL-65% NICKEL	-	-	200 - 300	225 - 350
TITANIUM ALLOYS				
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	- -	500 min. -	250 - 400 -	250 - 400 -
STAINLESS STEEL (PRECIPITATION)				
12/8, 15/5, 17/4, AM-350/355	UNDER 32 OVER 32	- -	200 - 350 150 - 250	200 - 350 150 - 250
STAINLESS STEEL (AUSTENITIC)				
200 SERIES, 302, 303, 304, 316	UNDER 32 OVER 32	- -	250 - 350 175 - 275	250 - 350 175 - 275
STAINLESS STEEL (AUSTENITIC)				
304L, 316L	UNDER 32 OVER 32	- -	125 - 200 90 - 125	125 - 200 90 - 125
STAINLESS STEEL (MARTENSITIC)				
403, 410, 416, 440	UNDER 32 OVER 32	- -	200 - 350 150 - 250	200 - 350 150 - 250
HIGH STRENGTH TOOL STEELS				
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, 01	UNDER 32 OVER 32	- -	225 - 300 125 - 200	225 - 300 125 - 200
MEDIUM ALLOY STEELS				
200, 250, 300	UNDER 32 OVER 32	- -	250 - 350 150 - 200	250 - 350 150 - 200
CARBON STEELS				
1000's, 1100's, 1300's	UNDER 32 OVER 32	- -	250 - 350 150 - 200	250 - 350 150 - 200
DUCTILE				
DUCTILE CAST IRONS	-	-	350 - 450	300 - 400
CAST IRONS				
GRAY CAST IRONS	-	-	300 - 400	250 - 350
ALUMINUM				
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	- -	500 min. -	500 min. -	500 min. -
MAGNESIUM				
	-	500 min.	500 min.	500 min.
COPPER, COPPER ALLOYS				
	-	400 - 500	400 - 500	250 - 350
BRASS BRONZE				
BRASS, ALUM/BRONZE, LOW SILICON BRONZE	- -	300 - 400 -	300 - 400 -	- -
COMPOSITES				
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	- -	250 - 1000 -	- -	- -

TECHNICAL INFORMATION

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



GENERAL PURPOSE 45° & 60° HELIX END MILLS - CARBIDE

I.P.T. (INCH PER TOOTH)					
MATERIAL / TYPE	Rc HARDNESS	1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"
COBALT BASE ALLOYS					
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32 OVER 32	.0005"-.0010" .0003"-.0005"	.0005"-.0010" .0003"-.0005"	.0008"-.0020" .0005"-.0015"	.0020"-.0040" .0010"-.0030"
NICKEL BASE ALLOYS					
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32 OVER 32	.0005"-.0010" .0003"-.0005"	.0005"-.0010" .0003"-.0005"	.0008"-.0020" .0005"-.0015"	.0020"-.0040" .0010"-.0030"
IRON BASE ALLOYS					
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32 OVER 32	.0005"-.0010" .0003"-.0005"	.0005"-.0010" .0003"-.0005"	.0008"-.0020" .0005"-.0015"	.0020"-.0040" .0010"-.0030"
MONEL					
MONEL-65% NICKEL	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"
TITANIUM ALLOYS					
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	- -	.0007"-.0015" -	.0007"-.0015" -	.0010"-.0025" -	.0030"-.0050" -
STAINLESS STEEL (PRECIPITATION)					
12/8, 15/5, 17/4, AM-350/355	UNDER 32 OVER 32	.0005"-.0010" .0003"-.0005"	.0005"-.0010" .0003"-.0005"	.0008"-.0020" .0005"-.0015"	.0020"-.0040" .0010"-.0030"
STAINLESS STEEL (AUSTENITIC)					
200 SERIES, 302, 303, 304, 316	UNDER 32 OVER 32	.0005"-.0010" .0003"-.0005"	.0005"-.0010" .0003"-.0005"	.0008"-.0020" .0005"-.0015"	.0020"-.0040" .0010"-.0030"
STAINLESS STEEL (AUSTENITIC)					
304L, 316L	UNDER 32 OVER 32	.0005"-.0008" .0003"-.0005"	.0005"-.0008" .0003"-.0005"	.0008"-.0015" .0005"-.0010"	.0015"-.0030" .0010"-.0020"
STAINLESS STEEL (MARTENSITIC)					
403, 410, 416, 440	UNDER 32 OVER 32	.0005"-.0010" .0003"-.0005"	.0005"-.0010" .0003"-.0005"	.0008"-.0020" .0005"-.0015"	.0020"-.0040" .0010"-.0030"
HIGH STRENGTH TOOL STEELS					
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	UNDER 32 OVER 32	.0005"-.0010" .0003"-.0005"	.0005"-.0010" .0003"-.0005"	.0008"-.0020" .0005"-.0015"	.0020"-.0040" .0010"-.0030"
MEDIUM ALLOY STEELS					
200, 250, 300	UNDER 32 OVER 32	.0007"-.0015" .0005"-.0010"	.0007"-.0015" .0005"-.0010"	.0010"-.0025" .0008"-.0020"	.0030"-.0050" .0020"-.0040"
CARBON STEELS					
1000's, 1100's, 1300's	UNDER 32 OVER 32	.0007"-.0015" .0005"-.0010"	.0007"-.0015" .0005"-.0010"	.0010"-.0025" .0008"-.0020"	.0030"-.0050" .0020"-.0040"
DUCTILE					
DUCTILE CAST IRONS	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"
CAST IRONS					
GRAY CAST IRONS	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"
ALUMINUM					
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	- -	.0010"-.0020" -	.0010"-.0020" -	.0015"-.0040" -	.0030"-.0150" -
MAGNESIUM					
	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"
COPPER, COPPER ALLOYS					
	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0020"-.0080"
BRASS BRONZE					
BRASS, ALUM/BRONZE, LOW SILICON BRONZE	- -	.0007"-.0015" -	.0007"-.0015" -	.0010"-.0025" -	.0020"-.0080" -
COMPOSITES					
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	- -	.0010"-.0020" -	.0010"-.0020" -	.0015"-.0040" -	.0030"-.0100" -

TECHNICAL INFORMATION



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

GENERAL PURPOSE 30° HELIX END MILLS - CARBIDE

THESE VALUES ARE FOR UNCOATED TOOLS.
FOR COATED TOOLS INCREASE SFM: TICN = +25% ALTIN = +40%

SFM FOR GENERAL PURPOSE CARBIDE END MILLS

MATERIAL / TYPE	Rc HARDNESS	2 Flute 30° Helix Stub, Reg	2 Flute 30° Helix Long, X-Long	4 Flute 30° Helix Stub, Reg	4 Flute 30° Helix Long, X-Long
COBALT BASE ALLOYS					
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32 OVER 32	- -	- -	175 - 225 125 - 175	150 - 200 100 - 150
NICKEL BASE ALLOYS					
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32 OVER 32	- -	- -	125 - 175 70 - 115	100 - 150 70 - 100
IRON BASE ALLOYS					
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32 OVER 32	- -	- -	175 - 225 125 - 175	150 - 200 100 - 150
MONEL					
MONEL-65% NICKEL	-	175 - 300	125 - 175	175 - 300	125 - 175
TITANIUM ALLOYS					
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	- -	200 - 300 -	125 - 250 -	200 - 300 -	125 - 250 -
STAINLESS STEEL (PRECIPITATION)					
12/8, 15/5, 17/4, AM-350/355	UNDER 32 OVER 32	- -	- -	150 - 250 125 - 175	100 - 150 80 - 150
STAINLESS STEEL (AUSTENITIC)					
200 SERIES, 302, 303, 304, 316	UNDER 32 OVER 32	- -	- -	200 - 250 150 - 200	125 - 175 100 - 150
STAINLESS STEEL (AUSTENITIC)					
304L, 316L	UNDER 32 OVER 32	- -	- -	90 - 125 75 - 110	80 - 120 60 - 90
STAINLESS STEEL (MARTENSITIC)					
403, 410, 416, 440	UNDER 32 OVER 32	- -	- -	150 - 250 125 - 175	100 - 150 80 - 150
HIGH STRENGTH TOOL STEELS					
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, 01	UNDER 32 OVER 32	- -	- -	150 - 225 60 - 125	125 - 175 80 - 120
MEDIUM ALLOY STEELS					
200, 250, 300	UNDER 32 OVER 32	- -	- -	200 - 250 125 - 175	150 - 200 100 - 150
CARBON STEELS					
1000's, 1100's, 1300's	UNDER 32 OVER 32	- -	- -	200 - 250 125 - 175	150 - 200 100 - 150
DUCTILE					
DUCTILE CAST IRONS	-	250 - 350	200 - 300	300 - 400	200 - 300
CAST IRONS					
GRAY CAST IRONS	-	225 - 325	175 - 250	250 - 350	175 - 250
ALUMINUM					
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	- -	500 min. -	500 min. -	500 min. -	500 min. -
MAGNESIUM					
	-	500 min.	500 min.	500 min.	500 min.
COPPER, COPPER ALLOYS					
	-	400 - 500	400 - 500	300 - 400	250 - 350
BRASS BRONZE					
BRASS, ALUM/BRONZE, LOW SILICON BRONZE	- -	300 - 400 -	300 - 400 -	250 - 350 -	200 - 300 -
COMPOSITES					
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	- -	250 - 1000 -	250 - 1000 -	250 - 1000 -	250 - 1000 -

TECHNICAL INFORMATION

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



GENERAL PURPOSE 30° HELIX END MILLS - CARBIDE

I.P.T. (INCH PER TOOTH) FOR GENERAL PURPOSE CARBIDE END MILLS

MATERIAL / TYPE	Rc HARDNESS	UP TO 1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"	1" - 1-1/4"
COBALT BASE ALLOYS						
STELLITE, HS-21,	UNDER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
HAYNES 25/188, X-40, L-605	OVER 32	.0003"- .0005"	.0003"- .0005"	.0005"- .0015"	.0010"- .0030"	.0020"- .0040"
NICKEL BASE ALLOYS						
INCONEL-625/718, WASPALLOY,	UNDER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
RENE, HASTELLOY	OVER 32	.0003"- .0005"	.0003"- .0005"	.0005"- .0015"	.0010"- .0030"	.0020"- .0040"
IRON BASE ALLOYS						
INCOLOY 800-802, MULTIMET N-155,	UNDER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
TIMKIN 16-25-6, CARPENTER 22-b3	OVER 32	.0003"- .0005"	.0003"- .0005"	.0005"- .0015"	.0010"- .0030"	.0020"- .0040"
MONEL						
MONEL-65% NICKEL	-	.0007"- .0015"	.0007"- .0015"	.0010"- .0025"	.0030"- .0050"	.0040"- .0060"
TITANIUM ALLOYS						
COMMERCIALLY PURE, 6Al-4V,	-	.0007"- .0015"	.0007"- .0015"	.0010"- .0025"	.0030"- .0050"	.0040"- .0060"
ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	-	-	-	-	-	-
STAINLESS STEEL (PRECIPITATION)						
12/8, 15/5, 17/4, AM-350/355	UNDER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
	OVER 32	.0003"- .0005"	.0003"- .0005"	.0005"- .0015"	.0010"- .0030"	.0020"- .0040"
STAINLESS STEEL (AUSTENITIC)						
200 SERIES, 302, 303, 304, 316	UNDER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
	OVER 32	.0003"- .0005"	.0003"- .0005"	.0005"- .0015"	.0010"- .0030"	.0020"- .0040"
STAINLESS STEEL (AUSTENITIC)						
304L, 316L	UNDER 32	.0005"- .0008"	.0005"- .0008"	.0008"- .0015"	.0015"- .0030"	.0020"- .0040"
	OVER 32	.0003"- .0005"	.0003"- .0005"	.0005"- .0010"	.0010"- .0020"	.0015"- .0030"
STAINLESS STEEL (MARTENSITIC)						
403, 410, 416, 440	UNDER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
	OVER 32	.0003"- .0005"	.0003"- .0005"	.0005"- .0015"	.0010"- .0030"	.0020"- .0040"
HIGH STRENGTH TOOL STEELS						
4140, 4340, 6150, 5210, A2,	UNDER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
D2, P20, H11, H13, S2, 01	OVER 32	.0003"- .0005"	.0003"- .0005"	.0005"- .0015"	.0010"- .0030"	.0020"- .0040"
MEDIUM ALLOY STEELS						
200, 250, 300	UNDER 32	.0007"- .0015"	.0007"- .0015"	.0010"- .0025"	.0030"- .0050"	.0040"- .0060"
	OVER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
CARBON STEELS						
1000's, 1100's, 1300's	UNDER 32	.0007"- .0015"	.0007"- .0015"	.0010"- .0025"	.0030"- .0050"	.0040"- .0060"
	OVER 32	.0005"- .0010"	.0005"- .0010"	.0008"- .0020"	.0020"- .0040"	.0030"- .0050"
DUCTILE						
DUCTILE CAST IRONS	-	.0010"- .0020"	.0010"- .0020"	.0015"- .0040"	.0030"- .0100"	.0050"- .0100"
CAST IRONS						
GRAY CAST IRONS	-	.0010"- .0020"	.0010"- .0020"	.0015"- .0040"	.0030"- .0100"	.0050"- .0100"
ALUMINUM						
2014, 2024, 6061-(T1-T6)	-	.0010"- .0020"	.0010"- .0020"	.0015"- .0040"	.0030"- .0150"	.0050"- .0150"
7075, DIE CAST, EXTRUDED	-	-	-	-	-	-
MAGNESIUM						
	-	.0010"- .0020"	.0010"- .0020"	.0015"- .0040"	.0030"- .0100"	.0050"- .0100"
COPPER, COPPER ALLOYS						
	-	.0007"- .0015"	.0007"- .0015"	.0010"- .0025"	.0020"- .0080"	.0040"- .0100"
BRASS BRONZE						
BRASS, ALUM/BRONZE,	-	.0007"- .0015"	.0007"- .0015"	.0010"- .0025"	.0020"- .0080"	.0040"- .0100"
LOW SILICON BRONZE	-	-	-	-	-	-
COMPOSITES						
G-10 FIBERGLASS, GRAPHITE,	-	.0010"- .0020"	.0010"- .0020"	.0015"- .0040"	.0030"- .0100"	.0050"- .0100"
GRAPHITE/EPOXY, PLASTICS	-	-	-	-	-	-

TECHNICAL INFORMATION



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

GENERAL PURPOSE CHAMFER MILLS - CARBIDE

THESE VALUES ARE A STARTING POINT BASED ON A UNCOATED TOOL.
FOR ALTiN COATED TOOLS INCREASE VALUES BY UP TO +40%

TECHNICAL INFORMATION

SFM & I.P.T. (INCH PER TOOTH)

MATERIAL TYPE (<32 HRC)	SFM	SUGGESTED CHIP LOAD PER TOOTH					
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"
NON FERROUS							
ALUMINUM ALLOYS — 2024-T4/T6, 2014, 6061-T6/T651, 7075-T68	500 - 1000	.001	.002	.002	.002	.003	.004
COPPER — YELLOW BRASS, HIGH LEAD BRASS, RED BRASS	400 - 750	.001	.001	.002	.002	.0025	.003
COPPER ALLOYS — ALUM/BRONZE, LOW SILICON BRONZE	400 - 500	.001	.001	.002	.002	.0025	.003
MAGNESIUM — DE-CAT, EXTRUDED	450 - 650	.001	.002	.002	.002	.003	.004
PLASTICS, ACRYLICS, PHENOLICS — POLYSULFONE	100 - 300	.001	.002	.003	.003	.004	.006
CARBON, GRAPHITES	100 - 200	.040	.040	.060	.060	.080	.010
STAINLESS STEEL							
PRECIPITATION — 13/8, 15/5, AM-350/355	40 - 125	.0005	.0005	.001	.001	.001	.002
AUSTENIC — 200 SERIES, 302, 303, 304L, 316L	50 - 175	.0001	.0002	.0005	.0005	.001	.0015
MARTENSITIC — 403, 410, 416	50 - 125	.0001	.0002	.0005	.0005	.0005	.001
HIGH TEMP ALLOYS							
COBALT BASE — STELLITE, HS-21, HAYNES25/188, X-40, L-605	30 - 50	.0004	.0005	.001	.001	.001	.001
IRON BASE — INCOLY 600-802, MULTIMET N-155, TIMKIN 16-25-6	40 - 65	.0005	.0005	.001	.001	.0015	.002
TITANIUM ALLOYS — 6AL-4V, ASTM 1/2/3, 6 AL-25N-4ZR-2MO-SI	25 - 125	.0005	.0005	.0005	.0005	.001	.001
STEEL							
HIGH STRENGTH STEELS — 4340, 6150, 52100, H-11, H-13	25 - 125	.0005	.0005	.001	.001	.001	.001
HIGH ALLOY STEELS — A-2/6/10, P-3/10, 01, 02, 06	50 - 150	.0005	.0005	.001	.001	.001	.001
MEDIUM ALLOY STEELS — 200, 250, 300	75 - 175	.0005	.0005	.001	.001	.002	.0025
LOW ALLOY STEELS MARAGING — 10XX, 11XX, 13XX	50 - 200	.0005	.001	.0015	.0015	.002	.003
CAST IRON							
DUCTILE IRON — DUCTILE CAST IRON	50 - 200	.0005	.001	.0015	.0015	.002	.002
CAST IRON — GRAY CAST IRON	50 - 200	.0005	.001	.002	.002	.003	.004

CHAMFER MILL FLAT DIMENSIONS

SIZE	FLUTES	FLAT WIDTH	DISTANCE TO THEORETICAL POINT				
			60°	82°	90°	100°	120°
1/8	2	0.018	0.0156	0.0104	0.0090	0.0076	0.0052
1/8	4	0.020	0.0173	0.0115	0.0100	0.0084	0.0058
3/16	2	0.028	0.0242	0.0161	0.0140	0.0117	0.0081
3/16	4	0.030	0.0260	0.0173	0.0150	0.0126	0.0087
1/4	2 & 4	0.044	0.0381	0.0253	0.0220	0.0185	0.0127
5/16	2 & 4	0.060	0.0450	0.0300	0.0260	0.0220	0.0150
3/8	2 & 4	0.060	0.0520	0.0350	0.0300	0.0250	0.0170
1/2	2 & 4	0.080	0.0690	0.0460	0.0400	0.0340	0.0230

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



GENERAL PURPOSE DRILLS - CARBIDE

THESE VALUES ARE FOR UNCOATED TOOLS. FOR ALTiN COATED TOOLS INCREASE SFM +40%

CARBIDE DRILLING – SFM & I.P.T. (INCH PER TOOTH)

MATERIAL / TYPE	Rc HARDNESS	25° HELIX	15° HELIX STR FLT	SUGGESTED CHIP LOAD PER TOOTH				
				1/16" - 1/8"	1/8" - 1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 5/8"
COBALT BASE ALLOYS								
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32 OVER 32	100 - 150 80 - 110	100 - 150 80 - 110	.0004"-.0010" .0004"-.0010"	.0008"-.0020" .0005"-.0010"	.0015"-.0025" .0010"-.0015"	.0020"-.0040" .0010"-.0020"	.0025"-.0050" .0015"-.0030"
NICKEL BASE ALLOYS								
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32 OVER 32	125 - 150 100 - 125	125 - 175 100 - 125	.0005"-.0015" .0004"-.0010"	.0010"-.0015" .0008"-.0015"	.0015"-.0025" .0010"-.0015"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
IRON BASE ALLOYS								
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32 OVER 32	150 - 200 150 - 175	175 - 200 150 - 200	.0010"-.0015" .0008"-.0015"	.0010"-.0020" .0010"-.0020"	.0015"-.0035" .0015"-.0025"	.0020"-.0020" .0020"-.0040"	.0030"-.0060" .0025"-.0050"
MONEL								
MONEL-65% NICKEL	-	100 - 150	100 - 150	.0004"-.0010"	.0008"-.0015"	.0010"-.0015"	.0015"-.0030"	.0020"-.0040"
TITANIUM ALLOYS								
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	- -	150 - 200 -	150 - 200 -	.0008"-.0015" -	.0010"-.0020" -	.0015"-.0030" -	.0020"-.0040" -	.0025"-.0050" -
STAINLESS STEEL (PRECIPITATION)								
12/8, 15/5, 17/4, AM-350/355	UNDER 32 OVER 32	125 - 175 80 - 125	150 - 200 100 - 150	.0005"-.0015" .0004"-.0010"	.0010"-.0020" .0008"-.0015"	.0015"-.0035" .0010"-.0015"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
STAINLESS STEEL (AUSTENITIC)								
200 SERIES, 302, 303, 304, 316	UNDER 32 OVER 32	100 - 175 100 - 125	150 - 200 125 - 150	.0005"-.0015" .0004"-.0010"	.0010"-.0020" .0008"-.0015"	.0015"-.0035" .0010"-.0015"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
STAINLESS STEEL (AUSTENITIC)								
304L, 316L	UNDER 32 OVER 32	80 - 100 60 - 90	90 - 125 80 - 100	.0004"-.0010" .0003"-.0008"	.0008"-.0015" .0005"-.0010"	.0010"-.0015" .0010"-.0015"	.0015"-.0030" .0010"-.0020"	.0020"-.0040" .0015"-.0030"
STAINLESS STEEL (MARTENSITIC)								
403, 410, 416, 440	UNDER 32 OVER 32	100 - 150 80 - 125	125 - 175 100 - 140	.0005"-.0015" .0004"-.0010"	.0010"-.0020" .0008"-.0015"	.0015"-.0035" .0010"-.0015"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
HIGH STRENGTH TOOL STEELS								
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, 01	UNDER 32 OVER 32	100 - 175 80 - 130	125 - 175 80 - 130	.0005"-.0015" .0004"-.0010"	.0010"-.0020" .0010"-.0020"	.0015"-.0025" .0010"-.0020"	.0015"-.0030" .0015"-.0030"	.0020"-.0040" .0020"-.0040"
MEDIUM ALLOY STEELS								
200, 250, 300	UNDER 32 OVER 32	125 - 175 100 - 150	125 - 175 100 - 150	.0010"-.0015" .0005"-.0010"	.0015"-.0025" .0010"-.0020"	.0020"-.0030" .0010"-.0025"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
CARBON STEELS								
1000's, 1100's, 1300's	UNDER 32 OVER 32	125 - 175 100 - 125	150 - 200 100 - 175	.0010"-.0015" .0005"-.0010"	.0015"-.0025" .0010"-.0020"	.0020"-.0030" .0010"-.0025"	.0020"-.0040" .0015"-.0035"	.0025"-.0050" .0020"-.0040"
DUCTILE								
DUCTILE CAST IRONS	-	125 - 200	150 - 250	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
CAST IRONS								
GRAY CAST IRONS	-	100 - 200	150 - 250	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
ALUMINUM								
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	- -	150 - 300 -	- -	.0010"-.0020" -	.0015"-.0040" -	.0020"-.0020" -	.0030"-.0060" -	.0035"-.0070" -
MAGNESIUM								
	-	200 - 500	-	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
COPPER, COPPER ALLOYS								
	-	150 - 300	-	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
BRASS BRONZE								
BRASS, ALUM/BRONZE	-	150 - 300	-	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
BRASS BRONZE								
LOW SILICON BRONZE	-	125 - 200	-	.0008"-.0015"	.0010"-.0020"	.0015"-.0030"	.0020"-.0040"	.0025"-.0050"
COMPOSITES								
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	- -	150 - 300 -	150 - 300 -	.0010"-.0020" -	.0010"-.0030" -	.0015"-.0035" -	.0025"-.0040" -	.0030"-.0050" -

TECHNICAL INFORMATION



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

MICRO END MILLS - CARBIDE

THESE VALUES ARE FOR UNCOATED TOOLS. FOR ALTiN COATED TOOLS INCREASE SFM +40%

SFM & I.P.T. (INCH PER TOOTH)

MATERIAL / TYPE	CONDITIONS	STARTING SFM	DIAMETER RANGE - SUGGESTED CHIP LOAD PER TOOTH							
			.005-.015	.015-.030	.030-.045	.045-.060	.06-.075	.075-.090	.090-.105	.105-.125
STAINLESS STEELS										
PRECIPITATION 13-8, 15-5, 17-4PH	Slotting @ ≤ 10% of D	90	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
	Profiling @ 6% of D Axial ≤ 20% of D Radial	250	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
AUSTENITIC 302, 303, 304L, 316L	Slotting @ ≤ 15% of D	100	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
	Profiling @ 6% of D Axial ≤ 30% of D Radial	250	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
MARTENSITIC 302, 303, 304L, 316L	Slotting @ ≤ 15% of D	100	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
	Profiling @ 6% of D Axial ≤ 30% of D Radial	250	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
HIGH TEMP ALLOYS										
COBALT BASE Stellite, Haynes 25, 188, X-40, L-605	Slotting @ 7% of D	50	.0001"	.0001"	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"
	Profiling @ 5% of D Axial ≤ 20% of D Radial	80	.0001"	.0001"	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"
NICKEL BASE Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel PermaNickel 300, Incoloy 600	Slotting @ 7% of D	40	.0001"	.0001"	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"
	Profiling @ 5% of D Axial ≤ 20% of D Radial	60	.0001"	.0001"	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"
IRON BASE Incoly 800-802, Multimet N-155, Timken 16-26-6	Slotting @ 7% of D	80	.0001"	.0001"	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"
	Profiling @ 5% of D Axial ≤ 20% of D Radial	100	.0001"	.0001"	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"
STEELS										
HIGH STRENGTH STEELS 4140, 4340, 52100	Slotting @ ≤ 15% of D	100	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
	Profiling @ 6% of D Axial ≤ 30% of D Radial	180	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
HIGH ALLOY STEELS MOLD & DIE A-2, P20, 01, 02, D2, H-13	Slotting @ ≤ 10% of D	125	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
	Profiling @ 6% of D Axial ≤ 20% of D Radial	250	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
MEDIUM ALLOY STEELS 200, 250, 300	Slotting @ ≤ 15% of D	125	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"	.0006"	.0006"
	Profiling @ 6% of D Axial ≤ 30% of D Radial	250	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"	.0006"	.0006"
LOW ALLOY STEELS MARAGING 10XX, 11XX, 13XX	Slotting @ ≤ 15% of D	150	.0004"	.0004"	.0005"	.0005"	.0006"	.0006"	.0007"	.0007"
	Profiling @ 6% of D Axial ≤ 35% of D Radial	300	.0004"	.0004"	.0005"	.0005"	.0006"	.0006"	.0007"	.0007"
CAST IRONS										
DUCTILE IRON Ductile Cast Iron	Slotting @ ≤ 15% of D	100	.0004"	.0004"	.0005"	.0005"	.0006"	.0006"	.0007"	.0007"
	Profiling @ 10% of D Axial ≤ 25% of D Radial	250	.0004"	.0004"	.0005"	.0005"	.0006"	.0006"	.0007"	.0007"
CAST IRON Gray Cast Iron	Slotting @ ≤ 25% of D	125	.0004"	.0004"	.0005"	.0005"	.0008"	.0008"	.0010"	.0010"
	Profiling @ 10% of D Axial ≤ 35% of D Radial	400	.0004"	.0004"	.0005"	.0005"	.0008"	.0008"	.0010"	.0010"
TITANIUMS										
TITANIUM ALLOYS 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM & IPM 25%	Slotting @ ≤ 15% of D	125	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
	Profiling @ 6% of D Axial ≤ 20% of D Radial	250	.0002"	.0002"	.0003"	.0003"	.0004"	.0004"	.0005"	.0005"
ALUMINUM										
ALUMINUM ALLOYS 6061-T6, 7075	Slotting @ ≤ 15% of D	650	.0004"	.0004"	.0005"	.0006"	.0008"	.0008"	.0010"	.0010"
	Profiling @ 10% of D Axial ≤ 35% of D Radial	775	.0004"	.0004"	.0005"	.0006"	.0008"	.0008"	.0010"	.0010"

SPEED & FEED CALCULATION FORMULAS

$$RPM = (3.82 \times SFM) \div Dia.$$

$$IPR = IPM \div RPM$$

$$SFM = (RPM \times Dia.) \div 3.82$$

$$IPM = IPT(\text{chip load}) \times \text{No. of Teeth} \times RPM$$

$$IPT(\text{chip load}) = IPM \div (\text{No. of teeth} \times RPM)$$

TECHNICAL INFORMATION

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



ROUGHING END MILLS - M42 COBALT

TECHNICAL INFORMATION

SFM & I.P.T. (INCH PER TOOTH)										
MATERIAL / TYPE	CONDITIONS	STARTING SFM ALTN	DIAMETER RANGE - SUGGESTED CHIP LOAD PER TOOTH							
			1/4"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	
STAINLESS STEELS										
PRECIPITATION 13-8, 15-5, 17-4PH	Slotting Axial 1 x D	100-150	.0015"	.0020"	.0026"	.0036"	.0046"	.0054"	.0070"	
	Heavy Profiling		.0015"	.0020"	.0029"	.0040"	.0050"	.0060"	.0075"	
AUSTENITIC 302, 303, 304L, 316L	Slotting 1 x D	100-150	.0015"	.0020"	.0030"	.0045"	.0056"	.0067"	.0090"	
	Heavy Profiling		.0019"	.0025"	.0034"	.0049"	.0061"	.0074"	.0098"	
MARTENSITIC 403, 410, 416	Slotting Axial 1 x D	100-170	.0015"	.0020"	.0030"	.0045"	.0056"	.0067"	.0090"	
	Heavy Profiling		.0019"	.0025"	.0034"	.0049"	.0061"	.0074"	.0098"	
HIGH TEMP ALLOYS										
COBALT BASE Stellite, Haynes 25, 188, X-40, L-605	Slotting 1 x D	10-40	.0011"	.0014"	.0018"	.0026"	.0033"	.0040"	.0053"	
	Heavy Profiling		.0011"	.0014"	.0020"	.0029"	.0037"	.0045"	.0059"	
NICKEL BASE Inconel 600, 625, 718, Nickel 200, 270, Invar, Monel 400, 405, K-Monel PermaNickel 300, Incoly 600	Slotting Axial 1 x D	20-40	.0011"	.0014"	.0018"	.0026"	.0033"	.0040"	.0053"	
	Heavy Profiling		.0011"	.0014"	.0020"	.0029"	.0037"	.0045"	.0059"	
IRON BASE Incoly 800-802, Multimet N-155, Timken 16-26-6	Slotting 1 x D	30-80	.0011"	.0014"	.0018"	.0026"	.0033"	.0040"	.0053"	
	Heavy Profiling		.0011"	.0014"	.0020"	.0029"	.0037"	.0045"	.0059"	
STEELS										
HIGH STRENGTH STEELS 4140, 4340, 52100	Slotting Axial 1 x D	100-150	.0015"	.0020"	.0025"	.0035"	.0045"	.0053"	.0071"	
	Heavy Profiling		.0015"	.0020"	.0028"	.0039"	.0050"	.0059"	.0079"	
HIGH ALLOY STEELS MOLD & DIE A-2, P20, O1, O2, D2, H-13	Slotting 1 x D	80-115	.0015"	.0020"	.0025"	.0035"	.0045"	.0053"	.0071"	
	Heavy Profiling		.0015"	.0020"	.0028"	.0039"	.0050"	.0059"	.0079"	
MEDIUM ALLOY STEELS 200, 250, 300	Slotting Axial 1 x D	100-180	.0016"	.0023"	.0033"	.0050"	.0032"	.0075"	.0093"	
	Heavy Profiling		.0020"	.0027"	.0040"	.0054"	.0070"	.0082"	.0110"	
LOW ALLOY STEELS MARAGING 10XX, 11XX, 13XX	Slotting 1 x D	130-200	.0018"	.0025"	.0037"	.0053"	.0068"	.0080"	.0100"	
	Heavy Profiling		.0022"	.0029"	.0042"	.0059"	.0074"	.0090"	.0115"	
CAST IRONS										
DUCTILE IRON Ductile Cast Iron	Slotting Axial 1 x D	70-130	.0015"	.0019"	.0030"	.0042"	.0056"	.0065"	.0087"	
	Heavy Profiling		.0018"	.0024"	.0034"	.0048"	.0061"	.0073"	.0093"	
CAST IRON Gray Cast Iron	Slotting 1 x D	120-200	.0014"	.0018"	.0024"	.0034"	.0044"	.0053"	.0070"	
	Heavy Profiling		.0014"	.0018"	.0027"	.0038"	.0050"	.0058"	.0078"	
TITANIUMS										
TITANIUM ALLOYS 6AL-4V, ASTM 1, 2, 3, 6AL-2S For 5553, decrease SFM & IPM 25%	Slotting Axial 1 x D	75-150	.0015"	.0020"	.0028"	.0040"	.0052"	.0062"	.0080"	
	Heavy Profiling		.0017"	.0022"	.0030"	.0045"	.0057"	.0067"	.0090"	
ALUMINUM										
ALUMINUM ALLOYS 6061-T6, 7075	Slotting Axial 1 x D	650-950	.0024"	.0058"	.0067"	.0103"	.0112"	.0180"	.0210"	
	Heavy Profiling		.0027"	.0058"	.0076"	.0110"	.0120"	.0205"	.0260"	

SPEED & FEED CALCULATION FORMULAS

RPM = (3.82 x SFM) ÷ Dia.	IPR = IPM ÷ RPM	SFM = (RPM x Dia.) ÷ 3.82
IPM = IPT(chip load) x No. of Teeth x RPM		IPT(chip load) = IPM ÷ (No. of teeth x RPM)

MADE IN THE USA



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

HIGH PERFORMANCE TAPS



SPEED CHART

MATERIAL / TYPE	HARDNESS		CUTTING SPEED (fpm)		CUTTING FLUID*
	Bhn	Rc	SPIRAL POINT	SPIRAL FLUTE	
ALUMINUM ALLOYS					
UNALLOYED - 1000 SERIES	-	-	80	60	WS, CO
CAST - 360, A380	-	-	60	45	WS, CO
WROUGHT - 2000-7000 SERIES	-	-	80	60	WS, CO
BRASS					
HIGH-LEADED, FREE CUTTING - C34000, C36000	-	-	60	45	WS
NAVAL, RED - C46400-C46700, C23000	-	-	60	45	WS
CAST IRON					
PEARLITIC, GRAY CAST IRON, FERRITIC - A48 CLASS 20, CLASS 25, CLASS 40	< 253	< 25	20	15	WS
MALLEABLE - ASTM A47 GRADE 32510, SAE J158 GRADE M3210	< 253	< 25	15	12	CO
NICKEL ALLOYS					
NICKEL BASE ALLOY, WROUGHT & CAST - NICKEL 200, MONEL ALLOY 400	< 253	< 25	15	12	CO
HIGH TEMPERATURE ALLOY, WROUGHT & CAST - INCONEL 600, 718, HASTALLOY B & C	253 - 390	25 - 42	10	10	CO
STEEL					
LOW CARBON - 1010, 1018, 1029, 1513, 1522	< 190	< 10	55	40	WS, CO
MEDIUM CARBON - 1030, 1040, 1045, 1050	< 208	< 15	35	25	WS, CO
HIGH CARBON - 1050, 1070, 1080, 1090, 1561, 1572	< 253	< 25	15	12	CO
HIGH STRENGTH STEEL - 4140, 4340	327 - 390	35 - 42	10	10	CO
STAINLESS STEEL					
AUSTENITIC - SAE (300 SERIES)	< 253	< 25	20	15	CO
MARTENSITIC & FERRITIC - 400 SERIES, 416, 420F, 446	253 - 301	25 - 32	15	12	CO
HARDENED - 15-5PH, 17-4PH, A286	< 327 - 390	< 35 - 42	10	10	CO
TITANIUM ALLOYS					
ALPHA & ALPHA-BETA ALLOYS ANNEALED - Ti-6Al-4V	253 - 301	25 - 32	10	10	CO
ALPHA & ALPHA-BETA ALLOYS SOLUTION TREATED & AGED - Ti-6Al-6V	327 - 390	35 - 42	8	8	CO
TOOL STEEL					
HOT WORK, COLD WORK & MOLD - A2, D2, H10, H14, P2, P13	190 - 253	10 - 25	20	15	CO
HOT WORK, COLD WORK & MOLD - A2, D2, H10, H14, P2, P13	327 - 390	35 - 42	15	12	CO

Your individual manufacturing conditions will greatly influence speeds.

* WS - Water Soluble

CO - Cutting Oil

In most instances cutting fluid manufacturers recommend specific fluid for different materials.

TECHNICAL INFORMATION

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



GENERAL PURPOSE TAPS

MACHINE SCREW TAPS (NC & NF)

SIZE	OVERALL LENGTH	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE
#0 (.060)	1-5/8	5/16	3/16	.141	.110
#1 (.073)	1-11/16	3/8	3/16	.141	.110
#2 (.066)	1-3/4	7/16	3/16	.141	.110
#3 (.099)	1-13/16	1/2	3/16	.141	.110
#4 (.112)	1-7/8	9/16	3/16	.141	.110
#5 (.125)	1-15/16	5/8	3/16	.141	.110
#6 (.138)	2	11/16	3/16	.141	.110
#8 (.164)	2-1/8	3/4	1/4	.168	.131
#10 (.190)	2-3/8	7/8	1/4	.194	.152
#12 (.216)	2-3/8	15/16	9/32	.220	.165

FRACTIONAL SIZE TAPS (NC & NF)

SIZE	OVERALL LENGTH	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE
1/4	2-1/2	1	5/16	.255	.191
5/16	2-23/32	1-1/8	3/8	.318	.238
3/8	2-15/16	1-1/4	7/16	.381	.286
7/16	3-5/32	1-7/16	13/32	.323	.242
1/2	3-3/8	1-21/32	7/16	.367	.275
9/16	3-19/32	1-21/32	1/2	.429	.322
5/8	3-13/16	1-13/16	9/16	.480	.360
11/16	4-1/32	1-13/16	5/8	.542	.406
3/4	4-1/4	2	11/16	.590	.442
7/8	4-11/16	2-7/32	3/4	.697	.523
1	5-1/8	2-1/2	13/16	.800	.600
1-1/8	5-7/16	2-9/16	7/8	.896	.672
1-1/4	5-3/4	2-9/16	1	1.021	.766
1-3/8	6-1/16	3	1-1/16	1.108	.831
1-1/2	6-3/8	3	1-1/8	1.233	.925

PIPE TAPS - STRAIGHT & TAPER

SIZE	OVERALL LENGTH	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE
1/16 - 27	2-1/8	11/16	3/8	.3125	.234
1/8 - 27	2-1/8	3/4	3/8	.3125(SS)	.234
1/8 - 27	2-1/8	3/4	3/8	.4375(LS)	.328
1/4 - 18	2-7/16	1-1/16	7/16	.5625	.421
3/8 - 18	2-9/16	1-1/16	1/2	.7000	.531
1/2 - 14	3-1/8	1-3/8	5/8	.6875	.515
3/4 - 14	3-1/4	1-3/8	11/16	.9063	.679
1 - 11-1/2	3-3/4	1-3/4	13/16	1.1250	.843
1-1/4 - 11-1/2	4	1-3/4	15/16	1.3125	.984
1-1/2 - 11-1/2	4-1/4	1-3/4	1	1.5000	1.125
2 - 11-1/2	4-1/2	1-3/4	1-1/8	1.8750	1.406

(SS) = SMALL SHANK (LS) = LARGE SHANK

PULLEY TAPS

SIZE	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE	NECK LENGTH	GROUND LENGTH
1/4	1	5/16	.255	.191	3/8	1-1/2
5/16	1-1/8	3/8	.318	.238	3/8	1-9/16
3/8	1-1/4	7/16	.381	.286	3/8	1-5/8
7/16	1-7/16	1/2	.444	.333	7/16	1-11/16
1/2	1-21/32	9/16	.507	.380	1/2	1-11/16
5/8	1-13/16	11/16	.633	.475	5/8	2
3/4	2	3/4	.759	.569	3/4	2-1/4

SEE PAGE 167 FOR OVERALL LENGTHS AVAILABLE.

SMALL SHANK EXTENSION TAPS

SIZE	NC/NF	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE
6 - 32	NC	11/16	3/16	0.097	0.073
8 - 32	NC	3/4	1/4	0.123	0.092
10 - 24	NC	7/8	1/4	0.136	0.102
10 - 32	NF	7/8	1/4	0.136	0.102
1/4 - 20	NC	1	5/16	0.185	0.139
1/4 - 28	NF	1	5/16	0.185	0.139
5/16 - 18	NC	1-1/8	3/8	0.240	0.180
5/16 - 24	NF	1-1/8	3/8	0.240	0.180
3/8 - 16	NC	1-1/4	7/16	0.275	0.206
3/8 - 24	NF	1-1/4	7/16	0.275	0.206
7/16 - 14	NC	1-7/16	13/32	0.323	0.242
7/16 - 20	NF	1-7/16	13/32	0.323	0.242
1/2 - 13	NC	1-21/32	7/16	0.367	0.275
1/2 - 20	NF	1-21/32	7/16	0.367	0.275
5/8 - 11	NC	1-13/16	9/16	0.480	0.360
5/8 - 18	NF	1-13/16	9/16	0.480	0.360
3/4 - 10	NC	2	11/16	0.590	0.442
3/4 - 16	NF	2	11/16	0.590	0.442

METRIC TAPS

SIZE	OVERALL LENGTH	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE	INCH BLANK
M1.6 x 0.35	1-5/8	5/16	3/16	.141	.110	#0
M2 x 0.40	1-3/4	7/16	3/16	.141	.110	#2
M2.5 x 0.45	1-13/16	1/2	3/16	.141	.110	#3
M3 x 0.50	1-15/16	5/8	3/16	.141	.110	#5
M3.5 x 0.60	2	11/16	3/16	.141	.110	#6
M4 x 0.70	2-1/8	3/4	1/4	.168	.131	#8
M4.5 x 0.75	2-3/8	7/8	1/4	.194	.152	#10
M5 x 0.80	2-3/8	7/8	1/4	.194	.152	#10
M6 x 1	2-1/2	1	5/16	.255	.191	1/4
M6.3 x 1	2-1/2	1	5/16	.255	.191	1/4
M7 x 1	2-23/32	1-1/8	3/8	.318	.238	5/16
M8 x 1.25	2-23/32	1-1/8	3/8	.318	.238	5/16
M10 x 1.50	2-15/16	1-1/4	7/16	.381	.286	3/8
M12 x 1.75	3-3/8	1-21/32	7/16	.367	.275	1/2
M14 x 2	3-19/32	1-21/32	1/2	.429	.322	9/16
M16 x 2	3-13/16	1-13/16	9/16	.480	.360	5/8
M18 x 2.50	4-1/32	1-13/16	5/8	.542	.406	11/16
M20 x 2.50	4-15/32	2	11/16	.652	.489	13/16
M24 x 3	4-29/32	2-7/32	3/4	.760	.570	15/16
M30 x 3.50	5-7/16	2-9/16	1	1.021	.766	1-3/16
M36 x 4	6-1/16	3	1-1/8	1.233	.925	1-7/16

TECHNICAL INFORMATION



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

GENERAL PURPOSE TAPS

TAP RECOMMENDATIONS FOR CLASSES 2B & 3B UNIFIED INCH SCREW THREADS

SIZE	THREADS PER INCH		RECOMMENDED TAP LIMITS		INTERNAL THREAD PITCH DIAMETER LIMITS		
	NC UC	NF UNF	CLASS 2B	CLASS 3B	MIN. ALL CLASSES (BASIC)	MAX CLASS 2B	MAX CLASS 3B
0	–	80	H2	H1	.0519	.0542	.0536
1	64	–	H2	H1	.0629	.0655	.0648
1	–	72	H2	H1	.0640	.0665	.0659
2	56	–	H2	H1	.0744	.0772	.0765
2	–	64	H2	H1	.0759	.0786	.0779
3	48	–	H2	H1	.0855	.0885	.0877
3	–	56	H2	H1	.0874	.0902	.0895
4	40	–	H2	H2	.0958	.0991	.0982
4	–	48	H2	H1	.0985	.1016	.1008
5	40	–	H2	H2	.1088	.1121	.1113
5	–	44	H2	H1	.1102	.1134	.1126
6	32	–	H3	H2	.1177	.1214	.1204
6	–	40	H2	H1	.1218	.1252	.1243
8	32	–	H3	H2	.1437	.1475	.1465
8	–	36	H2	H1	.1460	.1496	.1487
10	24	–	H3	H3	.1629	.1672	.1661
10	–	32	H3	H2	.1697	.1736	.1726
12	24	–	H3	H3	.1889	.1933	.1922
12	–	28	H3	H3	.1928	.1970	.1959
1/4	20	–	H5	H3	.2175	.2223	.2211
1/4	–	28	H4	H3	.2268	.2311	.2300
5/16	18	–	H5	H3	.2764	.2817	.2803
5/16	–	24	H4	H3	.2854	.2902	.2890
3/8	16	–	H5	H3	.3344	.3401	.3387
3/8	–	24	H4	H3	.3479	.3528	.3516
7/16	14	–	H5	H3	.3911	.3972	.3957
7/16	–	20	H5	H3	.4050	.4104	.4091
1/2	13	–	H5	H3	.4500	.4565	.4548
1/2	–	20	H5	H3	.4675	.4731	.4717
9/16	12	–	H5	H3	.5084	.5152	.5135
9/16	–	18	H5	H3	.5264	.5323	.5308
5/8	11	–	H5	H3	.5660	.5732	.5714
5/8	–	18	H5	H3	.5889	.5949	.5934
3/4	10	–	H5	H5	.6850	.6927	.6907
3/4	–	16	H5	H3	.7094	.7159	.7143
7/8	9	–	H6	H4	.8028	.8110	.8089
7/8	–	14	H6	H4	.8286	.8356	.8339

The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.

TECHNICAL INFORMATION

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



GENERAL PURPOSE TAPS

TAP RECOMMENDATIONS FOR CLASSES 2B & 3B UNIFIED INCH SCREW THREADS

SIZE	THREADS PER INCH		RECOMMENDED TAP LIMITS		INTERNAL THREAD PITCH DIAMETER LIMITS		
	NC UC	NF UNF	CLASS 2B	CLASS 3B	MIN. ALL CLASSES (BASIC)	MAX CLASS 2B	MAX CLASS 3B
1	8	–	H6	H4	.9188	.9276	.9254
1	–	12	H6	H4	.9459	.9535	.9516
1	NS		H6	H4	.9536	.9609	.9590
1 1/8	7	–	H8	H4	1.0332	1.0416	.10393
1 1/8	–	12	H6	H4	1.0709	1.0787	.10768
1 1/4	7	–	H8	H4	1.1572	1.1668	1.1644
1 1/4	–	12	H6	H4	1.1959	1.2309	1.2019
1 3/8	6	–	H8	H4	1.2667	1.2771	1.2745
1 3/8	–	12	H6	H4	1.3209	1.3291	1.3270
1 1/2	6	–	H8	H4	1.3917	1.4022	1.3996
1 1/2	–	12	H6	H4	1.4459	1.4542	1.4522

TAP RECOMMENDATIONS FOR CLASS 6H METRIC SCREW THREADS

THREAD SIZE		RECOMMENDED TAP LIMIT NUMBER	INTERNAL THREAD - PRODUCT LIMITS - CLASS 6H			
NOMINAL DIA. (MM)	PITCH (MM)		PITCH DIAMETER (MM)		PITCH DIAMETER (MM)	
		MIN.	MAX.	MIN.	MAX.	
1.6	.35	D3	1.373	1.458	.05406	.05740
2	.4	D3	1.740	1.830	.06850	.07205
2.5	.45	D3	2.208	2.303	.08693	.09067
3	.5	D3	2.675	2.775	.10531	.10925
3.5	.6	D4	3.110	3.222	.12244	.12685
4	.7	D4	3.545	3.663	.13957	.14421
4.5	.75	D4	4.013	4.131	.15789	.16264
5	.8	D4	4.480	4.605	.17638	.18130
6	1	D5	5.350	5.500	.21063	.21654
7	1	D5	6.350	6.500	.25000	.25591
8	1.25	D5	7.188	7.348	.28299	.28929
10	1.5	D6	9.026	9.206	.35935	.36244
12	1.75	D6	10.863	11.063	.42758	.43555
14	2	D7	12.701	12.913	.50004	.50839
16	2	D7	14.701	14.913	.57878	.58713
20	2.5	D7	18.376	18.600	.72346	.73228
24	3	D8	22.051	22.316	.86815	.87858
30	3.5	D9	27.727	28.007	1.09161	1.10264
36	4	D9	33.402	33.702	1.31504	1.32685

TECHNICAL INFORMATION



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

TECHNICAL INFORMATION

THREAD FORMING TAPS

PRE TAP HOLE SIZE				
TAP SIZE	TPI	75% THREAD	65% THREAD	NEAREST DRILL SIZE
0	80	0.054	0.055	#54 or 1.4 mm
1	64	0.066	0.067	#51 or 1.7 mm
1	72	0.067	0.068	#51 or 1.75 mm
2	56	0.078	0.079	#47 or 2.0 mm
2	64	0.079	0.080	2.0 mm
3	48	0.090	0.091	2.3 mm
3	56	0.091	0.092	2.3 mm
4	40	0.100	0.101	#39
4	48	0.103	0.104	#37
5	40	0.113	0.114	#33 or 2.9 mm
5	44	0.114	0.115	#33 or 2.9 mm
6	32	0.124	0.125	3.1 mm
6	40	0.126	0.127	1/8" or 3.2 mm
8	32	0.149	0.150	#25 or 3.8 mm
8	36	0.151	0.152	#24
10	24	0.170	0.172	11/64"
10	32	0.175	0.176	#16 or .176"
12	24	0.196	0.198	#9 or 5.0 mm
12	28	0.199	0.201	#7 or 5.1 mm
1/4	20	0.225	0.227	5.75 mm
1/4	28	0.233	0.235	"A"
5/16	18	0.285	0.287	7.25 mm
5/16	24	0.292	0.294	.293"
3/8	16	0.344	0.347	"S" or 11/32"
3/8	24	0.355	0.357	9.0 mm
7/16	14	0.402	0.405	"Y"
7/16	20	0.414	0.416	"Z" or 10.5 mm
1/2	13	0.462	0.466	.463"

PRE TAP HOLE SIZE - METRIC				
TAP SIZE	PITCH	75% THREAD	65% THREAD	NEAREST DRILL SIZE
M1.6	0.35	0.057	0.058	1.45 mm
M1.7	0.35	0.061	0.062	1.55 mm
M2	0.4	0.072	0.073	1.85 mm
M2.5	0.45	0.091	0.092	2.30 mm
M3	0.5	0.110	0.111	#35
M3.5	0.6	0.128	0.129	#30
M4	0.7	0.145	0.146	3.70 mm
M5	0.8	0.183	0.184	#14
M6	1	0.218	0.220	5.50 mm
M8	1.25	0.291	0.294	7.40 mm
M10	1.5	0.365	0.368	9.30 mm
M12	1.75	0.439	0.442	7/16"

WHERE TO USE THREAD FORMING TAPS

Materials particularly well suited for thread forming include aluminum, brass, copper, lead, stainless steel, carbon steel, cast steel, leaded steel and zinc. In general, any material which produces a stringy chip is a good candidate for cold forming threads. If the chips are powdery, the material may be too brittle. Forming taps generate threads without producing chips. The threads produced are much stronger than those created by cut taps because of the displacements of the grain of the metal in the workpiece. Cutting taps produce chips which may interfere with the tapping process.

MAJOR ADVANTAGES TO THREAD FORMING

- Chipless Tapping – no chip removal problems in blind holes.
- Stronger Threads – the grain flow of formed threads follows the contour of the thread in steel and stainless steel, resulting in greater thread strength.
- Better Thread Gaging – forming taps create their own lead therefore the possibility of producing oversized threads is greatly reduced.
- Stronger Taps – the absence for the need for flutes results in a stronger more solid tap.
- Longer Tap Life – forming taps last 3 to 20 times longer because they have no cutting edge to dull.
- More Efficient Production – longer tap life, less tap breakage and faster tapping speeds (up to 2X faster than cutting taps).
- Ideal for Non-Lead Screw Tappers – the ability to form their own lead makes forming taps well suited for NC machines or other machines without lead screws.



THREAD FORMING TAPS

SPEED CHART FOR THREAD FORMING TAPS

MATERIAL / TYPE	HARDNESS		FORMING SPEED (fpm)
	Bhn	Rc	
ALUMINUM ALLOYS			
UNALLOYED - 1000 SERIES	-	-	80
CAST - 360, A380	-	-	60
WROUGHT - 2000-7000 SERIES	-	-	80
BRASS			
HIGH-LEADED, FREE CUTTING - C34000, C36000	-	-	60
NAVAL, RED - C46400-C46700, C23000	-	-	60
NICKEL ALLOYS			
NICKEL BASE ALLOY, WROUGHT & CAST - NICKEL 200, MONEL ALLOY 400	< 253	< 25	15
STEEL			
LOW CARBON - 1010, 1018, 1029, 1513, 1522	< 190	< 10	55
MEDIUM CARBON - 1030, 1040, 1045, 1050	< 208	< 15	35
HIGH CARBON - 1050, 1070, 1080, 1090, 1561, 1572	< 253	< 25	15
STAINLESS STEEL			
AUSTENITIC - SAE (300 SERIES)	< 253	< 25	20
MARTENSITIC & FERRITIC - 400 SERIES, 416, 420F, 446	253 - 301	25 - 32	15
TITANIUM ALLOYS			
ALPHA & ALPHA-BETA ALLOYS ANNEALED - Ti-6Al-4V	253 - 301	25 - 32	10
TOOL STEEL			
HOT WORK, COLD WORK & MOLD - A2, D2, H10, H14, P2, P13	190 - 253	10 - 25	20

CALCULATING TAP DRILL SIZES - THREAD FORMING TAPS

$$\text{DRILL SIZE} = \text{MAJOR DIAMETER} - [(0.0068 \times \text{desired \% of thread}) \div \text{Threads Per Inch}]$$

$$\text{DRILL SIZE (mm)} = \text{MAJOR DIAMETER} - [(0.0068 \times \text{desired \% of thread} \times \text{Pitch (mm)})]$$

GUIDELINES FOR USING THREAD FORMING TAPS

PRE-TAP HOLE SIZE - Thread Forming taps require a larger pre-tap hole size than a cutting tap. Tapping with too small of a pre-tap hole size results in excessive tap wear, torque and possible tap breakage.

LUBRICATION - Thread Forming Taps require good lubrication. Cutting oils are generally preferred because of their lubricity compared to water soluble coolants.



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

DRILLS - HIGH SPEED STEEL & M42 COBALT

ELEMENT & DIMENSIONAL DRILL TOLERANCES

DIAMETER AT POINT

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	+0.000 TO -0.005
OVER 1/8 TO 1/4	+0.000 TO -0.007
OVER 1/4 TO 1/2	+0.000 TO -0.010
OVER 1/2 TO 1	+0.000 TO -0.012
OVER 1 TO 2	+0.000 TO -0.015
OVER 2 TO 3-1/2	+0.000 TO -0.020

SHANK DIAMETER

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	-0.000 TO -0.025
OVER 1/8 TO 1/4	-0.005 TO -0.030
OVER 1/4 TO 1/2	-0.005 TO -0.045
OVER 1/2 TO 2	-0.005 TO -0.030

BACK TAPER

SIZE (INCLUSIVE)	TOLERANCE PER INCH
OVER #81 TO 1/8	.0000 TO .0008
OVER 1/8 TO 1/4	.0002 TO .0008
OVER 1/4 TO 1/2	.0002 TO .0009
OVER 1/2 TO 1	.0003 TO .0011
OVER 1 TO 3-1/2	.0004 TO .0015

FLUTE LENGTH

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	+1/8 TO -1/16
OVER 1/8 TO 1/2	+1/8 TO -1/8
OVER 1/2 TO 1	+1/4 TO -1/8
OVER 1 TO 2	+1/4 TO -1/4
OVER 2 TO 3-1/2	+3/8 TO -3/8

OVERALL LENGTH

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	+1/8 TO -1/16
OVER 1/8 TO 1/2	+1/8 TO -1/8
OVER 1/2 TO 1	+1/4 TO -1/8
OVER 1 TO 2	+1/4 TO -1/4
OVER 2 TO 3-1/2	+3/8 TO -3/8

INCLUDED POINT ANGLE

SIZE (INCLUSIVE)	INCLUDED ANGLE	TOLERANCE
1/16 TO 1/2	118°	±5°
OVER 1/2 TO 1-1/2	118°	±3°
OVER 1-1/2 TO 3-1/2	118°	±2°

LIP HEIGHT

SIZE (INCLUSIVE)	TIV (TOTAL INDICATOR VARIATION)
1/16 TO 1/8	.0020
OVER 1/8 TO 1/4	.0030
OVER 1/4 TO 1/2	.0040
OVER 1/2 TO 1	.0050
OVER 1 TO 3-1/2	.0060

NOTE: 95% of drills in any one lot to fall within tolerances above.

SUGGESTED METHOD OF MEASUREMENT:

1. Rotate the drill in a vee block against a back end stop.
2. Measure the cutting lip height variation on a comparator, or with an indicator set at allocation approximately 75% of the distance from the center to the periphery of the drill.

CENTRALITY OF WEB

SIZE (INCLUSIVE)	TIV (TOTAL INDICATOR VARIATION)
1/16 TO 1/8	.0030
OVER 1/8 TO 1/4	.0040
OVER 1/4 TO 1/2	.0050
OVER 1/2 TO 1	.0070
OVER 1 TO 3-1/2	.0100

NOTE: 95% of drills in any one lot to fall within tolerances above.

SUGGESTED METHOD OF MEASUREMENT:

1. Rotate the drill in a close fitting bushing.
2. Record the difference in indicator readings of the web at the point as the drill is indexed 180°.

FLUTE SPACING

SIZE (INCLUSIVE)	TOLERANCE (TIV)	ACTUAL DEVIATION
1/16 TO 1/8	.0030	.0015
OVER 1/8 TO 1/4	.0060	.0030
OVER 1/4 TO 1/2	.0100	.0050
OVER 1/2 TO 1	.0140	.0070
OVER 1 TO 3-1/2	.0260	.0130

NOTE: 95% of drills in any one lot to fall within tolerances above.

SUGGESTED METHOD OF MEASUREMENT:

1. Place the drill in a vee block against a back end stop, and rotate it against a radial finger stop.
2. Take an indicator reading at the leading edge of the margin on the opposite flute.
3. Repeat for the other flute and note the difference between the two readings.
4. The deviation in flute spacing is equal to one-half the difference between the two readings.

Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



DRILLS - HIGH SPEED STEEL & M42 COBALT

ALTiN COATED INCREASE SFM BY 40%

SFM & I.P.T. (INCH PER TOOTH)

MATERIAL / TYPE	SFM			FEED in INCHES PER REVOLUTION (IPR) +/-25%									
	GENERAL PURPOSE	HSS HEAVY DUTY	COBALT	1/32"	3/32"	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	9/16"
STEEL													
12L14, 12L15	115	115	115	.0008-.0009	.0026-.0033	.0040-.0053	.0046-.0060	.0051-.0067	.0059-.0078	.0075-.0098	.009-.0117	.0096-.0124	.0107-.0137
1005-1025, 1214, 1215, A36	98	98	98	0.0008	0.0026	0.004	0.0046	0.0051	0.0059	0.0075	0.009	0.0096	0.0107
1000'S, 1100'S	82	89	89	0.0007	.0020-.0022	.0029-.0033	.0033-.0038	.0037-.0043	.0043-.0050	.0054-.0063	.0065-.0075	.0070-.0081	.0080-.0091
4140, 4340, 52100, 8620, H11-H41, A2, D2, 01, P20, 420	30-66	33-79	33-79	.0006-.0007	.0015-.0020	.0021-.0029	.0024-.0033	.0027-.0037	.0031-.0043	.0039-.0054	.0047-.0065	.0051-.0070	.0059-.0080
STAINLESS STEEL													
200, 303, 416, 440	49	72	72	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068
300 SERIES	26	36	36	0.0007	0.0022	0.0033	0.0038	0.0043	0.005	0.0063	0.0075	0.0081	0.0091
318-329, 400-446, DUPLEX	30	49	49	0.0006	0.0013	0.0017	0.002	0.0022	0.0025	0.0031	0.0039	0.0043	0.0049
CAST IRON													
GREY, G10, Gg40, J431C, A48 CLASS 20	79-98	92-115	92-115	.0006-.0008	.0013-.0026	.0021-.0040	.0024-.0046	.0027-.0051	.0031-.0059	.0039-.0075	.0047-.009	.0051-.0096	.0059-.0107
A220, A436, A439, A602, BLACK	66	72	72	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068
BLACK Gts/Gtw, J434C	46	56	56	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068
TITANIUM													
COMMERCIALLY PURE	75	92	92	0.0007	.0017-.0020	.0024-.0029	.0028-.0033	.0031-.0037	.0037-.0043	.0045-.0054	.0055-.0065	.0059-.0070	.0068-.0080
6Al4V, 6A14V-2SnMonel, Monel K	20-39	36-66	36-66	0.0006	.0011-.0015	.0015-.0021	.0016-.0024	.0018-.0027	.0021-.0031	.0026-.0039	.0031-.0047	.0035-.0051	.0041-.0059
NICKEL													
COMMERCIALLY PURE, 17644, 200, 5553	33	49	49	0.0007	0.0022	0.0033	0.0038	0.0043	0.005	0.0063	0.0075	0.0081	0.0091
Monel 400, Hastelloy C, Inconel 625, Waspalloy	20	23	23	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068
Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286	10	20	20	.0004-.0006	.0009-.0011	.0011-.0015	.0013-.0016	.0014-.0018	.0017-.0021	.0021-.0026	.0024-.0031	.0027-.0035	.0032-.0041
COPPER													
COMMERCIALLY PURE	108	125	125	.0007-.0008	.0022-.0026	.0033-.0040	.0038-.0046	.0043-.0051	.0050-.0059	.0063-.0075	.0075-.0090	.0081-.0096	.0091-.0107
BRASS, BRONZE 314-340, 350-370	115	131	131	.0007-.0008	.0020-.0030	.0029-.0047	.0033-.0053	.0037-.0059	.0043-.0068	.0054-.0087	.0065-.0104	.0070-.0110	.008-.0122
BRASS ALLOYED Cu+Al+Fe, LONG CHIPPING	89	89	89	0.0008	0.0026	0.004	0.0046	0.0051	0.0059	0.0075	0.009	0.0096	0.0107
High Strength Bronze	52	69	69	0.0007	.0020-.0022	.0029-.0033	.0033-.0038	.0037-.0043	.0043-.0050	.0054-.0063	.0065-.0075	.0070-.0081	.0080-.0091
ALUMINUM, MAGNESIUM													
Commercially Pure	108	108	108	0.0009	0.0033	0.0053	0.006	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137
6061, T6	89-98	98	98	.0007-.0009	.0022-.0033	.0033-.0053	.0038-.0060	.0043-.0067	.0050-.0078	.0063-.0098	.0075-.0117	.0081-.0124	.0091-.0137
SYNTHETIC MATERIALS													
Thermoplastics	98	-	-	0.0009	0.0033	0.0053	0.006	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137
Thermosetting Plastics	92	-	-	0.0008	0.0026	0.004	0.0046	0.0051	0.0059	0.0075	0.009	0.0096	0.0107
Reinforced Plastic Material	46	-	-	0.0007	0.002	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.007	0.008

TECHNICAL INFORMATION



Technical Information

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS

TECHNICAL INFORMATION

REAMERS - CARBIDE

CARBIDE REAMERS - SFM & I.P.T. (INCH PER TOOTH)

MATERIAL	SFM	FEED (IPR)
ALUMINUM / ALUMINUM ALLOYS	100 - 250	.005 - .015
ALUMINUM - HIGH SILICON	80 - 200	.003 - .012
BRASS	100 - 250	.005 - .015
BRONZE	90 - 175	.003 - .012
COPPER / COPPER ALLOYS	90 - 220	.005 - .015
CAST IRON - SOFT	80 - 200	.006 - .015
CAST IRON - MEDIUM	60 - 150	.006 - .012
CAST IRON - HARD	40 - 90	.004 - .010
MAGNESIUM	100 - 250	.005 - .015
MONEL	40 - 120	.004 - .012
STEEL - CAST & FORGED	40 - 100	.003 - .010
STEEL - HEAT TREATED (35-40 Rc)	40 - 70	.004 - .008
STEEL - HEAT TREATED (40-45 Rc)	30 - 50	.002 - .006
STEEL - HEAT TREATED (45+ Rc)	15 - 40	.001 - .004

MATERIAL	SFM	FEED (IPR)
STEEL - MEDIUM CARBON	50 - 100	.005 - .010
MOLD STEEL	40 - 120	.004 - .006
TOOL STEEL	30 - 90	.004 - .006
STAINLESS STEEL - 300 SERIES	20 - 80	.004 - .008
STAINLESS STEEL - 400 SERIES	30 - 120	.005 - .010
INCONEL	20 - 60	.001 - .005
RENE	20 - 60	.002 - .006
TITANIUM	30 - 90	.002 - .008
WASPOLOY	20 - 60	.002 - .006
EPOXY FIBER	100 - 250	.005 - .015
PLASTIC	100 - 300	.005 - .015
RESIN - FIBER GLASS	100 - 300	.005 - .015
MASONITE	60 - 150	.005 - .015
PHENOLIC	60 - 100	.005 - .015

REAMERS - HIGH SPEED STEEL

RECOMMENDED SPEEDS

MATERIAL	SFM
STEEL - ALL TYPES	
60+ Rc	8 - 12
50 - 60 Rc	15 - 30
40 - 50 Rc	20 - 40
30 - 40 Rc	35 - 65
Less than 30 Rc	60 - 90
CAST IRON & MALLEABLE IRON	50 - 85
NON-FERROUS	
ALUMINUM, BRASS, BRONZE, COPPER	90 - 175
FIBER, PLASTIC, HARD RUBBER, etc.	90 - 175

Work piece hardness and machinability must be considered when setting machine speed. The feed rate plays an important part in the life expectancy of a tool and the hole finish which one is looking to attain. Improper feed rate can cause excessive tool wear as well as an inadequate hole finish.

To eliminate chatter, slow cutting speed and increase feed appropriately. Stock removal on roughing operations should not exceed 2 to 4 percent of tool diameter in most cases. Stock removal recommendations on finishing operations are .002 to .004.

For best results with brass, cast iron and some plastics, use a Left-Hand Spiral-Fluted reamer with negative shear action. This type of reamer helps prevent chips from working back into the flutes and scoring the hole. In all reaming operations, use constant-flow coolants. Soluble oil is effective for most metals; however, sulphur-based oils are recommended for stainless and certain alloy steels. Lard oil and kerosene improve the finish on aluminum.

RECOMMENDED FEEDS

MATERIAL	FEED (IPR)
STEEL - ALL TYPES	
50+ Rc	.002 - .004
30 - 50 Rc	.004 - .008
CAST IRON & MALLEABLE IRON	.005 - .012
NON-FERROUS	
ALUMINUM, BRASS, BRONZE, COPPER	.005 - .012
FIBER, PLASTIC, HARD RUBBER, etc.	.005 - .012

RECOMMENDED STOCK REMOVAL

REAMER DIAMETER	REMOVAL (Inches)
Up to 1/16" incl.	.003 - .005
Over 1/16" to 1/8" incl.	.004 - .008
Over 1/8" to 1/4" incl.	.006 - .012
Over 1/4" to 3/8" incl.	.008 - .014
Over 3/8" to 1/2" incl.	.010 - .015
Over 1/2" to 3/4" incl.	.012 - .018

RECOMMENDED LUBRICANTS

MATERIAL	LUBRICANT
Steel harder than 50 Rc	Light Oil
Steel softer than 50 Rc	Light Oil for good finishes or Soluable Oil and Water
Cast Iron & Malleable Iron	Soluable Oil and Water
Non-Ferrous Materials	Soluable Oil and Water

Decimal Equivalent Chart

PREMIUM QUALITY AMERICAN MADE CUTTING TOOLS



DECIMAL EQUIVALENTS & TAP DRILL SIZES

DRILL SIZE	DECIMAL INCHES	DRILL SIZE	DECIMAL INCHES	TAP SIZE	DRILL SIZE	DECIMAL INCHES	TAP SIZE	DRILL SIZE	DECIMAL INCHES	TAP SIZE	DRILL SIZE	DECIMAL INCHES	TAP SIZE
.97	.0059	58	.0420		27	.1440		H	.2660		17/32	.5312	5/8-11
.15mm	.0059	57	.0430		3.7mm	.1457		6.8mm	.2677		13.5mm	.5315	
.96	.0063	1.1mm	.0433		26	.1470	3/16-24NS	6.9mm	.2717		35/64	.5469	
.16mm	.0063	1.15mm	.0453		3.75mm	.1476	m4.5x0.75	I	.2720	5/16-24NF	14mm	.5512	m16x2
.95	.0067	56	.0465		25	.1495	#10-24	7mm	.2756	m8x1	9/16	.5625	3/8-18NPT
.17mm	.0067	3/64	.0469	#0-80	3.8mm	.1496		J	.2770		14.5mm	.5709	m16x1.5
.94	.0071	1.2mm	.0472		24	.1520		7.1mm	.2795		37/64	.5781	5/8-18NF
.18mm	.0071	1.25mm	.0492	m1.6x0.35	3.9mm	.1535		K	.2810		15mm	.5906	
.93	.0075	1.3mm	.0512		23	.1540		9/32	.2812	5/16-32NS	19/32	.5938	3/8-18 NPS PIPE
.19mm	.0075	55	.0520		5/32	.1562		7.2mm	.2835		39/64	.6094	
.92	.0079	1.35mm	.0531		22	.1570	3/16-32NS	7.25mm	.2854		15.5mm	.6102	m18x2.5
.2mm	.0079	54	.0550		4mm	.1575		7.3mm	.2874		5/8	.6250	11/16-16NS
.91	.0083	1.4mm	.0551		21	.1590	#10-32	L	.2900		16mm	.6299	m18x2.0
.21mm	.0083	1.45mm	.0571	m1.8x0.35	20	.1610		7.4mm	.2913		41/64	.6406	
.90	.0087	1.5mm	.0591		4.1mm	.1614		M	.2950		16.5mm	.6496	
.22mm	.0087	53	.0595	#1-64,72	4.2mm	.1654	m5x0.8	7.5mm	.2953		21/32	.6562	3/4-10NC
.89	.0091	1.55mm	.0610		19	.1660		19/64	.2969		17mm	.6693	
.23mm	.0091	1/16	.0625		4.25mm	.1673		7.6mm	.2992		43/64	.6719	
.24mm	.0094	1.6mm	.0630	m2x0.4	4.3mm	.1693		N	.3020		11/16	.6875	3/4-16NF
.88	.0095	52	.0635		18	.1695		7.7mm	.3031		17.5mm	.6890	m20x2.5
.25mm	.0098	1.65mm	.0650		11/64	.1719		7.75mm	.3051	m9x1.25	45/64	.7031	1/2-14NPT PIPE
.87	.0100	1.7mm	.0669		17	.1730		7.8mm	.3071		18mm	.7087	m20x2.0
.26mm	.0102	51	.0670	#2-56	4.4mm	.1732		7.9mm	.3110		23/32	.7188	
.86	.0105	1.75mm	.0689	m2.2x0.45	16	.1770	#12-24	5/16	.3125	3/8-16NC	18.5mm	.7283	m20x1.5
.27mm	.0106	50	.0700	#2-64	4.5mm	.1772		8mm	.3150		47/64	.7344	1/2-14NPS PIPE
.85	.0110	1.8mm	.0709		15	.1800		O	.3160		19mm	.7480	
.28mm	.0110	1.85mm	.0728		4.6mm	.1811		8.1mm	.3189		3/4	.7500	
.29mm	.0114	49	.0730		14	.1820	#12-28	8.2mm	.3228		49/64	.7656	7/8-9NC
.84	.0115	1.9mm	.0748	m2.3x.04	13	.1850		P	.3230		19.5mm	.7677	m22x2.5
.3mm	.0118	48	.0760		4.7mm	.1850		8.25mm	.3248		25/32	.7812	
.83	.0120	1.95mm	.0768		4.75mm	.1870		8.3mm	.3268		20mm	.7874	m22x2.0
.82	.0125	5/64	.0781		3/16	.1875		21/64	.3281		51/64	.7969	
.32mm	.0126	47	.0785	#3-48	4.8mm	.1890		8.4mm	.3307		20.5mm	.8071	m22x1.5
.81	.0130	2mm	.0787		12	.1890	7/32-32NS	Q	.3320	1/8-27NPT PIPE 3/8-24NF	13/16	.8125	7/8-14NF
.34mm	.0134	2.05mm	.0807	m2.5x0.45	11	.1910		8.5mm	.3346	m10x1.5	21mm	.8268	m24x3
.80	.0135	46	.0810		4.9mm	.1929		8.6mm	.3386		53/64	.8281	
.35mm	.0138	45	.0820	#3-56	10	.1935		R	.3390		27/32	.8438	
.36mm	.0142	2.1mm	.0827		9	.1960		8.7mm	.3425		21.5mm	.8465	
.79	.0145	2.15mm	.0846	m2.6x0.45	5mm	.1969	m6x1	11/32	.3438		55/64	.8594	
.38mm	.0150	44	.0860	#4-36	8	.1990		8.75mm	.3445	m10x1.25	22mm	.8661	m24x2
1/64	.0156	2.2mm	.0866		5.1mm	.2008		8.8mm	.3465		7/8	.8750	1-8NC
.4mm	.0157	2.25mm	.0886		7	.2010	1/4-20	S	.3480	1/8-27NPS PIPE	22.25mm	.8760	
.78	.0160	43	.0890	#4-40	13/64	.2031		8.9mm	.3504		22.5mm	.8858	m24x1.50
.42mm	.0165	2.3mm	.0906		6	.2040		9mm	.3543	m10x1.00	57/64	.8906	
.44mm	.0173	2.35mm	.0925		5.2mm	.2047		T	.3580		23mm	.9055	
.45mm	.0177	42	.0935	#4-48	5	.2055		9.1mm	.3583		29/32	.9062	3/4-14NPT PIPE
.77	.0180	3/32	.0938		5.25mm	.2067	m6x0.75	23/64	.3594		59/64	.9219	
.46mm	.0181	2.4mm	.0945		5.3mm	.2087		9.2mm	.3622		23.5mm	.9252	
.48mm	.0189	41	.0960		4	.2090	1/4-24	9.25mm	.3642		15/16	.9375	3/4-14 NPS 1-14 NF
.5mm	.0197	2.45mm	.0965		5.4mm	.2126		9.3mm	.3661		24mm	.9449	m27x3
.76	.0200	40	.0980		3	.2130	1/4-28	U	.3680	7/16-14NC	61/64	.9531	
.75	.0210	2.5mm	.0984	m3x0.5	5.5mm	.2165		9.4mm	.3701		24.5mm	.9646	
.55mm	.0217	39	.0995		7/32	.2188		9.5mm	.3740	m11x1.50	31/32	.9688	
.74	.0225	38	.1015	#5-40	5.6mm	.2205		3/8	.3750		25mm	.9843	m27x2
.6mm	.0236	2.6mm	.1024		2	.2210		V	.3770		63/64	.9844	1-1/8-7NC
.73	.0240	37	.1040	#5-44	5.7mm	.2244		9.6mm	.3780		1	1.0000	
.72	.0250	2.7mm	.1063		5.75mm	.2264		9.7mm	.3819		25.5mm	1.0039	
.65mm	.0256	36	.1065	#6-32	1	.2280		9.75mm	.3839		1-1/64	1.0156	
.71	.0260	2.75mm	.1083		5.8mm	.2283		9.8mm	.3858		26mm	1.0236	
.7mm	.0276	7/64	.1094		5.9mm	.2323		W	.3860		1-1/32	1.0312	
.70	.0280	35	.1100		A	.2340		9.9mm	.3898		26.5mm	1.0433	m30x3.5
.69	.0292	2.8mm	.1102		15/64	.2344		25/64	.3906	7/16-20	1-3/64	1.0469	1-1/8-12NF
.75mm	.0295	34	.1110		6mm	.2362	m7x1	10mm	.3937	m12x1.75	1-1/16	1.0625	
.68	.0310	33	.1130	#6-40	B	.2380		X	.3970		27mm	1.0630	
1/32	.0312	2.9mm	.1142	m3.5x0.6	6.1mm	.2402		Y	.4040		1-5/64	1.0781	
.8mm	.0315	32	.1160		C	.2420	1/16-27 NPT PIPE	13/32	.4062		27.5mm	1.0827	
.67	.0320	3mm	.1181		6.2mm	.2441		Z	.4130		1-3/32	1.0938	
.66	.0330	31	.1200		D	.2460		10.5mm	.4134	m12x1.25	28mm	1.1024	m30x2.0
.85mm	.0335	3.1mm	.1220		6.25mm	.2461		27/64	.4219	1/2-13	1-7/64	1.1094	1-1/4-7NC
.65	.0350	1/8	.1250	5/32-32NS	6.3mm	.2480		11mm	.4331		28.5mm	1.1220	
.9mm	.0354	3.2mm	.1260		E	.2500	1/16-27 NPS PIPE	7/16	.4375	1/4-18 NPT PIPE	1-1/8	1.1250	
.64	.0360	3.25mm	.1280		1/4	.2500		11.5mm	.4528		1-9/64	1.1406	
.63	.0370	30	.1285	5/32-36NS	6.4mm	.2520		29/64	.4531	1/4-18 NPT 1/2-20	29mm	1.1417	
.95mm	.0374	3.3mm	.1299	m4x0.70	6.5mm	.2559		15/32	.4688		1-5/32	1.1562	1-11/42NPT PIPE
.62	.0380	3.4mm	.1339		F	.2570	5/16-18NC	12mm	.4724	m14x2	29.5mm	1.1614	
.61	.0390	29	.1360	#8-32	6.6mm	.2598		31/64	.4844	9/16-12	1-11/64	1.1719	1-1/4-12NF
1mm	.0394	3.5mm	.1378		G	.2610		12.5mm	.4921	m14x1.5			
.60	.0400	28	.1405		6.7mm	.2638		1/2	.5000				
.59	.0410	9/64	.1406		17/64	.2656		13mm	.5118	m14x1.25			
1.05mm	.0413	3.6mm	.1417		6.75mm	.2657	m8x1.25	33/64	.5156	9/16-18			

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